

THE MAKERS OF SURVEYING
INSTRUMENTS IN AMERICA
SINCE 1700



THE MAKERS OF SURVEYING
INSTRUMENTS IN AMERICA
SINCE 1700

By
CHARLES E. SMART
Chairman of the Board of Directors
W. & L. E. Gurley
Troy, N. Y.

REGAL ART PRESS
Troy, New York
1962

THE MAKERS OF NINETEENTH
CENTURY AMERICA
SINCE 1800

© Charles E. Smart 1962

Library of Congress Catalog Card Number 62-21911

TO MY FAMILY

FOREWORD

In the summer of 1958 searching in the old Gurley Record Room for the record of a transit made in 1876, I chanced upon the date Jan. 1, 1860 in an old order journal partly burned in the fire of 1862. Looking further I found "Order Book - Jan. 1, 1860 to December 29, 1866" with the following note facing page one - "Orders in this book from January 1, 1860 to May 10 1862 are transferred from the Order Book which was partly damaged in our safe at the Great Fire of May 10, 1862."

The first entry for other than Gurley instruments, either new or to be repaired was :

"Orders February and March 1861
Prof. C. H. Churchill, Oberlin, Ohio. Sends
English theodolite to be repaired."

Another item -

"Orders March and April 1861 -
1 Meneely Compass to be repaired and as good as New."

As more and more names appeared, we asked ourselves, "Who were our early competitors? How early were such instruments made in the United States? Who made them?" Trying to find answers to these questions, I started a search for surveying instruments not made by W. & L. E. Gurley, but sent to us for repair or resale. What started as a hobby turned into serious research - a rewarding experience which has resulted in finding over three hundred men who either made, or were associated in the manufacture of, surveying instruments in America since 1700. Many of these names were found in the Gurley records.

To augment the collection of facts and figures, I sent on June 1, 1959 a questionnaire to 135 Historical Societies requesting information concerning surveyors' instruments in their possession. Eighty-five answers were received adding new names to the already growing Gurley list. After four years of intensive research, new names appear almost weekly, so I realize that this list is still not complete; additional information and corrections from readers of this edition will be more than welcome.

Many have helped in this work, - the first to be mentioned is Brig. Gen. Lester C. Higbee, a friend and business associate of many years, whose encouragement and counsel, together with his copious notes collected over many years concerning these craftsmen, is gratefully acknowledged.

Voluminous correspondence with William A. Berger, together with letters from his brother, Louis H. Berger, has added much information to this research.

Gratitude should also be expressed to Dr. Robert P. Multhauf and Mr. Silvio A. Bedini of the Smithsonian Institution, Mr. Franklin G. Williams and Mrs. Virginia M. Wolfe, all of Washington, D. C.; Mr. Penrose R. Hoopes and Mr. B. Hoff Knight of Philadelphia; Dr. Thomas D. Cope of Wayne, Pennsylvania; Mr. M. V. Brewington, Assistant Director East India Marine Hall, Peabody Museum, Salem, Massachusetts. Mr. Donald A. Hutslar, Assistant Curator of History, The Ohio Historical Society, The Ohio State Museum, Columbus, Ohio. Mr. James R. Case of Bethel, Connecticut and Mr. Leonard C. Johnson formerly of the Henry Ford Museum of Dearborn, Michigan, now Director of the Mercer Museum and Bucks County Historical Society, Doylestown, Pennsylvania. Also four members of the W. & L. E. Gurley staff, Mr. Ralph D. Geiser, Research Photographer, Mr. Daniel H. Harkness, Sales Manager, Engineering Instruments and two secretaries, Miss Cora M. LeBarron and Mrs. Mary Kobylar, who have so ably assisted me in my correspondence.

It is interesting to note that a number of clock makers of the Eighteenth Century turned their talents to making surveying instruments.

It is from the following three books that more names have been added that were not recorded elsewhere to whose authors I wish to acknowledge my indebtedness.

Connecticut Clock Makers of the Eighteenth Century.

Penrose R. Hoopes

Book of American Clocks.

Brooks Palmer

Six Quaker Clock Makers.

Edward E. Chandlee.

Troy, New York
November 19, 1962

Charles E. Smart

ACKNOWLEDGEMENTS

In addition to those listed on pages iii and iv, I especially wish to acknowledge the helpful and invaluable information that has been received from the following:

James deT. Abajian	Willard L. Egy
Charles J. Afflick	Arthur H. Frazier
Philip Allen	Georgia Gambrill
Mr. & Mrs. W. G. Armstrong	Joseph R. Garrett
James M. Babcock	Captain Roger G. Gerry
Elizabeth Baughman	Leo R. Green
Paul L. Berry	Jeanette S. Grimm
Prof. Ralph M. Berry	Per E. Guldeck
Ethel A. Bingham	Colonel Edward P. Hamilton
Eugenia Blackburn	Frederick L. Hanks
Helen P. Bolman	Colonel Stedman S. Hanks
Margaret M. Bridwell	Dr. James J. Heslin
George R. Brooks	Gertrude D. Hess
Carl R. Bryant	Bradford D. Hill
Constance C. Burke	Robert W. Hill
E. Milby Burton	Brooke Hindle
Harriet R. Cabot	Dr. Rudolph Hirsch
Dolores Cadell	Edna Huntington
Gertrude Cahalan	William F. Jackson, Jr.
Dr. Marvin R. Cain	James Katsaros
Gilbert A. Cam	James A. Kelley
C. R. Carter	Lewis B. Kerberg
Edward J. Cole	Helen R. Kline
Frances Coleman	Marvin F. Kivett
Francis W. Cunningham	Dr. Eugene F. Kramer
William J. Dale	Robert H. Land
Florence L. Dawley	Helen M. Leadbeater
Marie Dickore	Harry E. Lichter
Dodge & Sons	Jeanne C. Lewis
Rev. Cornelius Dykhuizen	Elizabeth C. Litsinger
L. C. Eichner	Robert M. Lunny
James McGurrian	Sam Shearer, Jr.
Dr. R. Gerald McMurry	Clifford K. Shipton
Arthur J. McNair	Elizabeth H. Sias
Ridgway McNallie	Effie C. Smart
Allan R. Ottley	Isabell H. Smart
Amelia Peabody	Edouard A. Stackpole

Mrs. Paul Peddie
 Jean B. Pinney
 Harry F. Prandoni
 Elizabeth Putnam
 F. Garner Ranney
 Prof Paul P. Rice
 Alice Hester Rich
 Arthur E. Roby
 Josephine W. Sale
 Robert C. Sale
 Elaine Sawyer
 Myron T. Seifert

Dr. David F. R. Steuart
 Mason Tolman
 Louise W. Turpin
 William L. Warren
 J. Wartnaby
 Marjorie F. Waterman
 Colonel Willard Webb
 Gladys H. Webster
 R. N. Williams, 2nd
 Richard N. Wright
 Alfred C. Young
 Joseph B. Zyurcki

Note: There is in parenthesis following the name of each person or firm described on the following pages (where known) the year of the birth and death of the individual or in case of a company the year of the founding and the year that it ceased to exist. However, if the individual or firm is continuing in business in 1962, the founding date is followed by the letter C. For example, Wm. Ainsworth and Sons, Inc., was incorporated in 1905 and continues to be in business in 1962. Hence, WM. AINSWORTH & SONS, INC. (1905 - C)

THEODOLITE

Theodolites have generally been divided into two classes: Direction and Repeating

In the older types of theodolites the telescope was usually of extra length and higher magnification and did not transit through the standards. In the modern type of theodolite, the telescope is made shorter and the standards made higher so that the telescope will revolve a complete 360 degrees.

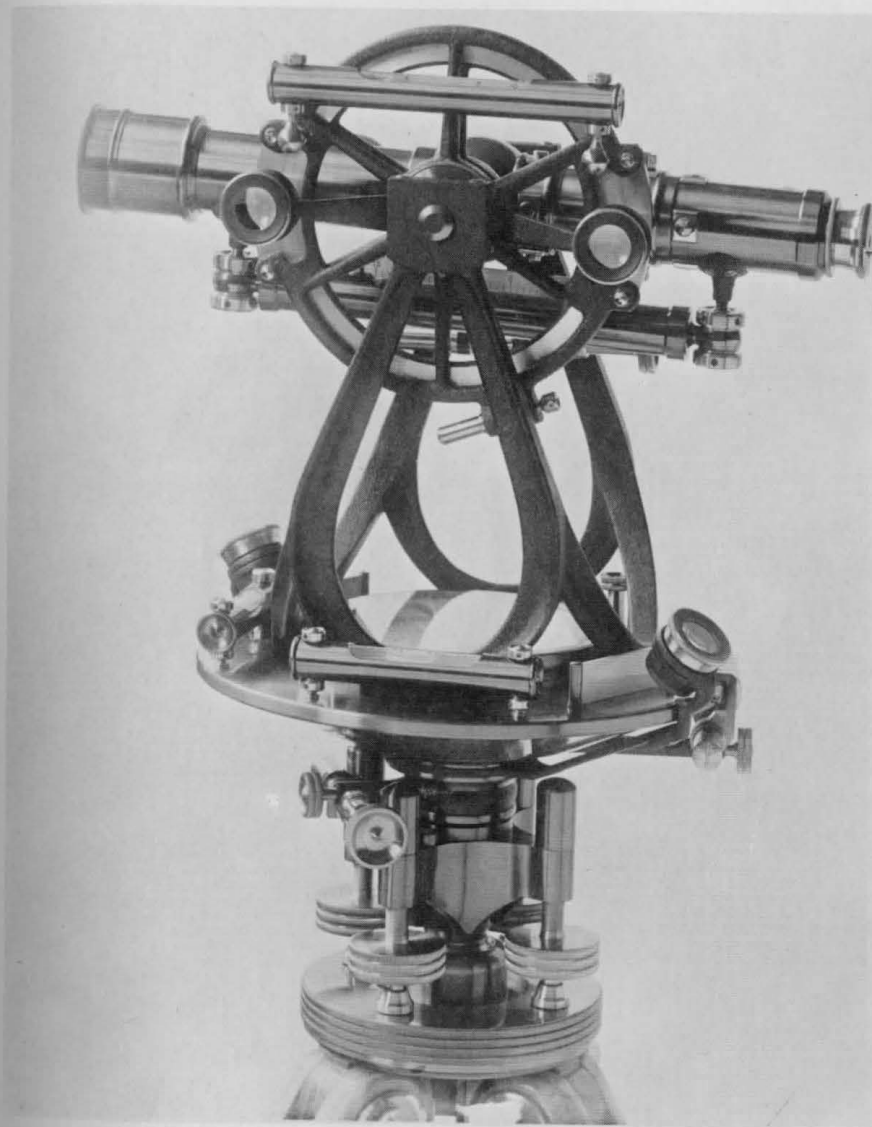
There are 8 characteristics of a theodolite:

1. The divided circles be accurately and finely divided so that readings down to single seconds are possible.
2. The use of a striding level across the horizon axis of the telescope.
3. One piece type of standard, cast in U - shape, providing a symmetrical and extremely rigid structure for supporting the telescope.
4. The compass is usually omitted.
5. A three screw leveling head is generally supplied.
6. Extreme care must be taken that the mechanical construction is the best known to the designers.
7. It must be made of the best available materials.
8. The level vials should have a sensitiveness consistent with the fineness of the reading of the instrument.

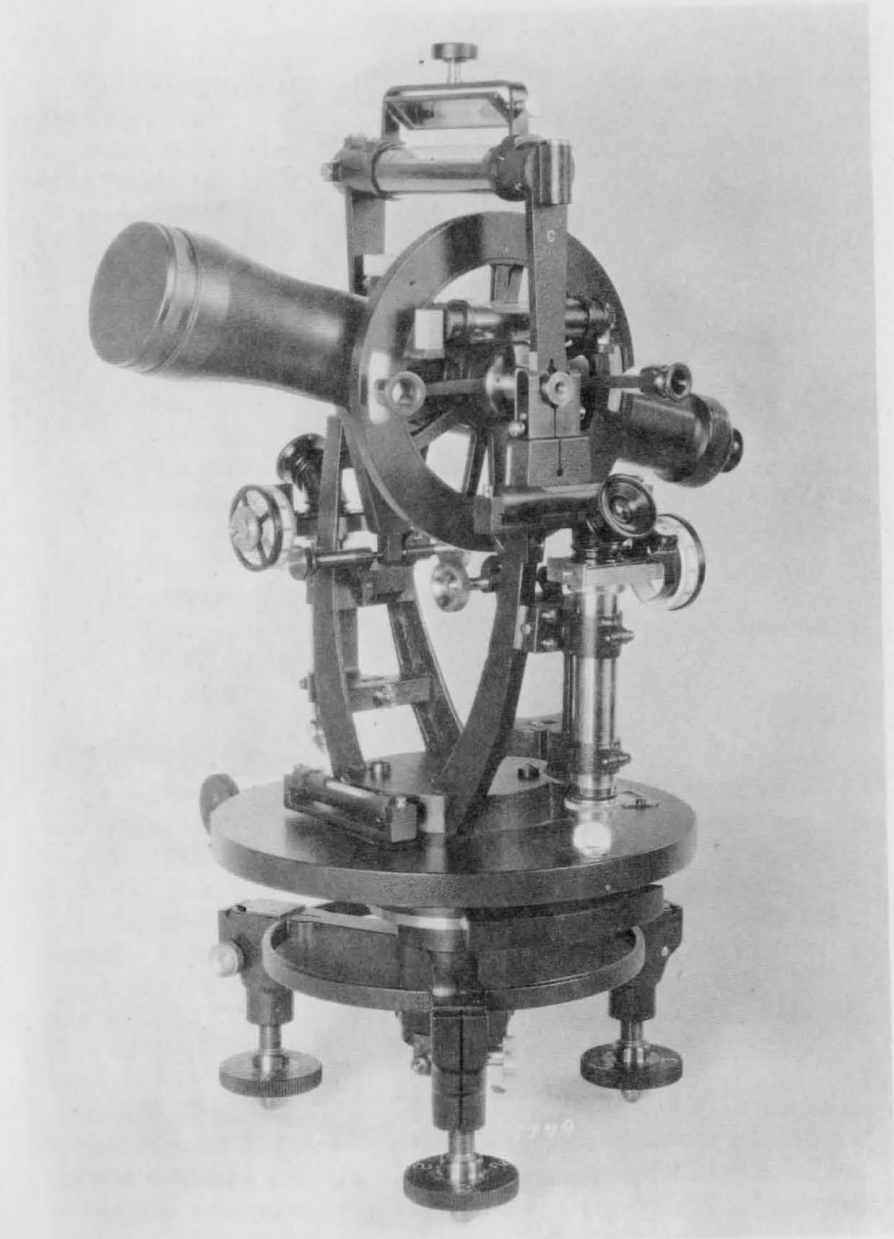
“A Surveying Instrument for accurately measuring both horizontal and vertical angles in land surveying by aid of a telescope and graduated circles.” Vol. XXXVII Cyclopaedia or a new Universal Dictionary of Arts & Sciences by Abraham Rees. First American Edition.

“The oldest Theodolite in the world is in the Museum at Greenwich, England. It is dated 1574, and has inscribed upon it the name of its maker, “H. Cole” (Humphrey Cole), the foremost maker of the Elizabethan period.” The Military Engineer, Vol. XLVI, No. 311, page 208, Commander Charles J. Merdinger, Civil Engineer Corps, United States Navy.

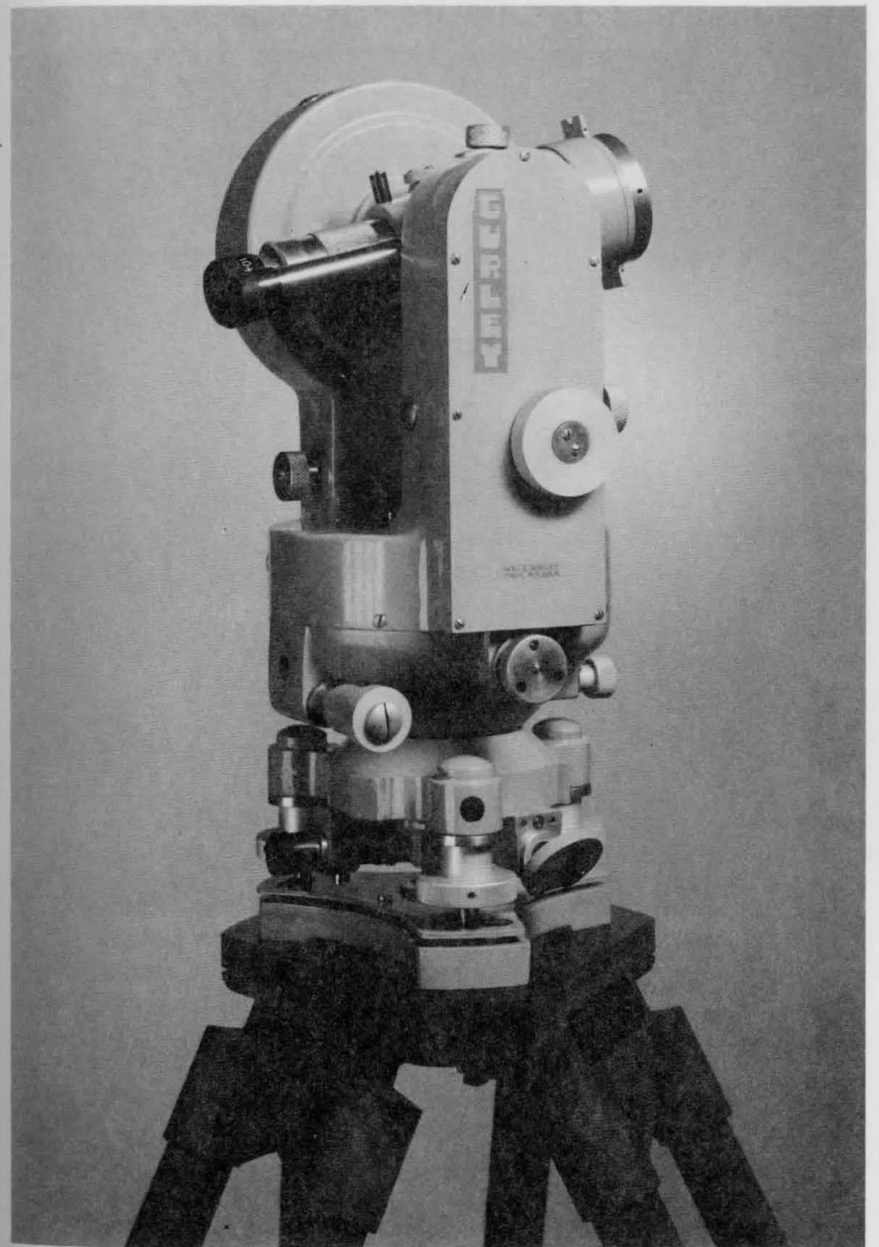
Modern Theodolites, like the one illustrated (1945 model), have become reduced in size and weight. In place of the Filar Micrometers, there is now used a single telescope which reads the position of both circles and automatically averages out any eccentricity in mounting.



1915 Model Gurley Theodolite

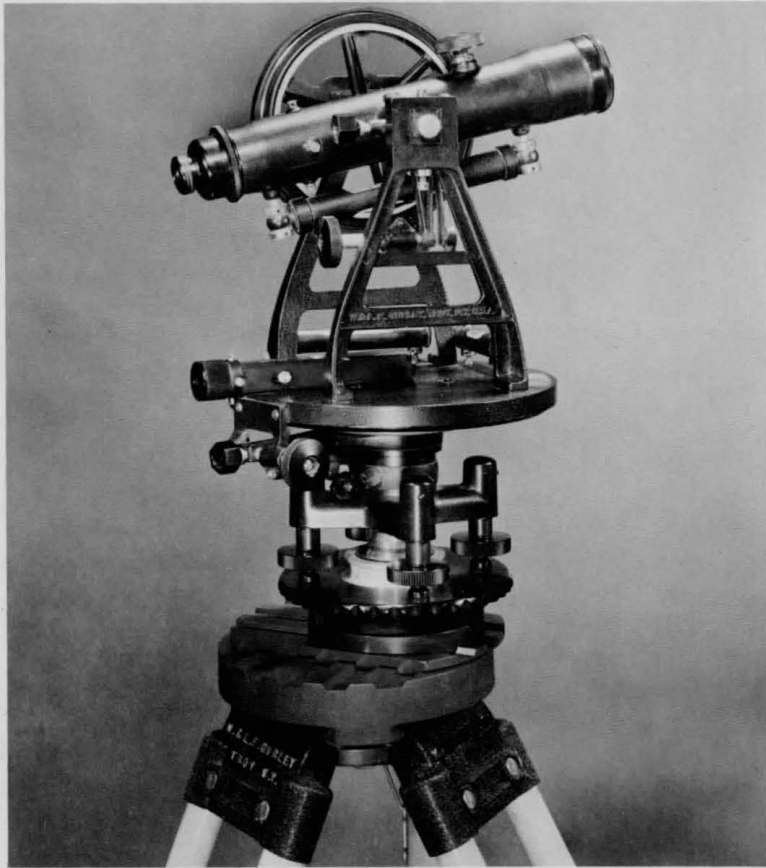


Gurley Parkhurst Theodolite
U. S. Coast and Geodetic Survey Model 1927



1945 Model Gurley Theodolite

THE TRANSIT

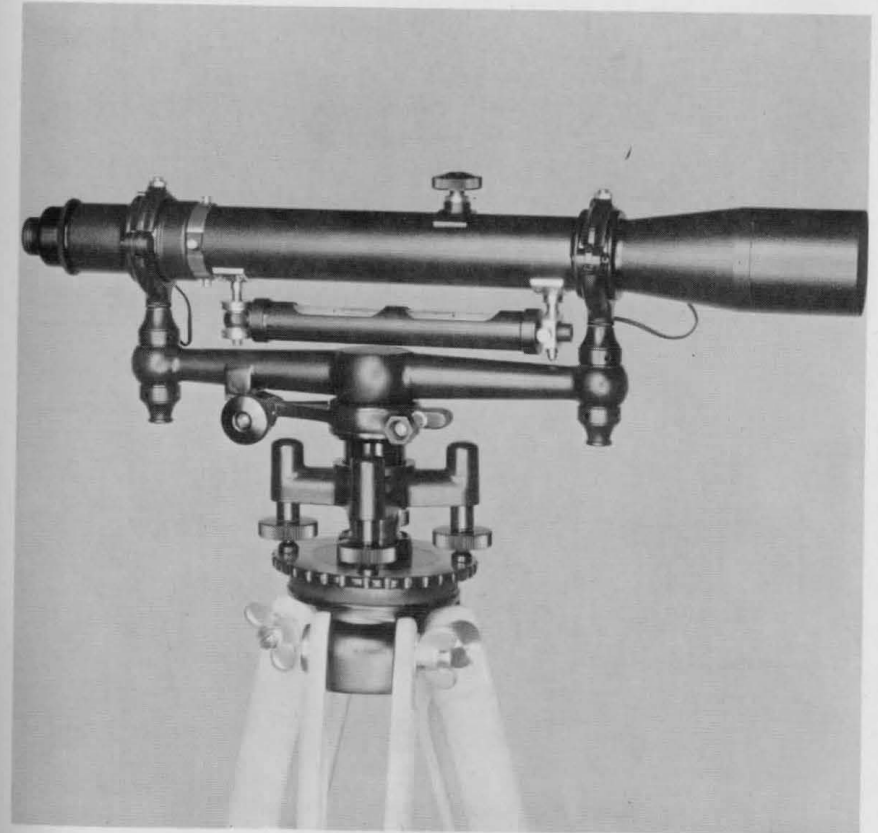


Gurley Standard Precise Transit
with Optical Plummet

The Transit is an instrument made use of by operative engineers to project alignments, to observe or lay out angles in the horizontal or vertical plane, to estimate distances, establish grades, run levels and erect perpendiculars.

It is made up essentially of three component parts: the leveling base, which contains the outer socket of the compound center, the graduated horizontal plate which is mounted on an intermediate socket known as the azimuth axis, and the alidade, carrying the vernier scales, the standards, the telescope and vertical limb, which is mounted on an inner spindle known as the vertical axis. The compound centers are, therefore, more or less intimately related to every working portion of the instrument.

THE WYE LEVEL



The Y-Level was invented by Jonathan Sissons of London in 1740. The general design has never been changed, for revision of details which make for improvement is necessarily restricted by the fundamental principles of construction.

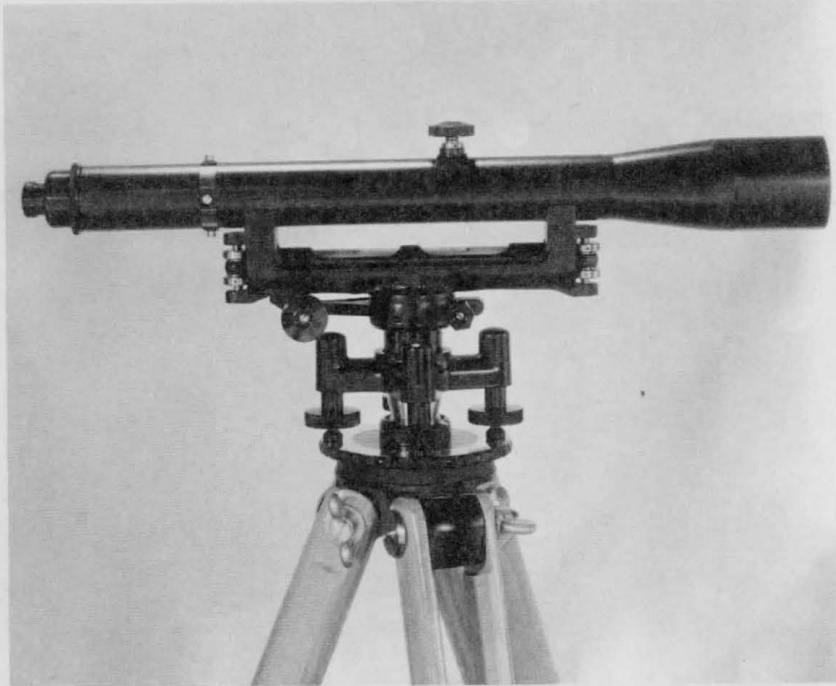
It is so called because the telescope rests in two Y-shaped supports. It has two important characteristics.

1. The telescope may be revolved about its own axis as it rests in the wyes.
2. The telescope may also be taken out of the wyes and reversed end for end.

There are other important details in its design and manufacture.

1. The collimated line of sight must be brought exactly at right angles with the spindle.
2. The two collars of the telescope that rest in the wyes must be of the same diameter.
3. There must be parallelism between the bubble in the level vial and the sight line.

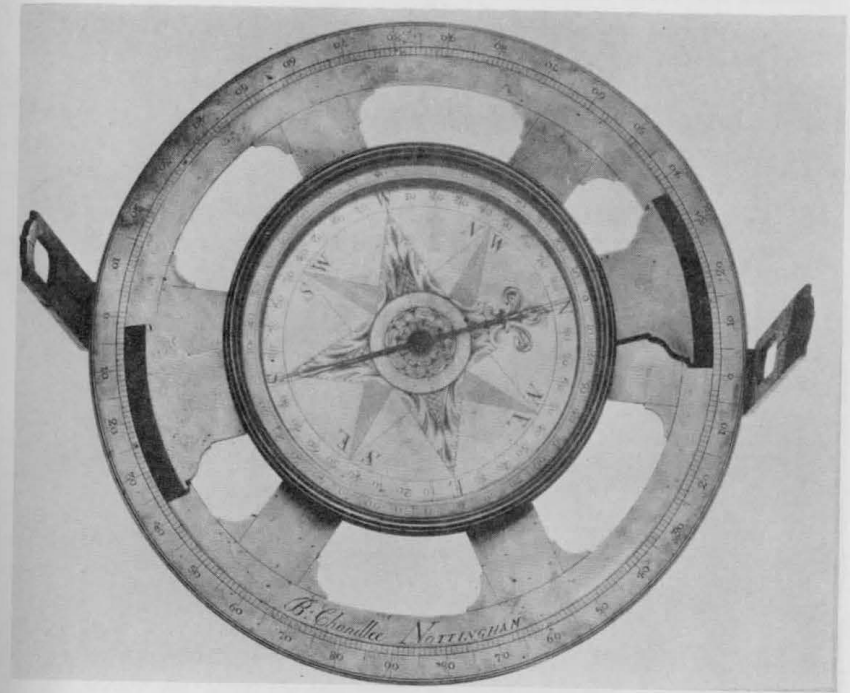
THE DUMPY LEVEL



This model was introduced in England in 1845 by Wm. Gavatt, C.E., and is now in use in that country to the exclusion of nearly all other types. The objection to this type heretofore has grown out of the fact that collimation has been made subservient to other requirements; but it has been found that it may be nearly as readily tested and even more accurately secured.

When the collars of a Y-Level have not been perfectly made, or wear eccentric, or conical, in wye bearings that are unprotected against dust, a state of affairs exists, so far as adjustments are concerned, in which the Y-Level offers little or no advantage; and the dumpy level lays claim to superiority in that there are fewer mechanical details in its construction which may have any effect upon the character of the results obtained.

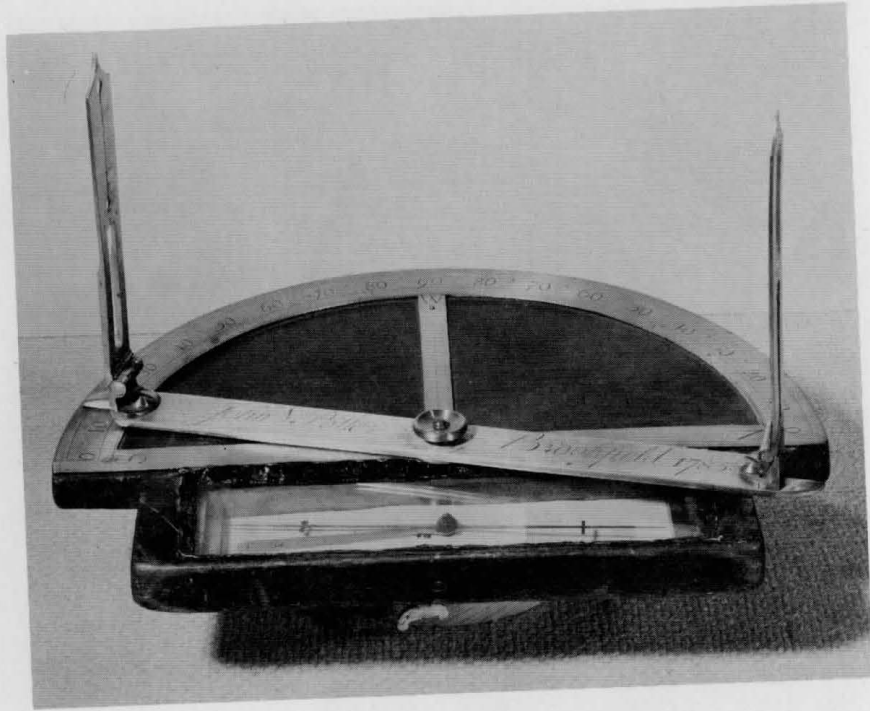
CIRCUMFERENTOR



Photograph Courtesy Penrose R. Hoopes
Philadelphia Pennsylvania

An instrument used by surveyors for taking angles. It consists of a graduated brass circle graduated in quadrants, a set of sights revolving around the same center as the magnetic needle which is suspended above the center of the circle. The sights being directed to an object, the angle which it makes with the magnetic meridian is noted. The sights are then directed to the second object, and the angle it makes with the same meridian observed in like manner. The difference or sum (as the case may be) of the two observed angles gives the angle between the two objects. Also called circumventor and land-compass.

SEMI CIRCUMFERENTER



As its name implies, it is half a circumferenter with the magnetic needle on the side opposite the arc of 180 degrees.

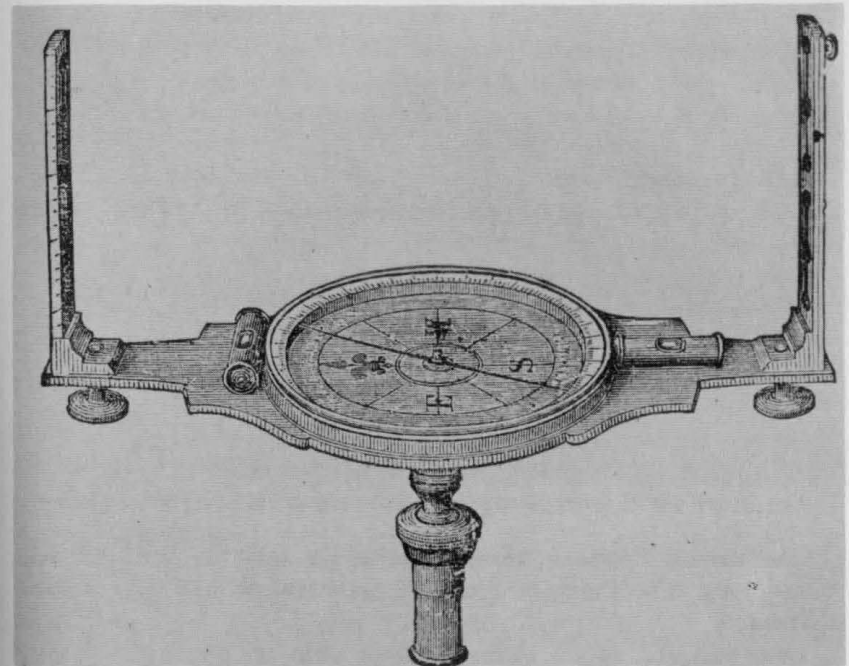
COMPASS *

An instrument for determining directions on the earth's surface by means of a magnetic needle swinging on a hardened pivot and pointing to the magnetic north.

The four principal divisions (dividing the circumference into four equal parts) are called cardinal points, north, east, south and west. The names of the others are compounded of these; and if the direction or bearing referred lies between any two points, it is expressed in degrees as south 42 degrees west.

The needle is made of hardened steel selected for its ability to retain its magnetism over a long period of time. The bearing in the center of the needle is usually a sapphire or a similar hard material.

SINGLE PLATE COMPASSES *



Common, or Single Plate Compasses differ from the Vernier Compass mainly in the absence of the Vernier and its attachments.

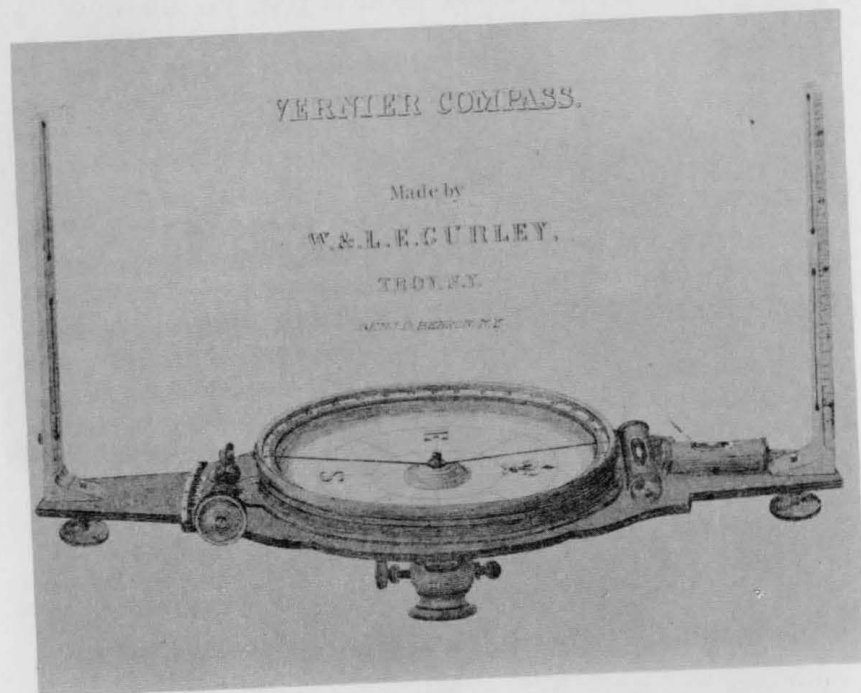
The adjustments and arrangements of their parts may be easily understood, from our account of the instrument just described, being precisely the same, with the exception of such as are peculiar to the Vernier.

We make three sizes of the Plain Compass, differing in the needles, which are respectively four, five and six inches long.

The Common Compass, which was the only one in use in this country previous to the time of David Rittenhouse (1732-1796), has gradually given way before the superior advantages of the Vernier or Rittenhouse Compass, and is comparatively but little used at the present day.

* From the May 1, 1855 W & L. E. Gurley Manual page 15.

VERNIER COMPASS



The Vernier Compass, represented in the cut, has a needle, six inches long. The Compass circle is graduated to half degrees and silvered.

Upon one end of the main plate are seen the two spirit levels, placed at right angles to each other, and adjustable by a common screw driver. In the same plane with the vernier is an arc or limb, fixed to the main plate of the Compass, and graduated to half degrees.

On the vernier are thirty equal divisions, which exactly correspond in length with twenty-nine of the half degrees of the limb. Each division of the vernier, is therefore, one-thirtieth, or, in other words, one minute longer than a single division of the limb.

In "reading" the vernier, if it is moved to the right, count the minutes from its zero point to the left, and vice versa. Proceed thus until a division on the vernier is found exactly in line with another on the limb, and the lower row of figures on the vernier will give the number of minutes passed over. When the vernier is moved more than fifteen minutes to either side, the number of the additional minutes up to thirty or one-half degree of the limb is given by the upper row of figures on the opposite side of the vernier.

To read beyond thirty, add the minutes given by the vernier to that number, and the sum will be the correct reading. In all cases when the zero point of the vernier passes a whole degree of the limb, this must be added to the minutes, in order to define the distance over which the vernier has been moved.

The "sights", or standards, have fine slits cut through nearly their whole length, terminated at intervals by large circular apertures, through which the object sighted upon is more readily found. Sometimes a fine horsehair or wire is substituted for one half the slote, and placed alternately with it on opposite sights. The right and left hand edges of the sights of our compasses, have respectively an eyepiece, and a series of divisions, by which angles of elevation and depression, for a range of about twenty degrees each way, can be taken with considerable accuracy.

Such an arrangement is very properly termed a "tangent scale", the divided edges of the north sight, being tangents to segments of circles having their centres at the eye-pieces, and their points of contact with the tangent lines at the zero divisions of the scale.

In using the Compass the Surveyor should keep the south end towards his person, and read the bearings from the north end of the needle. He will observe that the E and W letters on the face of the compass are reversed from their natural position, in order that the direction of the line of sight may be correctly read, the reason being that since the graduated circle turns, the needle remains stationary on its pivot, thus the needle gives the correct bearing if the north end of the needle is read.

From the May 1, 1855 W. & L. E. Gurley Manual, pages 5, 6 and 7.

THE MASON AND DIXON LINE *

Dr. Thomas D. Cope in his monograph of "Charles Mason and Jeremiah Dixon" begins with these words: "Stargazer" has a special meaning in Chester County, Pennsylvania, though it is now nearly two hundred years since Charles Mason and Jeremiah Dixon came from England to set up their surveying instruments on the farm of John Harlan in Newlin township. Except in this community, however, and to a few astronomers and geodesists, and perhaps a few chance historians, the men Mason and Dixon are shadowy figures or just "surveyors".

Charles Mason and Jeremiah Dixon were English astronomers, mathematicians and surveyors.

Charles Mason was born at Wherr in the parish of Bisley in Gloucestershire, England the early part of 1728. He died in Philadelphia on October 2, 1786.

Jeremiah Dixon was born at Bishop Auckland, Durham County, England on July 27, 1733. He died at Cockfield, Durham County on January 22, 1779.

They landed in Philadelphia on November 15, 1763. They met the commissioners of Maryland and Pennsylvania, who had assembled to receive them and took oaths to make the survey. That part of the southern boundary of Pennsylvania that separates it from Delaware, as defined by the charter of 1681, is an arc of twelve statute miles having New Castle, Delaware, as its center. This boundary was in dispute for many years between Lord Baltimore and William Penn. In 1760, commissioners and surveyors were appointed and they spent two or three years measuring the base line and the tangent between Maryland and Delaware. The proprietors became wearied of the long delay, and sent to England for Mason and Dixon. In January, 1764, the surveyors moved to the Harlan farm, which became their headquarters. When the season opened, they moved southward from Harlan's along a meridian. Distances were measured as they proceeded, on level ground by chain, on slopes by levels. A post marked "West" was set up in a field of Alexander Bryan's farm in Newcastle County to mark the latitude 15 miles south of the South Point of Philadelphia. This post became the reference point for the parallel of latitude that separates Pennsylvania from Maryland.

For the next four years the survey proceeded. When the winter of 1766/1767 set in, the West Line, as the parallel between Maryland and Pennsylvania was called, had been extended to the crest of the Alleghenies. It had also been carried eastward and measured to the shore of the Delaware. When the following spring began to open, there was delay in starting the work on the Line. For beyond the Alleghenies lay the Indian country, and the commissioners were obliged to call upon

Sir William Johnson to win the good will of the Six Nations and secure from them an escort for the surveying party. Through the summer and into the fall of 1767, Mason and Dixon pushed the West Line westward. At the end of September, they crossed the Monongohela. Here 26 of their men left them for they would not pass the river for fear of the Shawne and Delaware Indians. On October 9, they crossed a warpath and immediately beyond it, Dunkard Creek. On October 18, Mason's diary records, "On the top of very lofty ridge at 233 miles, 17 chains, 48 links from the Post marked West in Mr. Bryan's field, we set up a Post." On January 29, 1768, Mason and Dixon handed the map of the boundary to the commissioners.

The instruments used by Mason and Dixon consisted of a fine Zenith Sector made by John Bird, two transit instruments and two reflecting telescopes.

The Indian uprisings and massacres prevented the continuance of the Mason & Dixon line until 1784. In 1778, the Six Nations perpetrated the Wyoming Massacre upon settlers along the upper Susquehanna. General Washington and the Continental congress sent General Sullivan to avenge the outrage. General Sullivan devastated the Six Nations and their prestige. Then the way lay clear to extend the line 5 degrees of longitude as was granted to William Penn of the province of Pennsylvania by Charles II of England in the charter of 1681.

In the spring of 1784, the Virginia surveyors, Andrews, Ellicott, Madison and Page and the Pennsylvanians, Ewing, Hutchins, Luscens and Rittenhouse, extended the line from the farthest west of Mason & Dixon to its full span of five degrees longitude from the western shore of the Delaware with no worries about Indians.

In a letter written on September 3, 1959, by Mr. D. Chilton, Deputy Keeper, Department of Astronomy and Geophysics, the Science Museum of South Kensington, London, it is stated "There is a strong family tradition that the instrument actually used by Jeremiah Dixon was not an altazimuth theodolite but a circumferenter." It is described in the Geographical Journal Vol. 47, No. 1 of January 1916. This instrument is now in the possession of the Royal Geographical Society of London.

The same letter goes on to state that in Vol. 58 of the Philosophical Transactions of the Royal Society for 1768, pages 274-335, "that in their Pennsylvania-Maryland determination, Mason & Dixon used an equal altitude or transit instrument of the same construction with that described by M. LeMonier, in the preface to the single volume of the French "Histoire Celeste."

* Sources of Material:

Charles Mason and Jeremiah Dixon, The Scientific Monthly June 1946, Vol. LXII pages 541-554 by Dr. Thomas D. Cope.

Letters from Dr. Cope dated January 15 and October 19, 1960, from Wayne, Pennsylvania.

A Note on Charles Mason's Ancestry and His Family. H. W. Robinson proceedings of the American Philosophical Society. Vol. 91, No. 2, May 1949.

MAGNETIC DECLINATION IN THE UNITED STATES *

DEFINITIONS

As there is much confusion in the use of the word "variation", the Coast and Geodetic Survey has adopted in its magnetic work a preferred terminology as outlined in the following paragraphs.

"The angle between true north (the celestial meridian) and magnetic declination, and is considered east or west according as the north end of the compass needle points east or west of true north. It is often called "variation of the compass" or simply "variation."

"The changes of declination with time may be separated into several parts, depending on their character. Of these changes, there will be mentioned the secular, the daily, and the irregular changes. The average value of the declination during one year differs from that during the next; and the change may progress in the same direction for many decades. This long-continued change is called the secular change, and the amount of the secular change in one year is called the annual change."

"There is also a more-or-less systematic departure of the declination from its mean value, which has a period of 24 hours. This is called the daily variation of declination. Superimposed under the secular change and the daily variation are frequent irregular fluctuations. When these become large and rapid they constitute a magnetic storm. Such a disturbance may last for several days, and the range of the declination may be greater than 1° ."

COMPASS SURVEYS

The magnetic compass as a surveying instrument has been superseded by the transit and theodolite for precise work, but it is nevertheless still widely used. It is the mainstay of the woodsman and of many land surveyors, and no doubt will continue to be used for a long time for surveys of an approximate nature. Its proper field includes original surveys where accuracy can be sacrificed to speed and cheapness, and resurveys of boundaries which have been surveyed previously with the same instrument.

Its lack of accuracy is due to its construction and to the shifting nature of its line of reference. Surveyors' compasses are graduated usually in half-degrees, and the limit of accuracy in reading bearings is about 5 minutes of arc. In addition the instrument is subject to index error, which affects all its readings by the same amount and in the same direction. This error is the angle between the geometric and magnetic axes of the needle, combined with any angle there may be between the

line of sight and the line which passes through the zeros of graduation of the horizontal circle.

The earth's magnetism furnishes the force that directs the compass needle, and the direction of this force has variations of several kinds, of which the secular change, the daily variation, and the irregular fluctuations have been mentioned already. In surveying, the daily variation and the irregular fluctuations are usually neglected, though they may be large enough to affect the results of a survey appreciably. Compass surveys should not be made during a magnetic storm, the occurrence of which may be detected by an irregular motion of the needle. The secular change is slow, but it accumulates for many years in the same direction, and must be considered when lines originally determined by compass bearings are to be rerun.

On account of the errors which may be inherent in the compass itself, as well as those which may arise from the changes of magnetic declination, it has been recognized as highly desirable to provide means for referring compass bearings to the true meridian. This can be done by determining the true bearing of one line of the survey by observations of Polaris or the sun.

The desirability of having some check on the performance of compasses has been so generally recognized that many States of the East and South have enacted laws requiring each surveyor to test his compass at stated intervals at some established meridian line.

The magnetic declination has also its variations from place to place. In the United States it ranges from 22° West in northern Maine to 24° East in Puget Sound, a total of 46° . For small changes of locality such as would be encountered in the course of a survey, the overall rate of change is small, amounting to a maximum in the North Central States of less than 2' per mile, so that throughout the area of a small survey this systematic change may be disregarded.

However, local magnetic conditions may be such as to produce much more abrupt changes. For example, in the vicinity of Wilmington, Delaware, the magnetic declination varies from 4.6° West to 13.5° West within a few miles. In various other localities similar strong gradations have been discovered. In the immediate vicinity of deposits of magnetite the declination may have any value. Such extreme conditions are exceptional, but there are quite likely to be smaller changes within the area of a survey, large enough to be noticeable as a difference between the foresight and the backsight of a line. Such a local disturbance is said to be natural if it is due to magnetic material in the soil or underlying rocks, and artificial if it is caused by the works of man.

OUR KNOWLEDGE OF SECULAR CHANGE

General features.-- The secular change does not go on indefinitely in one direction. Eventually a turning point is reached, and a change in the opposite direction sets in. Disregarding minor fluctuations, the indications are that the time intervals between such reversals are to be counted in centuries, and that they are not the same over the whole earth, but have a wide regional variation. The record of observations in New England in the seventeenth century indicates that the declination had there a westerly extreme in the early part of that century. This was followed by an easterly extreme about 1785. After that time, in New England the north end of the compass needle moved continuously westward until very recently. At the present time the motion is slightly eastward, indicating that another westerly extreme has been passed, after the lapse of somewhat over 300 years. Meanwhile, the easterly extreme mentioned above traveled slowly westward, appearing in the Mississippi Valley about 1815 and along the Pacific Coast about 1880, after which time it receded toward the East.

Not only does the secular change have complete reversals of its direction, but it is also found that the intermediate changes take place in an irregular way.

These irregularities have never been explained, and no law or formula has been found which would enable them to be predicted. The determination of secular change is thus entirely a matter of observation.

ABBOTT-MCKAY CORPORATION (1924 - 1929)

Boston, Massachusetts

The Corporation is listed in Boston directories from 1924 to 1926. Everett W. Abbott, President, Thomas W. McKay, V. P., Arthur F. Probst, Treasurer.

In 1929 the Corporation had the following officers: Thomas W. McKay, President, Arthur F. Probst, Treasurer. In the Gurley Museum is an Abbott McKay, Boston transit Serial 5002. It has a 9" telescope, a 5" limb and 3-3/8" needle.

WM. AINSWORTH COMPANY (1880 - 1905)
WM. AINSWORTH & SONS, INC., (1905 - C)

Denver, Colorado

The present Wm. Ainsworth & Sons, Inc., was founded in 1880 by William Ainsworth. At that time it was called Wm. Ainsworth Company. The two sons, Robert G. and Alfred W. were taken into the business when they became 21, and the name was changed as noted above in 1905.

William Ainsworth was born in Lancashire, England on January 22, 1850 and died in Denver on January 1, 1917.

Robert G. Ainsworth was born on January 1, 1877 and died in Denver on July 6, 1949.

Alfred W. Ainsworth was born on October 30, 1884 and died in Denver in February, 1952.

William Ainsworth started his business as a balance manufacturer. the business which the company still follows. The first Brunton Pocket Transits were made in 1894 or 1895 and which continue to be made. The large engineering transits, "Y" and Dumpy levels were first manufactured in 1906 and discontinued in 1938.

William Ainsworth and his sons built a dividing engine in 1907 which is still being used for extremely accurate work.

The Civil Engineering Department of Cornell University in Ithaca, New York have a Wm. Ainsworth & Sons Mining Transit, #2100. The diameter of the limb is 3-1/2", the vertical circle 3", the needle 2-1/2".

Gurley has serviced many Ainsworth transits.

* The above extracts are from:

MAGNETIC DECLINATION IN THE UNITED STATES, 1945
U. S. Department of Commerce,
Coast and Geodetic Survey, Washington
Serial 664 1946

JOHN ALLEN

Baltimore, Maryland

Baltimore directories list as follows:

1810 Allen, John, optician and mathemat. instrumt. maker Fell St. No. 26 F.P. 1814-15 Allen, John, mathemat. instrum. maker, 86 Bond st. F.P. June 1819 Allen, John, Mathematical instrument mker, 1 Fell f.p.

Heartt's Ars Navigandi, published in 1819, states: John Allen, Mathematical Instrument maker, Fells Point sells his Ars Navigandi

A. S. ALOE COMPANY (1860 - C)

St. Louis, Missouri

The A. S. Aloe Company's annual report of 1957 states that the company was founded in 1860 by A. S. Aloe, but no detailed history before 1912 is possible because the company suffered a disastrous fire in that year and all the books of record were destroyed.

The following information was obtained from the St. Louis city directories:

1859, 1860 Not listed 1861, 1863 No directories published 1864 Aloe S. optician 3rd & Olive 1865, 1866 Aloe S and Son (Sadock and Albert S. Aloe, opticians 3rd & Olive) 1857 Aloe, Albert S optician 300 Olive 1868, 1871 Aloe, A. S. optician and mathematical instrument manufacturer 206 N. 4th 1878, 1880 Aloe, Hernstein & Co.

In the Gurley records of August 20, 1880 is the following item: Aloe, Hernstein & Co., by Mr. Aloe in person Orders 2 - 18 in. or 20 in. Y Levels.

On November 27, 1885, Gurley repaired an Aloe Vernier Compass sent from Sand Hill, N.Y.

For many years, Aloe bought surveying instruments of Gurley. Later they bought them of Wissler of St. Louis, Mo. They were usually engraved A. S. Aloe.

From 1910 through 1940 Gurley serviced at least 10 Transits, Levels and Compasses engraved Aloe.

It is understood that for a number of years Aloe has not handled surveying instruments. Albert S. Aloe was born in Scotland in 1842. He died in St. Louis on January 30, 1893.

In the Gurley Museum is an A. S. Aloe Co. 12" Architects "Y" Level, Serial 12619

Also an Engineers Transit 6-1/4" limb, Serial 11915.

ANDREWS & SONS (1848 - 1893)

Buffalo, New York

Robert Fisher Andrews (1800 - 1868)

Robert E. Andrews (1829 - 1922)

Charles Andrews (1824 - 1868)

In the 1880 Buffalo directory, the advertisement on page 147 states that the firm was established in 1848. 1848-49 not listed, 1849-52 Andrews, Robert F., mathematical and optical instrument maker, 14 Webster block, upstairs, 1852-67 Andrews & Sons, opticians 171 Main Andrews, Charles, Firm, Andrews & Sons, 171 Main, Andrews, Robert E. firm, 171 Main, Andrews, Robert F. Mathematical and optical instrument maker, 171 Main, corner Ninth & York.

In the Chicago city directory of 1857-58, 1859-60 and 1860-61 is listed: Charles Andrews (From Andrews & Sons, Buffalo, N.Y.) Optical and Mathematical Instrument Maker No. 3 Clark Street, 1868 Andrew & Sons, opticians, Main or Swan, Robert E. h. 287 Ninth, Robert F. h. 529 Ninth, 1869-89 Andrews, Robert E. optician, 275 Main, 1890 Andrews, Robert E. optician 5 Niagara h 74 Mariner, Andrews, Robert F. with Robert E. 5 Niagara, 1893 Andrews, Robert E. optician 105 Niagara h 67 Park, Charles J. Andrews with Robert E. 105 Niagara h. 67 Park, Charles J. Andrews with Robert E. 105 Niagara, Not listed in 1894.

Robert F. Andrews was born in England on July 8, 1800. He died in Buffalo on July 14, 1868.

Robert E. Andrews was born in England in 1829, He died in Abbazio, Italy on August 5, 1922 and is interred in Pasadena, Cal.

Charles Andrews was born in England, October 30, 1824. He died in Buffalo June 23, 1868.

There are no known Andrews instruments in existence.

Robert F. Andrews July 27, 1865.

Orders 1 - 4 pole heavy steel chain with oval rings.

Sent C.O.D. by Gurley July 29, 1865.

JOHN AVERY

Bridgewater

The Western Reserve Historical Society in Cleveland, Ohio has a surveyor's compass said to have been used by George Washington when surveying for Lord Fairfax. It is engraved, John Avery, Bridgewater. It is 10 1/4" overall, 3 7/8" needle, no level vial, sights are missing.

JOHN BAILEY (1731 - 1823)

Hanover, Massachusetts

He was born in Hanover May 6, 1731 and died there January 23, 1823.

He was a natural mechanic, a man of great ingenuity and a successful inventor. He was a clock maker by trade and a manufacturer of compasses. Many of his clocks still exist in the town. From John S. Barry's "History of Hanover" (1853).

From 1768 to 1771 he was a selectman of Hanover. His part time military service in those years (he rose to the rank of Colonel in the regiment of John Thomas of Kingston) came in handy during the Revolution. Bailey served in the Army until 1780 (Trenton, Dorchester Heights, Saratoga) when he was discharged due to ill health. Boston (Mass) Sunday Herald August 17, 1958.

There is a J. Bailey plain surveyor's compass in the New York Historical Society's collection. It is engraved J. Bailey Hanover. It is 15-7/8" overall 5" needle.

JOHN A. BAILEY

Detroit, Michigan

He is first listed in the Detroit directories in 1850-51 as a brass founder.

In the "Detroit Free Press" of July 14, 1853 and the "The Detroit Advertiser" of September 6, 1853 he is advertised as a member of the firm of Burt & Bailey, Mathematical Instrument Makers.

From 1873 to 1882 he is listed in the Detroit directories as Superintendent of Construction, 11th Lighthouse District. The Detroit 1884 directory lists him as "bds 153 Case". He is not listed in the 1885 directory.

There is a Burt & Bailey Surveyor's Compass in the Sacramento County Historical Society, Sacramento, California.

THOMAS H. BALCH (1771 - 1817)

Newburyport, Massachusetts

He was born in Newburyport on July 7, 1771 and died there April 14, 1817.

Essex Institute, Salem, Mass. has a Surveyor's Plain Brass Compass, Length overall 14-13/16", Needle 5-1/2"

East India Marine Hall, Salem, Mass. has a Plain Surveyor's Compass made of American walnut. It is 8-7/8" overall. There are notches for the sights which are missing. The engraved compass card is marked "Thos. H. Balch, maker, State Street, Newburyport".

SAMUEL BALLARD (1718 - 1793)

Boston, Massachusetts

Samuel Ballard was born in Boston in 1718-19. He died in Boston, March 5, 1793. He was a mathematical instrument maker.

His granddaughter, Mehitable Ballard, married Benjamin K. Hagger in Framingham on October 6, 1796.

Ballard Geneology, compiled by C. F. Farlow edited by C. H. Pope (published by C. H. Pope) Boston 1911.

J. BAUSCH & CO. (1857 - 1863)

BAUSCH & LOMB (1864 - 1875)

BAUSCH & LOMB OPTICAL CO. (1876 - C)

John Jacob Bausch (1830 - 1926)

Henry Lomb (1828 - 1907)

Rochester, N. Y.

John Jacob Bausch was born in Gross, Suessen, Germany on July 25, 1830. He died in Rochester on February 14, 1926. He came to the United States in April 1849. He had two younger brothers, Edward E. and George, who also came to this country. Edward E. Bausch was in the optical business with John Jacob for a few years. John J. then sold his retail business to his brother and then devoted his time to manufacturing. He was first listed in the Rochester directory in the 1857-58 issue.

Henry Lomb was born in Hesse Cassel, Germany on November 24, 1828. He died in Rochester June 13, 1907. He came to Rochester in 1849, and was a cabinet maker until 1853, when with John J. Bausch he went into the retail optical business. He was first listed in the Rochester directory in the 1855-56 issue.

Bausch & Lomb are first listed in the Rochester directory in the 1864-65 issue and Bausch & Lomb Optical Co. were first listed in 1876.

Bausch & Lomb Optical Co. merged with Fauth & Co. of Washington, of which George N. Saegmuller was sole owner in 1905. They continued making engineering instruments for some time after the close of World War 1.

The Gurley Museum has a Bausch & Lomb transit. It is engraved Bausch Lomb Saegmuller Co. Rochester, N.Y. 2617.

It has a 10" telescope 5 1/2" limb 4" needle.

THE L. BECKMANN COMPANY (1874 - C)

Toledo, Ohio

Ludwig or Louis Beckmann was born in Doberon, Mecklenburg, Germany on February 5, 1845. He died in Toledo on August 30, 1914.

Mr. Beckmann came to the United States in 1870. He started making transits, levels and surveyor's compasses in 1874.

Mr. Beckmann made three dividing engines. The first was built in 1878 and was hand operated. The second engine was designed in 1900. This machine was automatic in action. His third and last was started in 1912. It took two years to build this dividing engine. Mr. Beckmann stated in his 1914 catalog that the greatest error was two seconds of arc.

After his death in 1914, the business was carried on by his son, Mr. Louis Beckmann Junior, until 1945 when the actual manufacture of Beckmann instruments was discontinued. Mr. Beckmann continued the instrument repair service until January 1951, when Mr. R. J. Hoover and Mr. C. G. Anderson acquired the L. Beckmann Company.

There is a Surveyor's Vernier Compass in the Gurley Museum. It is 15" overall with a 5" needle. It is engraved L. Beckmann. Toledo, O.

SAMUEL T. BEER & CO., (1889 - 1902)
SAMUEL T. BEER (1903 - 1905)

New Orleans, Louisiana

New Orleans Directories:

1888 Not listed; 1889 S. T. Beer & Co. (Samuel T. & Herman Kosky); 1905 Beer, Samuel T. architects supplies.

An 18" Y Level, engraved "S. T. Beer & Co. No. 609" is privately owned by a party in Cambridge, New York. It is said to have been used on the Panama Canal many years ago.

SAMUEL AMERICANUS BEMIS (1790 - 1881)

Boston, Mass.
Crawford Notch, N. H.

He was born in Marlboro, Vermont in 1790. His father, Samuel Bemis, was a soldier in the Revolution. He was living in Marlboro in 1806; in Keene, New Hampshire in 1808, and Boston in 1817. He died at his stone mansion at Hart's Location on May 22, 1881.

His name first appears in the Boston directories in 1822 as a den-

tist, which continues until 1861.

In 1830, he began buying land in Hart's Location in New Hampshire, which he continued to do for many years. In February 1840, Dr. Bemis imported one of the complicated Daguerre Outfits, the first such importation into America. He took his first picture in April 1840, a picture of King's Chapel in Boston.

In 1850 he began to build his stone house which is now "The Inn Unique" in Crawford Notch, N. H.

An interesting story of him was published in "Appalachia" issue of June 1958 by Florence Morey.

In the Henry Ford Museum, Dearborn, Michigan is a semi-circumferenter. It is engraved "Made originally under tutition of Samuel Bemis by S. A. Bemis in 1810, with improvements and additions also made by him in 1860". It is 12-1/4" overall with a 5-1/8" needle.

Brooks Palmer in his book, "The Book of American Clocks" states on page 148 "Bemis, Samuel (1789-1881) Boston, made clocks and watches Dentist 1822-1861. At 72, proprietor Hart's Location, New Hampshire; had fine collection of watch papers".

His dental equipment is in the Dental Museum of the University of New York City, the "Watch" record books of Samuel Bemis from 1785-1822 are in the Henry Ford Museum in Dearborn, Michigan. The Daguerre Outfit is in Eastman's Rochester Museum, his portrait by Chester Harding in the Detroit Art Museum, the Alvin Clark miniature is in the Metropolitan Art Museum in New York City.

C. L. BERGER & SONS, INC., (1898 - C)

Boston, Massachusetts

Christian L. Berger, or C. Louis Berger, as he preferred to be known was born in Stuttgart, Germany September 26, 1842, and he died in Boston on November 22, 1922.

After 4 years of apprenticeship with Christian Seeger in Stuttgart and a year's course in mechanical technology at the Royal Polytechnic Institute, also in Stuttgart, he had varied employment with G. Schubart of Marburg; F. W. Breithaupt & Son of Cassell; J. Lohmeyer and A & G Repsold of Hamburg; and Thos. Cooke & Sons in York, England. He came to America in 1866. In Boston he worked for Thos. Upham who had a small shop. About 1870 he worked for E. S. Ritchie in Brookline, Mass.

On October 28, 1871 he formed a partnership with George L. Buff which became the firm of Buff & Berger. It was dissolved on October 18, 1898. The factory was at 9 Province Court in Boston. On the same date he founded a new firm, C. L. Berger & Sons, taking into partnership his two sons, William A. and Louis H. Berger.

New York City
Philadelphia, Penna.

William Albert Berger was born December 16, 1876. Louis Herman Berger was born March 21, 1878, both in Dorchester, Mass.

They moved to their new factory at 37 Williams Street in Roxbury, Mass. in 1902. In 1922 the partnership was changed to a corporation.

William A. and Louis H. Berger carried on the business until November 28, 1947 when Charles S. Narins of New York acquired the company.

During the partnership of Buff and Berger, one son of each of the partners was sent to Germany to be trained as instrument makers. Accordingly, William A. Berger and Carl W. Buff were sent to the L. Tesdorpf factory in Stuttgart, Germany from 1894 to 1898. Carl W. Buff died soon after his return to the United States in 1908. It is interesting to note that G. N. Saegmuller of Washington, D. C. sent his son, John L. for training to L. Tesdorpf at the same time that the Berger and Buff sons were there.

Their first dividing engine (a24 inch) was made by Jesse Ramsden of England. The second dividing engine was the Temple dividing engine referred to in the article concerning Temple. Their third dividing engine was made by William Wurdemann of Washington, D. C.

GEORGE BERTIE

Baltimore, Maryland

He is listed in the Baltimore directories, as follows:
1807-1808 Bertie, George, Mathematical instrument maker. Georges street F. P.

OWEN HIBBARD BESTER (1809 - 1857)

Washington, D. C.

He was born in Washington on December 1, 1809, and died there on March 1, 1857.

In the 1855 edition of the Washington directory, he is listed as a mathematical, optical and philosophical instrument maker. His father, Harvey Bestor, was Assistant Postmaster General at one time. The family home was at 8th and Pennsylvania, and the only shot fired by the British into Washington, in the war of 1812, lodged in a pewter coffee-pot which became a family heirloom.

The New York City directory list him as follows:

1786 Biggs, Thomas, instrument maker 60, facing Beekman's slip. The Philadelphia directories: 1792 Biggs, Thomas mathematical instrument maker from New York at 81 South Front Street. (The house lately occupied by Mr. Benjamin Condy); 1801-06 Thomas Biggs was at 85 South Front Street. 1807-1821 Thomas Biggs, 66 South Front Street. Thomas Biggs served his apprenticeship with Benjamin Condy. He states in one of his advertisements in 1792 that he was in the service of his country during the war for a period upwards of five years and upwards of eight years in New York where his reputation was firmly established. No record is available of his birth or death though he states that he was a native of Philadelphia.

ZIBA BLAKSLEE (1768 - 1834)

Newtown, Conn.

Ziba Blakslee was born in Plymouth, Connecticut on July 9, 1768. He moved to Newtown in 1792 and established himself as a clockmaker, bell founder and jeweller. In the same year he advertised in the "Farmers Journal": "Bell foundry, Smithery, Jewellery & c. The subscriber respectfully informs the public that he carries on, at his shop at the Head of the street in Newtown, the Gold-Smith's business in all its branches; casts bells for Churches; Makes and repairs Surveyor's Instruments. Church clocks and Clocks and Watches of all kinds - where orders will be punctually attended and all favors greatly acknowledged, by the public's humble servant. Newtown, March 27, 1792. Ziba Blakslee".

He continued to reside in Newtown until his death, November 9, 1834, aged 66. (Hoopes)

JACOB BLATTNER (1812 - 1888)

St. Louis, Missouri

Jacob Blattner came to St. Louis in the fall of 1839, by way of the port of New Orleans from Berne, Switzerland. Probably he had made instruments in Switzerland before coming to America, because besides his own family, he brought with him his foreman and the foreman's family. Jacob Blattner was born in Berne, Switzerland, May 21, 1812 and died in St. Louis November 15, 1888.

He is first listed in the 1840-41 St. Louis directory as a mathematical instrument maker. He continued in business until about 1872, when failing eyesight compelled his retirement. The business was carried on by his son Henry and his son-in-law Frank Adam, under the firm name of Blattner & Adam.

The Missouri Historical Society in St. Louis has a silver cup willed by one of Jacob Blattner's Granddaughters on which is inscribed "Mechanic's Fair-St. Louis 1841, awarded to J. Blattner"; a water color of his birth place in Berne; and 2 Surveyor's Compasses inscribed, "J. Blattner, St. Louis". They are 16" overall, with a 6" needle.

Gurley repaired a Blattner transit in 1875; another in 1880 and a level in 1886.

BLATTNER & ADAM (1872 - 1891)

St. Louis, Missouri

When Jacob Blattner retired in 1872, Henry Blattner, his son, who had been working with his father, took over the business, together with his brother-in-law, Frank Adam. The 1874 St. Louis directory lists them as "Blattner & Adam, (Henry Blattner & Frank Adam) mathematical and optical instrument makers." The instrument business was continued until 1891, though Frank Adam had become interested in the electrical construction work of the Western Electric Company in 1876 as a sub-contractor.

In 1891 the business was split into three parts, because the Blattner & Adam store was taken over by a real estate firm to build the Rialto building.

Henry Blattner took the optical business to a store on Broadway. After several years in his Broadway store, Henry Blattner sold his optical business, and he went into special photography. He was one of the early developers of the so-called "dry plate" for photography.

Adolph Wissler, who had been a workman and foreman for Blattner & Adam took over the instrument business, which he continued until his death in 1926.

Frank Adam took over the electrical department which became the Frank Adam Electrical Company, which is a continuing business in 1962.

Henry Blattner was born in St. Louis March 6, 1848, and died there on November 10, 1922.

Frank Adam was born in Freiburg, Alsace-Lorraine, February 2, 1838 and died in St. Louis September 13, 1922. He married Jacob Blattner's daughter, Louise, who was born on the high seas coming from Europe to America on September 29, 1839.

In 1890 Gurley sold Blattner & Adam two Architect levels. Gurley repaired a Blattner & Adam transit #10, which was owned by the Southern Pacific Company in 1892.

THE BLUNT FAMILY

New York City

Edmund March Blunt (1770 - 1862)

Edmund Blunt (1799 - 1866)

George William Blunt (1802 - 1878)

Edmund Blunt Junior (1842 - 1894)

William Sinclair Blunt (1837 - 1903)

"Edmund March Blunt was born in Portsmouth, New Hampshire on June 20, 1770. He died at Sing-Sing (now Ossining) New York on January 4, 1862. He moved from Newburyport, Massachusetts to New York City in 1811. He appears to have retired in 1826 or 1827 from active management of "Edmund and George W. Blunt" and from the publishing world in June 1833. His store was taken over by his son-in-law, William Hooker and then by Blunt's sons, Edmund and George William Blunt. E. & G. W. Blunt existed until 1866. The business was then taken over by sons of Edmund, Edmund Junior and William Sinclair. In August 1866, Edmund Blunt Junior, F. M. Nash and John H. Nichols took over the business and the firm name was changed to Blunt and Nichols. In the fall of 1868 Blunt and Nichols became Blunt and Company and William S. succeeded his brother Edmund Junior in the Company.

Edmund Junior established the New York Optical Works at 16 Burling Slip. John Gowans joined the firm and Mr. Nichols' name vanished from the firm's letterhead. Nash wrote to Coast Survey on September 25, 1871, "Our firm has made an assignment to Mr. G. W. Blunt with the view of settling up the business of Blunt & Co." Nash was to continue to manufacture surveying instruments. Letters from Blunt and Company were still sent as late as August 1872." "At the Sign of the Quadrant" by Harold L. Burstyn (1957)

The New York City directory of 1810 lists: Blunt, Edm. M. printer 391 Broadway h 18 Bowery. The July 4, 1812, New York City directory on the bottom of page 29 has an advertisement stating that Edmund M. Blunt has opened a Chart and Quadrant Store at 202, Water-Street corner Beekman Slip.

In the 1823-24 directory: Blunt, E. & G. W., chart sellers 147 Maiden, Blunt, Edmund M. Chart Publisher 202 Water.

From 1828 to 1872 E. & G. W. Blunt were located at 179 Water Street, corner of Burling Slip.

Edmund Blunt was born in Newburyport, Massachusetts on November 23, 1799. When his father retired in 1822, his store was first taken over by his son-in-law, William Hooker, then by his sons, Edmund and George William and the firm became E. & G. W. Blunt. Edmund entered the Coast Survey as First Assistant in 1833 serving under Ferdinand Rudolph Hassler, its first superintendent, and was with Coast Survey until his death on September 2, 1866 in Brooklyn. He commenced to build a dividing engine as early as 1831. However, in 1851 he started anew, and the engine was finally completed in 1857. It was at this time that E. & G. W. Blunt commenced constructing theodolites for the Coast Survey instead of importing them.

George William Blunt was also born in Newburyport on March 11, 1802. His life is fully reviewed in Harold L. Burstyn's "At the Sign of the Quadrant". He died in Brooklyn, N. Y. on April 19, 1878.

Edmund Blunt has two sons, Edmund, junior, and William Sinclair. Edmund, junior was born in Brooklyn on June 8, 1842. William S. was born on September 21, 1837. Edmund served in the Civil War as a Captain, Fifth, N.Y. Calvary. William S. was appointed Acting paymaster on November 1, 1861. He resigned May 7, 1866. He was on the U.S.S. Saranac of the Pacific Squadron. Frederick Eckel also served on the Saranac.

Edmund Blunt junior died in Brooklyn on January 24, 1894. William Sinclair Blunt died in Palmerton, Carbon County, Pennsylvania on March 7, 1903.

The Chicago Historical Society in Chicago, Illinois has an: E. & G. W. Blunt Surveyor's Vernier Compass. It is 15-1/2" overall with a 5-1/4" needle. The Buffalo Historical Society in Buffalo, N. Y. has a E. & G. W. Blunt, New York, Surveyor's Vernier Compass. It is 15-1/2" overall, with a 5-1/4" needle.

There is an E. & G. W. Blunt, New York, Surveyor's Vernier Compass owned in Ridgefield, Connecticut.

The Marine Historical Association of Mystic, Connecticut has a copy (8 page booklet) containing a description and line drawings of E. & G. W. Blunt's Dividing Engine.

There is an E. & G. W. Blunt Surveyor's Vernier Compass in the Museum of the Michigan State University of East Lansing, Michigan. It is 13-1/4" overall, with a 5" needle.

BLUNT & CO.

Page 195, Kolesch & Company's catalog of 1913

Edmund M. Blunt was making and selling surveying instruments during the war of 1812 and had been in business for several years prior to the war. In 1849 his two sons, Edward and George W., succeeded to the business established by their father. About 1870 or 1871, two sons of Edward Blunt and an uncle by the name of Nichols took over the plant under the firm name of Blunt and Nichols. Later the names were changed to Blunt & Co., then Eckel & Imhoff and afterwards to F. Eckel. About 1885 the name was changed to Kolesch & Co.

The Automatic Dividing Engine, originally built by the Messrs. Blunt during the years 1851-1858, is with some slight changes in the propelling power, still in use at the present time. As it may interest the Engineering Profession, we give an illustration of same on page 198. This engine is one of the first built in this country and its accuracy has been attested by the late J. E. Hilgard, of the U. S. Coast Survey. Work divided on this engine has stood the most critical tests of Engineers during the many years of its constant use, and the engine ranks today as one of the most accurate of its kind.

SAMUEL BLYDENBURGH (1802 - 1852)

Philadelphia, Penna.

Samuel Blydenburgh; if the age was correctly stated at the time of his death, was born circa 1802. Nothing has been found to indicate under whose instruction he received his training or when and where he first became employed as a mathematical instrument maker.

The earliest definite record appeared in "The Philadelphia Circulating Business Directory, for 1838", arranged by J. R. Savage, page 103: "BLYDENBURGH & GILES, Mathematical Instrument Makers, AT THE NAUTICAL STORE, No. 130 South Front St. near the Drawbridge, Philadelphia. Levels, Theodolites, Tunnelling, Transit, and Angular Instruments. NONIUS COMPASS and PLAIN COMPASS, Target Rods, Surveyor's Chains, & c. & c. N. B. Instruments made to order, and the strictest attention paid to their repairs and adjustments." The Philadelphia City directories, list as follows:

1839 Giles E., math ins. mr, Front above Dock h Vernon; 1840-1842 Blydenburgh & Giles, math ins. mkr, 130 S. Front; 1842 Giles Edward, Math ins mr, 130 s. Front, h 9 Vernon; 1843 Giles Edward, Math ins mr, Vernon, 1844 Blydenburgh Samuel, math ins mr, Baker below 8th; 1844-1850 Giles Edward, math ins mr, 257 Catharine. Apparently, the firm was of short duration, its dissolution prior to 1847, as in that year the following change was noted:

1847 Blydenburgh & Hyde, machinists, 1 Fetter Lane; 1847 Blydenburgh Samuel, 1 Fetter Lane, h 121 Noble; 1847 Hyde Joseph, machinist, 1 Fetter Lane, h Cresson's alley.

"Public Ledger", Philadelphia, Saturday, February 7, 1852 and the "Philadelphia Board of Health Records - Register of Deaths" Nov. 22, 1851 to Aug. 12, 1853, page 41, states that Samuel Blydenburgh died in Philadelphia on February 6, 1852.

BOSTROM-BRADY MANUFACTURING COMPANY (1901 - C)

Atlanta, Georgia

The company was founded in 1901 and incorporated in 1905.

Ernst Alfred Bostrom was born in 1855 in Stockholm, Sweden. He died in Atlanta on February 2, 1922.

Isaac Albert Brady was born in 1847 in Charleston, South Carolina. He died in Atlanta on August 10, 1929.

T. S. BOWLES

There is privately owned in Connecticut a 12" o.a. 4" needle T. S. Bowles wooden compass. Height of sights 5".

- F. BRANDIS & CO., (1875 - 1890)
- F. E. BRANDIS, SONS & CO. (1890 - 1916)
- BRANDIS & SONS, INC. (1916 - C)
- Frederick Ernest Brandis (1845 - 1916)
- Henry Brandis (1866 - 1959)
- William Brandis (1868 - 1936)

Brooklyn, N. Y.

Frederick Ernest Brandis was born in Hildesheim, Germany on August 23, 1845. He came to the United States when he was thirteen years old.

He is first listed in the New York City directory on May 1, 1872, Brandis, F. & Co. math insts.

He had been working for Stackpole & Brother, when in 1872 he went into business for himself. His advertisement of that date states "Formerly with Stackpole & Brother".

In the New York City directory of 1878-79 he is listed Brandis & Teckritz, math insts.

F. E. Brandis Richard E. Teckritz

In the 1882 directory he is listed: Brandis, Frederick E. math insts. He apparently made three circular dividing engines because in Catalog No. 17, issued in 1902, he states on page 30:

"Description of Our New Graduating Engine - When in 1884, we completed our second circular graduating machine with very gratifying results, we immediately undertook the construction of a third one, which is automatic in all its movements. We are proud to say that the results obtained have surpassed our most sanguine expectations, and we can now justly claim for our graduating engine superiority over those of most European competitors.

This engine bears 4,320 lines, the relative positions of which are exactly verified to less than three seconds."

F. E. Brandis died in Brooklyn on February 25, 1916, and his two sons, William and Henry operated the firm as Brandis & Sons, Inc. from 1916 to 1922.

Henry Brandis was born in New York City on February 25, 1866. He died in Brooklyn on December 1, 1959.

William Brandis was born in Brooklyn on February 3, 1868. He died in a Long Island Hospital on November 26, 1936.

In 1922 The Pioneer Instrument Company purchased control. They sold to Bendix Aviation Corporation in 1928, who in 1932 stopped manufacturing Brandis items, with Richard D. Leaf as Sales Agent.

In 1938 Mr. Leaf purchased the remaining stock and the corporate name of Brandis & Sons, Inc.

The Gurley Museum has a Brandis transit. It has a 6" limb and a 4" needle. Serial 6290. It was manufactured around 1906.

The Clark Institute of Art in Williamstown, Massachusetts has a F. E. Brandis Sons & Co., Brooklyn, N. Y. Theodolite No. 2482.

AARON BREED (1791 - 1861)

Boston, Massachusetts

He was born in Lynn, Mass. on January 9, 1791. He died in Chelsea, Mass. on September 6, 1861. He is buried in Mt. Hope Cemetery in Dorchester, Mass.

He is listed in the Boston directories from 1813 to 1860 as a mathematical and optical instrument maker.

In the 1860-61 directory he is listed Breed, Aaron, Boarding house, Lincoln.

Old Sturbridge Village Museum has a Wood Surveyor's Plain Compass. The Compass Card is paper. It is 18" overall with a 5-3/4" needle.

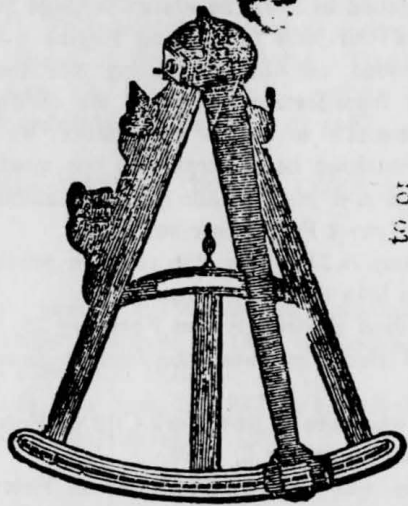
The Henry Ford Museum, Dearborn, Michigan has a Surveyor's Plain Compass. It is 11-1/2" overall with a 5-1/2" needle. It is engraved A. Breed, Boston.

At the sign of the Quadrant.

NO.

2,

to or



ROWE'S

WHARF.

AARON BREED,

MATHEMATICAL-INSTRUMENT

Manufacturer

NO. 2, ROWE'S WHARF,

(Opposite Purchase-Street,)

BOSTON.

HAS FOR SALE, SEXTANTS, QUADRANTS, DAY AND NIGHT TELESCOPES, SHIPS COMPASSES, OF BRASS OR WOOD. TIME-GLASSES, AND THERMOMETERS.

A General Assortment of CHARTS, Navigation Books and Stationary.

Second-hand Instruments bought, Sold or exchanged.

N. B.—Personal and Prompt attention paid to the repairing and accurately adjusting of SEXTANTS, QUADRANTS, COMPASSES, TELESCOPES and TIME-GLASSES.

EDMUND BROWN (1800 - ?)
Edmund Brown & Son (1841 - 1863)
Bush G. Brown (1820 - 1863)

New York City

Edmund Brown was born in Connecticut in 1800. He probably died in January 1867. His will was probated in Elizabeth, N. J. on February 7, 1867.

Bush G. Brown was born in New York City in 1820. He died on April 18, 1863.

The following from New York City directories: 1821-33 Brown Edmund, math inst mkr; 1834-35 Brown & Hunt, math inst. mkr 190 Water; 1835-36 Brown & Hunt, math inst mkr 27 Fulton; 1838-40 Brown, Edmund math insts 27 Fulton; 1840-41 Brown, Edmund & Son math insts 27 Fulton Brown, Edmund; Brown, Bush G.; 1841-63 Brown, Edmund & Son math instruments 27 Fulton h Brooklyn; 1863-64 Brown, Edmund, math insts 27 Fulton h N. J.

There is an E. Brown & H. W. Hunt broadside which states that "Mr. Brown has been in the employment of Mr. R. Patten for the last 20 years with whom he served a regular apprenticeship". Dated May 1, 1835 No. 27 Fulton Street, New York City. Thus it is evident that Edmund Brown commenced as an apprentice with Richard Patten in 1815.

Gurley repaired a Brown level in October 1868.

E. C. Eichner, Clifton, N. J. has an E. Brown & Son, N. Y. Surveyor's Compass.

JOHN G. BROWN (1805 -)


New York City
Baltimore, Maryland
Washington, D. C.

The Baltimore American of January 5, 1830 has a Brown & Heartte advertisement stating "Mr. B. being well experienced in his profession, having for many years attached to the establishment of Richard Patten of New York."

He is listed in the Baltimore directories in 1833, 1835-36 and 1837. There is a John Brown, instrument maker, listed in the 1839 directory

The Federal census of the 1st ward, Washington City, County of

ARS NAVIGANDI
OR,
TABLES OF LONGITUDE,
FOR CORRECTING THE EFFECTS OF
PARALLAX AND REFRACTION,
ON THE DISTANCES OBSERVED BETWEEN THE
SUN AND MOON, OR MOON AND STAR;
WHEREBY
THE TRUE DISTANCE IS OBTAINED,
BY A MUCH SHORTER METHOD, THAN ANY HITHERTO PUBLISHED.
AND IN WHICH,
The errors contained in the Tables of Turner, and other writers on this science, are carefully corrected:
BY ISAAC T. HEARTTE—OF BALTIMORE.
EXAMINED AND APPROVED BY
PROFESSORS BLACKBURN AND CRAIG.
BALTIMORE,
PRINTED FOR THE AUTHOR, BY B. EDES.
And for sale at the bookstores of EDWARD J. COALE, Calvert-Street; FIELD-
ING LUCAS, Market-Street; F. M. WELLS, Stationer, St. Paul's Lane;
JOHN ALLEN, Mathematical Instrument Maker, Fell's Point;
and by all the principal Book and Chart Sellers,
in the United States of America.
1819.

BROWN & HEARTTE.

INSTRUMENT MANUFACTORY AND WAREHOUSE
No. 53, South Street, Baltimore, Maryland.
We have the honor to inform the public that at their establishment they intend to manufacture and sell for sale to the MATHEMATICAL ENGINEERS, SURVEYORS AND NAVIGATORS, all their instruments, and also to receive orders for the same. They have a large stock of the most improved instruments, and are enabled to give their friends the best of service, with confidence to the proprietors.
Mr. T. HEARTTE, of New York, has placed in their hands a new and improved method of measuring the height of objects, distant from the eye, who may be applied to the same, and their instruments for sale, and returned by any conveyance they may please to direct.
A first-rate and well-known CHRONOMETER for sale, made by a great artist, and of the most accurate construction, and which may be used in any climate, and will be sold very low for the sake of a specimen.
Also, a great variety of MATHEMATICAL INSTRUMENTS, of different descriptions, and superior to any ever published, and which will be sold very low for the sake of a specimen.
Just received and for sale, a few superior REPLICATING TABLES of LONGITUDE, and other tables, made as above a superior of MATHEMATICAL INSTRUMENTS, of different descriptions, and superior to any ever published, and which will be sold very low for the sake of a specimen.
The proprietors will be glad to receive the attention of Engineers, and others, who may be interested in the above.
J. T. H.

Baltimore American
January 5, 1830

www.compleatsurveyor.com

Washington, District of Columbia, Vol. 1 p. 57 lists him as follows:
John G. Brown, age 45 m. w. Math. inst. maker, b New York
Also listed are three daughters aged 14, 16 and 19, all born in Maryland (1831: 1834: 1836), and two daughters aged 2 and 5 that were born in Washington (1845 and 1848).

BROWN & HEARTTE (1830 - 1831)
John G. Brown (1805 -)
Isaac T. Heartte (1785 - 1836)

Baltimore, Maryland

Baltimore, Maryland directories: 1814-15 Heartte, Isaac, sea-capt, 16 Queen st F. P. (F.P. is Fell's Point), 1816 Not listed, 1817-18 In 1819 Isaac T. Heartte published "Heartte's Lunar Tables" Both Benj. K. Hagger and James Green advertised it for sale. The title is
Ars Navigandi

or
TABLES OF LONGITUDE

Heartte, Capt. Isaac T, 19 W. Alisanna f. p. June 1, 1819. Heartte, Capt. I. F, 76 Market f. p. 1822-23. Heartte Capt. I. F. sea capt 92 Granby f. p. 1824. Hearty, Isaac T. Captain 67 Albemarle o. t. 1827. Not listed, 1829. Hearty, Isaac T., sea captain 92 s. High, 1830. The Baltimore American of January 5, 1830 has a Brown & Heartte advertisement stating that "Mr. B. being well experienced in his profession, having been for many years attached to the establishment of Mr. Richard Patten of New York" Richard Patten is listed in the New York City directories from 1813 to 1834 as being on Water Street. In 1834 he was at 180 Water. 1831 Brown & Heartte, mathematical instrument makers, 53 South St. 1831 Advertisement in 1831 directory, Brown & Heartte, 1831 Heartte, J. T. 92 s High, 1833 Heartte, J. T. e. Pratt St. near High, 1833 Brown, John G. mathematical instrument maker e. Pratt near High. 1833 Ervin & Heartte, Philosophical optical and mathematical instrument makers, 53 South St. 1835-36 Brown, John T. mathematical instrument maker, 14 Salisbury St. American & Commercial Daily Advertiser, Vol LXXIII No. 13312 - Wednesday morning, April 13, 1836 "Died, yesterday morning, Capt. J. T. Heartte, in the fifty first year of his age, his friends and acquaintances are requested to attend his funeral from his late residence, in South near Pratt St. this morning at 10 o'clock without further notice."

1837 Brown, John mathematical instrument maker, Biddle n. of Pine. The Gurvey Museum has a surveyor's vernier compass engraved "Brown & Heartte, Baltimore". It is 15" overall, with 5-1/4" needle.

BROWN & HUNT (1835 - 1837)

New York City

Edmund Brown (1800 -)
Harvey W. Hunt (1796 -)

1834-35 Brown & Hunt, math inst mkr 190 Water, 1835-36 Brown & Hunt, math inst mkr 27 Fulton.

Edmund Brown served an apprenticeship with Richard Patten beginning in 1815.

Harvey W. Hunt commenced to work for Richard Patten in 1823.

**To Merchants, Engineers, Captains of Ships,
and others.**

E. BROWN & H. W. HUNT,
HAVE COMMENCED THE
**Mathematical Instrument Making
BUSINESS.**

IN ITS VARIOUS BRANCHES, AT THE
SIGN OF THE COMPASS CARD,
No. 27 FULTON, one door from Water-Street, near
Holt's Hotel, New-York.

Mr. B. has been in the employment of Mr. R. Patten, for the last 12 years, with whom he served a regular apprenticeship. Mr. H. has also been in the same employment for the last 12 years. B. & H. have been principally engaged at making the best instruments, such as Theodolites, Levels, Railroad Gradings, Surveyor's Compasses, Circular Protractors, and in fact all Instruments in the Engineering and Surveying departments.—Any of the above-named Instruments will be made to order of the best materials and good workmanship, and on reasonable terms. They have on hand a few sets of first rate Telescope Glasses and Spirit Bubbles, imported from France and England expressly for Railroad Levels. They will also make and keep for sale,

**Sextants, Quadrants, Telescopes, Ship Compasses,
Scales and Dividers,**

With other articles in the line. Captains leaving their orders as above will have immediate attention paid.

P. S.—All Instruments in the above line Cleaned and Repaired in the best possible manner, and on liberal terms. Persons leaving their orders will have their instruments sent for and returned.

No. 27 FULTON-STREET.

May 1, 1835.

Marsh & Harrison, Printers, 5 Eldridge-St.

SAMUEL BROWNING

Boston, Massachusetts

Boston directories list as follows: 1803 Newell & Browning, ship chandlers merchants row, 1805 Browning, Samuel, ship chandler No. 4 Dock Square. 1809 Browning, Samuel, ship chandler 35 Broad St. 1816 - 1825 Browning, Samuel, Mathematical instrument Maker and Optical instrument maker 77 Broad, 1829 - 1841 Browning, Samuel mathematical instrument maker, 282 Washington.

The Henry Ford Museum in Dearborn, Michigan has a surveyor's Plain Compass made by Browning. Plate is of wood 15-1/8" long, with 5-1/4" needle. It has brass sights, and is engraved "Browning, Maker, Boston" The card is paper. E. is left of North.

BROWNING & SON

Boston, Massachusetts

There is in the Gurley Museum a Surveyor's Plain Compass, 14-1/4" overall, 4-7/8" needle. Engraved Browning & Son, Boston.

BRUNSON INSTRUMENT CO. (1946 - C)

Kansas City, Missouri

Amber N. Brunson (1905 -)

Amber N. Brunson was born in Cedar County, Missouri October 22, 1905.

In 1927 he started the repair service with Gallup Map and Supply in Kansas City on a partnership basis with Mr. Gallup.

In 1938 he purchased the other half and thus owned all of the business.

March 26, 1946 the Brunson Instrument Company was incorporated under the laws of the State of Missouri.

The Wyoming State Archives and Historical Department, State Office Building, Cheyenne, Wyoming, has a Brunson Instrument Co. Transit. It has an 8" telescope.

BUFF & BERGER (1871 - 1898)

Boston, Massachusetts

George L. Buff (1837 - 1923)

C. Louis Berger (1842 - 1922)

The partnership of Buff & Berger was founded on October 28, 1871 and was dissolved on October 18, 1898.

The history of the Berger family will be found under the caption of C. L. Berger & Sons, Inc.

There is in the Gurley Museum a Buff & Berger Transit. It has a 10" inverting telescope, 5" limb, 3-1/2" needle. Serial Number 2809.

BUFF & BUFF MANUFACTURING CO., (1898 - C)

Jamaica Plain, Massachusetts

George Louis Buff was born in Giessen, a city in the Grand Duchy of Hesse, Germany on March 24, 1837. He died in Jamaica Plain on July 2, 1923.

He worked for Thos. Cooke & Sons in York, England. It was in York England that he met C. L. Berger. He came to the United States about 1865, and worked for Stackpole & Bro. in New York City until the partnership of Buff & Berger in Boston was formed on October 28, 1871.

The firm of Buff & Buff Manufacturing Co. was founded and incorporated in 1898 by George L. Buff, after the dissolution of the firm of Buff & Berger in Boston.

He had three sons who were in the firm of Buff & Buff: Louis F. born in 1876, died in Boston in 1941, Carl W. born in 1879, died in Boston in 1908, Henry A. born in 1884.

Their dividing engine was made by George L. and his three sons. It should be noted that there are a number of other firms in the United States who have also made their own dividing engines.

DANIEL BURNAP (1759 - 1838)

East Windsor, Connecticut
Coventry, Connecticut

He was born in Coventry, November 1, 1759 and died there in 1838.

On March 4, 1791, he advertised: Brass Wheel'd Clocks. The subscriber having for a number of years applied principally to the business of Clock Making, and having met with considerable encouragement in the business, take this method to inform the public that although he works in many other branches common to those in the silversmith line, as also Surveyor's Compasses, Watch repairing &c., yet not-

withstanding Clock Making is intended as the governing business of his shop, and is determined that no pains shall be wanting to merit the approbation of his customers. Clocks of various kinds may be had at his shop in East Windsor, on short notice on the most reasonable terms (warranted). Those persons that may be in want of public clocks may be supplied at the above shop, and may depend on a faithful performance, by the publick's humble servant. Daniel Burnap.

Penrose R. Hoopes "Connecticut Clock Makers of the Eighteenth Century" pp 55 and 56.

The Western Reserve Historical Society of Cleveland, Ohio has a Dan Burnap Surveyor's Compass. It is all brass, 11-1/2" overall, the blade is attached to the compass by screws, 13/16" wide and about 3/32" thick. It has a 4-1/4" needle, no needle lifter, the sights and screws are missing. It is engraved, "Dan Burnap, East Windsor 1791". It was once used by R. Edwards 1792-1798. It was a gift from Rudolph Edwards (son) 1868.

According to Burnap's account book, this was made in March 1791 for Rudolph Edwards, the compass being billed at £ 3-18-0.

WILLIAM AUSTIN BURT (1792 - 1858)

Detroit, Michigan

William Austin Burt was born on his father's farm in Petersham, Massachusetts, on June 13, 1792. He died in Detroit on August 18, 1858. He was buried at Mt. Vernon, Michigan. However, after the death of his wife, the two bodies were removed to Elmwood Cemetery in Detroit. He had five sons, John, Alvin, Austin, Wells and William.

After acting as a surveyor in Wales Township, Erie County, N. Y. he removed to Mt. Vernon, Macomb County, Michigan in 1824. He invented the Solar Compass which was patented by him.

On February 25, 1836 he was issued a patent "True Meridian Finding". The above is on pages 29 and 30 of Volume 28 Restored Patents, Record Room, Law Library, United States Patent Office. This patent is written in long hand in bold Spencerean type of script writing. Later it was called the Burt Solar Compass.

"In 1829 he made the first typewriter ever manufactured in the United States. It was called a typographer and was patented in that same year - 1829.

He gave to the world the equatorial Sextant for directing the course of ships, and was teaching captains the use of these instruments when he was taken with an illness that terminated in his death in August 1858.

He was a Judge of the Michigan circuit court and a member of the Territorial and State Legislatures, also a Commissioner of Internal Improvements and District and County Surveyor." (Memorial Record of the Northern Peninsula of Michigan 1883 pages 10 and 11)

He was one of the projectors of the Sault Ste. Marie Canal.

J. & W. BURT (1856 - 1857)

John Burt (1814 - 1886)

William Burt (1825 - 1898)

Detroit, Michigan

John Burt, son of William Austin Burt, was born in Wales Township, Erie County, New York on April 18, 1814. He died in Detroit on August 16, 1886. He is buried in the Burt Lot in Detroit.

From 1840 to 1850 he was engaged with his father in surveying in the Upper Peninsula of Michigan. He was the first superintendent of construction of the first canal at Sault Ste. Marie. He was the inventor of the locks and patentee that are used there. With his brother William he was a partner of J. & W. Burt in 1856 and 1857. Apparently he left the company in 1857 to engage in many other enterprises. He was also a partner in the firm of Burt and Watson in 1857 and 1858.

The biography of his brother William will be found in the Burt & Bailey history.

1856-57 Detroit directory show the following listings: Burt, J. & W. mathematical instrument makers 214 Jefferson Ave. Burt, W. of J. & W. Burt with J. Burt, Burt, John of J. & W. Burt res. 25 Rowland Fawcett, W. H. mathematical instrument maker.

BURT & BAILEY (1853 - 1856)

William Burt (1814 - 1898)

John A. Bailey

Detroit, Michigan

William Burt was a son of William Austin Burt. He was born in Mount Vernon, Michigan, October 31, 1825. He died in Marquette, Michigan on December 19, 1898. He is buried in the Burt Lot in the Elmwood Cemetery in Detroit.

He was associated with his father and his brother John as a surveyor until 1846. From early in 1847 to 1858 he was a United States Deputy Surveyor.

He was a member of the firm of Burt & Bailey from 1853 to 1856; in 1856 and 1857, with J. & W. Burt; and in 1857 and 1858 a member of the firm of Burt and Watson, all of the concerns being in Detroit.

In 1866 he moved to Marquette, Michigan where he was engaged in other enterprises until his death in 1898.

September 6, 1853 - The Detroit Advertiser: "Messrs. Burt & Bailey, three doors below the Advertiser Office, have opened a factory for making and repairing mathematical instruments. They are engaged in making Burt's Patent Solar Compass."

They are listed in the Detroit city directories, as follows:

1853-54 Burt & Bailey. Mathematical Instrument Maker, ss Jefferson Avenue, between Bates and Randolph, Bailey, J. A., of Burt & Bailey, math. instrument maker, ss. Jeff Avenue, between Bates & Randolph, Crossman, Charles, with Burt & Bailey, Grant, Wm. C. with Burt & Bailey, 1855-56 Burt & Bailey, Math. inst. mak, 214 Jefferson, Bailey, John, of Burt & Bailey, mathematical instrument maker, 320 Congress.

The Sacramento County Historical Society, located in Sutter's Fort State Historical Monument in Sacramento, California has a Burt & Bailey Surveyor's Compass.

BURT & WATSON (1857-1858)

William Burt (1825 - 1898)

Thomas Watson (1832 - 1906)

Detroit, Michigan

1857-58 Burt & Watson mathematical inst. man'fs over 214 Jefferson, Burt J. & W. (non-resident), Watson, Thomas of Burt & W. 34 Montcalm, Crosman, Charles, with Burt & Watson, Grant, W. C., math inst. maker.

In the Henry Ford Museum in Dearborn, Michigan there are two Burt & Watson Surveyor's Vernier Compasses, with Burt Solars. They are 14" overall, needle 3-5/8" long. They are engraved "1857-1858" No. 79 is engraved "Made for Henry Merryweather". The other one is engraved "No. 85"

"Burt Solar February 25, 1836 Patented" is engraved on both.

BENJAMIN CHANDLEE, JR. (1723 - 1791)

Nottingham, Maryland

Benjamin Chandlee, Jr. was born in Nottingham, Maryland on January 22, 1723. He died in Nottingham on September 18, 1791.

It is interesting to note that Nottingham was in Pennsylvania until after 1768, when the Mason-Dixon line transferred Nottingham to

Maryland, hence the birthplaces of the Chandleeps are described as having been born in Maryland, though actually, at the time of their births, they were in Pennsylvania.

Benjamin Chandleep, Jr. had three sons; Ellis, Isaac and Goldsmith, who were also clock and instrument makers.

The Chester County Historical Society has a Surveyor's Plain Compass made by Benjamin. It has no level vials. It is 12-1/8" overall, with 4-5/16" needle. West is left of North. It is illustrated on page 70 of Chandleep's "Six Quaker Clockmakers".

Mr. Penrose R. Hoopes of Philadelphia, Pennsylvania has a 10-1/2" Circumferenter with sights, said to have been made about 1790. It has a 5" needle. The cardinal letter W is to the left of North. He also has a Plain Surveyor's Compass made by Benjamin Chandleep, Jr.

The Kentucky Historical Society, Frankfort, Kentucky, has a Plain Surveyor's Compass, 14-1/2" overall, and a 4-1/2" needle.

BENJAMIN CHANDLEE III (1780 - 1822)

Winchester, Virginia
Baltimore, Maryland

Benjamin Chandleep III, the son of Goldsmith Chandleep, was born in Winchester on March 5, 1780. He died in Baltimore on April 18, 1822.

He is listed in the Baltimore directories from 1814-1822 as a clock and mathematical instrument maker.

From 1819-1822 he was a member of the firm of Chandleep and Holloway (Robert Holloway).

ELLIS CHANDLEE (1755 - 1816)

Nottingham, Maryland

Ellis Chandleep was born in Nottingham on July 11, 1755. He died in Nottingham on July 25, 1816.

Ellis and Isaac were in partnership from 1792 - 1804.

A Surveyor's Compass which he made was exhibited in 1901 during the Bi-centennial of the founding of Nottingham.

A graduating machine that he used was inventoried after his death at one dollar.

A Plain Surveyor's Compass made by Ellis and Isaac Chandleep about 1793 is illustrated on page 193 of "Six Quaker Clockmakers". It is 13" overall, with a 5" needle. It has no level vials. East is to the left of North. It is owned by the Chester County Historical Society.

GOLDSMITH CHANDLEE (1751 - 1821)

Stephensburg, Virginia
Winchester, Virginia

Goldsmith Chandleep was born in Nottingham, Maryland on August 18, 1751. He died in Winchester, Virginia on March 4, 1821 and is buried in Center Meeting graveyard on the Valley Pike.

The "Six Quaker Clockmakers" list the following: (1) Page 136 - Plain Surveyor's Compass, 14" overall. 2 level vials in compass card. E. left of N. Made about 1794 for Thomas Ashby. Privately owned. (2) Page 137 - Plain Surveyor's Compass, about 14-1/2" overall, 5-7/8" needle. No level vials. Made for Lawrence Augustine Washington, nephew of George Washington about 1795. In George Washington's Library, Mount Vernon. Owned by the Mount Vernon Ladies Association of the Union. (3) 1 Surveyor's Plain Compass, 14-1/2" overall, 5-13/16" needle. privately owned in Virginia.

In the Ohio State Museum there is a Surveyor's Compass, engraved "G. Chandleep Win^o R. Lucas Jun" It is 14-1/2" overall, with 5" needle.

They also have one engraved "G. Chandleep, Winchester G. Smith". It is 14-1/4" overall, with 5-1/4" needle.

The Gurley Museum has one on loan from North Carolina. It is engraved "G. Chandleep. W., A. T. Mason". It is 14-3/8" overall, with 5" needle. Sources of material - "Six Quaker Clockmakers" by Edward E. Chandleep. The Historical Society of Pennsylvania, Philadelphia 1943. Distributed by David McKay Company.

Walter Blackson, Wilmington, Delaware. Mineographed pages of the Chandleep Genealogy, a copy of which is with the Maryland Historical Society in Baltimore, Maryland.

The Goldsmith Chandleep Surveyor's Compasses are unusual not only for excellent workmanship and design but also for the linear table engraved on the south end of the blade and the circular table engraved on the south end of the compass card.

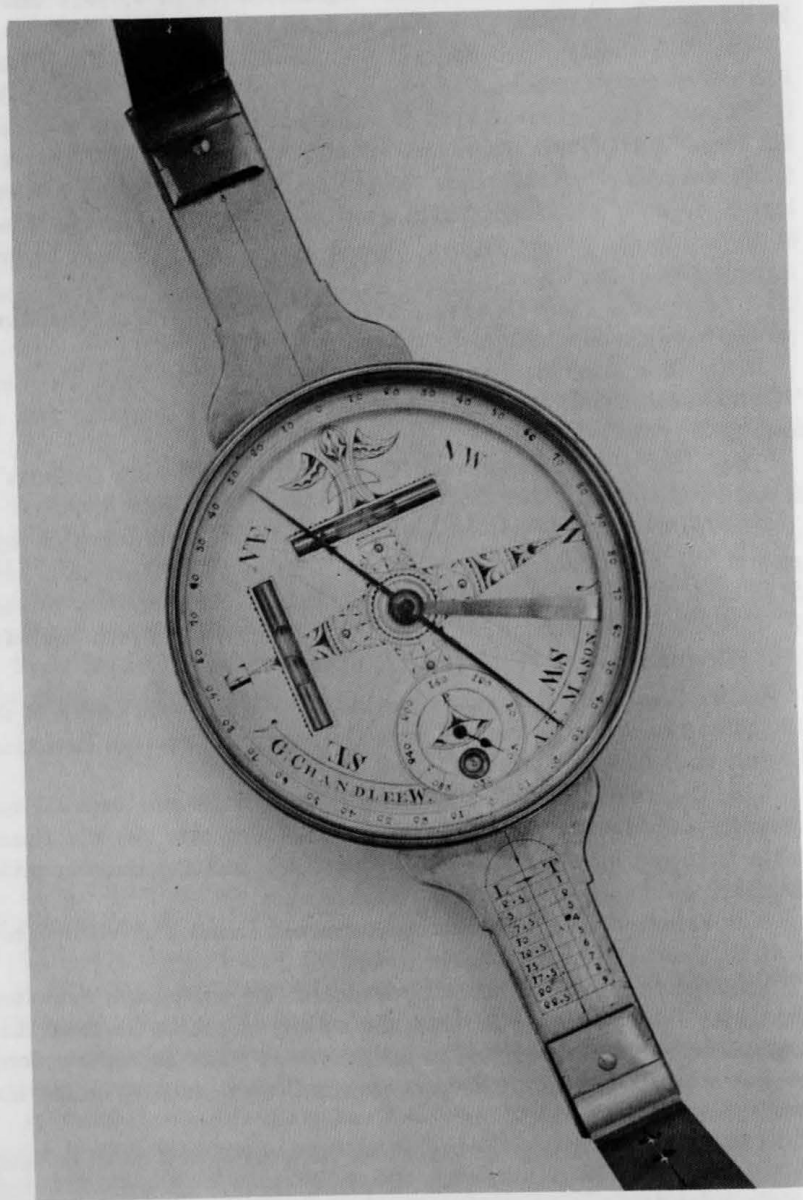
It is surmised that the linear table marked L and T refer to paces L (1-1/2 feet) and T to the number of paces 1 to 9.

The figures 1 to 16 in the compass card (the photograph indicates the figure 3) may be used to count the number of chains (66 feet) that the rod man has called back to the surveyor. Many surveyor's compasses made later than 1820 have this indicator, usually called the outkeeper.

A number of treatises on surveying, from 1791 and on have been

reviewed but none have an explanation of either the linear table on the blade or the circular table in the compass that has the engraved figures 40 to 320 with the letter P at the north end of the engraved figures.

Doubtless when Goldsmith Chandlee sold the compasses he either gave verbally or in writing an explanation to the customer of these tables.



ISAAC CHANDLEE (1760 - 1813)

Nottingham, Maryland

Isaac Chandlee was born in Nottingham on September 12, 1760, the son of Benjamin Chandlee, Junior. He died, unmarried, in Nottingham on December 10, 1813.

On page 212 "Six Quaker Clockmakers" there is an illustration of a Plain Surveyor's Compass made by Isaac Chandlee, also on pages 221 and 222.

The Ohio State Museum has an Isaac Chandlee Plain Compass. It is 14-1/4 " overall, with a 5 " needle.

ABIEL CHANDLER (1807 - 1881)

Concord, New Hampshire

Abiel Chandler was born in Concord on April 2, 1807, and died in Concord on April 22, 1881.

He is listed in the directories as follows: 1834 Clock maker on Main Street. 1850 Philosopher instrument maker on South St. 1853 h. South St. 1856 thru 1880 Horticulturist.

The New Hampshire Historical Society Museum has a Brass Surveyor's Plain Compass, engraved "A. Chandler" It is 12" overall, with 4-1/8" needle. E is left of North.

The Henry Ford Museum, Dearborn, Michigan has a Brass Surveyor's Plain Compass, engraved "A. Chandler Concord". It is 14" overall, with 5" needle. W is left of North,

"The Book of American Clocks" by Brooks Palmer, Illustration 163 has a clock made by Abiel Chandler.

NATHANIEL CHICKERING (1750 - 1837)

Dover, Massachusetts

He was born in Dover on March 29, 1750 and died there February 5, 1837. He was a civil engineer. He marched under Captain Battell to Lexington. Later in 1776, he took part in the battle of Ticonderoga. He was town treasurer of Dover from 1798 to 1810.

There is in the South Natick Historical Society's Museum, a wooden surveyor's compass made and sold by John Dupee, Boston, Mass. Attached to this compass is a card as follows: "Compass made by Nath'l Chickering Dover 1780"

Source of material: Correspondence with Mr. Carl R. Bryant of Dover and "The Genealogical History of Dover, Massachusetts Frank Smith 1917".

HORATIO CLARK (1772 - 1833)

Bennington, Vermont

He was born about 1772, probably in Bennington.
Vermont Gazette - Issue of April 26, 1803

Advertisement

(quote)

“WANTED IMMEDIATELY
An Apprentice to
Clock making business

An active lad, about 14 years old, enquire of

HORATIO CLARK
Bennington, April 25, 1803”

Vermont Gazette - Issue of February 5, 1833

Death Notice

(Quote)

“In this town, on Sunday, January 27th, Mr. Horatio Clark, aged about 60.

The Western Reserve Historical Society has a surveyor’s compass. It is engraved “Horatio Clark Bennington”. There are no sights. there is one sight screw. It is 10-1/4" overall, the needle is 5-1/8" in length. This compass was used by Seth Pease in surveying the Western Reserve in 1796.

JOHN CLARK (1815 - 1890)

Washington, D. C.

John Clark was born in England on May 22, 1815 and died in Washington on June 10, 1890.

The 1858 Washington directory lists him as a mathematical instrument maker.

The 1860 Federal Census, Washington, D. C. 5th Ward Vol. 2 page 457 states that he was 44 years old born in England.

He was appointed an instrument maker in January 1851 in the Coast and Geodetic Survey shops. He was appointed head of the instruments shops in January 1870.

The U. S. Official Register for 1871 records that he was employed in that year as an instrument maker by the Coast and Geodetic Survey in Washington.

ROBERT CLARK

Charleston, South Carolina

In the South Carolina Gazette & Public Advertiser of May 28, 1785, Robert Clark, from London, Mathematical, Optical and Philosophical Instruments Corner Tradd & Church Street.

CLARK & SON (1837: 1845 - 1846)

Wm. Clark & Son (1839 - 1843)

Wm. Clark (1844: 1847 - 1860)

Philadelphia, Pennsylvania

Of William Clark’s life only the span from 1837 to 1860 is known. Clark & Son, Wm. Clark & Son and Wm. Clark as math. inst. makers are listed in the Philadelphia directories as listed above.

In 1839 Clark, John, is listed at 122 S. Front same address as William Clark is listed at in 1844. It may be possible that he is the John Clark of Washington who is listed there from 1858 to 1890 as a mathematical instrument maker.

In the Philadelphia Circulating Directory for 1838, arranged by J. R. Savage, page 102 is the following: WILLIAM CLARK & SON Engineers and Surveyors Instruments Manufactory, No. 122 South Front Street Above Dock, Philadelphia.

There is privately owned in Bristol, Pennsylvania a Surveyor’s Plain Compass. It is engraved Wm. Clark & Son, Philada. Pa. It is 14-3/8" overall, with a 5-5/8" needle. The sights, 7-1/8" long, 1-3/16" wide.

LEVI COLTON (1803 - 1885)

New York City, N. Y.

Hartford, Connecticut

Levi Colton was born in Longmeadow, Massachusetts on May 23, 1803. He died in New Haven, Connecticut on February 5, 1885.

He learned the jewelry and silversmith business at which he worked in New York, Boston, Utica and other places. Later he engaged in a life insurance agency. From George W. Colton’s Genealogical Record of the Descendants of Quartermaster George Colton. George Colton, Lancaster, Pa.: Wickersham Printing Co. 1902 p. 261.

www.compleatsurveyor.com

He apparently made surveyor's compasses for a short while in Hartford because he is listed in Geer's Hartford City Directory 1854. as: Colton, Levi, Mathematical instruments, h. Russell St.

The Connecticut Historical Society, Hartford has a Surveyor's Vernier Compass, engraved "L. Colton & Co., Hartford, Ct." It is 14-3/8 " overall, with a 4-3/4 " needle.

There is a Plain Compass, privately owned in Peekskill, N. Y., engraved "L. Colton, New York" It is 12-1/4 " overall with a 3-3/4 " needle. It has 2 level vials.

Gurley repaired 3 Compasses, 2 with vernier declination arcs between 1885 and 1921.

In January 1959 Gurley repaired a 4" Colton Plain Compass from C. C. Houser, Rutherfordtown, North Carolina.

BENJAMIN CONDY (- 1798)

Philadelphia, Pennsylvania

Philadelphia Directories: 1785 Condy, Benjamin & Sons, mathematical instrument makers, Front b. Chestnut and Walnut Streets 1791 Condy, Benjamin, mathematical instrument maker 81 S. Front 1792 None issued, 1793-1796 Not listed, 1797 None issued, 1798 Condy, Benjamin, Gentleman, Fromberger's Court. He died August 26, 1798, a victim of the yellow fever epidemic which raged in Philadelphia at that time.

BENJAMIN CONDY. The first knowledge we have of another Philadelphia Mathematical Instrument maker is from a wooden Octant about 20 inches high, in the museum of the Historical Society of Pennsylvania. Though called a Quadrant, this is really an Octant. It bears an inlaid white bone label, inscribed, "Made by Benjamin Condy Philadelphia 1763 for Mr. Joseph Volens." Nothing has been found of Mr. Volens,* and little is known of Condy, his birth, where he came from, or his death. In the earliest city Directory, that of Captain John Macpherson, published in 1785, is given, "Condy, Benjamin, 522 Front Street." With Macpherson's peculiar method of numbering the then existing houses, little is to be gained by that information. In Biddle's Directory for 1791 is given "Condy, Benjamin, Mathematical Instrument Maker, 81 South Front Street." This was about midway between Chestnut and Walnut Streets. It was natural that he should locate near the river front and at a point near Dock Creek (Where most of the vessels landed in those days), thus meeting the sea-faring men and catering to their needs. Condy apparently retired from business in 1792, as he appears no longer in the city directories, and in that year Thomas Biggs advertises that he succeeds Condy, with whom he had been apprenticed.

Benjamin Condy died in 1798, his will signed March 31, 1796, was proved December 4, 1798, and recorded in Book Y, page 96/97. He mentions children, grandchildren, some real estate, but no other possessions; nor does the inventory of the estate include mention of instruments or other property than household effects.

The Pennsylvania Magazine of History and Biography Vol. LI, No. 3 page 294 - Harrold E. Gillingham - *Reverting to the sentence previously quoted, THE PENNSYLVANIA GAZETTE, January 5, 1769, Numb. 2089, page 3, column 2, and repeated the week later, carried this advertisement:

"To be SOLD cheap, by JOSEPH VOLANS, A Parcel of TAUNTON BEER, and ALE, of an extraordinary quality. Please to apply to him, at Messieurs James and Drinker's store." And while six years had elapsed, hints that he was a merchant, with his own ship, endeavoring to dispose of the cargo through appropriate colony sources, and possibly may have been the Joseph Volans for whom Benjamin Condy made the instrument, while in port on a similar mission.

CHARLES CROSMAN (1830 - 1907)

Detroit, Michigan

Charles Crosman was born in Dexter, Michigan in 1830. He died in Milwaukee, Wisconsin on May 1, 1907.

He is listed in Detroit directories as follows: 1853-54 With Burt & Bailey, 1858-58 With Burt & Watson, 1859 Mathematical instrument maker at 316 Congress, 1861 Mathematical instrument maker, 1862-63 Mathematical instrument maker.

"In 1861 he entered the Lighthouse Department of Staten Island. After a year he was transferred to the Detroit office and served on the lakes with the exception of a short period before his death. His name is linked with the history of the Great Lakes covering a period of almost half a century past, and he was long a Federal Engineer of note in the Department of Lake Michigan" Charles Crosman by M. D. Osband.

GEORGE CROW (- 1771-1772)

Wilmington, Delaware

Among the earliest clock-makers in Wilmington was George Crow. The first mention I find of him is in 1746, when he was elected high constable of the borough of Wilmington. He served one year. In 1755 he was elected one of the burgesses of Wilmington, and re-elected in

1756 and 1758. The records of Old Swedes show the marriage of George Crow to Mary Laudonet in August, 1746.

He was evidently in the watch and clock business prior to 1754, and continued in business until his death, which occurred in 1771 or 1772. I know of a surveyor's compass, now owned by Jacob H. Emerson, of Middletown, which bears the date 1754 and the name "George Crow." The name of R. Bryan is also scratched on it, and the present owner tells me that Bryan was one of the early surveyors who laid out much land in the Vicinity of Middletown and the Bohemia Manor.

Old Delaware Clock-Makers by Henry C. Conrad, Paper XX of the Historical Society of Delaware, pages 6-8.

JACOB DANNER (1765 - 1850)

Middletown, Virginia

The First Jacob Danner was born in 1727 in Bavaria; married Elizabeth Dannerin; died in Muskegon County, Ohio in 1814.

The Second Jacob Danner was born December 4, 1765, in York, Pennsylvania, married October 25, 1795 to Hannah Sensensy, daughter of Dr. Peter Sensensy, who founded Middletown, Virginia. He died June 17, 1850. He was a German Baptist and received education enough to enable him to read and write in German and English. He was also taught arithmetic. He acquired a knowledge of astronomy and his philosophical acquirements were far in advance of his contemporaries. He knew the principles of electricity and galvanism and magnetism, and made experiments therein when they were little known in this country. His theory of the mutations of the variation of the compass are borne out by modern science. He wrote excellent poetry and painted in both oil and water color. By trade, Jacob Danner was a silversmith, clock and mathematical instrument maker, and his clocks were still doing service in the Valley of Virginia in 1904. He constructed a dividing and cutting instrument which would be creditable to a modern workshop. His instruments stood high in repute soon after the Revolution, and his mechanical genius enabled him to construct the tools and instruments then hard to get. During the War of 1812, he produced many kinds of needed machinery, invented a wire-drawing machine, made the machinery for making his own watch crystals. He was a noted surveyor and laid out Middletown, Virginia. He also acted as attorney in conveyances, wills etc., and was general peacemaker, knew something of medicine, and was a good bonesetter and dentist. He was buried in the Mount Carmel cemetery in Middletown.

Sources of material: Pennsylvania Archives and from the Danner Family Bible, 1905.

There are no available records known concerning his surveying instruments that he may have constructed.

JACOB SENSENSY DANNER (1807 - 1877)

Middletown, Virginia

Jacob S. Danner, the son of Jacob Danner, was born in Middletown March 15, 1807. He married Mary Miller December 17, 1829. He died April 15, 1877. He is buried in Mount Carmel Cemetery in Middletown.

The Winchester-Frederick County Historical Society in Winchester, Virginia has a Surveyor's Compass 12-3/4 " o.a. 5-1/4 " needle. It is engraved J. S. Danner.

The Smithsonian Institution has a compass made by J. S. Danner and patented by Samuel Kern near Strasburg, Virginia. It is patent number 4675, patented July 31, 1846. It has a 5" trough compass underneath the compass card. It has peep sights and one level vial.

S. & JAMES M. DAVENPORT (1830 - 1837)

Philadelphia, Penna.

Philadelphia City directories: 1830-33 Davenport S. & J. M., mathem & opti. insru mr. at South Front, d. h. 136 Chestnut. 1835-36 Davenport, Jas. M. dh 144 Race, 1837 Davenport, James M. math inst mr. 144 Race, See William Helffricht.

WILLIAM DAVENPORT (1778 - 1829)

Philadelphia, Penna.

The records of the First Presbyterian Church, Philadelphia Baptisms 1701-1856, page 276 1781 May 20 William, son of Michael and Ann Davenport born Nov. 20, 1778. 1797 Mrs. Davenport, 43 South Front, 1800 - 1801 Mary Davenport, widow 43 South Front St. 1802-1803 Davenport, Wm. mathematical instrument maker 43 S. Front 1818 - 1829 Davenport, Wm. mathematical instrument maker 25 S. Front h 86 Sassafras, 1829 Davenport S. H. accountant 86 Sassafras Poulson's American Daily Advertiser, Wednesday morning May 20, 1829 states: Died last evening, about six o'clock, in the 51st year of his age, Mr. William Davenport, of severe illness.

He was buried in the old La Grange Place Burial Ground of the First Baptist Church, from which the bodies were removed in 1860, to the section purchased by the church in Mount Moriah Cemetery in Philadelphia, the record of which is not available.

See S. & James M. Davenport and William Helfricht.

East India Marine Hall, Salem, Mass. has a Davenport Surveyor's Vernier Compass. Length overall 14½" Needle 4-3/8". Has two sets of sights.

There is a Davenport Surveyor's Vernier Compass in the Gurley Museum. Length overall 14" Needle 5". It is engraved Wm. Davenport, Maker, Philada.

There is a Wm. Davenport Surveyor's Vernier Compass in the Museum of the Michigan State University of East Lansing, Michigan. It is 14" overall Needle 5".

WILLIAM C. DAVIS

New York City, N.Y.

William C. Davis is listed in the New York City directory of 1835-36 as a "Math inst maker 36 Oak h. 26 Spruce". He is listed in the New York City directories until 1878-79 at 302 Pearl Street.

The New York State Museum has a Davis Surveyor's Vernier Compass. It is 14-1/2" overall, with a 4-3/4" needle. The sights are 6-1/4" high. It has quarter cardinal points.

The Historical Society of Plainfield and North Plainfield, New Jersey has a Plain Surveyor's Compass. 17" overall, with 5-3/4" needle. It is engraved "W. C. Davis, New York"

In the Gurley Museum there is a Plain Compass, 12" overall, with 4" needle, marked "W. C. Davis New York"

WILLIAM DEAN (- 1797)

Philadelphia, Penna.

William Dean entered the field of mathematical instrument manufacture with the announcement in DUNLAP'S AMERICAN DAILY ADVERTISER, Philadelphia, Monday, June 4, 1792, No. 4167, page 2, Column 1, and continued at frequent intervals thereafter: WILLIAM DEAN Mathematical Instrument-Maker Informs the public, he has commenced business No. 43, south Front street, directly opposite the post-office.

43 South Front Street was the address of Michael Davenport, whose son, William Davenport, established himself in a similar capacity, in 1802. William Davenport was born November 20, 1778, and it is possible he was apprenticed to William Dean.

Of William Dean's origin, record has not been found.

The Philadelphia Directory and Register, James Hardie, Years 1793 and 1794, carried the entry: Dean William, mathematical instrument maker, 43 So. Front St.

Register of Wills, Philadelphia County, 1797 No. 400 Box X page 593: "Whereas I, Wm. Dean am weak in Body but of sound mind and memory***Son John Jervis***Daughters Elizabeth & Ann***(advices executrices) to build a Plean two Story House between my Corner House & J. Servis's House***I order my Exrs to sell my lot in Bucks County***my Sisters Marcy Brown & Sally Brown my whole & sole Executrices***(appoints) Thomas Yardly, Jr. of Bucks to be gardeen to my three Children***this first day of June in the year of our Lord 1797. W. Dean
John Jarvis
Alexander Dean

On July 5, 1797 the witnesses were sworn, the will proved, and the executrices, Mercy Brown and Sally Brown, qualified.

EUGENE DIETZGEN CO. OF DELAWARE (1917 - C)

Chicago, Illinois

Eugene Dietzgen was born in Uckerrath, Germany, on May 6, 1862. He died in Chicago on December 1, 1929. He came to America in 1880.

The company was founded on November 13, 1885 under the name of Luhring & Dietzgen. This partnership was succeeded by Eugene Dietzgen & Co. in 1891. Successor corporation under the name of Eugene Dietzgen Co. of Illinois occurred on February 3, 1893 and the present corporate company, Eugene Dietzgen Co. of Delaware was incorporated in Delaware on October 29, 1917.

ENOS DOOLITTLE (1751 - 1806)

Hartford, Conn.

Enos Doolittle was born in Wallingford, May 17, 1751. His father, whose name was also Enos, was a younger brother of Isaac Doolittle, the clockmaker of New Haven. Young Enos served an apprenticeship under his uncle Isaac Doolittle in the latter's shop in New Haven and by 1772, when 21 years old, he had completed his apprenticeship made his first clock, and moved to Hartford, On 15 December 1772, he ran his first advertisement in the "Connecticut Courant" announcing the establishment of a clockmaking business at the printing office.

On March 24, 1788 he advertised among others that he made Mariners and Surveyors Compasses.

In 1793 he began to make up bells for stock, an indication that he must have found an excellent market for his product, and he continued actively making bells, mariners' compasses, protractors and miscellaneous brass goods until 1802, when he retired (probably due to ill health) and his son James Doolittle took over the bell business. In 1804 his wife Asenath d. at the age of 45 and two years later, in 1806, Enos himself died on October 26, and was buried in the Center Church Burying Ground at Hartford where his tombstone still stands.

From Penrose R. Hoopes's "Connecticut Clockmakers of the Eighteenth Century" (Hartford & New York; E. V. Mitchell and Dodd Mead & Co. 1930, page 66)

There is an Enos Doolittle brass circumferenter owned privately in West Hartford, Conn. It is 6-1/2" in diameter with sights. It has no needle.

ISAAC DOOLITTLE (1721 - 1800)

New Haven, Connecticut

Isaac Doolittle was born in Wallingford, Conn. on August 13, 1721, a son of Joseph and Elizabeth Doolittle. He died in New Haven on February 20, 1800.

"He settled in New Haven prior to 1743 and for over fifty years was one of the most outstanding mechanics of the colony. He made clocks, instruments, and small brasswares, cast church bells, operated one of the leading powder mills during the Revolution, built printing presses, and trained a number of apprentices. His nephew and apprentice, ENOS DOOLITTLE, settled in Hartford in 1772, and served that town for thirty years as a clockmaker, brass founder, instrument maker and bell founder."

From Penrose R. Hoopes' Connecticut Clockmakers of the Eighteenth Century (Hartford & New York; E. V. Mitchell, and Dodd Mead & Co. 1930) page 9.

ISAAC DOOLITTLE, JR. (1759 - 1821)

New Haven, Conn.

Isaac Doolittle, Jr., a son of Isaac the clockmaker, was born in New Haven in 1759, and he died there in 1821.

He served an apprenticeship under his father. He started in business in New Haven about 1780 and on June 7, 1781, advertised in the Connecticut Journal:

"Compasses of all kinds, both for sea and land, surveyor's scales, and protractors, gauging rods, walking sticks, silver and plated buttons, turned upon horn; also clocks and watches made and repaired, and a variety of other work, by Isaac Doolittle, Junr. at the house lately occupied by Mr. William Noyes, in Leather Lane, New Haven."

N.B. Said Doolittle, wants a lad of about 13 or 14 years old to serve as an apprentice to his business.

Page 53, Connecticut Clockmakers of the Eighteenth Century, (Penrose R. Hoopes):

The Vermont Historical Society in Montpelier, Vermont has a surveyor's compass engraved "Doolittle Jun^{ior} 46 N. Haven" It is 8" in length, with 4-1/2" needle. There is one hinged brass sight 4" in length. The other sight is missing. There is no needle lifter for the needle. The needle circle is in quadrants.

PHILIP DORSEY

Baltimore, Maryland

1796 - 1802 Dorsey, Philip, mathematical instrument maker Fell's Point, 20, Queen street.

EDMUND DRAPER (1805 - 1882)

Philadelphia, Pennsylvania

Edmund Draper was born in Philadelphia in 1805, and died there on December 24, 1882.

The Philadelphia City directories show as follows: 1833-37 Draper, Edmund, instrument mf. 80 S 3rd, 1837-38 Draper & Knox, Mathematical Instrument maker 60 Dock Edmund Draper, Joseph Knox. 1852 Draper, Edmund, math & opt inst mr 22 Pear, Advertisement on page 12 showing cut of a transit. 1882 Draper, Edmund, inst mr 226 Pear h. 271 S 4th.

In the Fifth edition of the catalog of Young & Sons dated April 1878 is the following paragraph: "About the same time (1830-1835) Mr. Edmund Draper constructed a graduating engine, which, amongst those acquainted with it, has a high reputation for accuracy."

He made the first distinctive mine transit about 1850. See pages 703 and 704 Vol. XXVIII Trans. A. I. M. E.

Frank C. Knight advertised that he was the successor to Edmund Draper in 1882.

The Smithsonian Institution has a Draper Surveyor's Vernier Compass 14" overall with 5" needle.

The Ohio Historical Society in Columbus, Ohio has an Edmund Draper Plain Compass. It is 10-3/4" overall, with a 4" needle. It is engraved "Edmund Draper, Philadel^a, Warranted".

This Compass was last in public service in 1866, in the re-survey of Leesburg, Ohio.

From 1868 through 1910 Gurley repaired at least 30 instruments: Surveyor's Compasses, Levels and Transits made by Draper.

DRAPER & KNOX (1837 - 1838)

Philadelphia, Pennsylvania

Edmund Draper (1805 - 1882)

Joseph Knox (1805 - 1877)

Philadelphia City directory, lists as follows: 1837 Draper & Knox, math ins. nr 60 Dock.

JOHN DUPEE

Boston, Mass.

In the South Natick Historical Society Room in the Bacon Free Library building in South Natick, Mass. there is a surveyor's Plain Compass, made of either applewood or walnut, 13-1/2" overall, with 4-7/8" needle. The paper compass card is printed: Made & Sold by John Dupee North Side of Swing Bridge Boston, N. E.

The Bostonian Society, Boston, Mass. has a surveyor's Plain Compass, also made of wood. 13-7/8" overall, with 4-3/4" needle, marked John Dupee North Side of Swing Bridge, Boston.

There is a privately owned surveyor's Plain Compass, made of wood, 13-1/2" overall, with 4-3/4" needle. It has wooden sights. Compass card of paper, marked: Made by John Dupee of Northside, Swingbridge, Boston & New England.

There is a John Dupee that appears in the Boston Town Records in various capacities in the early 1700's.

FREDERICK ECKEL (1835 - 1898)

New York City

Frederick Eckel was born in New York City on February 11, 1863 and died there on April 23, 1898.

The San Francisco directory of 1865 lists: Eckel, Frederick, salesman 411 Sansom dwg. 162 Tehama.

The New York City directories lists as follows: 1873-77 Eckel Frederick, surveying insts. 16 Burling sl. 1878-95 Eckel F & Co., math insts. 16 Burling sl. 1895-96 Eckel Fred surveyors insts, 101 Beekman, 1896-97 Eckel Fred h. Hotel Arlington B'klyn.

Extracts from Brooklyn Daily Eagle, April 26, 1898 "Frederick Eckel attended Cooper Institute and graduated from there at an early age. When the Civil War broke out he went to the front and served three years on the Saranac, which at the time was in the Pacific squadron. After the war he entered the employ of Schuyler, Harvey and Graham in San Francisco, and for five years was the head of the department where civil engineers' and surveyors' instruments were manufactured. When he severed his connection with that firm he came to New York and started in business for himself, on Broadway, in the building where he was located at the time of his death. He was a veteran of the Fifth Company of the old Seventh Regiment, and was also a member of Lafayette Post, G.A.R., Dewitt Clinton Council, R.A., and the American Legion of Honor."

This firm was Schuyler (Jacob R) Hartley (Marcellus) and Graham (Malcolm) They are listed in the San Francisco directory as importers and jobbers, guns, pistols, military goods, etc., 320 Battery res New York. This was a branch office, the main office in New York City, 19 Maiden Lane.

Gurley repaired an Eckel Transit #2, Southern Pacific Co. 23 Broad St., N.Y. City, Geo. Howes, P.A. Received April 8, 1892, repaired and returned April 20, 1892.

October 4, 1940 received from Pennsylvania RR, N.Y. City a F. Eckel 4" D. V. Plain Transit. Considered not worth repairing, May 4, 1951 given permission to dispose of it as we saw fit. It was scrapped. See Eckel & Imhof, also Imhof.

ECKEL & IMHOF (1875 - 1877)

New York City

Frederick Eckel (1835 - 1898)

Herman Imhof (1847 -)

New York City Directories: 1875-76 Eckel & Imhof math ins 16 Burling Slip, 1876-77 Eckel & Imhof surveying inst 16 Burling Slip.

FRANK HERBERT ELLERBE (1870 - 1921)

St. Paul, Minnesota

He was born in Kemper County, Mississippi on June 20, 1870. He died in Rochester, Minnesota on July 20, 1921.

In the 1890's, he formed the firm of Kuhlo and Ellerbe, manufacturers of optical goods and surveying instruments. They were last listed in the St. Paul city directory in 1900.

ANDREW ELLICOTT (1754 - 1820)

Philadelphia, Pennsylvania
16 North Sixth Street
(1794 - 1800)

Andrew Ellicott was born in Bucks County, Pennsylvania, on January 25, 1754. He made many important surveys, among them were:

1. In 1784, he was appointed by Virginia to survey and mark the boundary between Virginia and Pennsylvania, which had been left unfinished by Mason and Dixon in 1767. On this expedition there were three men from Virginia, and three surveyors from Pennsylvania, one of whom was David Rittenhouse.

2. In 1789 and 1790, he surveyed and marked the meridian line forming part of the west boundary of the state of New York.

3. In 1792, Robert Morris employed him to survey his lands in western New York, near Geneva.

4. The boundary between Georgia and Florida was affirmed by the treaty of 1795 between the United States and Spain. In 1799, Andrew Ellicott, as commissioner for the United States, was directed to survey and mark this line from the Mississippi River to the Atlantic Ocean.

5. The long-standing controversy between Georgia and North Carolina regarding the boundary was settled in 1810, when Andrew Ellicott determined the true location of the 35th degree of latitude. "His instruments were always handsome, usually his own work, that of his brother, Benjamin Ellicott, or of his friend, David Rittenhouse."

At the time of his death, at West Point, on August 25, 1820, he was Professor of Mathematics at the West Point Military School.

There are 5 Ellicott instruments in the National Museum in Washington.

Sources of Material

Boundaries, Areas, Geographic Centers and Altitudes of the United States and the Several States, Geological Survey, Bulletin 817, 2nd edition.

"Some Early Philadelphia Instrument Makers", Harold E. Gillingham. The Pennsylvania Magazine of History and Biography, Vol. LI, No. 3, 1927.

Andrew Ellicott, His Life & Letters. Catherine Van Cortlandt Mathews. The Grafton New York 1908.

BENJAMIN ELLICOTT (1765 - 1827)

Philadelphia, Penna.

He was born in Bucks County, Pennsylvania, April 17, 1765. He died in Williamsville, New York, on December 10, 1827.

Benjamin was with his brothers Andrew and Joseph, when the western boundary of New York was determined between 1789 and 1790. He helped in the surveys of the Holland Purchase in New York State in 1794 and 1795.

In 1803, he was a judge in Genesee County, of which Batavia is the county seat.

Dr. G. Hunter Bartlett, his biographer, states that "he was a man of science and an accomplished surveyor. Some of the uncommon instruments used in the surveys, particularly a transit instrument which was used to correct the variations of the magnetic needle, by celestial observations were the work of his own hands."

Source of Material

Buffalo Historical Society, proceedings page 35, Vol. XXVL

B. K. ELLIOTT COMPANY (1905 - C)

Pittsburgh, Pennsylvania

Byron Kenneth Elliott, the founder of the B. K. Elliott Company was born in Hagerstown, Indiana on May 15, 1870. He died in Pittsburgh on June 29, 1962.

He came to Pittsburgh when he was a young man. He first worked in the engineering department of the Pennsylvania Railroad, in 1890 he went to work with the Mackey Print Paper Company, which at that time was one of the three companies in the United States which could sensitize blue print paper by machinery. He eventually became manager and later assumed financial control.

In 1900 the Elliott Electric Blue Print Company was organized.

The B. K. Elliott Company was first incorporated on March 1, 1905. In 1912 further claims were added to their original charter.

The company manufactured surveying instruments (wye levels, reconnaissance instruments, light mountain transits, engineer's transits and builder's instruments) from 1911 to 1929. They sold about 800 instruments of their manufacture during this period.

GEORGE EVANS (- 1798)

Philadelphia, Pennsylvania

Claypoole's American Advertiser of September 12, 1798, has the following item:

"DIED, at Lancaster on the 2nd inst. after an illness of 5 days, Mr. George Evans, of Philadelphia."

George Evans announced the establishment of his American business through an advertisement inserted in The Philadelphia Gazette & Universal Daily Advertiser, Wednesday, June 22, 1796:

"GEORGE EVANS

Mathematical and Philosophical Instrument maker, from London, No. 33. North Front Street, BEGS leave to solicit the favors and patronage of the gentlemen, merchants, captains, mates, and inhabitants of Philadelphia and the United States, hoping that his exertions will render him worthy of their approbation. He has brought with him an handsome assortment of instruments consisting of quadrants, telescopes, microscopes, globes, cases of drawing instruments, parallel rulers, Gunter's, spectacles made to accord with all ages, in silver, tortoise shell, and steel - Bibles mounted in silver, and many other instruments all of the best quality, which he intends selling at a very low rate wholesale or retail. All kinds of mathematical instruments made, cleaned and repaired, compasses touched and quadrants cleaned.

N. B. An handsome assortment of London made cutlery, and lady's pocket books for sale, retail."

SAMUEL EMERY (1787 - 1882)

Salem, Massachusetts

He was born in Boston January 5, 1787. He moved to Salem in 1808 and on June 13, 1809 he was in business at 12 Water Street. His last place of business was 162 Derby Street. He retired in 1868 and died March 24, 1882.

East India Marine Hall, Peabody Museum, Salem, Massachusetts has a S. Emery Surveyor's Compass.

JOHN EWIN

Baltimore, Maryland

Baltimore Directories: 1840-41 Ewin, John, mathematical inst mkr, 23 Thames St. w of Market. 1845-48 Ewin, John, math inst mkr 71 Thomas.

From 1848 to 1857, he is listed as above at various addresses in Baltimore.

EWIN & HEARTTE (1833 - 1836)

William Ewin (Not known)
Isaac T. Heartte (1785 - 1836)

Baltimore, Maryland

Baltimore Directories: 1833 Ewin & Heartte, philosophical, optical and mathematical instrument makers 53 South st. 1833 Ewin, William, mathematical instrument makers 3 Commerce st. October 1836, Ewin, William (of the late firm of Ewin & Heartte) 53 South st. 1840-41 Ewin, William, mathematical instrument maker 53 South st.

FAUTH & CO., (1874 - 1900)

Camill Fauth (1847 - 1925)
George N. Saegmuller (1847 - 1934)
Henry Lockwood (1834 - 1897)

Washington, D. C.

Camill Fauth was born in Karlsruhe, South West Germany on February 28, 1847. He died January 16, 1925 in Ansbach Germany.

He was employed by Sickler in Karlsruhe.

When the Franco-German war broke out in 1870, William Wurdemann went to Germany to get his family and he brought Camill Fauth back with him, whom he employed. Later Fauth went into business for himself. He made small equatorials, meridian transits and latitude instruments for astronomical observations.

He married a sister of George N. Saegmuller.

George N. Saegmuller and his two brothers-in-law Camill Fauth and Henry Lockwood founded Fauth & Co. in 1874. They are first listed in the Washington directories in 1876.

About 1888 Mr. Saegmuller bought the interest of Camill Fauth, previous to which he had bought the interest of Henry Lockwood.

In 1900 the name of Fauth & Co. was changed to George N. Saegmuller.

Camill Fauth left Washington in 1889 on account of ill health and went back to Ansbach, Bavaria to live, where he was registered as a private person on November 6, 1889. W. A. Berger and John L. Saegmuller visited him at Ansbach sometime during the period between 1894 and 1898 while they were at the L. Tesdorph factory in Stuttgart, Germany.

The Exhibit Room of U. S. Geological Survey has a Fauth Theodolite 8 " horizontal limb, 22 " telescope.

Civil Engineering Department, Cornell University has a Fauth Geodetic Level (Packed in a box in 3 parts) No compass. Micrometer screw for tilting telescope. 5 " horizontal limb reading to 30 seconds. Telescope 17 " long, 6 " level vial, Contains 4 agate bearing blocks for Telescope collars.

Fauth Heliotrope 19-1/4 " telescope, Mirrors 1-1/4" and 3-1/2" in diameter.

JOSEPH FARR (1775 - 1845)

Manlius Village, New York

Joseph Farr was born in Cummington, Massachusetts February 4, 1775. He died in Manlius Village, N.Y. on December 2, 1845.

His father, Joseph, Senior was the first innkeeper in Cummington, (1771) who died there on February 24, 1796.

Joseph Farr was a silversmith by trade and a manufacturer of mathematical instruments.



The Buffalo Historical Society have a Farr Surveyor's Vernier Compass. It is 16" overall, with 5-3/4" needle.

One Compass privately owned in Syracuse, N.Y. It is 16" overall, with 5-3/4" needle. It is numbered 82, and engraved "J. Farr, Manlius Village, N.Y."

The State of Wisconsin, State Historical Society, Madison, Wisconsin have a Surveyor's Compass, 16" overall, with 6" needle, engraved "J. Farr, Manlius Village, N.Y."

The Henry Ford Museum, Dearborn, Michigan, have a Surveyor's Plain Compass. 15-3/4" overall, with a 5-3/4" needle. It is numbered 85, and engraved "J. Farr, Manlius Village, N.Y."

GEORGE FORD SR. (- 1842)

Lancaster, Pennsylvania

George Ford was of English descent, his period of activity was from 1811 to 1840. He died on April 8, 1842.

He did not push the business of Grandfathers Clocks too hard. So far as we can learn about twenty-five or thirty clocks would count the number he made.

Watch making and manufacturing and repairing nautical and surveyor's instruments was a more important part of his business.

He had three children, one of whom was his son, George, to whom he gave his engines and tools, mathematical instruments and machines, also his home property, who continued the business awhile after his father's death - just how long does not appear.

Source of Material:

"Grandfather's Clocks: Their Making and Their Makers in Lancaster County (Pa.)" by D. F. Magee, Lancaster County Historical Society Vol. XLIII No. 5

JAMES FOSTER, JR. (1814 - 1873)

Cincinnati, Ohio

James Foster, Jr. was born in Baltimore, Maryland in 1814 and died in Linwood, Spencer township, Hamilton County, Ohio on May 13, 1873.

Cincinnati directories list as follows: 1839-40 First listed - employed at Wells and Foster, Mathematical instrument makers. This listing continued through 1844. Also listed as a machinist in 1839 and 1840. 1846 Foster, James Jr., Mathematical and Philosophical instrument makers. 1880 Last time the James Foster Jr. Company is listed.

From the Cincinnati Enquirer, May 15, 1873:

"The late James Foster, Jr.

James Foster, jun, optician, who died on Tuesday, May 13, 1873, at his residence in Linwood, was born in Baltimore, in 1814, and came to Cincinnati very young. He was apprenticed to the Cincinnati Type Foundry and remained there until the financial crisis of 1837, when the foundry closed. In the following year he associated himself with William Wells, under the firm name of Wells & Foster, and commenced the manufacture of philosophical and optical instruments in a single room on Third Street near Sycamore. From there the firm moved to a store-room in the old Universalist Church, on Walnut Street between Third & Fourth, where a fine business was done for several years. In 1852 Mr. Foster, having dissolved partnership with Mr. Wells, removed his stock to the building on the south-west corner of Fifth and Race Streets, where he has since carried on business. Mr. Foster was not only a hard worker at his business, but an enthusiastic scientific student. It is thought, indeed, that over-labor shortened his valuable life."

In the Oregon State Logging Museum at Klamath Falls, Oregon, there is a No. 220 Foster Solar Compass.

The Ohio State Museum, Columbus, Ohio, has a transit, engraved "James Foster, Jr. & Co., Cincinnati, Ohio" Telescope is 10-5/8", with 5" needle. The horizontal circle is 5-1/4" diameter.

JOSEPH FRYE (1712 - 1794)

Fryeburg, Maine

Joseph Frye was born March 19, 1712 in Andover, Massachusetts. He died July 25, 1794 in Fryeburg (then in the Province of Maine and a part of Mass.)

The earlier Gordon History of the Town mentions only that he himself used a compass in running the boundary lines. The first division lots were surveyed and laid out during the spring or summer of 1762 by several surveyors, as five different proprietors were credited with from 27 to 36 days "attendance on the surveyors"; and in May 1763 Frye charged the proprietors for the cash he paid at Boston for 1/2 barrel of pork and 3-1/2 gallons of rum (plus freight to Biddeford) "for the use of surveyors while surveying land in said Fryeburg". In September 1763 he charged the proprietors for the service of Jeremiah Page, Timothy Clements and Benjamin Stevens in surveying lands in Fryeburg in 1762.

Barrows History of Fryeburg states that "Frye was by profession a civil engineer, and was able to run-out his grant himself. He 'early' joined the Massachusetts Militia, served in 2 French & Indian Wars as well as one year of the Revolution."

From Helen M. Leadbeater's letter from Fryeburg, Maine dated January 3, 1959.

There is a Surveying Compass in the Smithsonian Institution used by Joseph Frye. It is possible that he made it.

FRYE & SHAW (1837 - 1845)

Addington D. Frye

Robert Ludlow Shaw (1813 - 1876)

New York City

New York City directory: 1837-38 Frye & Shaw, mathematical instruments 222 Water.

New York State Business directory: 1840 Listed on page 108, 1844-45 Same.

ADDINGTON D. FRYE

New York City

New York City directories lists as follows: 1836-37 Frye, Addington D. naut. inst. 222 Water h. 33 Pike. 1840-43 Frye & Shaw 1844-45 Frye, Addington D. math inst mkr 33 Pike, 1845-46 Frye, Addington D. math inst mkr 33 Pike, 1847-48 Frye, Addington D. late math inst mkr h. 33 Pike.

W. GARDAM & SON (1878 - 1901)

William Gardam (1825 - 1905)

Joseph Gardam (1849 - 1918)

Frederick W. Gardam (1859 - 1922)

New York City

The New York City directories list as follows: 1878-79 Gardam, W. & Son, math insts. 112 John William & Joseph. 1882-83 Gardam, W. & Son, math insts. 96 John William, Joseph & Frederick W. 1891-92 Gardam W. & Son, math inst. 96 John, They apparently discontinued making transits and levels about 1894. 1897 Gardam, W. & Son, models 98 John, 1898-1901 Gardam, W. & Son, machinery 45 Rose.

W. Gardam & Son, Inc. (1901 - 1929)

1901-1929 Gardam, W. & Son, machinists 47 Rose Incorporated in New York City August 8, 1901, Dissolved by proclamation December 16, 1929.

The following orders were received by Gurley: November 14, 1882- Rubber Hood for transit May 30, 1885 - Platinum cross wires January 26, 1886 - Cross wire and ring. Other items through December 12, 1890. Gurley serviced a Gardam transit in 1892.

FREDERICK W. GARDAM (1859 - 1922)

New York City

Frederick W. Gardam was born in Leeds, England 1859, the son of William and Mary A. Gardam. He died in the State of Washington on August 30, 1922.

The New York City directories list as follows: 1882-1866 A partner of Wm. Gardam & Son. 1887-1888 A mathematical instrument maker at 36 Maiden Lane. 1889-1891 An engraver at various addresses in New York City.

JOSEPH GARDAM (1849 - 1918)

Brooklyn, N. Y.
New York City

Joseph Gardam was born in Leeds, England on July 30, 1849, the son of William and Mary A. Gardam. He died in Middletown, N.Y. on March 2, 1918.

He first appears in the Brooklyn, N. Y. directory of 1877 as an artist.

From 1878 to 1902 he is listed as an instrument maker as a partner of W. Gardam & Son in New York City.

In 1881 he patented a solar attachment for transits which is shown and described on page 17 of "The History of Solar Surveying Instruments" by J. B. Davis of Cleveland, Ohio.

In August 1901 he was one of the incorporators of W. Gardam & Son, Inc.

He is not listed in the New York or Brooklyn directories after 1903.

WILLIAM GARDAM (1825 - 1905)

Brooklyn, N. Y.
New York City

William Gardam was born in Leeds, England in 1825. He died on June 28, 1905 at 4923 Third Avenue, Brooklyn, N. Y.

He first appears in the Brooklyn directories in 1877, listed as an engraver.

1877-1899 Gardam, William, math inst. mkr, N.Y. 96 John, 607 3rd Avenue, Brooklyn.

GEIER & BLUHM, INC. (1907 - C)

Troy, New York

Founders: James Geier, Born October 11, 1883 in Ramsen, Kt. Schaffhausen, Switzerland and died August 26, 1946 in Stamford, Conn. Joseph Bluhm, Born January 27, 1883 in Cshata, Hungary.

The business was started in the spring of 1907 in Troy, N.Y. and incorporated September 1922 in the State of New York.

Both Messrs. Geier and Bluhm worked for Hanna Mfg. Co. before they started their own company. They came to America in 1905.

The instrument business was sold to Bostron-Brady on May 8, 1936.

MAX GOLDBACKER (1813 - 1883)

New York City

Max Goldbacker was born in Oettinger, Bavaria on June 6, 1813. He died in New York City on July 14, 1871.

He came to America in 1849.

The New York City directories list as follows: 1850-1862 Goldbacker, Max, Optician. 1870-1871 Goldbacker, Max.

A blueprint company in Little Rock, Arkansas stated under date of October 15, 1958 that they had a customer who had an old surveyor's vernier compass made by Goldbacker.

WILLIAM CICERO GRANT (1815 - 1883)

Detroit, Michigan

William Cicero Grant was born December 17, 1815 and he died in Detroit on February 22, 1883. He is buried in Woodmere Cemetery.

He is first listed in 1853-54 directory as being with Burt & Bailey. In 1857-58; 1859; 1862-63 he is listed as a mathematical instrument manufacturer.

He was also a partner of Grant & Crosman from 1858 to 1861.

The 1880 Federal Census states that he was born in New York State and was 60 years old.

The Certificate of Death of the Michigan Department of Health, state that he was 67 years old at the time of his death on February 22, 1883 and that he was born in Michigan.

The Detroit Post and Tribune, February 23, 1883, p 2 Col 5: "Deaths: - In the city, on the 22nd instant, at Harper Hospital, William C. Grant, father of Miss Nellie Grant, aged 68 years." The Detroit News - Same as above.

In the Transportation Library of Michigan University there is a surveyor's compass made by William Young & Co. Philadelphia. In the case is a card, "William C. Grant, Mathematical Instrument Maker, No. 55 Woodward Avenue, Detroit, Michigan."

GRANT & CROSMAN (1858 - 1861)

W. C. Grant (1815 - 1883)
Charles Crosman (1830 - 1907)

Detroit, Michigan

The Detroit Advertiser, October 23, 1858: Grant & Crosman have purchased the establishment of Burt & Watson, next door to the Advertiser's office, for manufacturing Burt's Solar Compass and Mathematical Instruments generally.

1860-61 Detroit Business Directory: Grant & Crosman, mathematical instrument makers, 214 Jefferson.

JAMES GREEN (1808 -)

Baltimore, Maryland

The Baltimore directories list as follows: 1833 Green, J. & W. optician 41 South St. 1835-36 Green, James, philosophical instrument maker 72 Baltimore St 1837-38 Green, James, philosophical instrument maker 15 Liberty St. 1840-41 Green, James, mathematical and philosophical instrument maker 1 s Liberty St. 1842 Green, James, mathematical instrument maker, 53 South St. Adv. p 15 1845 Not listed. However in the index on page 6, under mathematical instruments is James Green, listed as an advertiser. 1847-1850 Same as 1840-41, 43 South St. 1851 Directory F. W. & R. King advertise as successors to James Green. 1876 Directory Edward Meister advertises as successor to F. W. & R. King.

In the Gurley Museum there is a verifax copy of "Catalogue of Philosophical Instruments manufactured and sold by James Green, No. 43 South Street, Baltimore" (in pencil "1844").

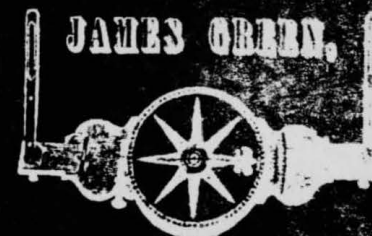
Mr. M. V. Brewington, Peabody Museum, East India Marine Hall, Salem, Massachusetts, kindly loaned us his original copy from which our verifax copy was made.

15

WILLIAM GRUBB,
MOROCCO MANUFACTURER,
No. 3, Hillen Street,

Adjoining the Bridge,

Keeps constantly on hand a general assortment of
Black and Coloured Morocco, Undressed Morocco, Boot Morocco, Black and Coloured Skivers, Bark Skivers, Hatters' Linings, Yellow, White and Pink Linings, also Book Binders' Leather, of all kinds, Stock Binding, &c. &c.



JAMES GREEN,

Manufacturer of

Mathematical and Philosophical Instruments,
No. 53, South Street, Baltimore.

Engineers' and Navigators' Instruments of every kind, with Charts, Books, &c. constantly on hand. Philosophical and Chemical Apparatus, for College and School use, in illustration of Experimental Science.

J. MEISSEL,
GROER,

Flour and Produce Dealer,
N. E. corner of Green & Lexington streets
BALTIMORE.

JAMES GREEN (1808 -)

New York City

Assuming that James Green of Baltimore who sold his business there in 1850 to F. W. & R. King came to New York in 1850 and continued to manufacture mathematical and philosophical instruments then the history will be continued as follows:

New York City directories 1849-1850 to 1889, Green, James, Optician, Importer and Manufacturer of mathematical and philosophical instruments. The Federal Census of New York City, Ward 23, for 1880 lists James Green as 72 years old born in England.

July 21, 1868 James Green, 175 Grand Street New York City ordered 1 Miner's Compass. October 9, 1869 ordered 1 Miner Compass.

The Infantry and Cavalry School, Fort Leavenworth, Kansas sent a Green Compass to Gurley to be serviced on January 5, 1891.

The Smithsonian Institution, Washington D. C. Has a compass with a 2" needle. It is engraved J. Green, New York.

STEPHEN GREENLEAF (1704 - 1795)

Boston, Massachusetts

The Hon. Stephen Greenleaf was born on October 4, 1704 in Newbury, Massachusetts. He died in Boston on January 26, 1795.

He advertised in the Boston Gazette, as follows: "Stephen Greenleaf, Mathematical Instrument-Maker, in Queen Street, Boston, opposite to the Prison, Makes and Mends all Sorts of Mathematical Instruments, as Theodolites, Spirit Levels, Semi-circles, Circumferences, and Protractors, Horizontal and Equinoctial Sun Dials, Azimuth and Amplitude Compasses, Elliptical and Triangular Compasses, and all sorts of common Compasses, drawing Pens and Portagraions, Pencil Cases, and parallel Rulers, Squares and Bevils, Free Masons Jewels, with sundry other articles too tedious to mention.

N.B. He sets Load Stones on Silver or Brass, after the best manner" - Boston Gazette, June 18, 1745. (p. 271).

"On January 3, 1757 he was appointed Sheriff to the King from Suffolk County". Genealogy of the Greenleaf Family by James E. Greenleaf, Boston 1896.

*In the New Hampshire Historical Society's Museum in Concord, New Hampshire there is a plain wood and brass surveyor's compass. It is 12-3/16 " over all, with 3-1/4" needle. The needle circle is brass. It is marked "S. Greenleaf, Boston, Fecit".

*Stephen Greenleaf and the author of this book have a common ancestor, Edmund Greenleaf who died in Boston in 1671.



Stephen Greenleaf Surveyor's Plain Compass

TO be Sold by publick Vendue or Auction at the Royal Exchange Tavern in *London*, on Thursday the eleventh Day of July next at half one o'clock Afternoon, the Ship *St. Vincent* (built in *Spain*) and her Cargo together with her Cargo of *Cacao*. The Cargo of said Ship, with Sample of the Cargo, may be seen on board her, or at the Warehouse of Mr. Charles Smith, and of Messrs. Edward and John Smith.

TO BE SOLD AT PUBLIC VENDUE
By Benjamin Church,
On Thursday next,
Road Cloths, Camlets, Buffs, Gaiters, Biscuits,
Men and Womens Hosiery, Hanks, Ribbons, a great
variety of wearing Apparel, Household Furniture, viz. Desks,
Tables, Cases of Drawers, Looking Glasses, &c. Carpen, Likewise
a Set of choice green Haricots, turneps, Valens &c. Choco-
late &c &c

TO be Sold by Richard Francis at the black and
white Halls at the South End, or at the Garden at the
bottom of the Common, good Gardeners, Cucumbers &c.
at the Season, at a very reasonable Price.

THOSE are to give Notice to the Proprietors of
the Townships No. 1, at *Hampshire* (to waded) that
upon the 21 Day of *August* 1744, they voted to raise a Tax
of twenty Shillings old Tenor, on each River, also another
Tax at said Meeting of five Shillings old Tenor on each
River. This is therefore to require the Proprietors of
the said Township that have not already paid the aforesaid
Sums, to pay them unto Mr. Nathaniel Harrington of *Winstons*,
Township Treasurer, before the sixth Day of July
next, as they would prevent their Rights being made Sale
of, as the Law directs, for the Payment of the same.

Just published } Proprietors
Waterdown, May 31. } Nath Harrington, Commr.
1745 } John Harrington, Secy.

TO be Let a dwelling House in Wing's Lane,
in the City of *London*.

Whereas Col. John Hill, & Jeremiah Powell, Esqs,
a Committee for and in behalf of the Proprietors
of the Township of North Yarmouth in the County
of York have petitioned the General Court that a Tax of one Penny
per Acre annually for three Years next ensuing, be levied on
all the appropriated Lands in said Township (excepting those Lands
appropriated since the 15th of May 1742) that they may be obli-
ged to pay their Propriety's just Debts. The following Order passed
the whole Court thereon, viz.

In the House of Representatives, June 15 1745
Ordered That the Petitioners notify the Proprietors of the
Lands in North Yarmouth of this Petition, by infrising the
Sabbath; thereof in the Boston Gazette three Weeks suc-
cessively, that they make Answer thereto (if they see Cause)
on the fifth Day of the next ensuing July Court.

Sent up for Concurrence. T. Cushing, Speaker.
In Council June 15. 1745. Read and concurred.
J. Willard, Secy.

Consented to W. SHIRLEY,
Cambridge, June 5 1745

THese are to give Notice to the Candidates for their se-
cond Degree this Year, that they attend at the College, in
this Place, at, or before the twenty-sixth Day of this In-
stant; and if any neglect to give their Attendance accordingly,
without sufficient Reason therefor, they may not expect their
Degree this Year. EDWARD HOLYOKE, President.
Cambridge June 5. 1745.

Notice is hereby given to all those who desire an Admission
into Harvard College this Year, that the President and
Tutors have determined to attend the Business of Examin-
ation on Monday and Tuesday the eighth and ninth Days of
July next. EDWARD HOLYOKE, President.

B O S T O N : Printed by S. KNEELAND and T. GREEN at their Printing House in Cornhill
Street, where Advertisements are taken in. Price 16s. a Year, old Tenor, and 20s. Seal'd.

Just Published,
And to be Sold by Kneeland and Green in Queenstreet.

AN Expository Letter from the Reverend Mr.
Edwards of Northampton, to the Reverend Mr. Clegg,
Rector of the College in New-Haven: In Reply to his late
learned Letter to him relating to what he reported concern-
ing the Rev. Mr. Whitefield's *Boston* and *Cambridge*
and elsewhere, as from Mr. Leavens; making the Fidelity
of the Report very much more manifest.

Job 31. 4. Let us close to our selves Judgment; let us know
among our selves what is good.

ALL Persons indicated to or have any Demands
upon the Estate of Samuel Elliot late of Boston Merchant,
deceased, are desired to bring their Accounts to Andrew Elliot
Shopkeeper, Administrator, and Elizabeth Elliot Administratrix
trix, in order for settlement.

Notice to Elizabeth Elliot Widow to the Deceased, con-
cerning to sell most Sorts of Stationary Ware, also Lead Gold
and Silver.

TO be Let, a convenient House for a private
Family, with the Town House, well furnished, with an
Orchard, Garden &c. Inquire at the Printer

Very good Maryland Pork, well pickled, and in
good Order to be bought for any foreign Markets, to be
sold at 12 s. per Cask. Inquire at Mr. Cushing's Store-House,
in Cornhill.

TO be Sold by Kneeland and Green over against
the Prison in *Boston*, a valuable Collection of Classic
Authors, and others of the best Editions, viz. Homer Xepher,
Theocritus, Ovid, Juvenal, Quintilian, Juvenal,
Petrus, Greek Anthology, Lessings Hist. Bible Dupin's Library of
Historians, Davens Plato Homers Life Raws Works Jurins's
Civile Hist. Richard's Classic Dict. Legend East India Voyage,
&c. &c. &c.

Stephen Greenleaf,
Mathematical Instrument-Maker.

In *Queen-Street*, *Boston*, opposite to the Prison.

Makes and mends all Sorts of Mathematic
Instruments, as Theodolites, Spirit Level, Semicircles,
Circumferences, and Protractors, Horizontal and Equinoctial
Sun Dials, Azimuth and Amplitude Compasses, and
Trigonular Compasses, and all Sorts of Gunners Compasses,
drawing Pentagons and Particulary, Parallel Circles and parallel
Rings, Squares and Levels, Fine Masons Jewels, with hun-
dred other Artificers too tedious to mention.

Notice to the Load Stones in Silver or Brass, after the
best Manner.

Just Published, and Sold by Kneeland & Green,

A LETTER from the Rev. Mr. Nicholas Loring,
of North-Yarmouth in the County of York to the Rev.
Mr. Thomas Smith of Falmouth in the same County. Giving
him his Opinion of the Preaching and Conduct of the Rev.
Mr. WHITEFIELD.

A LETTER to those of his Brethren in the Mini-
stry who refuse to admit the Rev. Mr. Whitefield into
their Pulpits. By William Sturtevant, M. A. And Pastor of
the Second Church in Portsmouth in New-Hampshire. With
an Appendix containing the Concurrence of some other Ministers.
Sold by Kneeland and Green in Queen-Street.

Just Published,

AN Account of the Experience of the Work
of God, and the Revealing of Jesus CHRIST in the
Heart of John Edwards. Written by Himself. And pub-
lished that Men may know how precious the Lord is. The
Third Edition, corrected and amended (by the Au-
thors own Hand) of some Things which crept into the first
Impression. Sold by Kneeland and Green in Queen-Street.

B O S T O N : Printed by S. KNEELAND and T. GREEN at their Printing House in Cornhill
Street, where Advertisements are taken in. Price 16s. a Year, old Tenor, and 20s. Seal'd.

THOMAS GREENOUGH, SR., (1710 - 1785)
THOMAS GREENOUGH, JR., (1738 - 1775)

Boston, Massachusetts

Thomas Greenough, Sr. was born in Boston on May 6, 1710 and
died there on August 16, 1785.

Thomas Greenough, Jr. was born in Boston on May 8, 1738 and
died there on August 11, 1775.

The Franklin Institute, Philadelphia has a black walnut or apple
tree wood surveyor's compass, 13-1/4" overall, with 5" needle. It
has a paper dial. The sights fit into square holes in the main plate.
The sights are slightly tapered where they fit into the holes in the
main plate. It is marked "Thomas Greenough, Boston, N. England".

The South Natick Historical Society, South Natick, Mass. has a
brass compass 11-7/8" long, with 4-7/8" needle, no needle lifter.
It is engraved "Thomas Greenough, Boston, Fecit."

There is also one privately owned that appears identical with the
one in South Natick Historical Society's Museum. Engraved "Thomas
Greenough, Boston, Fecit". From correspondence with Cooperstown
Farmers' Museum.

Old Sturbridge Village Museum has a Plain Wood Surveyor's Com-
pass, 11-5/8" overall, with 4-1/2" needle. Marked "Thomas Green-
ough, Boston, New England".

The Western Reserve Historical Society has a Greenough Com-
pass, 15" overall, engraved "Made by Thomas Greenough, Boston,
N. England".

Bucks County Historical Society, Doylestown, Penna. has a Green-
ough Compass. It is 11" overall, with 2-3/8" needle. It is wood with
brass sights with paper compass card. Engraved "Thomas Greenough,
Boston, N. England.



Thomas Greenough Surveyor's Plain Compass

THE GREENWOOD FAMILY (1730 - 1829)

Boston, Mass.
Providence, Rhode Island
New York City

Isaac Greenwood Jr. was born in Cambridge, Massachusetts on May 9, 1730. He may have served his apprenticeship with Deacon Thomas Greenough (1710-1785), a relative and a maker of mathematical instruments. Isaac advertised in the Boston Gazette from May to August, 1771, as a turner in ivory. He died in Dedham, Massachusetts on October 18, 1803.

He had three sons, all born in Boston; Isaac born November 3, 1758; John, May 17, 1760; and Clarke, March 8, 1764.

Clarke was in New York City from 1788 to 1810 as a mathematical instrument maker. He died February 15, 1810.

Isaac was in New York from 1783 to 1787. He was in Providence from 1787 to 1810. He went to New York City at the time of Clarke's death to take over Clarke's business at 126 Front Street. He continued in business until 1818. He died in New York City on October 21, 1829.

John took over the business of J. Quincey about 1786 and continued as a mathematical instrument maker at 199 Water Street in New York until 1788, when he turned over his business to Clarke. He then became a dentist. He died in New York City on November 16, 1819.

WILLIAM THEODORE GREGG, SR. (1818 -)
William Theodore Gregg, Jr. (1850 - 1916)

New York City

New York City directories list as follows: 1844-53 Gregg & Rupp, mathematical instruments William T. Gregg Michael Rupp. 1873-1880 William T. Gregg, Sr. & Jr. are at 110 Wall Street.

In 1891 Senior is living in Plainfield, N. J. About this time Junior went into the real estate and insurance business.

W. T. Gregg, Sr. probably died about 1897, as Mrs. Gregg is listed as a widow in Plainfield, N. J.

The 1880 Federal Census of Brooklyn, N. Y. states that he was 62 years old and was born in Ireland.

W. T. Gregg, Jr. was born in Brooklyn in 1850 and died in Yonkers, N. Y. on March 8, 1916.

GREGG & RUPP (1844 - 1853)
William Theodore Gregg (1818 -)
Michael Rupp (1818 - 1899)

New York City

New York City directories list as follows: 1844-1853 Gregg & Rupp, mathematical instruments - William T. Gregg Michael Rupp.

JOHN GOULD (- 1797)

Philadelphia, Pennsylvania

The Philadelphia City directories for years: 1794-1795, 1796-1797 Gould, John, Mathematical instrument maker, 47 Walnut St. & 46 So. Fifth St. 1798 Not listed.

The name, "William Gould", mathematical instrument maker, has been found in but a single instance and is believed to have been erroneously reported for "John Gould". However, it is not definitely rejected and investigation is continuing.

Aurora General Advertiser, Philadelphia, Friday, October 13, 1797: "Died: - On Wednesday, Mr. William Gould, mathematical instrument maker, Front street - an ingenious and a worthy citizen."

While the exact date of John Gould's death cannot be stated, it can be approximated by the record in the Register of Wills, Philadelphia County, by the granting of letters of administration unto his estate, October 23, 1797 and, later, because of a situation of which we are not aware, were again issued on November 15, 1798. Further, as nothing has been found to fit the William Gould announcement, the conclusion appears the name William was incorrectly printed.

BRYAN GRIFFIN

Philadelphia, Pennsylvania

From 1793 to 1806, Griffin, Bryan, is listed as a mathematical instrument maker, 81 So. Front St. in the Philadelphia directories.

No will or administration of an estate appears in the index at the Register's office.

Not mentioned in any other source of possible bearing.

W. & L. E. GURLEY (1852 - C)
William Gurley (1821 - 1887)
Lewis Ephraim Gurley (1826 - 1897)
William Frank Gurley (1860 - 1915)

Troy, New York

In 1812 Ephraim Gurley married Clarissa Sharpe of Pomfret, Connecticut. He came from Madison, Connecticut in 1811 to Gibbonsville, N. Y. now Watervliet. He worked for a short while for Julius Hanks and in 1813 went into business for himself. In 1818 he came to Troy, entered into partnership with Alpheus and Truman Hanks under the firm name of Hanks & Gurley. They built the first iron foundry in Troy at the south-east corner of Fifth and Grand streets. In 1821, the Hanks sold their interests to Charles and Nathaniel Starbuck, the firm becoming Starbuck and Gurley. When Charles Starbuck died in 1823, the firm became Starbuck and Gurley. They continued in business until the death of Ephraim Gurley in February 1829.

William, the son of Ephraim and Clarissa Gurley, was born in Troy, on March 16, 1821. In the summer of 1839 he was graduated as a civil engineer from Rensselaer Institute, later called the Rensselaer Polytechnic Institute. After graduation, he went as far west as Michigan, seeking employment as a civil engineer. Finding none, he returned to Troy, and in the fall of 1839, went to work for Oscar Hanks, who was making surveying instruments at the north-east corner of Fifth and Fulton streets, the location of the present Gurley factory. William served nearly 5 years as a foreman for Oscar Hanks. In February 1845, he formed a partnership with Jonas H. Phelps under the firm name of Phelps and Gurley. Jonas Phelps had come to Troy in 1833 and had been employed by Oscar Hanks, later branching out for himself as a maker of mathematical and philosophical instruments.

Lewis E. Gurley was born in Troy, December 30, 1826. In the spring of 1844, he became an apprentice to Jonas H. Phelps, and later, was employed by Phelps and Gurley. In the fall of 1847, Lewis Gurley entered Union College in Schenectady, as a member of the freshman class, graduating in July 1851, with a B. A. degree. He was admitted to partnership with his brother William and Jonas H. Phelps in September 1851, under the firm name of Phelps and Gurleys. On February 1, 1852, the brothers purchased the Jonas H. Phelps interests in the business, and the firm name was changed to W. & L. E. Gurley, which firm name has continued ever since. In 1852, the Gurley brothers bought the Oscar Hanks property at the corner of Fifth and Fulton Streets, moving from their location at 319 River Street, where the firm of Phelps and Gurley had originally started. At this time, they ad-

vertised that they were manufacturing "surveyors' compasses, transits, theodolites, goniometers, air pumps, leveling instruments, electrical machines and apparatus to illustrate the principles of natural philosophy."

For the purpose of extending the knowledge and sale of their instruments, William, in the fall of 1856, personally exhibited specimens of their work at the State Fairs at Indianapolis and St. Louis, and further extended his tour to the cities of Minneapolis and St. Paul, favorably introducing himself and his enterprise to the leading business men of those flourishing centers of Western trade and activity.

Among the number of the firm's notable customers at this time was Captain John Brown. In 1855, as he was beginning his famous career in Kansas, he ordered several compasses to be made for him. In June 1859, previous to his abortive attempt near Harper's Ferry, to free the slaves in Virginia, he visited the establishment and purchased an illuminated compass for use at night. For it, and all the other instruments purchased by him, he tendered gold coin in payment. While conversing with the members of the firm, he drew from the leg of his boot the bowie knife he had taken from Captain H. C. Pate at the battle of Black Jack. They examined with interest, the knife which had a blade about eight inches long. The pikes, which he afterward had shipped to Harper's Ferry to arm the slaves, had similar blades. The Ohio State Museum in Columbus, Ohio, has a No. 226 Gurley Surveyor's Vernier Compass. It is labelled "Used by John Brown in Kansas and later by John Brown Jr. in Ohio. There is a W. & L. E. Gurley Troy, N. Y. mailing label on the case addressed to John Brown Jr., Put-In-Bay Island, Lake Erie, Ohio.

At the International Exhibition, held at Philadelphia, in 1876, W. & L. E. Gurley made a most attractive display of their different instruments, among which was an engineer's transit of aluminum, the first ever made of that light and costly metal. The records indicate that the aluminum cost \$1.30 per ounce, and that it was purchased in France.

On May 10, 1862, a disastrous fire destroyed the Gurley buildings and contents. In December 1862, they moved into their new four-story building. This building erected on the same site is still used as a part of the company's present manufacturing facilities.

In September 1865, Gurley bought the uncompleted circular dividing engine from the estate of their predecessor, Jonas H. Phelps, who had spent several years on it. Dr. Edward W. Arms changed a part of the mechanism and finished the machine which was used until 1883. Dr. Arms who was in the employ of W. & L. E. Gurley from December 13, 1862 until his death on March 31, 1936, designed and built in 1883

a new engine that was three times faster than existing engines. He also built two more similar engines, one in 1907 and the other in 1908.

Both William and Lewis E. Gurley were active in the civic and commercial affairs of Troy. William was elected president of the Union National Bank in 1881, he was elected a vice-president of the Rensselaer Polytechnic Institute in 1872, and was acting president at the time of his death; he was a trustee of the Troy Female Seminary from 1866 and its president for several years previous to 1887, a vice-president of Troy Young Men's Association and a trustee of the Troy Cemetery Association from 1867. In 1866 he was elected to the Assembly of the State Legislature and reelected for several terms. He served the City of Troy in many civic capacities from his early manhood until his death on January 10, 1887.

Lewis E. Gurley held many offices at the time of his death on May 18, 1897. He was president of the Union National Bank, treasurer of Pioneer Building and Loan Association, Editor of the Manual of Instruments for the American Engineers and Surveyors, president of the Board of Trustees of the 5th Avenue Baptist Church, vice-president of the Troy Orphan Asylum, on the board of governors of the Marshall Infirmary, a trustee of Colgate College at Hamilton, New York, president of the Board of Trustees of the Troy Female Seminary (Emma Willard School) and a trustee of the Mohawk & Hudson River Humane Society. He was president of the Rensselaer County Agricultural Society, for twenty years beginning in 1861, president of the Troy School Commissioners and for forty-five years superintendent of the Sunday School of the 5th Avenue Baptist Church.

William Frank Gurley, the son of Lewis E. Gurley was born in Troy on June 11, 1860. He died in Atlantic City, New Jersey on February 17, 1915. He was graduated from Williams College in June 1882. On August 26, 1882, he commenced to work for W. & L. E. Gurley. The payroll records indicate that he worked 60 hours that week for which he received \$6.00.

He became a partner of W. & L. E. Gurley on the death of his Uncle William in 1887. When the Company was incorporated under the name "W. & L. E. Gurley" on October 18, 1899, he was elected its first president.

He was the first president of the Troy Chamber of Commerce. At the time of his death he was president of the Union National Bank, president of the board of trustees of the Emma Willard School and the Troy Orphan Asylum, vice-president of the Rensselaer Hotel Company, and the Y. M. C. A.; treasurer of the Taylor Truck Co. and Troy Record, director of Earl & Wilson, Trustee of the Troy Public Library, Troy Savings Bank, Rensselaer Polytechnic Institute, Colgate College and a Commissioner of Education of Troy, N. Y. He was a member of the Pafraets Dael Club, Sons of the Revolution and the Troy Citizens Corps.

In the Gurley Museum are the following Gurley Transits: A single vernier transit made about 1870. It has a 6-1/2" limb.

A two vernier transit with 2 telescopes made between 1860 and 1870. It has a 6-1/2" limb.

A two vernier transit made between 1870 and 1878. It has a 7" limb.

A two vernier aluminum transit made in 1876. It has a 6-1/4" limb.

An explorer's transit made in 1900. It has a 4" limb.

An experimental transit made in 1921. It has a 5.65" limb.

An explorer's transit made in 1930. It has a 4" limb. It was used on the Byrd-Expedition in 1933.

The Original Hell Gate Bridge in New York City in 1917. Photograph on page IX.

There are two Gurley Theodolites. One made in 1943 with a 4" Stainless Steel Limb and Vertical Circle. One made in 1949 with a 4" Glass Limb and Vertical Circle.

There are two Gurley Dumpy Levels. One made in 1880 with a 11" telescope. One made in 1929 with a 7" telescope. This explorer's level was used in the Byrd 1933 expedition to the Antarctic.

The following Gurley compasses are in the Museum. Two No. 210 Gurley Compasses with Burt Solars. One is made of brass, the other of aluminum. One vernier compass with a 12" telescope and a 6" Needle made about 1860. One vernier compass with a 10" telescope and a 6" Needle. Made about 1870. A pocket Railroad Vernier Compass with a Burt Solar. It has a 3" Vertical Needle. A number 335 Geologist's Compass with a 2-1/2" Needle. It was used by Admiral Byrd in the 1926 expedition to the North Pole. A number 226 Gurley Surveyor's Vernier Compass with a William J. Young model of the 1835 Burt Solar. It is 15-1/4" long with a 5" needle and an outkeeper. A James W. Queen Surveyor's Plain Compass, 15" overall with a 5" needle. Made by W. & L. E. Gurley.

At the present time (1962), W. & L. E. Gurley have products and services as follows:

Custom Services

Reticles for Optical and Photoelectric Instruments
Precise Photography - Precision Patterns on Glass & Metal - Electroforming and Electroetching - Circular, Linear, Cylindrical and Spherical Dividing.

Photoelectric Devices

Shaft Position Encoder - Pulse Generators - Readout Devices for Angular and Linear Position.

Optical Instruments

Optical Coincidence Reading Systems - Illuminated Inspection Telescopes - Collimators - Special Optical Instruments.

Surveying Instruments
Transits - Theodolites - Levels - Alidades - Rods - Plane Tables
- Field Equipment.

Hydrological Instruments
Current Meters - Water Level Recorders - Hook Gages

Meteorological Instruments
Wind Direction and Velocity - Pilot Ballon Theodolites

Testing Instruments
Smoothness, Softness, Stiffness, Porosity, Sizing Testers for Paper
and Textiles.

Scientific Instruments
Standards of Mass, Length and Volume.

BENJAMIN KING HAGGER (1769 - 1834)

Boston, Massachusetts
Baltimore, Maryland

Benjamin King Hagger was probably the son of William Guyse Hagger and Mary or Mehitable King, who were daughters of Benjamin King. He may have been born in Newport in 1769. He died in Baltimore on November 8, 1834.

The Baltimore American and Commercial Advertiser of November 11, 1834, states that he was sixty-five years old, formerly of Massachusetts, but 18 years a resident of Baltimore.

He is listed in the Boston City directory of 1798 as a mathematical instrument maker, Ann Street.

He is not listed in the 1803 directory or any subsequent one.

A report of the Boston Record Commissioners: Marriage Document No 101, page 298, states "William King Hagger of Boston and Mehitable Ballard of Framingham were married October 6, 1796" The marriage intention reads "Benjamin King Hagger". Mehitable Ballard was the granddaughter of Samuel Ballard of Boston.

WILLIAM GUYSE HAGGER (1748 -)

Newport, Rhode Island
Boston, Massachusetts

*William Guyse Hagger is listed in Newport directory of 1774, his family consisting of himself, his wife, 5 children (two boys and three girls) and a negro servant.

He is not listed in the 1790 census of Newport.

He is listed in the Boston City directory in 1789 as a mathematical instrument maker on Ann Street (The 1789 directory was the first directory of Boston)

In the June 1796 Boston directory he is listed Hagger, William G., mathematical instrument maker, Ann Street, house Ship Street.

*William Guyse Hagger was probably born in Newport about 1748, the son of William Hagger and Mary Knowlton who were married at Trinity Church in Newport on November 7, 1734.

HAGGER & BRO. (1842 - 1859)

John W. Hagger (1805 - 1858)
Wm. G. Hagger (1800 -)

Baltimore, Maryland

The Baltimore Directories from 1842 to 1859 list Hagger & Bro., as mathematical instrument makers.

The 1850 Federal Census of Baltimore records: Hagger, John W. born in Massachusetts 44 years old. Hagger, William G., born in Massachusetts 50 years old.

School of Civil Engineering, Cornell University, Ithaca, N. Y. has a Hagger & Bro. Surveyor's Vernier Compass, 15-1/4" overall, 5-7/8" needle. It has an outkeeper.

BENJ. K. HAGGER. & SON (1824 - 1838)

Benjamin K. Hagger (1769 - 1834)
John W. Hagger (1805 - 1858)

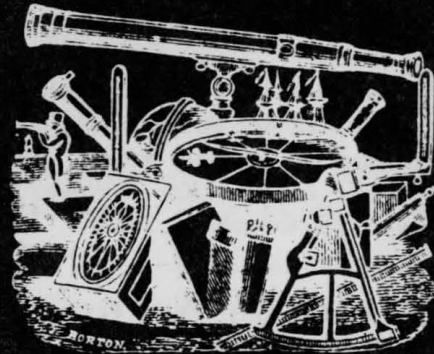
Baltimore, Maryland

John W. Hagger was born in Massachusetts in 1805 and died in Baltimore in 1858.

The Baltimore directories list Benj. K. Hagger & Son, as mathematical instrument makers from 1824 to 1838.

They are listed at 57 South Street from 1833 to 1838.

TO MARINERS and SURVEYORS.



BENJ. K. HAGGER AND SON, Manufacturers and Importers of MATHEMATICAL, OPTICAL, and PHILOSOPHICAL INSTRUMENTS, at the sign of Dr. Franklin, No. 72, Baltimore street, (between Gay and South) Baltimore—Have and keep constantly for sale, a very extensive assortment of the following goods—Surveying Compasses, of a very superior quality, Levelling Instruments, Surveying Chains of different patterns, cases of Mathematical Instruments from \$2 to \$10 each, Proportional Dividers, superior steel point Dividers, Drawing Pens, Bow Pens, Protractors, ivory, brass and wood Scales for plating, superior metal silver arch Sextants, ebony ivory arch Sextants, double tangent vertical screw and plane Quadrants of every description, ships brass, wood amplitude and azimuth Compasses of every description, Artificial Horizons, Log Glasses, Hour and Half Hour Glasses, first rate day and night Spy Glasses, with shades and without, all kinds of Common Spy Glasses and Opera Glasses, Marine Thermometers, Brewers, Distillers, Sugar Refiners and Ganger's Thermometers, Gunter Scales, Parallel Rules, Hydrometers for distillers with weights, &c., Linen Provers, Microscopes, Lenses from 1-8 inch focus to 3 feet, Saccharometers for brewers, Tape Measures from 40 to 100 feet long, Gauging Rods, Out Sticks, Steel Callipers, sliding Gunter's, Ivory Rules, carpenters and lumber inspectors Rules, pocket Compasses, silver, steel and plated Spectacles, Goggles, Penknives, Sun Dials, Spirit Levels set in brass and wood, Hearn's, Ward's and Turner's Lunar Tables, Blunt's Coasts Pilots, Seamanship and naval Tactics, expedition Measures, Merchants and Shipmasters Assistants and Nautical Almanacks for the years 1830—31 and 32, Shipping Papers, Coasting Manifests, Blank Books, letter, writing and log Paper, Charts of all parts the World, with a general assortment of goods in our line too numerous to mention—Compasses, Sextants, Quadrants, Spy Glasses and Instruments of every description sold and repaired for cash or approved paper. Those that purchase Land Instruments to sell again, will find it much to their advantage to give us a call and examine the above articles. We have opened an extra establishment for the purpose of manufacturing Surveyors Compasses and Levelling Instruments, which we are now making of a superior quality, and offer for sale wholesale and retail at very reduced prices.

BENJ. K. HAGGER & SON,
No. 72, Baltimore st. between Gay and South sts.
no 8 tuthurks Baltimore.

Baltimore (Maryland) American. 1830

JAMES HALSY (1695 - 1767)

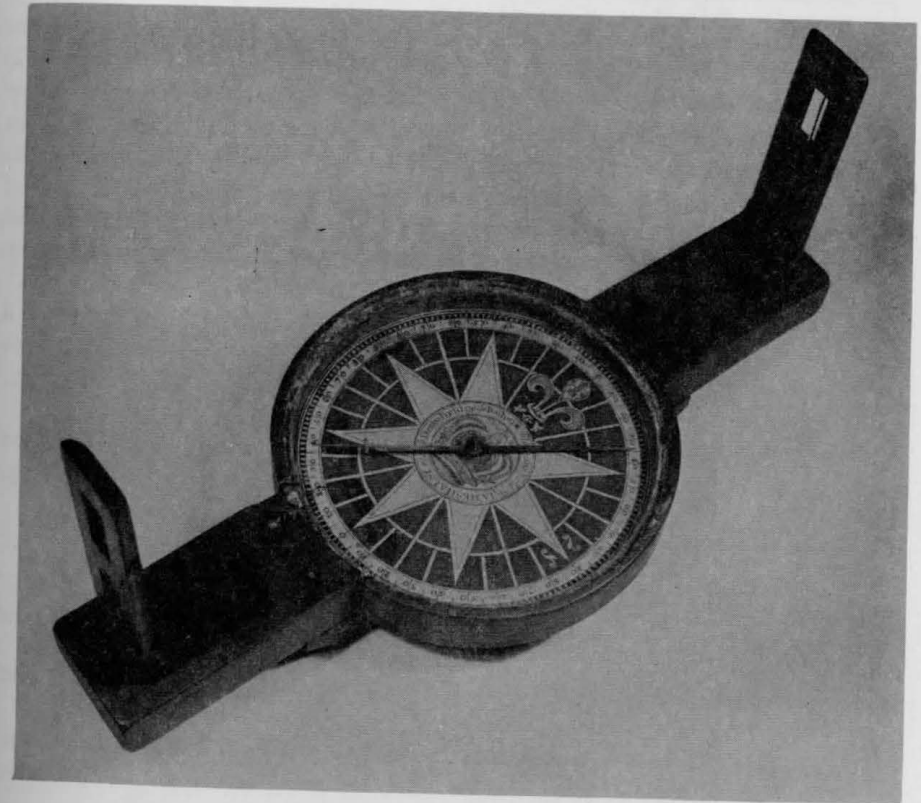
Boston, Massachusetts

James Halsy was probably born in Boston in 1695 and died there in 1767.

He was married May 30, 1717 by the Rev. Cotton Mather (Boston Marriages 1700 - 1751. A Report of the Record Commissioners Boston, page 172.)

The East India Marine Hall in Salem, Massachusetts has a surveyor's compass, either mahogany or applewood. It is 11" overall, with a 3" needle. The sights are also of wood. The compass card is apparently printed. It reads "Made and sold by James Halsy, Near drawbridge in Boston".

www.compleatsurveyor.com



James Halsy Surveyor's Plain Compass

Photograph Courtesy East India Marine Hall
Peabody Museum, Salem, Mass.

JOHN HALSY

Boston, Massachusetts

John Halsy, mathematical instrument maker, Green St. (Report of the Record Commissioners of Boston)

He was married December 10, 1700 by Rev. Cotton Mather. (A Report of the Record Commissioners of Boston marriages 1700-1751.

It is not known how long he was an instrument maker, because he became a pirate, went out to Madagascar, died in his own bed, and was buried with the rites of the Church of England in his watermelon patch.

JOSEPH HALSY

Boston, Massachusetts

Joseph Halsy married Ann Lloyd January 10, 1731 (A Report of the Record Commissioners of Boston, Boston Marriages 1700-1751 page 172)

The New Hampshire State Historical Society in Concord, New Hampshire, has a surveyor's compass made of either mahogany or apple wood. It is 11" overall, with a 5-1/4" needle. It has no needle lifter. The sights are missing, but there are two slots at each end of the blade that are approximately 3/4" square. The Jacob staff holder is a separate piece attached to the bottom of the compass. It is 7/8" thick.

The compass card is in 4 colors. The North cardinal point is a fleur-de-lis. The other seven points, cardinal and semi cardinal have busts of seven females, Grammar, Logick, Geometry, Arithmetick, Astronomy, Rhetorick and Musick.

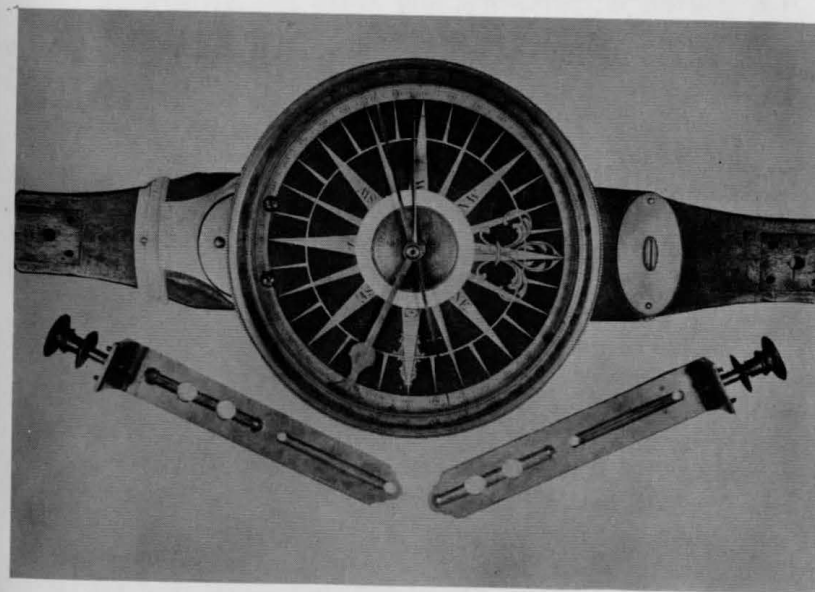
The frontispiece in the book is a copy of the original compass card. It was delineated by Harriett H. Harris of the W. & L. E. Gurley, Engineering Department.

WILLIAM HAMLIN (1772 - 1869)

Providence, Rhode Island

William Hamlin was born in Providence on October 15, 1772 and died there on November 22, 1869.

The Providence directories list him as follows: 1823 Engraver and mathematical instrument maker at 135 South Main Street, 1862 Mathematical instrument maker, 1867 Nautical instrument maker.



Benjamin Hanks. Surveyor's Vernier Compass

COLONEL BENJAMIN HANKS (1755 - 1824)

Norwich, Connecticut
Windham, Connecticut
Litchfield, Connecticut
Mansfield, Connecticut
West Troy, New York

Benjamin Hanks was born in Mansfield on October 29, 1755. His father, Uriah, was a farmer and a mechanic. Benjamin stayed on the farm until 1772 when he went to Norwich and was apprenticed to Thomas Harlan, a famous maker of clocks and watches.

He enlisted as a drummer, served twenty-seven days in the Lexington alarm, re-enlisted in the 3rd Regiment under General Putnam and was Colonel of a regiment of the Connecticut State troops.

In the early part of the Revolutionary War, Benjamin Hanks was a Tory. At that time he was very eager to procure tools to carry on the business of making clocks and watches; but, as Great Britain discouraged the growth of manufactures in the American Colonies, in order to keep her own population employed and to gain additional revenue from the taxes imposed on goods sent to this country, it was difficult to procure such tools. However, being a Tory, he stood a fair chance of getting them, and, going to New York City, by good luck he succeeded in purchasing a set of tools. He had, however, been watched; and, before he reached home, he found that, unless he made his escape, he would be arrested. Therefore, he locked the tools in a desk, and went away, telling his wife to invite the officers to search the house if they wished. Finding that he had left, the officers declined to search the house, saying that would be of no use, for, if he had purchased any tools, he had taken them with him. Soon after this he became a Whig, took an active part in support of the Revolutionary cause, and was made colonel of a regiment.

In 1777 he moved to Windham. On May 16, 1777, he advertised that he was a clock and watch maker, opposite the Court House, Windham. On August 14, 1777 he presented a petition to the General Assembly of the State of Connecticut that he be granted a "Premium" to construct a Stocking Loom. This petition was denied. On April 1, 1779 he advertised that he was still a Clock and Watch Maker in Windham.

In 1780 Hanks moved from Windham to Litchfield. After moving to Litchfield, he took a contract to make a clock for the Old Dutch Church at Nassau and Liberty streets in New York City, which would be wound automatically by air. In 1783, he petitioned the General Assembly for a patent for this invention which was granted. The patent was for fourteen years. He advertised in Litchfield in 1785 that he was a clock and watch maker and that he was making surveyors' compasses.

In 1786 he began casting church bells in Litchfield and on August 19, 1787 the Fairfield Gazette commented on the fact that Mr. Hanks had placed an excellent bell in the belfry of the Litchfield meeting-house.

Early in 1790 he announced in Litchfield that "The Brazier Business would be carried on (for a few weeks only) at the shop of Mr. Benjamin Hanks, a few rods south of the Court House." Shortly afterwards he moved to Mansfield where he continued to make clocks, bells, surveyor's compasses and carried on a woolen business.

In Mrs. Caroline Wright (Hanks) Hitchcock's original manuscript of the Hanks family is this statement. "In 1797 Benjamin (Hanks) made the first two 4-pound cannons made in the United States. They were carried by the First Company of Connecticut Artillery and are now at the foot of the Liberty Pole in the State Arsenal Building at Hartford, Connecticut." A recent letter (August 15, 1962) from the Connecticut State Library reads as follows - "From available evidence, these cannons are supposed to be the two noted in Middlebrook's Salisbury Connecticut Cannons' as Hanks guns. These were apparently in the State Arsenal in Hartford in 1888 and were probably transferred to the State Armory on, or soon after 1909. The State Library received two brass cannons from the State Armory in 1935. They are on display in our ground floor Museum."

He was Worshipful Master of St. Pauls (Masonic) Lodge in Litchfield from 1782 to 1786. The original charter was granted by the Massachusetts Grand lodge on June 1, 1781, and bears the signature of Paul Revere as Senior Warden, another maker of bells. Hanks was elected Senior Warden of the lodge at its organization meeting on June 13, 1781.

In 1808 he took his son Julius into partnership in the bell and brass foundry business in Gibbonsville (later West Troy, now Watervliet) New York. On July 20, 1808 there was an advertisement in one of the local newspapers.

"Bells cast in the old foundry at Mansfield, Connecticut and at Troy, N. Y. by Benjamin Hanks & Son. They also have surveyor's compasses upon the Rittenhouse improved plan. The business in Mansfield will be managed by Truman Hanks of Ashford."

In the records of Hadley, Massachusetts, we read of a bell weighing 932 pounds that was purchased of Benjamin Hanks of Mansfield.

On November 16, 1816, Hanks was granted a patent for "Moulding and casting Bells." He was then living in West Troy.

In the old burying ground in West Troy, near the Watervliet Arsenal, was for many years a single monument, bearing these words, "In Memory of Col. Benjamin Hanks Who Died December 17, 1824 Age 70 years."

In 1918 he was reinterred in the Albany Rural Cemetery.

This history of Benjamin Hanks was obtained from three sources: 'Connecticut Clockmakers of the Eighteenth Century' by Penrose R. Hoopes; Vol. LXXXVI, "The New England Historical Register" January 1932 and from manuscript compiled by Caroline Wright (Hanks) Hitchcock.

In the Deerfield Museum, Deerfield, Massachusetts and in the Suffield Historical Society in Shuffield, Connecticut are two identical compasses. 15-7/8" overall, with 6" needle. The body is wood, a paper card, brass needle circle, a declination arc, one level vial, the brass sights are 6-1/2" high. The compass cards are engraved "Hanks" "Mansfield".

HORATIO HANKS (1790 - 1838)

Mansfield, Connecticut; Gibbonsville, New York; Auburn, New York; Troy, New York; Albany, New York; New York City; New Bern, North Carolina; Cincinnati, Ohio; Vicksburg, Mississippi.

Horatio Hanks, the seventh child (twin) and fourth son of Benjamin Hanks and Alice Hovey was born in Mansfield, Connecticut in 1790. After a varied career, he died in Vicksburg, Mississippi in 1838.

The "Boston Budget" newspaper, date unknown of Boston, Massachusetts had this item, "In 1810, the first silk mill in America run by water-power was erected by Rodney Hanks and his nephew, Horatio Hanks."

He left Mansfield in 1816 and came to Gibbonsville where his father, Benjamin, and his brother, Julius, were then engaged in the bell, clock and mathematical instrument manufacturing business. About 1820, he left Gibbonsville and went to Auburn, New York where he began making surveyor's compasses and casting bells. He was in Auburn until 1826. Andrew Meneely was a workman with him from 1823 to 1826. Horatio came to Troy in 1826 and advertised in the Troy Sentinel from July 14, 1826 through December 1826 as follows:

**Philosophical and Mathematical
INSTRUMENTS, &c.**

HORATIO HANKS has recently commenced business in Troy, near Starbuck & Gurley's Furnace, Fifth-street, and also in the immediate vicinity of Langdon's Steam Engine Factory and Machine Shop, and of the Bell and Cannon Foundry and Mathematical Instrument Factory of Julius Hanks, and offers his services to the public in the various branches of his business. He will make and accurately graduate all descriptions of Mathematical and Philosophical Instruments—having an improved and perfect Graduating Engine of three feet radius, on Troughton's plan, of his own make. He makes and keeps constantly on hand Spirit Levels, and warrants them to be accurate. Surveyors' Instruments of all descriptions constantly on hand, and warranted superior to imported instruments of the same descriptions. Having very perfect Engine Lathes, he will execute all kinds of Engine Turning, in all kinds of metal, such as Air Pumps, Soda and Beer Pumps, Screws for Coupling Boxes, &c. &c., Steel Taps, &c. &c.

Mr. Hanks invites Machinists and others, who wish to procure any articles of his manufacture, to examine his machinery and work, which he is confident will be a sufficient recommendation. He will make all descriptions of Turning and Engine Lathes, from 30 to 500 dollars each.

The location of this establishment is such as presents uncommon facilities for the speedy manufacture of every description of metallic machinery.

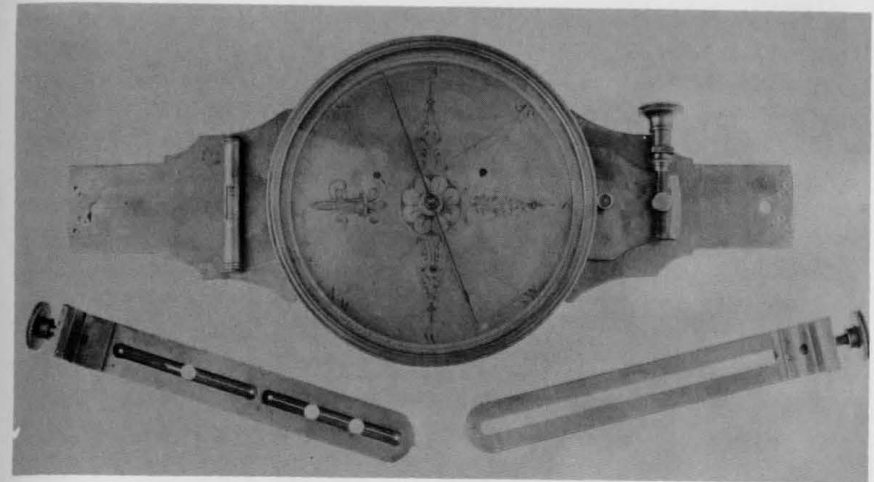
July 14 14

He did not stay in Troy very long because in the Albany, New York directory of 1828 he is listed as an engineer. He had just started to make steam engines when his shop burned down and he lost all the tools that he had been accumulating for years.

He is in the New York City directories from 1828 to 1833, sometimes as a workman in a number of manufacturing establishments. He then moved to New Bern, North Carolina where he manufactured buckets until 1836. In that year, he went to Cincinnati, Ohio where he was employed by Hanks (L.B.) & Niles until 1838. In that year he went to Vicksburg, Mississippi where he erected a sawmill on the Yazoo River. He died there of typhoid fever in 1838.

There is illustrated a surveyor's

vernier compass which he made while he was in Auburn. It is 15-1/2" overall with a 5-7/8" needle.



Horatio Hanks Surveyor's Vernier Compass

JULIUS HANKS (1784 - 1855?)

Gibbonsville, New York
Troy, New York
Chicago, Illinois

Julius Hanks was born in Litchfield, Connecticut in 1784, the fifth child and third son of Colonel Benjamin Hanks (and Alice Hovey).

We have read in the history of Benjamin Hanks how he had taken his son, Julius, into business in Gibbonsville in 1808.

On September 11, 1810 Julius advertised in the Northern Budget as follows. Apparently he was in business for himself.

Bell Founding.
JULIUS HANKS

INFORMS the public, that he has erected a **BELL FOUNDRY** on the west bank of Hudson River, opposite Troy, where may be had **CHURCH BELLS**, from 50 to 2000 weight. Broken Bells re-cast, and other Castings, in Copper or Brass, on the shortest notice.

J. HANKS also manufactures Surveyors' Compasses, Scales and Protractors, on the latest improved plan, which he warrants to be correct.

One or two Apprentices wanted, immediately, at the above business. (78) September 11, 1810.

In the Troy Sentinel of May 4, 1824 he advertised:

CHURCH BELLS,



WITH improved cast iron Yokes, made and warranted by JULIUS HANKS, at his old place at Gibbonsville, opposite the city of Troy, and near the Erie Canal. Also on hand, Town Clocks on an improved plan, and Surveyor's Instruments of the most approved construction, Copper and Brass Castings, &c.
may 4 85

In The Troy Sentinel of December 6, 1825 he advertised:

BELL FOUNDRY.



JULIUS HANKS having removed from Gibbonsville, and established himself in Troy, on Fifth-street near Starbuck & Gurley's Air Furnace and John C. Langdon's Machine Shop, is prepared to execute any orders in his line of business: viz:

CHURCH BELLS,

With Improved Cast-iron yokes— Also Town Clocks, Copper and Brass Castings, Surveyor's Instruments of the most Improved Construction, &c. &c.
December 6 51

In the April 24, 1829 issue of The Troy Sentinel was this advertisement:

BELL FOUNDRY.



JULIUS HANKS, corner of Fifth and Elbow streets, Troy, is prepared to execute any orders in his line of business, viz: Church Bells with Improved Cast Iron Yokes; also, Town Clocks on a superior plan with escapements which operate without friction, and consequently require no oil. Copper and Brass Castings, Surveyor's Instruments of the most approved construction.
Nov 20 1y55

On May 10, 1830 Alpheus and Truman Hanks have taken over the business with Julius Hanks as agent:

CHURCH BELLS,
Town Clocks, and Surveyors' Instruments.



The undersigned having purchased the establishment, stock, tools, &c. of J. Hanks, situated in Troy, N. Y. are now prepared to furnish Church Bells of all sizes, from 100 to 3000 lbs. Also, Town Clocks and Surveyors' Instruments of the most approved construction. Copper and brass Castings of all kinds, will be furnished at short notice and on the lowest terms.
Orders addressed to JULIUS HANKS, Agent, Troy, N. Y. or to the undersigned, will be promptly attended to.

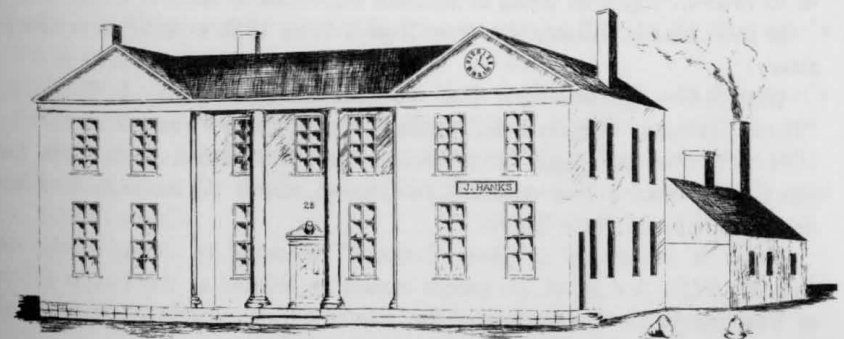
A. & T. HANKS.

Hartford, may 10

This arrangement continued until April 26, 1834 when Oscar Hanks, a son of Julius, states that he is successor to A. & T. Hanks "at the old stand, corner Elbow & Fifth Streets".

"Julius Hanks had moved from Gibbonsville to Troy in 1825. On June 15th, of that year he had purchased from Jacob D. VanderHeyden the corner lot (795) on the northeast corner of Fifth and Elbow Streets and afterward the one adjoining it (796), and there erected a two-story weather boarded building; the north half of which he occupied as a dwelling, and the south part divided into work and sale rooms. The entablature of the doorway within the columned recess on Fifth Street he had ornamented with a small bust of Benjamin Franklin. The dial of the clock, which he placed in the gable above the workshops, windowing on Fifth Street, gave considerable signifiante to the establishment where 'church bells, town clocks, copper and brass castings, and surveyors' instruments of the most improved construction' were made. East of the building and on the west side of the alley, he had built a foundry, a small wooden structure with a tall brick chimney" ("In Memoriam William Gurley, Troy, N. Y., 1890")

Herewith is an illustration of the building



www.compleatsurveyor.com

"Julius Hanks was brought up by his father in the bell and mathematical instrument business. In 1808 his father established him in the bell foundry business at West Troy, N. Y. In time he built up quite a large business, and became the most celebrated bell founder of his time. He continued his business in West Troy (then called Gibbonsville) until 1825 when he removed to Troy and built a new foundry where he continued for some time in business until he failed, (when he left West Troy one of his former apprentices, Andrew Meneely, continued the business in that place, and in time became the most celebrated bell founder in the United States.) Julius Hanks in his prosperous days was a man of considerable importance in Troy, was a deacon in the Reformed Dutch Church, and highly respected, was a man of the strictest integrity in all business transactions, but like many others was unfortunate in business.

The writer has often heard the following story of him - Many years ago and at the time he was a bell founder most people were led to believe that bells contained silver to give them a better tone (such however was not the case in bells made in this country - although many of the old Spanish bells undoubtedly did have silver in them). In those days when a bell of any considerable size, say a thousand pounds or over was cast, he would have many visitors to see the operation - It is said that Julius had a large quantity of block tin dollar pieces cast for such occasions, and would throw them into the heated metal by handfuls, thus convincing the spectators by ocular demonstration that such was the fact, no doubt, but what most people in those days believed there was silver in all bells. In personal appearance Julius was a large fine looking man and one who always commanded respect. After his failure he removed west and died in Chicago." (From a Manuscript not dated, unsigned.)

Julius Hanks was the first president of the Board of Trustees of the village of Gibbonsville, which was incorporated in 1824.

The village of West Troy was incorporated in 1836.

The city of Watervliet was incorporated in 1896.

He is listed in the Troy directories as follows: From 1829 to 1838 as either a bell founder or a mathematical instrument maker, In the 1838-40 he is listed as sealer of weights and measures for the city of Troy. From 1840-41 to 1846-47, listed as living at different addresses in Troy.

In the Chicago, Illinois directory listed: From 1852 to 1857 as a clock-maker.

Gager's Chicago directory: For the year ending June 1, 1857, lists: "Hanks, Julius h. Sangamore bt. Adams & Monroe Conn. 9 years."

It is not known where Julius was located in Connecticut between the years 1846 when in Troy and 1852 in Chicago, nor is the exact date of his death or his burial place known.

There is illustrated a "Hoop Compass" patented by Julius Hanks on July 22, 1833. A copy of the patent cannot be located at the Patent Office in Washington, D. C. Apparently the Patent Office records of this period were destroyed by fire which occurred in the 1830's.

In the State Education Building in Albany, New York there is a Julius Hanks Hoop Vernier Compass. It is engraved "J. Hanks, 1830, Troy, N.Y." The hoop is 11" in diameter, with a 6" needle.

The Henry Ford Museum in Dearborn, Michigan has a Julius Hanks Surveyor's Vernier Compass. It is 14-3/8" overall, with a 6" needle and the sights are 6-1/2" high.

OSCAR HANKS (1810 - 1883)

Troy, N. Y.

Oscar Hanks was born in Gibbonsville (now Watervliet) about 1810, the second child and first son of Julius and Olive Hanks. He died in Cincinnati on April 21, 1883.

He is listed in the Troy directories from 1831 through 1845-46 as a math. inst. maker.

In the Chicago directories 1856-57 and 1860.

In the Cincinnati directories from 1876 to 1883.

In the May 21, 1830 issue of Troy Sentinel there is an advertisement to the effect that A. (Alpheus) & T. (Truman) Hanks have purchased the establishment of Julius Hanks in Troy and that Julius Hanks will be their agent. Alpheus was the brother and Truman was the son of Benjamin Hanks.

In the July 1, 1834 issue of The Troy Daily Whig, Oscar Hanks advertises that he is the successor to A. & T. Hanks and that he will continue the same line at the same address.

On July 25, 1838, David L. Seymour, Master in Chancery, sold to Truman Hanks, the Oscar Hanks property and land (lots No. 795 and 796) (North East Corner of Fifth & Elbow Streets). Truman Hanks, in turn, deeded the property to Anson G. Phelps, William E. Dodge and Daniel James.

The Gurley Museum has a "hoop" compass made by Oscar Hanks, that was patented by Julius. It has a 5-3/8" needle.

Also a Compass-Transit made by him. Telescope 11" overall, 4-3/4" limb, single vernier, 5-1/4" needle. This Compass-Transit is illustrated on page 78.

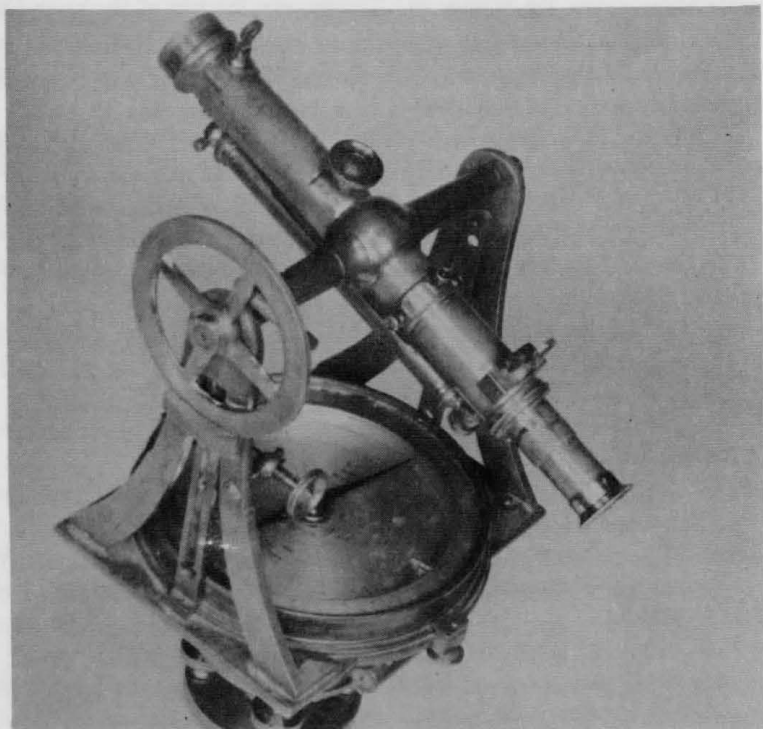
There is privately owned in Tennessee an O. Hanks Surveyor's Plain Compass. 15" overall, with a 5" needle.

Also one privately owned in New York State an O. Hanks Surveyor's Plain Compass. 9-1/4" overall, with a 5-3/8" needle.

The State Historical Society, State of Wisconsin, Madison, Wisconsin, has an O. Hanks Surveyor's Compass. It is 11" overall, with a 5-3/8" needle.



Oscar Hanks Hoop Vernier Compass



Oscar Hanks Compass Transit

HANNA MANUFACTURING COMPANY (1904 - 1928)

John Hanna (1853 - 1932)

Troy, New York

John Hanna was born in Ireland on December 15, 1853. He died in Troy on March 17, 1932.

He entered the employ of W. & L. E. Gurley on December 27, 1886. He left on December 31, 1902 to start his own company, Hanna Manufacturing Company. It was incorporated on September 14, 1904. Mr. Hanna was elected president of the company. He re-entered the employ of W. & L. E. Gurley on June 29, 1919. His last working day with Gurley was September 9, 1922.

The Hanna Company manufactured transits and levels.

The Corporation was dissolved on January 2, 1928.

There is a Hanna Transit in the Gurley Museum. It has a single vernier, an 8" telescope, a 4-1/2" limb and a 3" needle. It was made about 1910.

WM. HART

The New Hampshire Historical Society of Concord, New Hampshire has a semi-circumferenter and a surveyor's plain compass made by Mr. Hart.

The semi-circumferenter is engraved Wm. Hart Fecit 1753. It is an oblong piece of wood, 15/16" thick. It is 4" wide and 8-1/4" long. The semi-circle 0° to 180° figures and degree marks are marked on the wood. The compass is nearly in the center of the main plate. The needle is 4-1/4" long. The brass alidade is one piece 8-1/4" long.

The surveyor's plain compass is engraved W. Hart Fecit. The main plate is wood 1-5/16" thick. There are 2 brass folding sights 5-1/4" long, 1-3/16" wide and 1/16" thick. There are brass hooks to hold the sight upright when the compass is in use. The needle circle is brass 5-1/8" outside diameter, 4-1/2" inside diameter. Engraved figures in quadrants. Paper Compass Card is figured 0 to 360.

STEPHEN HASSAM (1761 - 1861)

Charlestown, New Hampshire

Stephen Hassam was born in Boston, Massachusetts about 1761. He died in Charlestown on February 4, 1861 and is buried in Forest Hill Cemetery in Charlestown.

He learned his trade as a clockmaker in Grafton, Massachusetts. He may have been an apprentice of Aaron Willard in Grafton. He was married in Charlestown, New Hampshire on September 27, 1787 so he probably went to Charlestown before that date.

He wrote his name in the old fashioned way so that the second "s" resembled the letter "h" so the name is sometimes spelled "Hasham."

The History of Charlestown by Henry H. Saunderson published in 1876 devote pages 390-392 to his life while the Second History of Charlestown by Martha McDonald Frizzell, published in 1955 also has a number of references to him.

Brooks Palmer in his "The Book of American Clocks" (1959) lists Stephen Hassam as a clockmaker and states that there are some shelf and tall clocks still extant.

The first town clock put up in Troy, New York was one placed in the tower of the old Baptist church steeple on Third street, in 1824. It had three dials, one facing the west, and the others north and south. It was built by Stephen Hasham, of Charlestown, New Hampshire. The city agreed to pay for the clock if the Trustees of the Baptist Society would let it remain in the tower of the Church and have it wound up free of any expense to the city. The clock cost five hundred and fifty dollars, for which the city made appropriations.

In the Henry Ford Museum in Dearborn, Michigan is a semi-circumferenter engraved: S. Hassam, Maker, Charlestown. 1788. Length overall 9". Length of needle 5-1/4" Diameter of semi circle 7" Height of hinged sights 4-1/2".

HERR & SEELIG (1884 - 1898)

Peter Herr (1857 - 1938)

Roman Seelig (1848 - 1924)

Chicago, Illinois

L. R. Strassberger an instrument maker in Chicago was succeeded by the partnership of Herr & Seelig in 1884.

Peter Herr was born in Gerlacseim, Baden Germany on December 10, 1857 and died in Chicago on November 1, 1938.

Roman Seelig, a brother-in-law of Peter Herr, was born in Blesen, East Germany on November 22, 1848. He came to the United States in 1862. He died in Chicago on May 3, 1924.

About 1897 or 1898, the partnership was dissolved and the corporation of Peter Herr & Co. was founded which existed until 1906. when a corporation under the name of Eugene Dietzgen Co. Factory was organized as an Illinois corporation. Peter Herr retired from Eugene Dietzgen Co. on March 1, 1912.

Roman Seelig continued after 1898 in business for himself until he died in 1924.

There is a Seelig transit in the Gurley Museum. It is engraved R. Seelig, Chicago. The telescope is 11 1/2" long, it has a 6 1/4" limb and a 4 1/2" needle. It was made about 1915.

CARL HEINRICH COMPANY (1932 - C)

Boston, Massachusetts

Carl Heinrich was born in Budapest, Hungary on January 20, 1884.

The business, which was originally started in 1932 as an individual proprietorship, was incorporated under the laws of Massachusetts in 1946.

The Carl Heinrich Company made and sold 50 Builders Levels. They were manufactured between March and December of 1950.

Mr. Heinrich, a resident of Belmont, died in Boston on November 26, 1957.

FREDERICK A. HEISELY (1759 - 1843)

Lancaster, Pennsylvania
Fredericktown, Maryland
Harrisburg, Pennsylvania

He was born in Lancaster on October 17, 1759 and died in Harrisburg on March 12, 1843. He lived in Fredericktown from 1783 to 1789 and in 1811 he moved to Harrisburg.

See George Hoff File.

Blair County Historical Society, Altoona, Penna. have a F.A. Heisely, Harrisburg, Penna. Surveyor's Compass 14" o.a. 5-1/4" needle.

In 1879 Gurley serviced a Heisely Compass that was owned in Markleysburg, Penna.

In 1886 Gurley serviced a Heisely Compass that came from Mapleton Depot, Penna.

In the Gurley Museum is a Heisely Plain Compass 14-1/4" o.a. 5-1/4" needle.

It is engraved F. A. Heisely Harrisburg.

In the David Rittenhouse Room at the Audubon Shrine there is a Heisely Surveyor's Plain Compass. It is engraved F. Heisely Harrisburg. It is 13-7/8" overall with a 6" needle.

In the Ohio State Museum in Columbus, Ohio there is a surveyor's vernier compass. It is engraved F. Heisely, Fred. town. It is 14" overall with a 6" needle. The compass was used by Joel Wright in surveying Columbus.

GEORGE J. HEISELY (1789 - 1880)

He was the son of Frederick A. Heisely.

He was born in Fredericktown, Maryland on November 29, 1789 and died in Harrisburg, Pennsylvania on June 27, 1880.

He moved with his father to Harrisburg about 1811.
At Campus Martius in Marietta, Ohio is a G. J. Heisely Surveyor's Plain Compass. It is 13-3/8" overall, with a 4-5/8" needle. The sights are 6-1/8" long.

It is engraved G. J. Heisely Harrisburg.

WILLIAM HELFRICHT (1807 - 1876)
CHARLES F. HELFRICHT (1816 - 1863)

Philadelphia, Penna.

William Helffricht was born in Germany in 1807. He died November 17, 1876 in Philadelphia.

In the Philadelphia Business Directory of 1838 there is an advertisement, "Wm. Helffricht has taken over the old established stand of the late Wm. Davenport Sign of the Quadrant 25 South Front."

He is first listed in the Philadelphia directories. 1837, Helffricht, William, math inst mkr 26 S. Front, 1848, Helffricht, William, math inst mkr 255 Front h 54 Vine, 1876, Helffricht, William, math inst mkr 140 S. 6th h 404 Dickinson.

Charles F. Helffricht was born in Germany in 1816. He died June 6, 1863 in Philadelphia.

He is first listed in the Philadelphia directories: 1841, Helffricht, Charles F. math inst mkr 54 Vine, 1849 - 1857, Helffricht, C. F. math inst mkr 122 S Front h 60 Vine, 1859, Helffricht, Charles F. alderman 140 S. 6th h 240 S. Front.

The Missouri Historical Society in St. Louis has a Surveyor's Compass 14-1/2" overall, 5" needle. It is engraved Wm. Helffricht, Philadelphia.

The Gurley Museum has a Charles F. Helffricht surveyor's plain compass.

It is 16" o.a. with a 6" vertical needle. It has an outkeeper and a 1" circular level vial. It is engraved Charles F. Helffricht, Philadelphia, Warranted.

Underneath the Jacob Staff Socket is engraved "1853"

HELLER & BRIGHTLY (1870 - C)
Charles S. Heller (1839 - 1912)
Charles H. Brightly (1816 - 1897)

Philadelphia, Penna.

Charles S. Heller had been working for William J. Young for fifteen years when Mr. Young died in 1870. For the last five years he had been a partner of William J. Young & Co. (1865 - 70)

In 1870 Mr. Heller and Charles J. Brightly formed the partnership of Heller & Brightly.

Charles H. Brightly was born in England in 1816. He died in Philadelphia on November 25, 1897. He retired from active business in 1889.

Charles S. Heller was born in Philadelphia on February 3, 1839. He died there December 1, 1912. Mr. Heller continued the business until his death in 1912. Mr. Brightly is first listed in the Philadelphia directories in 1844 as a machinist.

Mr. Heller is first listed in the Philadelphia directories in 1861 as a surg. instrument maker.

JOURNAL OF THE FRANKLIN INSTITUTE

NOVEMBER 1871

An Improved Transit. At the last meeting of the Franklin Institute there was exhibited and described an instrument of this character, devised and manufactured by Messrs. Heller and Brightly of this city. The instrument is the kind known to engineers as the "long centre" transit; and the points of modification which the inventors claims as improvements, are here briefly condensed. The weight of the instrument is reduced one-half as compared to the ordinary long centre transit, while its size is not diminished in any part. This is accomplished by ribbing or bracing the plates and other solid parts, while every superfluous particle of metal not essential to the strength or steadiness of the instrument is removed.

The errors arising from the wear of the "tangent or slow motion screw," which in time becomes very serious, the inventors claim to have obviated by an improved tangent screw.

An improved telescope, in which chromatic and spherical aberration are for practical purposes completely corrected, is also claimed.

The spiders web, hitherto used for cross hairs, being hygrometric, and hence liable in tunnel work, &c., to lengthen and shift the line of collimation, is replaced in the instrument here described, by cross hairs of platinum 1/10000 of an inch in thickness. These being perfectly independent of this atmospheric source of error, and at the same time perfectly opaque, are a most valuable substitute.

The extremely thin wire, it may be mentioned, is manufactured upon the plan first suggested by Wollaston, of covering a thin wire of platinum with silver, drawing the two metals together, and subsequently dissolving off the surrounding silver from the central platinum."

There is a Heller & Brightly Transit in the Gurley Museum.

Dia. of limb 6-1/4" reads to 1 min. Needle 5" Telescope 11-1/4"

JAMES HOBBS

Baltimore, Maryland

1796 Hobbs, James, Mathematical Instrument maker.
Old Town, So. Green St.

JONATHAN T. HOBBY (1813 - 1883)

New York City
Hempstead, Long Island

He was born in New Rochelle, New York on July 6, 1813. He died in Hempstead Long Island, New York on August 1, 1883.

New York City Directories: 1840-41 Hobby, Jonathan T., math. inst. 156 Water h. 258 Delancy, 1853-54 Hobby, Jonathan T., surv. inst. 156 Water, h. 105 Schermerhorn, Brooklyn, From 1840 to 1854 he is a partner of Sawyer & Hobby 156 Water, 1855 Hobby, Jonathan T. mth. Inst. 156 Water, h. 114 State, Brooklyn, 1862 The same, but house Hempstead, Long Island.

Hobby is listed until 1869 at 146 Water Street as a supplier of instruments under one of the above descriptions.

There is no record of him in 1870 in the New York City Directories. Curtains Directory of Long Island, Hempstead, N. Y., 1867-68 Hobby, Jonathan, spyglasses h Joraleman n. Henry. Long Island Directory, 1872-73 Hobby, Jonathan T. math. inst. mkr. Hempstead h Greenwich.

From 1865 to 1921 Gurley serviced 11 Transits, 2 Levels and 4 Compasses made by Hobby.

There is a Transit in the Gurley Museum. It is engraved J. T. Hobby Hempstead, Long Island, N. Y. 7" Limb 4-7/8" needle 10" telescope. No vertical arc or circle.

GEORGE HOFF (1740 - 1816)

Lancaster, Pennsylvania

George Hoff the progenitor of the family in this country, was born in Westerberg, Germany, about 1740, married Justina Margareta Schneitzel, in 1761, and came to this country in August, 1765, and soon thereafter settled in Lancaster, and followed watch and clock making the balance of his active life, dying July 21, 1816.

In 1793, George Hoff took in a partner by the name of Frederick

A. Heisely, advertised as an expert in the manufacture of surveyor's instruments, land compasses and projectors.

He married Catharine Julianna Hoff, daughter of George Hoff, in 1783. He was with George Hoff as a partner about eight years.

Material: Grandfathers' Clocks: Their Making and Their Makers in Lancaster County, Pennsylvania read before the Lancaster County Historical Society by D. F. Magee on April 6, 1917. Vol XLIII No. 5. Third Printing.

JOHN HOFF (1776 - 1819)

Just when John Hoff took over his father's (George Hoff) business is not apparent, but he seems to have worked for his father for many years and been with him at the time of his death.

He had become active and prominent in Lancaster's business and public affairs and was the second cashier of the Farmers Bank in Lancaster. He died soon after his father, in 1819.

It is doubtful if John Hoff ever made any surveyor's instruments under his own name though he may have worked with his father, George Hoff and Frederick A. Heisely at the time they were partners (1793 - 1801)

Material: Grandfathers' Clocks: Their Making and Their Makers in Lancaster County, Pennsylvania read before the Lancaster County Historical Society by D. F. Magee on April 6, 1917. Vol. XLIII No. 5 Third Printing.

AMASA HOLCOMB (1787 - 1875)

Southwick, Massachusetts

Scientist, clergyman, geneologist, inventor and manufacturer grew up almost without access to schools or instructors, but used his remarkable intelligence in self-instruction. He taught in Suffield, Connecticut at age 16 years having a large attendance of pupils, many being much older than he. He gained possession of a large collection of scientific books, owned by his uncle, Abjah Holcomb who was not accounted for and was believed to be lost at sea. From these books he studied surveying and astronomy, the knowledge of which shaped his life. His mechanical genius, which led to his fame, developed early. From his study of astronomy, he predicted accurately the eclipse of the sun in 1806. He made calculations, which he published in an almanac, 1807-08 while following surveying. He taught, at his home, students of astronomy, navigation and surveying for 20 years. Many of his apt pupils became famous. Surveying was his

favorite employment having more calls by 1825 than he could answer. Abandoning teaching he engaged in the manufacture of surveying instruments, magnets, electrical machines and leveling instruments.

His manufacturing began on a small scale, but he worked up a good business in it, which he kept many years. When he took up making telescopes all his efforts were required there. In 1833 he invented the achromatic telescope and sold glasses to Clark, noted telescope maker, Smithsonian Institution has on display one of his reflecting telescopes. Committees of experts inspected his lenses and mountings and in 1835 awarded him medals.

He was the first to sell American-made telescopes which he had made familiar by 1845, having the American field without domestic competition for 13 years. He sold at one-fourth the price of imported goods. He cast and ground his own lenses. In 1839 he began to make pictures by Daguerrean process on silver plates which he continued.

His measurements and calculations on water power utilization were much resorted to in arbitrations and litigation in courts at Hartford, Connecticut, and Springfield, Massachusetts where his conclusions as an expert were highly respected.

He found time to be ordained as a minister in the Methodist Episcopal Church in 1831 and availed himself of this license at intervals for the remainder of his life. Williams College conferred on him the honorary degree of Master of Arts in 1837. He served as a Selectman of Southwick in 1816. He served three terms in the House of Representatives after 1831 and one term in the Senate in 1852. He served for a long period after 1833 as a Justice of the Peace. Between 1865 and 1875 he did much research work into the history of the Holcombe family. His collection was acquired soon after his death in 1875 by Dr. William Frederick Holcombe of New York City who preserved and supplemented it extensively until his own death in 1904. Amasa was recorded in the 1850 census of Southwick Hampden County as a manufacturer of telescopes, owning \$5,500 of real estate.

He was born in Southwick June 18, 1787 and died February 22, 1875.

A great grandson Amasa Maynard Holcomb has a level also made by him.

JOSEPH WILSON HOLMES (1831 - 1919)

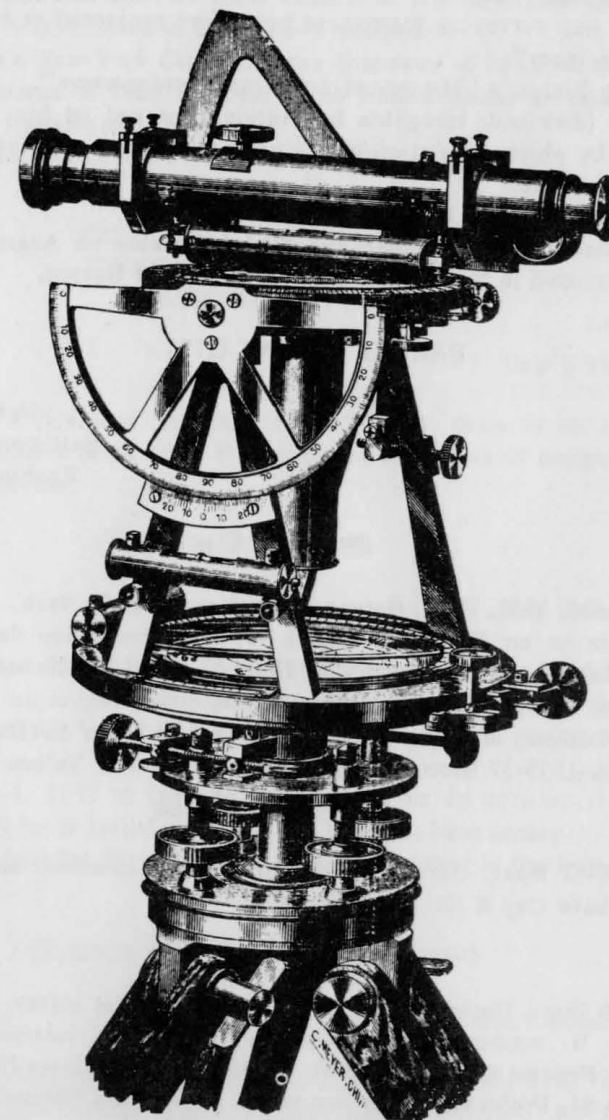
Batavia, New York

Joseph W. Holmes was born in Alabama, Genesee County, New York on July 4, 1831. He died in Batavia on October 15, 1919.

He had been a successful surveyor for many years and about 1885 he started making transits and levels which he continued to do until

about 1916. In 1878 he invented a solar attachment for a transit, which is described on pages 13, 14 and 15 in "The History of Solar Surveying Instruments" by J. B. Davis, Cleveland, Ohio, Author's Edition 1900.

Glenn D. Holmes, his son, states that his father made a few solar theodolites. Also that his father constructed his own dividing engine, starting with an 18 inch divided plate that had been made by Fauth & Co. in Washington D. C.



THE SOLAR THEODOLITE, 7 INCH LIMB.

Made by J. W. HOLMES, Batavia, N. Y.

ROWLAND HOUGHTON (1678 - 1744)

Boston, Mass.

As early as 1735, Rowland Houghton, a merchant of Boston, was the inventor of an instrument for surveying land, which he called "The New Theodolite". He obtained exclusive privileges for seven years for making and selling it, by an Act of the General Court, which declared that "land could be surveyed with greater ease and dispatch than by any surveying instrument heretofore projected or made within this Province."

From Bishop's "History of American Manufacturers".

Said (Rowland) Houghton has lately improved on his New Theodolite, by which the Art of Surveying is rendered more plain and easy than heretofore.

Boston Gazette, January 17/24, 1737 (p. 254)

He was born about 1678 and died in Boston on August 7, 1744. He is interred in the Granary Burying Ground in Boston,

HARVEY W. HUNT (1796 -)

New York City
Baltimore, Maryland
Washington, D. C.

New York City

June 25, 1821, Hunt, Harvey W. math inst mkr 78 Wall.

There is an E. Brown and H. W. Hunt broadside dated May 1, 1835 that states that Harvey W. Hunt was with R. Patten from 1823 to 1834. With the Brown and Hunt history page 20.

1834 Brown & Hunt, math inst mkrs 190 Water E. Brown Harvey W. Hunt. 1835-37 Brown & Hunt, math inst mkrs 27 Fulton.

Baltimore, Maryland

1840-42 Hunt, Harvey W. Mathematical instrument maker Granby Street betw Gay & Exeter 60 South St.

Washington, D. C.

1846 Hunt, Harvey W. mathematical instrument maker. 1850 Hunt, Harvey W. mathematical, optical and precision instrument maker.

The Federal Census of 1850, Washington D. C. lists Hunt, Harvey W. Age 54, Profession Math instrument maker Born England.

There is a H. W. Hunt Surveyor's Vernier Compass in Pittsford, N. Y. It is 15-1/2" overall, with a 5" needle. It is engraved H. W. Hunt New York

THOMAS HUNT (1799 - 1878)

New York City

He was born in the United States on February 18, 1799.

He is first listed in the 1850-51 edition of the New York City Directory as an instrument maker. In 1853-54 he is listed as a mathematical instrument maker at 53 Fulton Street.

He advertised in 1854-55 Rode edition of the New York City Directory. He is last listed in the 1870-71 edition.

In Wilson's New York City Business Directory of 1853-54, there is an advertisement of Hunt & Scott at 53 Fulton Street as makers of compasses, transits and levels.

He died in Brooklyn, N. Y. on January 18, 1878.

HUNT & SCOTT (1853 - 1854)

THOMAS HUNT (1799 - 1878)

ROBERT SCOTT

New York City

In Wilson's Business Directory of 1853-1854, there is an advertisement of Hunt & Scott at 53 Fulton Street as makers of compasses, transits and levels.

HUGH W. HUNTER

New York City

He is listed in the New York City directories from 1854-55 to May 1, 1858 as a mathematical instrument maker. There is an advertisement in the May 1, 1858 that he is a maker of mathematical instruments.

From May 1, 1859 to 1864-65 he is listed as an optician. In the 1897 directory he is listed as living in Clermont, New Jersey.

In 1900 Alexander Shaw is listed as his successor in the New York City directory.

GURDON HUNTINGTON (1763 - 1804)

Windham, Connecticut

Gurdon Huntington was born in Windham on April 30, 1763, a son of Hezekiah and Submit (Murdock) Huntington. On June 11, 1774, when 21 years old, he advertised in the CONNECTICUT GAZETTE: Gurdon Huntington, Informs the Public that he carries on the Clock

and Watch Business in its various branches, a few rods north of Maj. Ebenezer Backus' Store in Windham.

In October, 1789, he removed to Walpole, New Hampshire, became postmaster of that town and died there July 26, 1804. His estate, which was insolvent, was administered by Asa Sibley, the clockmaker.

There is a G. Huntington surveyors wooden compass owned privately in Connecticut. It is 14" overall, 4-3/4" needle.

HERMAN IMHOF (1847 -)

New York City

He is first listed in the New York City directories in 1872-73 as an optician.

1873-74 Imhof, Herman, surveying instruments 16 Burling St. 1875-77 Eckel & Imhof, surveying insts 16 Burling St. 1877-1887 Math inst and optician alternating Brooklyn directories, 1888-1891 Imhof, Herman, optician in Brooklyn.

The 1880 Federal Census of June New York City.

Imhof, Herman Age 33 Born in Wurtemberg, Germany.

NORTH INGHAM

Boston, Massachusetts

In the Massachusetts Historical Society's collection in Boston, there is a compass made by North Ingham with hardwood case and with pine cover with hole for Jacob's staff. It has about 4-3/4" printed paper dial, and a brass dial above it. Both dials register zero, but there is a little auxiliary nib pointer set in the case 4-1/2° E at the south end of the dial. This may be a declination corrector, but there is no apparent way of shifting it or the brass ring. It is driven into the wood just above the brass dial and so makes an excellent zeroing point for the needle. Dial is marked "Made by North Ingham in Boston in New England." It is said to have been used in about 1730 by Jacob Thompson, 1695-1789, of Middleborough and Bridgewater. In 1879, Thompson descendants gave it to a man who promptly turned it over to this Society.

There is a record of North Ingham, mathematical instrument maker in Boston at various times between 1725 and 1735, so this agrees with the reported use of compass (on paper pasted to inside of cover about 1880). Ingham apparently never advertised in the newspaper

ISZARD - WARREN CO. (1908 - 1912)

Philadelphia, Penna.

Charles F. Iszard (1873 - 1934)

J. Henry Warren (1877 - 1961)

In 1908 Charles F. Iszard, who had been secretary and treasurer of Queen & Company and J. Henry Warren, who had been in the engineering and sales department of the same company, founded the Iszard - Warren Company.

Mr. Iszard left the company in 1912.

Charles F. Iszard was born in New Jersey on September 10, 1873 He died in Philadelphia on January 22, 1934.

J. Henry Warren was born in Philadelphia in 1877. He died in 1961.

From Mt. Snow Development Co., West Dover, Vermont
Iszard - Warren Transit No. 426
Marked Compass
Top Opening Box
Plate "Sterling"
Returned to customer 1-15-59

In the Gurley Museum is an Iszard - Warren "Y" Level No. 116. The telescope is 20-3/4" long.

JOHN JONES

Baltimore, Maryland

1853-54 Jones, John, mathematical, optical and philosophical instrument makers, see adv. on p 181.

He is also listed in 1858-59 and in 1860.

MATHEMATICAL INSTRUMENT MAKER.

JOHN JONES,
MATHEMATICAL,
OPTICAL & PHILOSOPHICAL
Instrument Maker.



No. 18 SOUTH-ST., BALTIMORE.

Constantly on hand a large assortment of School and Chemical Apparatus, Drawing, and Surveying Instruments, Hydrometers, Thermometers, Barometers, &c. Microscopes, Telescopes, Linen Provers, Magnifiers, and a variety of articles useful for scientific research and manufacturing purposes.

Price Catalogues can be had by applying.

EDWARD KAHLER (1832 - 1890)

Washington, D. C.

Edward Kahler is listed in the Washington, D. C. directories from 1869 to 1890 as an instrument maker.

He was born in Germany in 1832 and died in Washington on September 28, 1890.

Max E. Kahler is his son.

MAX E. KAHLER (1861 - 1944)

Washington, D. C.

He was born in Yonkers, N. Y. on April 9, 1861.

He is listed as an instrument maker in Washington from 1920 to 1932.

His father, Edward Kahler, is listed separately.

Max E. Kahler died in Washington on January 2, 1944.

KEGELMAN BROS. (1947 - C)

GEORGE KEGELMAN (1900 -)

WILLIAM KEGELMAN (1907 -)

Huntingdon Valley, Penna.

George Kegelma n was born in Philadelphia, Pennsylvania on July 24, 1900. He became associated with Heller & Brightly in 1918. He left the company in 1947 to form Kegelma n Bros. with his brother, William Kegelma n, who was born on November 27, 1907.

Kegelma n Bros. manufacture engineering instruments and also specialize in prototype instrumentation.

JOHN KENNARD (1782 - 1861)

Newfields, New Hampshire

John Kennard was born in Kittery, Maine in 1782.

He died in Newfields in 1861.

Source of material, Fitts History of Newfields, New Hampshire.

Correspondence with Mr. Silvio R. Bedini indicates that he has seen a surveying instrument which is inscribed, "Made by John Kennard, Newmarket". Newfields was formerly South Newmarket.

Hoboken, New Jersey

W. J. D. Keuffel (1838 - 1908)

Herman Esser

Wilhelm J. D. Keuffel was born at Walbeck in Thuringen, Germany on July 21, 1838. He died in Hoboken on October 1, 1908.

Herman Esser was born in Germany. He retired from Keuffel & Esser in 1902.

Keuffel & Esser was founded July 19, 1867. It was incorporated in New Jersey on February 16, 1889.

They first manufactured surveying instruments in 1885.

There is a Keuffel & Esser Co. New York Railroad transit in the Gurley Museum. It has an 11" telescope, 6-1/2" limb and 4-1/2" needle. The serial number is 29034. It was manufactured about 1914.

BENJAMIN KING (1707 - 1786)

Salem, Massachusetts

Newport, Rhode Island

Benjamin King was born in Salem and baptized there on March 13, 1707. He died in Newport in 1786.

He moved to Newport and on either July 12 or 19, 1742 married Mary Hagger.

He advertised in the Newport Mercury on February 3, 1766, as follows:

"West India Pilots Mariner's Compass, Daily Assistant, Calenders, Scales and Dividers. Said King makes and sells Hadley's Quadrant, Davis's ditto, Ship Compases and Surveying ditto of all sorts."

BENJAMIN KING (1740 - 1804)

Salem, Massachusetts

Benjamin King was born in Salem November 23, 1740 and died there on December 26, 1804.

He was the son of Daniel King of Salem and a nephew of Benjamin King of Newport.

DANIEL KING (1704 - 1790)

Salem, Massachusetts

Daniel King was born in Salem on November 17, 1704. He died in Salem on June 27, 1790. He was the father of Benjamin King of Salem, also an instrument maker.

Letter from M. V. Brewington, Salem, Mass. April 2, 1959, was as follows:

Surveyor's Semi-Circumferenter

It is a beautifully made piece of boxwood approximately 6" long by 3" wide, and 3/4" thick. The needle is a flat bar needle with a brass bearing approximately 3-1/2" long. It is contained in a recess about 4" by 1" by 1/2". Beneath it is a "card" done by hand with black ink exactly duplicating the needle and marked N. and S. The pivot of the needle extends through the base and is threaded so that it may be used as a needle stop forcing the bearing against the glass cover of the recess. The piece is marked on top "Daniel King, Salem fecit 1767". There are three semicircular scales, the outer reading 0° - 180°, the middle 180° - 360° and the inner 180° - 0°. The alidade is of cast brass and exactly fits the face along one edge when not in use. When in use it is held in place by a thumb-nut. There is a brass socket for the staff.

GEDNEY KING & SON (1837 - 1839)

Boston, Massachusetts

Gedney King (1770 - 1839)
Charles Gedney King (1808 - 1858)

Gedney King is listed in the Boston directories from 1800 to 1836, as a mathematical instrument maker.

In 1837 King, Gedney & Son (Charles G.) 7 Broad, From 1841 to 1858 King, Charles G. Nautical, mathematical and engineering instrument maker 7 Broad.

Gedney King was born in Boston in 1770. The "Columbian Sentinel of August 3, 1839 has a notice of death though it does not state the day of his death.

Charles Gedney King (his son) was born in Boston on March 16, 1808. He died there on September 25, 1858.

The Essex Institute in Salem, Massachusetts has two surveyor's crosses made by C. G. King. Boston. They have a 3" needle and one level vial.

In the Gurley Museum is a King transit. It is engraved C. G. King, Boston. It has a 9-1/4" telescope, a 6-1/2" limb and a 4" needle.

F. W. & R. KING (1849 - 1875)

Frederick W. King (1821 - 1889)

Richard King (1823 - 1905)

New York City
Baltimore, Maryland

The New York City directory of 1849-50 lists F. W. & R. King math inst makers; 13 Nassau.

The Baltimore directories list in 1851 and 1852, King, F. W. & R. math & naut instrument makers successors to James Green 33 South St. They are listed through 1875.

In the 1876 Baltimore directory, Edward Meister advertises that he is the successor of F. W. & R. King. Also in the directory, Fred W. King is listed as supt. meters. He was born in London, England in 1821. He came to America in 1830. He died in Baltimore November 1, 1889.

Richard King is listed in the 1844-45 New York City directory as a clerk h. 102 Essex.

In 1884 to 1890 he is listed in the Baltimore directory as asst. supt. meters.

He was born in London, England, October 3, 1823. He died in Baltimore on April 26, 1905 (retired).

In the Gurley Museum is a F. W. & R. King, Baltimore, Surveyor's Plain Compass. It is 15-1/4" overall with a 5" vertical needle.

In December 1958, Gurley serviced an F. W. & R. King Plain Surveyor's Compass. It had a 6" needle, from North Carolina.

ROBERT KING (1812 - 1868)

New York City

He is listed in New York City directories, as follows: 1812 As a mathematical Inst. Maker at 16 Elm h. 82 Duane, 1813 to 1835 At various addresses in New York City. 1835 to 1866 At 212 Front Street house addresses being E. Broadway, E. 55th and 5 Essex Street. 1866-67 and 1868-69 At home address only.

SAMUEL KING (1748 - 1819)

Newport, Rhode Island

Samuel King was the son of Benjamin King of Newport. He was born in Newport on January 24, 1748 and died there December 30, 1819.

In the Newport Mercury of November 27, 1786, he advertises as follows: Samuel King informs the Public that he continues the business of Mathematical Instrument making (lately carried on by his Father, Mr. Benjamin King) at his house next to the Moravian Meeting House, Nov. 13. 1786.

FRANK CAMPION KNIGHT (1856 - 1923)

Philadelphia, Penna.

He was born in New Jersey December 30, 1856. He died in the Germantown Hospital in Philadelphia on September 10, 1923.

He advertised that he succeeded Edmund Draper in 1882.

He is listed in the Philadelphia directories from 1880 to 1895.

The 1917 and 1918 Philadelphia directories list him Frank C. Knight & Co.

HENRY R. KNIGHT (1874 - 1945)

Philadelphia, Penna.

He was born in Philadelphia on December 6, 1874. He died on May 7, 1945 in Germantown.

He was a member of the firm of Warren - Knight Company from 1912 to 1923 when he retired from the company.

See Warren - Knight Company.

HENRY MORTON KNOX (1841 - 1927)

Philadelphia, Penna.

He was born in Philadelphia in 1841, the son of Joseph Knox. He died in Philadelphia on January 9, 1927.

He is first listed in the Philadelphia directories in 1867 as a math inst mr 220 Dickerson. In the 1878 directory he is listed as a partner of Knox & Shain. The firm name continues until 1929.

JOSEPH KNOX (1805 - 1877)

Philadelphia, Penna.

Joseph Knox was born in Philadelphia in 1805. He died in Philadelphia on February 16, 1877.

In the 1808 Philadelphia directory there is a Joseph Knox, whitesmith, Sixth near George N. L. 1813 Knox, Joseph, bit and tip maker, near the intersection of the 6th and Germantown road. 1814 Knox, Joseph, whitesmith, 6th bel Germantown R. From 1829 to 1837 there is listed Knox, Joseph, mathematical instrument maker 7 Plum. 1851 Knox, Joseph mathematical instrument maker 72 Dock (Charles J. Shain was a mathematical instrument maker in 1851 at 72 Dock) In 1855 he is listed as a partner of Knox & Shain, mathematical instrument makers. (Joseph Knox and Charles J. Shain) 46 1/2 Walnut He is listed with Charles J. Shain as Knox & Shain until 1876.

KNOX & SHAIN (1855 - 1920)

Philadelphia, Penna.

Joseph Knox (1805 - 1877)

Henry M. Knox (1841 - 1927)

Charles J. Shain (1822 - 1891)

Knox & Shain are first listed in Philadelphia directories.

1855 Knox & Shain, mathematical instrument makers 46-1/2 Walnut (Joseph Knox & Charles J. Shain) The partnership continues until 1876 at 716 Chestnut. In 1878 Knox & Shain, mathematical instrument makers 716 Chestnut (Henry M. Knox & Charles J. Shain) This partnership continued until 1891 when Charles J. Shain died in Atlantic City. The firm name continued until 1929.

Gurley has serviced Knox & Shain transits and levels since 1871.

There is privately owned in Huntington, Tennessee a surveyor's vernier compass, 15-1/2" overall. The needle is 5-1/8" long. The label in the compass case gives the Knox & Shain address as 46-1/2 Walnut Street. They are listed at this address only in 1855 Philadelphia directory.

The University of North Dakota, Grand Forks, N.D. have a Knox & Shain Philadelphia, Transit; Telescope 10-1/4" long 5" needle 7-1/2" limb.

KOLESCH & COMPANY (1885 - 1947)

New York City

Heinrich Adolph Kolesch (1855 - 1903)

Percy Adolph Kolesch (1883 - 1931)

Heinrich Adolph Kolesch was born in Ulm, Germany, on February 27, 1855. He died in New York City on October 27, 1903.

The Eleventh Edition of their catalog states that the company was established in 1885.

They are listed in the New York City directories from 1886 thru 1942.

Kolesch and Company was incorporated in New York State on March 4, 1904. They were dissolved by proclamation on December 15, 1947.

Percy A. Kolesch, the son of Adolph was born in New York City on January 13, 1883 and died while on a trip at Cave City, Kentucky on October 4, 1931.

There is a Kolesch transit in the Gurley Museum. It is engraved Kolesch & Co., New York, Serial 2968. It has a 9" telescope, 5-1/4" limb and a 3-1/2" needle.

FRANZ KROEDEL (1834 - 1907)

New York City

He was born in Germany in 1834 and died in St. Mary's Hospital in Hoboken, New Jersey on December 29, 1907.

He is listed in the New York City directories from 1860 to 1907 as a mathematical instrument maker and as a maker of surveying instruments.

EDWARD KUBEL (1820 - 1896)

Washington, D. C.

He was born in Bavaria, Germany in 1820. He died in Washington June 21, 1896.

The 1860 Federal Census, Washington, D. C., 5th Ward Vol 2 page 430, states that he was 40 years old.

In the Smithsonian Institution is a Surveyor's Theodolite made by Edward Kubel about 1875. It has an 8" circle. It is numbered 247,971.

ERNEST P. KUBEL (1864 - 1936)

Washington, D. C.

He was born in Washington June 3, 1864, the son of Edward Kubel. He died in Washington on November 25, 1936.

He is listed in the Washington, D. C. directories from 1889 to 1895 as a mathematical instrument maker.

WILLIAM J. KUEBLER (1876 - 1900)

Philadelphia, Penna.

Philadelphia Directories: He is listed from 1876 to 1900 as an instrument maker and optician.

He was born in Germany in 1827 and he died in Philadelphia on August 17, 1900.

KUEBLER & SEELHORST (1867 - 1875)

Philadelphia, Penna.

William J. Kuebler Sr. (1827 - 1900)

Frederick Seelhorst (1813 - 1887)

Philadelphia Directories: 1867-1875 Kuebler & Seelhorst instrument makers William J. Kuebler Frederick Seelhorst.

On October 1, 1867, Kuebler and Seelhorst were granted patent No. 69450 for a method of adjusting eyepieces and objective glasses in telescopes.

Gurley serviced a Kuebler & Seelhorst level from Dallas, Texas in 1887, and a 5" Engineers Transit from Frederick, Michigan in 1900.

THE KUHLO MANUFACTURING COMPANY (1900 - 1909)

St. Paul, Minnesota

Arnold Kuhlo was the founder of this company after the dissolution of the firm, Kuhlo and Ellerbe.

He was born in the United States in 1863 and died in St. Paul on July 31, 1909.

There is an "A. Kuhlo Co. St. Paul, Minn." "Y" Level in the Department of Civil Engineering at the University of Wisconsin, at Madison, Wisconsin,

KUHLO & ELLERBE (1890 - 1900)

St. Paul, Minnesota

The firm was composed of Arnold Kuhlo (1863-1909) and Frank Herbert Ellerbe (1870-1921).

They were listed in the St. Paul directories from 1890 to 1900 as makers of surveying instruments.

There are no known surveying instruments in existence made by Kuhlo & Ellerbe.

ERASMUS A. KUTZ SR. (1778 -)

New York City

He was born in England in 1778. He came to America after 1812.

He is first listed in the New York City directories: 1818-1820, Kutz Erasmus, rule maker 343 Water, 1842-1850, Kutz Erasmus, naut. & Math. inst. 180 Water h Newark.

Newark, N. J. Directory: 1855-56, Kutz Erasmus A. 23 Centre St.

The 1850 Federal Census for New Jersey lists him: Erasmus A. Kutz Age 72 Occupation none Born in England, residence 23 Centre St. North Ward.

The Onondaga Historical Society Syracuse, N.Y. have an E. Kutz New York Surveyors Plain Compass, 14-5/8" overall 5-5/8" needle.

The Connecticut Historical Society, Hartford, Connecticut have an E. Kutz Surveyor's vernier compass Length overall 17-1/2" needle 6-3/4".

www.compleatsurveyor.com

The Civil Engineering Department of Cornell University, Ithaca, N. Y. have an E. A. Kutz Surveyor's Compass.

In the Gurley collection of surveying instruments, there is a Kutz surveyor's plain compass, engraved, Kutz, New York, the gift of Mr. Glenn D. Holmes of Syracuse, N. Y.

The Western Reserve Historical Society, Cleveland, Ohio has a Kutz vernier compass.

It is engraved E. Kutz New York. It is 14-1/16" overall, a 5" needle, 2 level vials, a needle lifter, sights and sight screws.

ERASMUS A. KUTZ JR. (1822 - 1868)

New York City

He is first listed in the New York City directories: 1839-40 Kutz Erasmus A. Jr. rule maker 2 Stanton, 1850-51 Kutz Erasmus Jr. Instrument maker 117 Madison, May 1, 1856 Kutz Erasmus Jr. instruments 91 Monroe, 1863-1864 Kutz Erasmus Jr. clerk, 236 9th Ave.

He was born in New York City in 1822 and died in Brooklyn, N.Y. August 18, 1868.

LALLIE SURVEYING INSTRUMENT CO. (1888 - C)

Denver, Colorado

John S. J. Lallie (1856 - 1911)

John S. J. Lallie was born November 6, 1856 at Marseilles, France. He died January 25, 1911 in Denver. He came to America in 1864.

Previous to 1888 he was a railroad surveyor, a mining engineer and a commissioned U. S. Mineral Surveyor.

Beginning in 1888 he made transits, levels and surveyor's compasses. The making of these instruments was discontinued in 1938.

He made his automatic dividing engine.

ANTHONY LAMB & SON (1750 - 1760)

New York City

Anthony Lamb (1703 - 1784)

John Lamb (1735 - 1800)

Anthony Lamb was apprenticed to Henry Carter a mathematical instrument maker near St. Clements Church, London, England; but in 1724 became an accomplice of Jack Sheppard, one of the most noted burglars in history. Sheppard died on the gallows at Tyburn, November 16, 1724, but because it was his only offense, Anthony Lamb was sentenced to be transported to the American Colonies.

In Virginia he served out his time and then settled in New York City.

He was the most noted instrument maker in New York City during his lifetime. According to Penrose R. Hoopes he advertised in 1749 as an instrument maker.

The New York Packet of December 13, 1784 carried this notice: "Anthony Lamb in his 81st year died December 11, 1784, a native of Old England.

John Lamb was born in New York City, January 1, 1735. He died there May 31, 1800.

He joined his father in the manufacture of mathematical instruments about 1750 and then in 1760 became a wine merchant. He was in the American Revolution rising to the rank of General. At one time he was commandant at West Point.

Source of Material: I. O. Leake, Memoirs of the Life and Times of General John Lamb. Joel Munsell Albany 1850.

The Passaic County Historical Society, Lambert Castle, Paterson, New Jersey have an A. Lamb & Son, New York City, surveyor's compass Length overall 13-1/4" Length of needle 5".

LEDDER & PROBST (1908 - 1923)

Boston, Mass.

Boston Directories: 1889-1895 Ledder, Gottfried G. clerk 9 Province St. 1900 Ledder, Gottfried G. surveying instruments 302 Washington St. 1906-07 Ledder, Gottfried G. mgr. 1908-11 Ledder & Probst (Arthur F.) 387 Washington St. 1921-23 Ledder & Probst 21-27 Pearl St.

Gurley serviced a Ledder 4" Engineers transit in 1910 that came from Portland Maine.

LEUPOLD AND VOLPEL (1907 - 1940)

Portland, Oregon

Frederick Leupold (1875 - 1944)

Adam Volpel (1875 - 1940)

Frederick Leupold and Adam Volpel founded the company in 1907. After the death of Mr. Volpel in 1940 Mr. J. C. Stevens bought out Mr. Volpel's interest. The concern is now Leupold and Stevens Instruments, Inc., in Portland, Oregon.

Frederick Leupold was born in Ravensburg, Wuerttemberg, Germany on September 12, 1875 and died August 15, 1944. Mr. Leupold served an apprenticeship at a large industrial plant in Augsburg, Germany before coming to this country at the age of sixteen. He worked for various concerns in the east including the Kidder Press Company,

Holzer-Cabot Electric Company and the C. L. Berger & Sons.

Adam Volpel was born in Austrian Poland on December 4, 1875 and died October 9, 1940.

In 1911 Mr. J. C. Stevens became associated with Leupold and Volpel and in 1940, after the death of Mr. Volpel, the Volpel interest was bought out by Mr. Stevens.

A. LIETZ CO. (1882 - C)

San Francisco, California

Adolph Lietz Sr. was born in Leubeck, Germany on April 25, 1860. He died in San Francisco on June 25, 1935.

The Cyclo-tomic Transit as made by Lietz is described in "Plane Surveying" by Paul C. Nugent. It was published by John Wiley & Sons in 1902.

There is a copy in the New York State Library in Albany.

He first started making transits and levels in 1882. He also made a dividing engine which was used for many years and is occasionally used at the present time.

JOHN LOCKE M. D. (1792 - 1856)

Cincinnati, Ohio

The Cincinnati Daily Gazette of Friday July 11, 1856 on page 2 has the following announcement. "It is our painful duty this morning to announce the death of Dr. John Locke, of this city.

Though his friends were not unprepared for his death - for he has been lying sick a number of weeks - the sad realization of their fears has thrown a deep gloom upon their spirits.

Dr. Locke was born in Fryeburg Me., on the 19th February, 1792. His early life was spent at Bethel, Me., where he attended an academy, and distinguished himself by mechanical and scientific attainments, rare for one of his years.

We understand that after graduating at Yale College he was for some time a surgeon in the Navy. Unable here to pursue as he wished, his scientific studies, he resigned and for a time employed himself as a teacher in New England. - Many of the old graduates of Dartmouth College remember his visit as a teacher of Botany to that Institution.

Some 30 years since he moved to the West and opened a school for young ladies at Lexington, Ky., which was afterwards removed to, and continued in this city. In 1836 he accepted the chair of Prof. of Chemistry in this city which he filled with great honor to himself and benefit to the Institution until his resignation some four or five years since. During the past winter his health was very feeble. Some three months since he was called to survey a coal mine in Western

Virginia. He was here much exposed to severity of weather and physical exertion.

His decease occurred at 8-1/2 A. M. yesterday. Dr. Locke's reputation as a scientific man was far-spread and permanent.

Though particularly interested in chemistry, he was at home in every department of physics and natural history, and his investigations were always marked with patience and depth of research. His principal scientific achievements were "Magnetical Researches" extending over a large portion of the country, and continued for many years, and the "Magneto-Astronomical Clock."

It is needless to praise either of these. They have already placed their author in the front rank of American Savans.

He was also widely known as a well informed and accurate geologist, and his connection with the geological surveys of Ohio, the mineral region of Lake Superior and Iowa, added much to their value.

Dr. Locke was eminently a self-made man. Our readers have probably seen the notice written by Seba Smith of Dr. Locke's early ingenuity. When at Bethel, Me., someone's watch was out of order and no one in the town could fix it. At last it was handed to John Locke, then a mere lad who, with his pen-knife took it to pieces, although, he had never seen the operation performed - cleaned it and put it together again.

Thus early did Prof. Locke display that knowledge of horology, which in later years gave the world the "magneto-astronomical clock" - a boon as valuable to practical, as logarithms are to theoretical astronomy. Through the whole of his life he manifested the strong will and unflinching energy which carried him through the privations of youth. To the scientific world of which he was so long a member, to the numerous friends to whom he endeared himself by his kindness, to the community, of which he was a bright ornament, and to his family who know as none others can his worth as father and husband, the death of Professor Locke is an irreparable loss."

Dr. Locke had trained two of his sons to help him put together various instruments and pieces of scientific apparatus that he was continually designing.

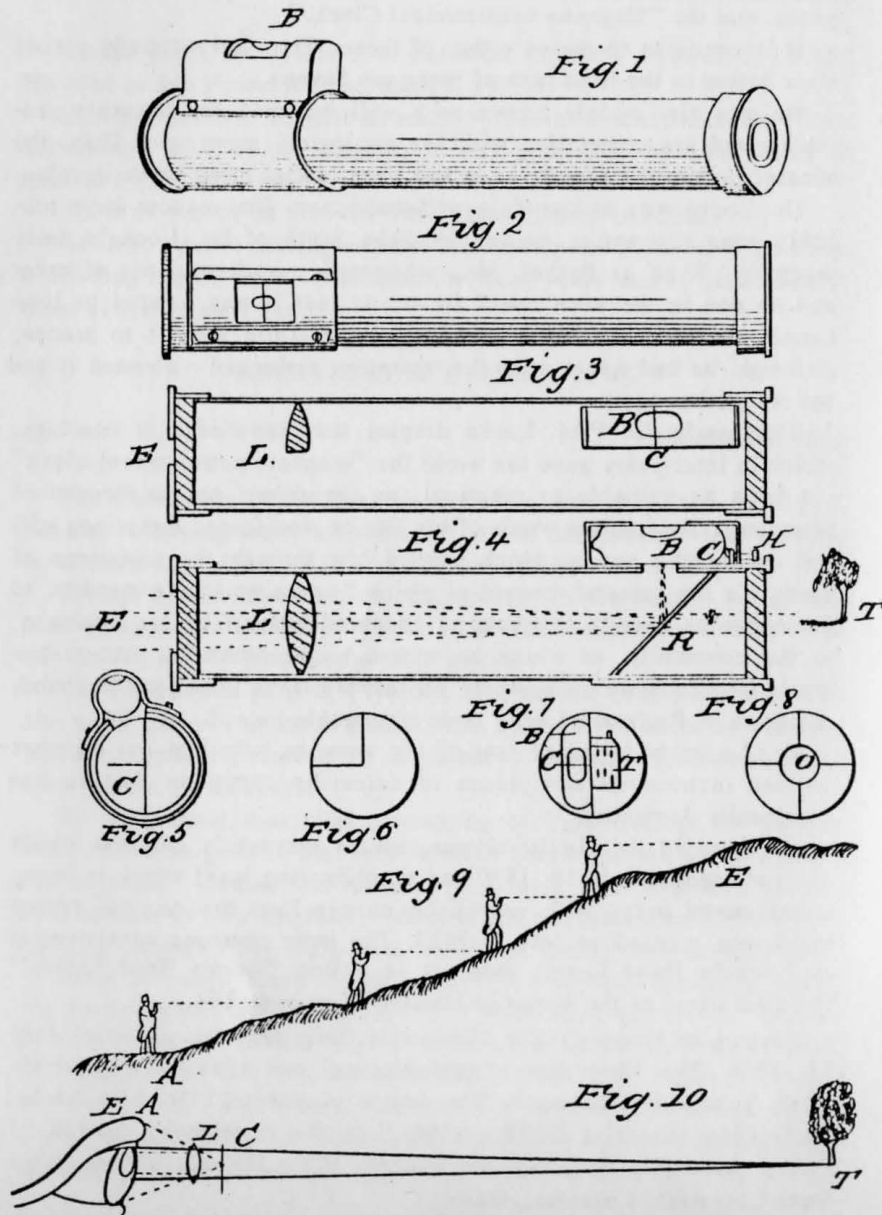
He invented the electro-chronograph, a surveyor's compass which was patented on July 16, 1850 and a collimating level which is being manufactured today with very little change from the original patent which was granted on July 2, 1850. The early catalogs advertised it as Locke's Hand Level, today it is called "Locke Hand Level." The first sheet of the patent is illustrated on page 104.

Sources of Material: The Cincinnati Daily Gazette, issue of July 11, 1856. The Ohio State Archaeological and Historical Quarterly 1946, Volume LV Number 4. The article is entitled "Dr. John Locke, Early Ohio Scientist (1792 - 1856)." It was written by Adolph E. Waller, Associate Professor and Curator of the Botanic Garden, Ohio State University Columbus, Ohio.

J. LOCKE.
Collimating Level.

No. 7,477.

Patented July 2, 1850.



HENRY LOCKWOOD (1834 - 1897)

Washington, D. C.

Henry Lockwood was born in Little Falls, N. Y. on August 13, 1834. He died in Washington on August 1, 1897.

He was a member of the firm of Fauth & Co. in Washington from 1874 to sometime previous to 1888. He was a brother-in-law of George N. Saegmuller.

CHARLES LOEBER

New York City

Shanahan & Loeber, Wilson's Business Directory 1853-54. 1854-55 Loeber, Charles, mat inst maker 181 William h 110 Gold Brooklyn.

D. H. LOOSLI COMPANY, INC. (1938 - C)

Idaho Falls, Idaho

Dimond Herschel Loosli founded the company in 1938. He was born in Marysville, Idaho, September 22, 1899.

The company makes several kinds of farm levels.

HENRY WILLIAM LORING (1807 - 1885)

Boston, Massachusetts

He was born in Boston, December 28, 1807. He died in Hammonton, New Jersey on February 23, 1885.

He is listed in the Boston directories from 1831 to 1858 as a jeweler, watch maker and mathematical instrument maker. 1859-60 Loring (Henry W.) & Churchill (Gardner A) mathematical instruments, 1863-65 Loring, Henry W. Mathematical instruments.

Gurley repaired a Loring Compass from Mt. Pleasant, N.C. In June 1885.

H. W. Loring may have been employed by Charles G. King at 7 Broad Street because they both have the same address from 1850 to 1857. Both had the same address, 72 Washington Street and both lived in West Newton.

Source of Material regarding his birth and death. Loring Genealogy. Charles Henry Pope 1917.

LOWELL & SENTER (1846 - 1873)

Portland, Maine

Abner Lowell (1812 - 1883)

William Senter (1813 - 1888)

The Portland directories list from 1846 to 1871 Lowell & Senter, watches, jewelers, nautical instruments.

In 1873 the Portland directories list Lowell, Abner, Jeweler, late Lowell & Senter. He is listed until 1872. In 1873 also Senter, William, watches, nautical instruments, etc. Senter, William Jr. From 1875 to 1883 Senter, William & Co., watches, nautical instruments, etc.

Abner Lowell died February 26, 1883 Age 71.

William Senter died December 22, 1888 Age 75 years 2 Mos.

CALEB MACKENZIE

Baltimore, Maryland

1807 & 1808 Mackenzie, Caleb, mathematical instrument maker
21 Thames Street F.P.

JAMES McCANN

Newmarket, Virginia

Mr. John G. Miller, editor Shenandoah Valley writes under date of November 17, 1960 that he had recently examined the court records in the county seat, (Woodstock). The only record was that he married Sarah Grey daughter of Daniel on January 7, 1824.

The Smithsonian Institution have a McCann 12" Circumferenter Catalog No. 308901.

It has a 5" needle. It was patented January 20, 1837 Patent No. 519 Gurley has a copy of the patent.

MAHN & CO. (1891 - 1906)

Herman Mahn

St. Louis, Missouri

Listed in St. Louis directories, as follows: 1891 Mahn & Co. (Herman Mahn) surgical instruments. 1906 Mahn & Co. (Herman Mahn) inst. mkr.

The Department of Civil Engineering, University of Wisconsin, Madison, Wisconsin has two levels and two transits made by Mahn: A precise tilting level with a telescope 16-1/2" long. The level vial is mounted on the top of the telescope with a mirror which reflects the level vial bubble image into the prism of an auxiliary side "telescope". It is internal focusing and it is similar to U. S. G. S. design of the 1900's. It is engraved: Mahn & Co., No. 255 St. Louis, Mo.

A "Wye" level that has a 19" telescope. It is engraved: Mahn & Co., No. 218 St. Louis, Mo.

There are two transits. The limbs are 6" in diameter, with a 3-1/2" needle. Each has an arrangement for mounting an auxiliary telescope on top of the main telescope. They are engraved: Mahn & Co., No. 215 No. 239. St. Louis, Mo.

ALEXANDER MEGAREY (1790 - 1850)

New York City

He was born in Ireland in 1790. He died November 7, 1850. He is buried in Green-Wood Cemetery in Brooklyn, N. 6.

He is listed in New York City directories as a mathematical instrument maker from 1827 to 1850, his last place of business was 190 Water Street. He lived in Brooklyn.

There is privately owned in Albany, New York a Megarey Surveyor's Vernier Compass. 14-1/2" overall, 5-3/4" needle. W on left hand side of N.

The Farmer's Museum, Cooperstown, N. Y. has a Megarey "Y" Level. Length of telescope 24-1/4" "Y" bearings approximately 12" apart.

The Oregon Historical Society, Portland, Oregon has an "A. Megarey" Surveyor's Compass. 15-3/4" overall 6-1/4" needle.

The Nebraska State Historical Society, Lincoln, Nebraska has a "Megarey" Surveyor's Compass. 14-3/8" overall 5-13/16" needle.

The University of North Dakota, Grand Forks, N. D. has an Alex Megarey Transit. Telescope 10-1/4" needle 5" No dimension given of diameter of the horizontal circle.

The Western Reserve Historical Society, Cleveland, Ohio has a Megarey "Y" Level. The telescope is 21-1/2" overall. It is engraved A. Megarey N. York.

In the case is a W. & L. E. Gurley label which would indicate that it had been in the Gurley factory for servicing.

EDWARD MEISTER (1853 - 1931)

Baltimore, Maryland

Baltimore Directories: 1876 Meister, Edward, successor to F. W. & R. King, manuf. of engineers and surveying instruments 226 W. Baltimore, 1877 same, adv on page 462 dw 26 Park Ave. 1877-84 Same as 1876. 1890-1894 Machinist dw 427 Calvin Street. He is not listed in 1895.

Previous to his retirement, in 1928, he was a Scientific Instrument Maker at Johns Hopkins Medical School of Hygiene.

He was born in Cassel, Germany on January 30, 1853. He died in Baltimore, Maryland June 30, 1931.

www.compleatsurveyor.com

ANDREW MENEELY (1802 - 1851)
 ANDREW MENEELY AND SON (1849 - 1851)
 EDWIN A. MENEELY (1828 - 1887)

Andrew Meneely was born at West Troy, (Gibbonsville) New York, May 19, 1802, the eldest son of Andrew James Meneely and Eleanor Cobb.

At the age of 15 or 16 he was apprenticed to Julius Hanks of West Troy to learn the trade of casting bells and manufacturing mathematical instruments. He served out his full apprenticeship and remained with Mr. Hanks until he was 21 years old.

After this apprenticeship with Julius Hanks, he worked with Horatio Hanks of Auburn, New York and finished his training in the manufacture of mathematical instruments such as levels, theodolites, transits and surveyor's compasses.

On November 10, 1826 he was married at Mansfield, Connecticut to Philena Hanks, the daughter of Rodney Hanks and a niece of Benjamin Hanks.

He increased his business from year to year so that by the year 1837 he took the lead of all other Bell Foundries in this Country. In 1849 Edwin A. Meneely, his eldest son, was admitted a partner with his father and the name changed to Andrew Meneely and Son and the business was continued under this name until the death of Andrew Meneely which occurred October 14, 1851. He is buried in the Albany Rural Cemetery.

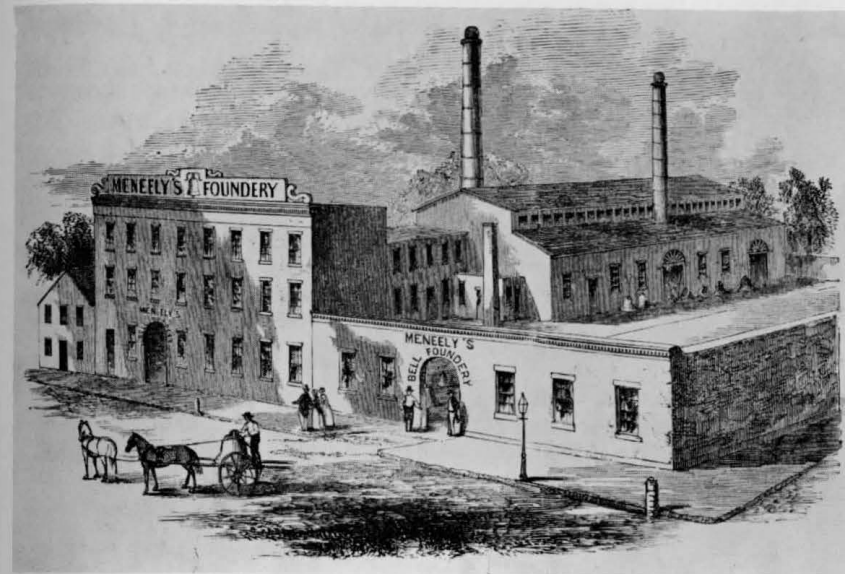
His mathematical instruments had a good reputation and a large sale but as the years passed more and more attention was given to the founding of bells and the manufacturing of other articles, including surveyor's compasses, was finally abandoned in 1852. It is probable that W. & L. E. Gurley took over the line of surveying instruments in 1852.

Edwin A. Meneely was born in West Troy, November 12, 1828. He died January 18, 1887.

In the State Education Building in Albany there is an Andrew Meneely Surveyor's Vernier Compass. It has one level vial. The needle is 5-7/8" long. It is 16" overall.

In Lakeville, Connecticut there is also an Andrew Meneely, West Troy, Surveyor's Vernier Compass No. 264.

The Western Reserve Historical Society, Cleveland, Ohio has a surveyor's vernier compass. It is 15-3/8" overall, a needle 5-3/8" long, 2 level vials and a set of sights. It is engraved: Andrew Meneely West Troy No. 1332 Warranted Locke's Patent 1850.



The Meneely Bell Foundry. West Troy, N. Y. 1834



LEVELING AND SURVEYING INSTRUMENTS.—ANDREW MENEELY, West Troy, makes to order, and keeps constantly on hand, the above instruments on the most approved construction.

Compasses so constructed that angles can be taken without the needle; angles of elevation can be taken with as much accuracy as horizontal angles, [and they cost no more than the common kind]—Theodolites, at various prices, from \$75 to \$200—Town Clocks, and eight day brass clocks for houses. He is also prepared to furnish Church Bells, of good tone, with cast iron yokes, and warranted to stand; copper and brass castings of every description.

April 2

The Troy Daily Whig July 1, 1834

MENEELY & OOTHOUT (1836 - 1838)

West Troy, N. Y.

Andrew Meneely (1802 - 1851)

Jonas V. Oothout (1814 - 1860)

On January 1, 1836 Andrew Meneely took Jonas Volkat Oothout as a partner. For a few years the business was carried on under the firm name of Meneely & Oothout. Mr. Oothout retired in 1838 and Andrew Meneely continued the business as formerly.

Jonas Volkat Oothout was born in West Troy on January 6, 1814 and died there on June 13, 1860. He is buried in the Albany Rural Cemetery near Andrew Meneely.

The Troy Budget January 2, 1836:

The subscribers are prepared to furnish to order at their Foundry in West Troy, Albany County, N. Y. Church Bells of superior tone and warranted to stand. Also Town Clocks, Theodolites, Leveling Instruments on the most approved construction for turning curves, and Surveying Compasses, of all kinds. Also Copper and Brass Castings of every description.

Meneely & Oothout

West Troy January 8, 1836

This advertisement was continued until March 13, 1838.

A Meneely and Oothout compass is in the possession of Mr. Clinton Meneely, a great grandson of Andrew Meneely.



THE subscribers are prepared to furnish to order at their Foundry in West Troy, Albany County, N. Y., CHURCH BELLS, of superior tone, and warranted to stand.

Also, TOWN CLOCKS, THEODOLETES, LEVELLING INSTRUMENTS, on the most approved construction, for running curves; and Surveyor's Compasses, of all kinds. Also, Copper and Brass Castings, of every description.
MENEELY & OOTHOUT.

West Troy, Jan. 8, 1836.

ROBERT MERRILL (1838 - 1864)

ROBERT MERRILL & SONS (1865 - 1899)

ROBERT MERRILL SONS (1900 - 1918)

R. MERRILL'S SONS INC. (1918 - 1923)

New York City

Robert Merrill (1804 - 1876)

William G. Merrill (1828 - 1898)

George W. Merrill (1838 - 1905)

Robert Merrill was born in Newburyport, Massachusetts, on April 19, 1804. He died in Brooklyn, New York, December 16, 1876. He is first listed in the New York City directory of 1835-36, Merrill and Davis, mathematical instrument maker, 36 Oak, Robert Merrill, mathematical instrument maker, 36 Oak. William C. Davis, mathematical instrument maker, 36 Oak h. 26 Spruce. 1836-37 Merrill and Davis

mathematical instrument makers, 255 Front, Davis, h. 13 Chestnut Merrill, h 223 Madison, 1838-1864 Merrill, Robert, mathematical instrument maker, 141 Maiden Lane, May 1, 1865, Merrill, Robert & Sons Math instrument makers 149 Maiden Lane. May 1, 1877, Merrill, Robert & Sons, Nautical Instruments 179 Water. William G. Merrill -- George W. Merrill 1900 - 1918, 110 Wall, 66 South, 68 South, March 1, 1918, R. Merrill's Sons Co., Inc.

July 7, 1923, R. Merrill's Sons Inc. Voluntary dissolution..

William G. Merrill was born in New York City October 16, 1828. He died in Brooklyn January 16, 1898.

George W. Merrill was born in Brooklyn August 14, 1838, and died in Brooklyn, May 27, 1903.

On February 17, 1864, (Gurley Order Book, page 398) Robert Merrill & Sons, New York City, bought 10 dozen C. jewels.

Gurley repaired a Merrill compass on February 27, 1886, that came from Dresden, Tennessee.

MERRILL & DAVIS (1835 - 1837)

Robert Merrill (1804 - 1876)

William C. Davis

New York City

1835-36 Merrill & Davis math. inst. makers 36 Oak, Davis, William C. math inst. maker 36 Oak h 26 Spruce, Merrill, Robert, Math inst. maker 36 Oak 1836-37 Merrill & Davis math inst. makers 255 Front Davis h 13 Chestnut Merrill h 223 Madison.

The Missouri Historical Society, St. Louis, Mo. have a Merrill & Davis Surveyor's Compass 15" overall 6" needle.

JAMES E. MOODY (1848 - 1913)

Neponset, Mass.

Boston, Mass.

He was born in Milford, New Hampshire on April 5, 1848 and died there on October 23, 1913. He is buried in Riverside Cemetery in Milford.

In the 1872 issue of the Boston Almanac and Business Directory, Vol. 37 he is listed under "Instruments", Mathematical and Optical, page 230. Moody, J. E. between Walnut and Taylor, opp. depot, ward 16, P. O. address Neponset.

Ward 16 on page 71. "All the territory formerly comprised in the town of Dorchester, county of Norfolk, and annexed to the City of Boston, by Chap. 349 of the acts of 1869"

Boston Register Surveyors Instruments: 1880 James E. Moody, Neponset Formerly with J. H. Temple p 135c, 1881 James E. Moody. 1882 James E. Moody, Walnut Nep, 1884 James E. Moody, 51 Commercial, 1891-1900 James E. Moody, 46 School, 1908 James E. Moody, repairing 387 Washington, 1909 removed to Milford, N. H.

NICHOLAS MYERS

1861 Buffalo Directory: Surveying Instrument makers. Myers, Nicholas Batavia cor Milner.

ANDREW NEWELL

Boston, Massachusetts

1789 Newell, Andrew, mathematical instrument maker No. 61, State Street. 1796 Same. 1798 Newell, Andrew & Son, mathematical instrument maker and ship chandlers, east end of market, 1800 Newell, Joseph, mathematical instrument maker Merchants row. 1803 not listed

CHARLES NEWELL

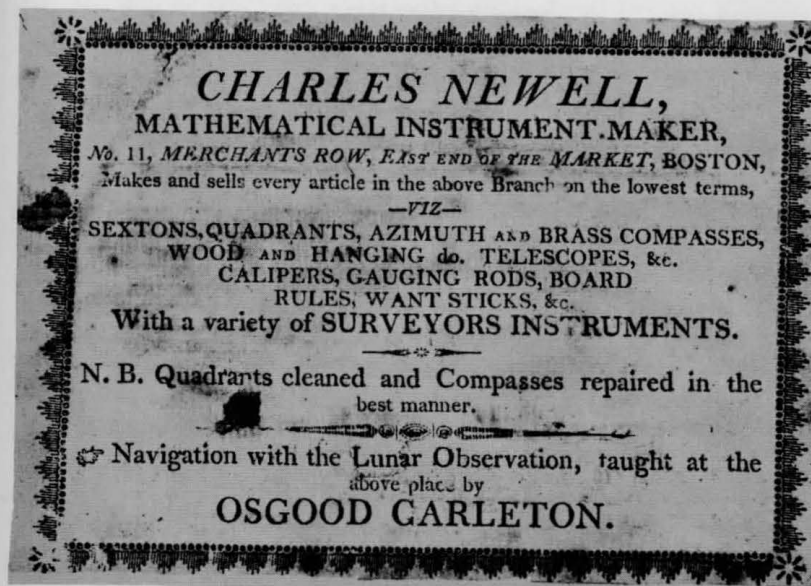
Boston, Massachusetts

Boston Directories: 1805 Newell, Charles, mathematical instrument maker 11 Merchants Row, Newell, Joseph, ship Chandler 11 Merchants Row. 1809 Same as 1805.

In the South Natick Historical Society's room in the Bacon Free Library building in South Natick is a Charles Newell brass surveyor's plain compass. The sights are in two pieces, the lower part a casting, the upper part brass strips. The compass was used by Austin Bacon, the town surveyor of South Natick. He was born February 2, 1813 and died in April 1888.

The label in the case is as follows: Charles Newell, Manufacturer and Importer of Mathematical & Optical Instruments East Side of the Market, Quadrants, Sextants & Compasses, cleaned and repaired in the best manner. Wightman Sculpt

East India Marine Hall, Peabody Museum in Salem, Mass. has a Surveyor's Plain Compass. It is 11-3/8" overall with a 3-3/8" needle. In the cover of the compass case is a date Aug. 13, 1857. East End of the Market.



CHARLES NEWELL,
MATHEMATICAL INSTRUMENT MAKER,
No. 11, MERCHANTS ROW, EAST END OF THE MARKET, BOSTON,
Makes and sells every article in the above Branch on the lowest terms,
—VIZ—
SEXTONS, QUADRANTS, AZIMUTH AND BRASS COMPASSES,
WOOD AND HANGING do. TELESCOPES, &c.
CALIPERS, GAUGING RODS, BOARD
RULES, WANT STICKS, &c.
With a variety of SURVEYORS INSTRUMENTS.
N. B. Quadrants cleaned and Compasses repaired in the
best manner.
Navigation with the Lunar Observation, taught at the
above place by
OSGOOD GARLETON.

JOSEPH NEWELL

Boston, Mass.

1798 Newell, Andrew & Son, mathematical instrument makers and ship chandlers east end of market. 1800 Newell, Joseph, mathematical instrument maker Merchants row. 1805-1813 Newell, Joseph, ship Chandler 11, Merchants row.

NEWELL & SON

Boston, Mass.

Andrew Newell
Joseph Newell

The Bostonian Society, Old State House, Boston, Mass. has a wood surveyor's plain compass. It is engraved: Newell & Son, Makers East End of Faneuil Hall Boston.

It is 14-5/8" overall with 5-1/4" needle.

NEWELL & BROWNING

Boston, Massachusetts

Boston Directories: 1803 Newell & Browning, ship chandlers, Merchants Row

There is a Newell & Browning plain surveyor's compass in the Henry Ford Museum Dearborn, Michigan. It is marked Newell & Browning, Boston. It is 12-1/2" overall with a 4-3/8" needle.

ELIJAH NORTON

Utica, New York

Directory: 1817 Norton, Elijah, Ship Carpenter 64 Whitesboro' - st. 1828 Norton, Elijah, math. instrument maker r. Whitesboro' 1829 Not listed. 1833 Norton, Elijah, mathematical instrument maker 128 Genesee r. Whitesborough, near Genesee. 1837 Norton, Elijah, boat runner bds. at J. C. Springs. 1839 Not listed.

In the Division of Archives and History of the University of the State of New York, 1260 Broadway, Albany, N. Y., there is an E. Norton, Utica, Surveyor's Vernier Compass. It is 15" overall 6-3/16" needle.

GEORGE PATTEN (1820 - 1857)

Baltimore, Maryland

George Patten was born in New York City, January 20, 1820. He died in Baltimore April 14, 1857. He was the son of Richard Patten (1792 - 1865)

Baltimore Directories: 1849-50 Patten, George, math and optical inst. maker 23 South. 1851 Same as above, dw 59 n High. 1856-57 Patten, George (Rich'd & Son) 38 W. Baltimore.

RICHARD PATTEN (1792 - 1865)

New York City
Washington, D. C.
Baltimore, Maryland

Richard Patten was born (probably in Maryland) on August 5, 1792. He is listed in the New York directories from 1813 to 1840 as a mathematical instrument maker. In the 1841-42 directory he is listed: Patten, Richard (Washington) h 119 Mercer.

The Business Directory and Baltimore Almanac, Baltimore, Maryland, for 1842 in the Washington Business Directory Section lists him as follows: Instrument Makers Patten, R. & Son.

In the Washington, D. C. directories of 1843 and 1846 Richard Patten is listed as an instrument maker, in the listing for the earlier year his name is misspelled Patton.

The Baltimore, Maryland directories list him from 1849-50 to the year ending December 31, 1860 as mathematical instrument maker.

There is no 1861 Baltimore directory.

In the Washington Directory he is listed in 1862 through 1865 also as a mathematical instrument maker.

He died October 26, 1865 in Washington, D. C. and is buried in the Baltimore Cemetery in Baltimore, Maryland.

The following paragraph is taken from pages 35 and 36 of Harold L. Burstyn's, "At the Sign of the Quadrant".

"His rival Greenwood became more desperate as Blunt's business continued to prosper. We have seen that he publicly charged Blunt with Plagiarism. When a Captain Steinhauer wrote him about charts, Greenwood replied that Blunt's were inaccurate and copied from English charts without authorization. Steinhauer showed the letter to Blunt, who promptly sued his competitor for libel. The trial was held in December, 1822, before a special jury of shipping merchants in the Court of Common Pleas of New York. Blunt's eldest son Joseph was counsel for his father. Richard Patten, another chart-seller, was a witness for Greenwood, but his evidence collapsed when the instrument maker Kutz testified that "the defendant said to Mr. Patten" it is damned strange if we cannot fix him (Blunt) between us." The defense was forced to contend that Blunt's reputation had in no way been damaged by the libel, but that his charts enjoyed as high a reputation after as before Greenwood's letter. The jury took only five minutes to award Blunt \$750.00 and costs. Six years later Blunt consolidated his position by a successful suit against Patten.

In 1827 Patten's chart of the New England coast delineated the shoal in the same position and with the same detail as Blunt's chart of 1821. Edmund March Blunt charged his competitor with violating the copyright, and the case was tried in 1828 before the Circuit Court of the United States. Again Joseph Blunt, assisted by D. B. Ogden, appeared for his father. Patten's several defenses, largely that the information was common property, vanished in the face of the procession of sea captains who affirmed that they had always credited Blunt with the discovery. The jury returned a verdict for the plaintiff in five minutes."

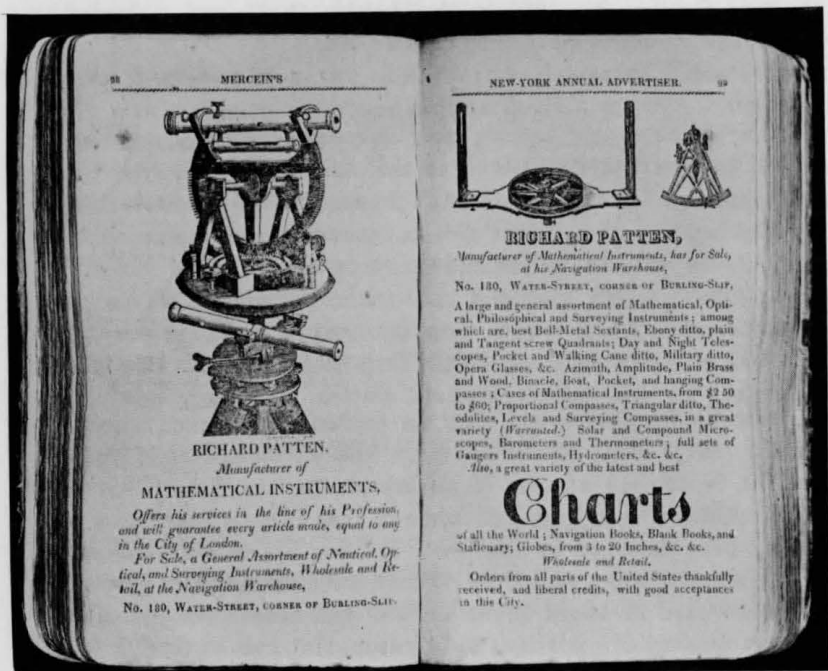
Also on page 45, Chapter 4, it is stated that "in 1834 Richard Patten has repaired Hassler's Instruments". Quote from Hassler Principal Documents 1, 114.

The Coast Survey in 1845 put another telescope on the Patten Theodolite, page 52 Vol 111 Public Documents, the Senate of the United States.

From April 4, 1870 to September 4, 1891, Gurley serviced one transit, two levels and four compasses made by Richard Patten.

The National Museum in Washington has a Surveyor's Plain Compass engraved Richard Patten, N. Y.

"Antiques" in the July 1959 issue, pages 56, 57 and 58 has an interesting article written by Captain Roger G. Gerry, including photographs of several instruments made by Richard Patten.



Mercein's New York City Directory. June 1, 1820

J. WILLIAM PFALTZ

Baltimore, Maryland

1807-1808 Pfaltz, I. W. mathematical instrument maker 39 Fells st. F. P. 1810 Pfaltz, Mr. Clock and watch maker St. Paul's Lane.

PHELPS & GURLEY (1845 - 1851)

Jonas H. Phelps (1809 - 1865)

William Gurley (1821 - 1887)

PHELPS & GURLEYS (1851 - 1852)

Jonas H. Phelps

William Gurley

Lewis E. Gurley (1826 - 1897)

319 River Street, Troy, N. Y.

Jonas H. Phelps was born in Watervliet, N. Y. on February 6, 1809.

He first appears in the Troy City Directory of 1833-34. (The first Troy city directory was issued in 1829).

Phelps, James H. bell founder boards 45 Fifth. In 1834-35 directory he is: Phelps, Jonas H., bell founder, boards 56 State. He is also listed as a bell founder through 1837. During this period (1833-37) he was associated with Oscar Hanks at 28 Fifth Street. It is quite possible that during the latter part of this time he was engaged in making mathematical instruments.

From 1838 through to 1844, he had a small shop in the alley on the north side of Fulton Street, between River and Fourth Streets, which he continued to occupy until 1845.

In the spring of 1844, Lewis E. Gurley became an apprentice of Mr. Phelps, serving under him until February 25, 1845, when William Gurley, who had been a foreman with Oscar Hanks, was admitted as a partner. The firm became Phelps & Gurley. The need for more space and conveniences caused them to rent, on March 1, 1845, the three-story brick building, No. 319, on the west side of River Street, between Grand Division and Fulton Streets, where they continued manufacturing surveyor's compasses, theodolites, transits, leveling instruments, goniometers, air pumps, electrical machines and apparatus to illustrate the principles of natural philosophy. The foundry was in the basement of the building, the office and sales rooms were on the first floor, the work rooms were on the second and third floors. Four workmen were employed, one of whom was Lewis E. Gurley. The surveying instruments made by the firm the first year of partnership did not aggregate in value more than \$1,000.00. During the second year there was a greater demand for them, as well as the other mathematical and philosophical instruments made by the establishment. In 1849, the business had increased so much, that to facilitate the manufacture of engineering and other instruments, the firm rented a part of the building occupied by Philo P. Stewart, on the west side of Mechanic Street, in the rear of the establishment, and there placed a small engine to move its improved machinery.

Lewis E. Gurley continued as a workman until the fall of 1847, when he entered Union College from which he graduated in June, 1851. That same year he was admitted to partnership with Phelps and his brother William, and the firm name became Phelps and Gurleys. On February 1, 1852, Mr. Phelps sold his interest in the partnership, and the firm became W. & L. E. Gurley.

Mr. Phelps moved to Westport, Connecticut, and there engaged in making surveying instruments. He also designed and partially built a circular dividing engine, which is now in storage at the Gurley plant. He died in Westport August 20, 1865.

The following information was found in the 1850 U. S. Census 4th Ward: Phelps & Gurley 319 River Street Capital invested \$14,000.00. Raw material value \$3000.00. Employed 26 males. Average monthly cost of male labor \$676.00 Value of math instruments produced \$18,000.00.

Employed in 1850, Gordon Hays; Lewis Heck; Augustus Kathrinus; Edward Pierson; Edward P. Searle (19) from Mass.; H. Emmons Thayer; Austin F. Park (25); Sydney W. Park (23); Jonas H. Phelps; Lewis E. Gurley; William Gurley.

1850 Troy Directory. William, Lewis and Clarissa Gurley 31 Fifth b. 28 Fifth Charles C. Hart R. B. Freeman Henry Phillips John Traffer Henry Wyatt. 28 Fifth Street was a boarding house in 1850.

Gordon Hays 31 Fifth; Lewis Heck 319 River; August Katrinus 319 River, h 44 Grand Division; Edward Pierson 319 River, b 36 Ferry; Edward P. Searle (19) 319 River, b 31 Fifth; H. Emmons Thayer 71 - Seventh; Austin F. Park (25) 319 River, b Ninth, below Jacob; Sidney W. Park (23) b Ninth, below Jacob; William Gurley 319 River b Fifth; Richard B. Freeman 319 River b 31 Sixth.

Extract from the W. & L. E. Gurley Order Book January 1860 to December 31, 1866

Memo of offer made to John W. Taylor for the Dividing Engine of the late J. H. Phelps. We will give "t as H s" payable in our notes equal amounts payable in 4, 6 and 9 months, without interest. (On January 12, 1866 a draft for \$250.00 was sent to J. W. Taylor Exc. The other drafts were paid as they came due.)

We taking it at our risk after it leaves the building - We to pack and transport it at our expense, except such aid as we may receive from Mr. Henry Taylor which shall be furnished at your charge.

We will further agree to purchase all the Surveyors and Engineers Instruments, partially finished and in progress and pay the sum of two hundred and fifty dollars on our note at 6 months without interest.

We will send our Mr. Searle about the 12th of September to pack, and the work should be insured from now to the 18th of September if it is not already so insured. (About August 25, 1865 in William Gurley's handwriting).

In the Gurley Museum are: a Phelps & Gurley Transit with a 7" limb, a 5-7/8" needle and a 10" telescope; A Phelps & Gurley Vernier Compass with a 6" needle and a 10" telescope.

The Buffalo Historical Society, Buffalo, N. Y. has a Phelps & Gurley Surveyor's Vernier Compass Length o.a. 15-1/4" with a 6" needle.

The Kansas State Historical Society, Topeka, Kansas has a Phelps & Gurley Surveyor's Vernier Compass, length o.a. 15-3/4" with a 5-3/4" needle.

The Smithsonian Institution in Washington has a Phelps & Gurley Transit 11" telescope 6" needle.

PHELPS & GURLEY,
MANUFACTURERS AND DEALERS IN
Civil Engineers' and Surveyors'
INSTRUMENTS,
No. 319 RIVER STREET,
TROY, N. Y.

Leveling and Transit Instruments, Goniometers, Theodolites, Improved Leveling Rods.	Chains, Metallic and Common Tape Measures, Telescopes, Microscopes, Drafting Instruments.	SURVEYORS' COMPASSES, including Common or Single Plate, Vernier, Rail-road, Trans- it, &c., &c., Builders' Levels.
--	---	---

Every Instrument warranted correct.

JONAS H. PHELPS. WILLIAM GURLEY.

W. & L. E. GURLEY,
(Successors to Phelps & Gurley.)
MANUFACTURERS AND DEALERS IN
Civil Engineers' and Surveyors'
INSTRUMENTS,
NO. 319 RIVER STREET,
TROY, N. Y.

Leveling and Transit Instru- ments, Goniometers, Theodolites, Improved Leveling Rods.	Chains, Metallic and Common Tape Measures, Telescopes, Microscopes, Drafting Instruments.	SURVEYORS' COMPASSES, including Common or Single Plate, Vernier, Rail-Road Tran- sit, &c., &c., Builders' Levels.
---	---	--

Every Instrument Warranted Correct.

WILLIAM GURLEY, LEWIS E. GURLEY.

www.compleatsurveyor.com

BENJAMIN PIKE, SR. (1777 - 1863)

New York City

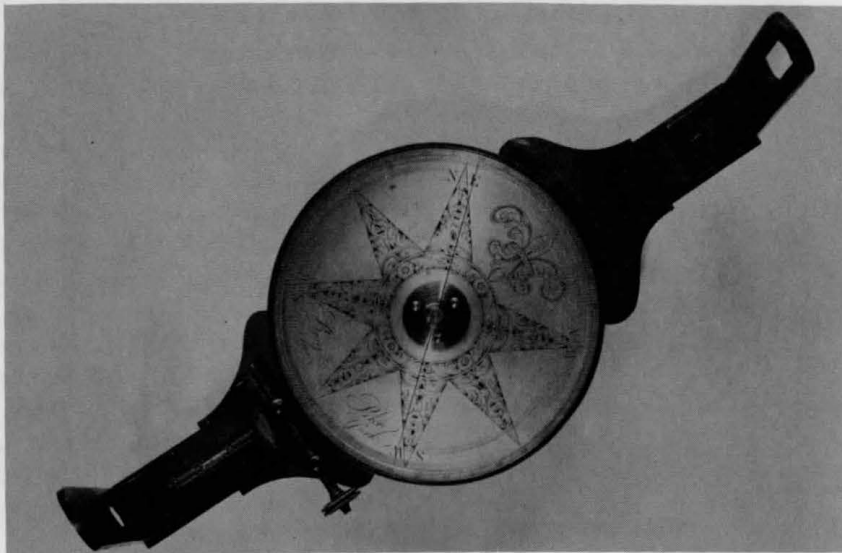
The 1884-85 New York City directory contains an advertisement which stated that the business was founded in 1804.

New York City Directories; 1807, Pike, Benjamin, optician 147 Pearl. 1810-1831, Pike, Benjamin, optician, 12 Wall.

He was born in England in March 1777 and died in New York City May 2, 1863.

Rutgers University, New Brunswick, New Jersey has a Benjamin Pike Surveyor's Vernier Compass in their library collection. It is 14" overall 6" vertical needle.

Photograph Courtesy Rutgers University.



Benjamin Pike Surveyor's Vernier Compass

BENJAMIN PIKE, JR. (1809 - 1864)

New York City

New York City Directories 1843-1844 Pike, Benjamin Jr., optician 294 Broadway h. 42 N. Moore. 1845-1846 Pike, Benjamin Jr., Manufacturer of Philosophical and Optical Instruments, microscopes, telescopes, magnets and electrical machines of every variety for medical use. 294 Broadway. 1846-1857 Pike, Benjamin, Jr., optician 294 Broadway.

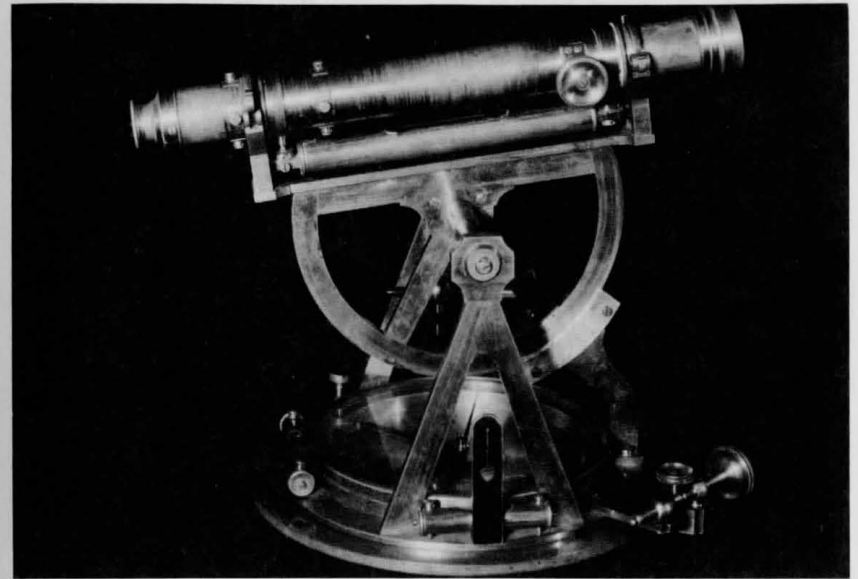
The Gurley Museum has vol. 1 (in two volumes) of Benjamin Pike Jr's "Illustrated Catalogue of Optical, Mathematical and Philosophical Instruments." It was published in 1848 at 294 Broadway.

May 1, 1858 Pike, Benjamin Jr., optician, 294 Broadway, h. Astoria May 1, 1864 Pike, Benjamin Jr., optician, 294 Broadway, h. Astoria

He was born in New York City in 1809. He died near Astoria, Long Island, May 7, 1864.

The Franklin Institute of the State of Pennsylvania, Philadelphia, has a Theodolite with a 13-1/4" telescope in wyes, 8" horizontal circle, beveled verniers, needle is 5-3/4" long, made by Benjamin Pike, Jr. Photograph courtesy of Franklin Institute.

There is privately owned in California, a B. Pike, Jr. 294 Broadway, N. Y. surveyor's compass. It is 14-1/2" overall with a 4-3/4" needle.



Benjamin Pike Jr. Theodolite

BENJAMIN PIKE & SON (1831 - 41)
(1844 - 49)

Benjamin Pike Jr. (1809 - 1864)

Daniel Pike (1815 - 1893)

New York City

1831-1841 Pike, Benjamin & Son, opticians, 12 Wall, 166 Broadway, Benjamin, Jr. (1809-1864) 1844-49 Pike, Benjamin & Son, opticians, 166 Broadway Daniel (1815-1893).

The Chicago Historical Society, Chicago, Illinois, has a Benjamin Pike & Son Surveyor's Compass 14-1/2" overall and a 5-3/4" needle.

The Nebraska State Historical Society, Lincoln, Nebraska, has a Benjamin Pike & Son Surveyor's Compass, 166 Broadway, New York City, Length 10" overall, needle, 3-5/8"

The Western Reserve Historical Society, Cleveland, Ohio has a surveyor's compass. It is 15-3/4" overall, the needle is 5-3/4". It has two level vials. It is engraved B. Pike & Son, New York. It was used by S. R. Oviatt for surveying in Ohio.

BENJAMIN PI KE & SONS (1841 - 1867)

Benjamin Jr. & Daniel (1841 - 1843)

Daniel & Gardiner (1850 - 1867) New York City

1841-1843 Pike, Benjamin & Sons, opticians 166 Broadway Benjamin Sr. Benjamin Jr. and Daniel. 1850-54 Pike, Benjamin & Sons, opticians 166 Broadway Benjamin Sr., Daniel and Gardiner. 1855-63 Pike, Benjamin & Sons manufacturers and importers of mathematical instruments, 518 Broadway Benjamin Sr., Daniel & Gardiner. 1864-65 Pike, Benjamin & Sons, opticians and manufacturers and importers of mathematical instruments, 518 Broadway Daniel & Gardiner. 1866-67 Pike, Benjamin & Sons, opticians 518 Broadway Daniel h. N. J. Gardiner 89 E. 19th.

The New York City Directory does not list Gardiner until 1886-87 Pike, Gardiner, restorer 331 Bowery h 280 St. James pl., Brooklyn. 1893 Maria M. Wid Gardiner h 115 W. 77th.

The Brooklyn, N. Y. directory lists as follows: 1886-87 Pike, Gardiner, optician N. Y. h 280 St. James Place, Brooklyn. 1888-91 Pike, Gardiner, optician N. Y. h 280 St. James Place, Brooklyn.

He is not listed in the 1893 Brooklyn directory.

Gardiner Pike was born in New York City July 9, 1824 and died in New York City (115 West 77 Street) April 13, 1893.

The New Jersey Historical Society, Newark, N. J., has a B. Pike & Sons, 166 Broadway, New York, Surveyor's Compass 15-7/8" overall, 5-3/4" needle. This instrument belonged to John Insley Blair, (1802-1899), Blairstown, N. J.

Sutter's Fort State Historical Monument, Sacramento, California have a B. Pike & Sons, 166 Broadway, New York, Surveyor's compass 15-3/4" overall, 5-1/4" needle.

In the Gurley Museum is a B. Pike & Sons, 166 Broadway, New York Plain Compass 14-5/8" overall, 5" needle.

The Farmers' Museum, Cooperstown, New York, has a B. Pike & Sons, New York, Surveyor's Vernier Compass 16" overall, 5-7/8" needle.

The Kansas State Historical Society, Topeka, Kansas have a B. Pike & Sons, 518 Broadway, New York, Surveyor's transit, 10" telescope, 7-1/2" horizontal limb, 6" needle.

The Smithsonian Institution, Washington, D. C. has a surveyor's vernier compass. It is engraved B. Pike & Sons 166 Broadway. It is 11" overall with a 3-3/4" needle.

BENJAMIN PIKE'S SON (1867 - 1916)

New York City

Daniel (1815 - 1893)

Daniel Pike was born in New York City on August 16, 1815, and died in New Providence, New Jersey, April 16, 1893.

1867-70 Pike's Benjamin Son optician and manufacturer of mathematical instruments. 518 Broadway. 1875-76 Pike's Benjamin Son, optician 518 Broadway (no mention of surveying instruments.) 1881 Pike's Benjamin Son & Co., optician 960 Broadway. In the advertising section, "manufacturers and importers of mathematical, philosophical and surveying instruments." 1886 Pike's Benjamin Son, optician, 930 Broadway, h. New Providence, N. J. 1900 Pike's Benjamin Son, optician 12 E. 23rd St. New Providence, N. J. 1906 Pike's Benjamin Son, optician 12 E. 23rd St., New Providence, N. J. (Daniel, not listed) 1913 Pike's Benjamin Son, opticians 638 Madison Ave. 1916 Pike's Benjamin Son (Mansfield and Hanvill) opticians 638 Madison Ave. & 24 E. 59th. 1917 Not listed.

On August 4, 1868, Benjamin Pike's Son 518 Broadway, N. Y., ordered a Solar Telescopic Compass of Gurley.

The Onondaga Historical Society in Syracuse, N.Y. has a transit with a 10" telescope and 4-3/16" needle. The horizontal limb is 7-5/8" inside diameter. It is marked "B. Pike's Son, New York."

From May 29, 1865 to July 5, 1950 Gurley has serviced at least thirty six Pike theodolites, transits, y levels and both plain and vernier surveyor's compasses.

AUGUSTUS PLATT (1793 - 1886)

Columbus, Ohio

Augustus Platt, son of Benjamin Platt and Adah Fairchild, was born in New York August 4, 1793. He died February 28, 1886 in Columbus. He is buried in Greenlawn Cemetery.

His son, William Augustus was born in Lanesboro, Massachusetts on March 7, 1809. He is said to have moved to Columbus, Ohio with his grandfather, Benjamin, about 1817.

The first directory of Columbus issued in 1843 lists as a mathematical instrument maker 1843, Platt, Augustus (Platt & Son). The son was Calvin Platt.

In 1862 Calvin was superintendent of another company. Augustus Platt is listed as mathematical instrument maker until 1872.

In the Ohio State Museum in Columbus, Ohio is a transit, engraved A. Platt Columbus. The telescope is 13-3/4" long, the length of the needle is 3-1/2". the limb is 5-1/4" diameter.

In the State Historical Society, The State of Wisconsin, in Madison is a surveyor's plain compass. It is engraved A. Platt, Columbus, the compass is 18" overall, the needle is 5-3/4" long.

BENJAMIN PLATT (1757 - 1833)

New Milford, Connecticut
Columbus, Ohio

He was born in Danbury, Connecticut on January 3, 1757. He removed to Lanesboro, Massachusetts, then to Columbus, Ohio about 1817.

Benjamin Platt was a worker in gold, silver and brass. He made clocks and invented a surveyor's compass, moveable for running lines over hilly ground. He was in New Milford in 1802. His grandson, William Augustus, was born in Lanesboro, Massachusetts, March 7, 1809. He was with his grandfather in Columbus in early boyhood.

"The Platt Lineage (N. Y. Thomas Whittaker 1891) G. Lewis Platt, History of the Town of New Milford and Bridgewater, Conn. 1703 - 1882 by Samuel Orcutt."

In 1802 he was Master of St. Peters Lodge No. 21, New Milford, Conn. Benjamin Platt died August 15, 1833 in Columbus, Ohio. His death notice appeared in the August 17, 1833 edition of the Ohio State Journal.

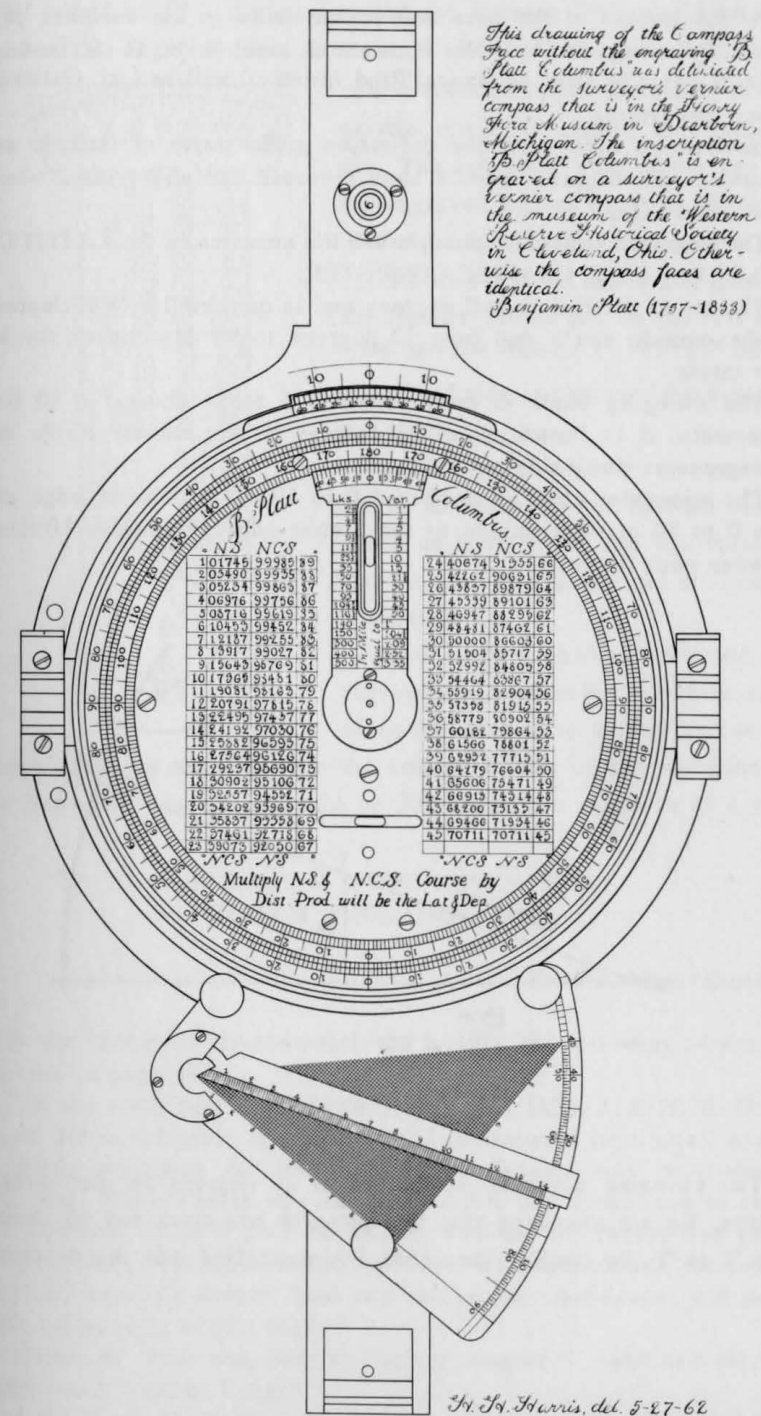
The Western Reserve Historical Society, Cleveland, Ohio has a surveyor's vernier compass. On the compass face is engraved "B. Platt. Columbus". The blade is engraved "Joseph M. Rickey". It is 15" overall with a 6" needle.

The Ohio State Historical Society, Columbus, Ohio has a surveyor's compass marked, B. Platt New Milford It is 14-1/4" overall. The needle is 6-1/8" long.

The Platt compass has additional information for the surveyor. On the compass card there is engraved the table of natural sines and cosines from 1° to 89°.

The two components of a traverse line are called the latitude and departure of that line. The latitude of the line is the component parallel with the meridian, and the departure is the component at right angles to the meridian.

The latitude of a point is equal to the length of the line measured from the preceding point multiplied by the cosine of the bearing, and the departure is equal to the length of the line multiplied by the sine of the bearing.



At the bottom of the sine and cosine table in the compass card is the following: Multiply N. S. (natural sine) & N. C. S. (natural cosine) Course by Dist. (distance) Prod. (product) will be Lat. (latitude) & Dep (departure).

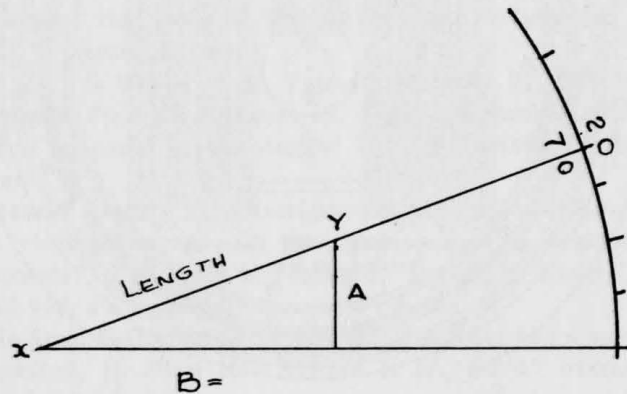
However to agree with the definition given above of latitude and departure, the engraver should have reversed the abbreviated words "Lat" and "Dep"

The engraved triangular chart below the compass is the LATITUDE AND DEPARTURE GRAPHIC COMPUTER.

The arc is divided to half degrees and is numbered 0 to 40 degrees on the outside circle and from 50 degrees to 90 degrees on the inside circle.

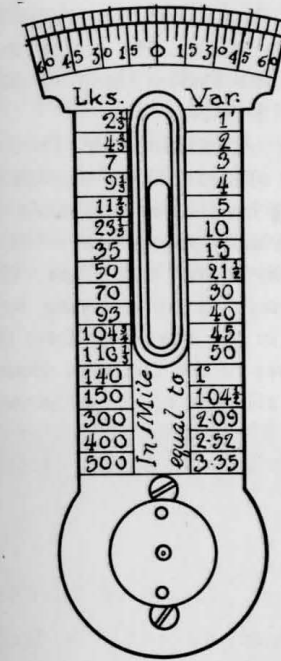
The swinging blade is numbered from 1 to 14 chains in 10 link increments. It is shown set at 20 degrees on the outside circle and 70 degrees on the inside circle.

The triangular chart is numbered 0 to 10 on the bottom edge and from 0 to 10 at right angles to the bottom edge. There are 10 lines between each figure.



The swinging blade is shown set at 20 degrees on the outside figures. We are assuming that the surveyor has measured 50 chains from X to Y. By reading the chart, he would find that the departure

"A" would be 17 + chains and that the latitude "B" would be 47 + chains. The engraved plate in the north end of the compass card whose



center coincides with the center of the needle circle is called the variation arc. The left hand side of the arc has the engraved figures 2-1/3 to 500 links. The right hand side is engraved variation 1 to 3°35". In the space between the figures 140 to 500 on the left hand side and the figures 1° to 3°35" on the right hand side is engraved the sentence "in 1 Mile equal to."

At the outer edge of the variation arc is an engraved and divided vernier scale so that in its use the variation may be read to degrees and the nearest 5 minutes.

An example might be as follows: The surveyor knows that his variation at the place he wishes to survey is two degrees and nine minutes; from the engraved table on the variation arc he finds that his offset would be 300 links at a distance of 1 mile.

HORACE M. POOL (1804 - 1879)
JOHN M. POOL (1824 - 1904)

Easton, Massachusetts

In the history of Easton published in 1886 the following paragraph appears on page 591.

"In the south part of the town, in the year 1828, J. & H. M. Poole began the manufacture of mathematical instruments on a small scale. A strong prejudice for foreign-made instruments was only slowly overcome. Poole's work was said not only to equal but even to excel the imported. In 1878 John M. Poole, who had for twenty-five years been foreman, succeeded to the business. He manufactures surveyor's transits, builder's levels, land and telescopic compasses, and many other instruments of this kind."

Horace M. Pool was born in Easton, August 9, 1804 and died in Easton on November 1, 1879.

John Murray Pool, his son, was born December 13, 1824 and died March 11, 1904. The business was discontinued soon after J. M.

Pool's death, by his son, Henry G. Pool. J. Pool's name does not appear in any of the records.

Mr. Kenneth C. Hayward of South Easton visited the Pine Grove Cemetery in Easton in March 1958 and found the information regarding Horace M. and John M. Pool on their grave stones. He states that the descendents of the Pools spell their name Poole. He also supplied the information regarding the history of Easton.

Mr. L. H. Berger supplied the following information: Mr. Pool of Easton, Massachusetts was an old time maker of Surveyor's Compasses, Transits and Wye Levels. The Pool Leveling instrument was made so that its 4-screw leveling base with its clamp and tangent screw could be detached from the cross-bar which supported the telescope. The telescope and bar could be packed separately in its carrying box. The four screw base could also be packed in the box away from the bar with its telescope. When the hinged cover of the box was closed the blocks inside of its cover firmly secured all parts of the instrument from shifting during transportation.

Both Horace M. and John M. were customers of Gurley, Horace from 1869 to 1874., John M. in 1876.

THOMAS POOL

Baltimore, Maryland

1864 Pool, Thomas, mathematical instrument maker 177 N. Eutaw
1865-66 Pool, Mrs. Thomas 164 S. Harvard.

JOHN POTTER (1746 - 1818)

Brookfield, Massachusetts

He was born in Brookfield on September 12, 1746 and died there on October 20, 1818.

"He was a captain in the Militia, and an acknowledged leader in this community. He repaired all the watches and clocks around these parts, and was known as a mathematician and instrument maker. His old home was torn down about 25 or 30 years ago and moved to the Eastern States Exposition Grounds in West Springfield, Mass. where it was rebuilt and is now a part of "STORROWTOWN", a colonial village.

One of our good friends was foreman of the disassembly of the home, and is sure that books and tools went with the house when it was moved to West Springfield (The books and tools were not in the house in 1959). This person also has a picture of the house taken about a century ago showing the building as it originally was, and tells us that it was in this house that the tools were made." (From Frank Cooke's letters of 1/2/59 and 1/22/59.

There is a semi-circumferenter in the Gurley Museum. It is engraved John Potter, Brookfield 1785. It is illustrated on page XVI.

W. L. POTTS

Bucks County, Pennsylvania

In the Gurley Museum is a surveyor's vernier compass engraved: W. L. Potts Bucks Pennsy:^A

It is 13-1/2" overall with a 5" needle and one level vial. This compass is very similar in design and workmanship to the three Rittenhouse and Potts compasses, two are plain and one is a vernier compass. There are photographs of the Rittenhouse and Potts compasses in the Gurley Museum.



W. L. Potts Surveyor's Vernier Compass

JAMES PRENTICE (1846 - 1883)
JAMES PRENTICE & SON (1883 - 1897)
JAMES PRENTICE & SON COMPANY (1897 - 1924)
James Prentice (1812 - 1888)
Charles F. Prentice (1854 - 1946)

New York City

James Prentice was born in London, England on January 2, 1812. He served a seven year apprenticeship with John Beal of London. He came to the United States in 1842. His death occurred at the Clifton Springs Sanitarium in Clifton Springs, New York on August 25, 1888. "Legalized Optometry and the Memoirs of its Founder" by Charles F. Prentice has a frontispiece photograph of James Prentice and his son Charles F. There is also an illustration of Charles F. Prentice taken in 1926.

1846-1883 Prentice, James, math insts 1883-1897 Prentice, James & Son, opticians James Prentice, Charles F. Prentice. 1897-1924 Prentice, James & Son Company Charles F. Prentice, President.

James Prentice & Son Company was incorporated April 9, 1897 in New York County and was dissolved by proclamation April 2, 1924.

Dr. Charles F. Prentice was born in New York City on June 24, 1854. He was the first president of the Optical Society of New York State in 1896.

James Prentice bought 2 Miner's Compasses of Gurley on October 17, 1864.

Gurley has records of servicing Prentice transits and compasses from 1862 to 1931.

New-York City Directory
for 1853 - 1854
Charles R. Rode, Publisher

ENGINEERS, ARCHITECTS, AND DRAUGHTSMEN.

The subscriber respectfully informs gentlemen in the above professions, that he is constantly manufacturing

MATHEMATICAL DRAWING INSTRUMENTS

of every description, superior style and workmanship; and he also offers to their notice the variety of articles he furnishes for their use, viz:

MATHEMATICAL DRAWING INSTRUMENTS, THEODOLITES, TRANSITS,
LEVELS, SURVEYOR'S COMPASSES, LAND CHAINS, MEASURING
TAPES, IVORY, BOXWOOD, PAPER AND METAL SCALES,
DRAWING PAPER, TRACING PAPER, DRAWING
BOARDS, DRAWING PENCILS, CAMERA
LUCIDAS, METAL, HORN, PAPER AND
IVORY PROTRACTORS, STRAIGHT
EDGES, T. SQUARES, ANGLES,
CURVES, COLORS, BRUSHES,
SLABS, VERNER LENSES,
OFFICE CUTLERY,
&c. &c.

N. B.—English Field Instruments constantly on hand, and Instruments made to order.

J. PRENTICE,
315 BROADWAY, N. Y.

L. M. PRINCE CO. (1872 - C)

L. M. Prince (1850 - 1918)

Cincinnati, Ohio

Louis M. Prince was born in St. Louis in 1850 and died in Cincinnati on May 25, 1918. ^{1870 - see catalog}

He started business in 1872 making transits, levels, surveyor's compasses and meteorological instruments until 1912 when their manufacture was discontinued.

On May 2, 1882 L. M. Prince sent an order to Gurley for transits, levels and compasses.

LEWIS PYE

New York City

New York City directories: 1868-70 Pye, Lewis, math inst New York State Directory. 1870 Pye, Lewis, mathematical and surveying instrument maker. Surveying Instruments, a specialty adv p 1131. 1870-71 Pye, Lewis math inst.

JAMES W. QUEEN (1853 - 1860)

JAMES W. QUEEN & CO. (1860 - 1893)

QUEEN & COMPANY, INCORPORATED (1893 - 1912)

QUEEN-GRAY COMPANY (1912 - 1925)

Philadelphia, Pennsylvania

James W. Queen was born in Philadelphia in 1815. He is first listed in 1839 Philadelphia directory as an optician at 48 Chestnut Street.

In 1860 he became associated with Samuel L. Fox and the firm became James W. Queen & Co.

Queen & Co. are first listed in the 1861 Philadelphia directory. For a number of years there was a branch office in New York City. Mr. Queen retired in 1870. He died July 12, 1890.

The business was continued as James W. Queen & Co. until 1893, when it was incorporated as Queen & Co., on January 11, 1893.

On August 6, 1894, the company became involved and then made a general assignment to John G. Gray for the benefit of creditors.

On March 13, 1907 an order was received by Gurley from Queen & Co. Inc., C. F. Iszard, Treasurer.

The last order to Gurley from Queen & Co. Inc., W. P. Barrows, Trustee, was dated July 3, 1912.

The first order to Gurley from Queen-Gray Co., Successors to Queen & Co. Inc., was dated March 29, 1913.

It was reorganized as the Queen-Gray Co. by John G. Gray in 1912 and continued as such until Mr. Gray's death in 1925.

From February 1, 1860 to probably 1900, Gurley made many surveying instruments for Queen & Co.

The Franklin Institute, Philadelphia, has an 18" Y Level. It is engraved Queen & Co. Warranted.

The Nebraska State Historical Society, Lincoln, Nebraska has a Surveyor's Compass, Length 15-5/8" Needle 5-3/4". It is engraved Jas. W. Queen, Philadelphia.

In the Gurley Museum are two surveying instruments. One is a plain compass which is engraved: James W. Queen & Co., Agents Philad^a & New York W. & L. E. Gurley, Troy, N. Y. It is 15" overall with a 5" needle. Also a transit (not made by Gurley). It has a 7" limb 5" needle and 11" telescope. It is engraved Queen & Co. Philadelphia.

J. QUINCEY

New York City

New York City Directory: 1786 Quincey, J. instrument maker 199 Water St.

CARL RAHSSKOPFF (1838 - 1921)

San Francisco, California

He was born in Coblenz, Prussia on March 13, 1838.

He studied in Paris, entering the United States in 1865. He arrived in San Francisco on September 2, 1868 after having spent a few years in New York and Washington, D. C.

He is first listed in the San Francisco directories in 1870.

Rahsskopff, Carl & Reedinger, Alfred; mathematical, nautical and philosophical instrument makers 10 Quincy.

In 1871, he had no partner and in 1880 sold his business to A. Lietz of San Francisco. It is said that a substantial part of his business consisted of orders from the United States government. At that time, 1880, he joined the Schmidt Label and Lithographic Co. in San Francisco where he remained until his death on October 28, 1921.

There are no known existing instruments of his manufacture.

THEODORE F. RANDOLPH (1829 - 1898)

He was born in Ohio in 1829. He died December 26, 1898, in Cincinnati (Obituary in Cincinnati Enquirer, December 27, 1898, P. 5, Col. 4, reports he died of injuries suffered in falling from a crowded streetcar: buried in Spring Grove Cemetery in Cincinnati.

Randolph's business listed for the first time in 1853 Cincinnati Directory as follows; Randolph, J. F. & Bro. (T. F. & Jas. F.) mathematical instrument manufacturers, N. W. cr. 5th & Walnut.

Company listed for the last time in 1941 Cincinnati Directory with Arthur J. Roedel named as proprietor.

LEADING MANUFACTURERS AND MERCHANTS OF CINCINNATI AND ENVIRONS

International Publishing Co., Publishers-1886 Boston, Cincinnati, and Chicago. p. 123 (commentary accompanied by engraved portrait)

T. F. Randolph, Manufacturer, Importer and Dealer in Surveyor's and Engineers' Instruments, etc. No. 51 West Fourth Street, Room 31, Carlisle Building.--This gentleman is one of the most experienced and successful manufacturers of surveyors' instruments, etc., in the country. His experience covers a period of near half a century, and has been established in this line of business in this city for the past forty years. He is a native of Ohio, is the proprietor of numerous patents, has a well-equipped factory, furnished with steam power, and affording employment to a large number of hands. He is the sole manufacturer of Randolph's new patent telescope compass, patent telescope attachment for common compasses, patent quick leveling tripod, patent sole leather boxes, and patent daisy level. Mr. Randolph's manufactures have not been exhibited in any fair or exposition since 1874, but in September, 1857, his surveyor's compass took the first premium at the Ohio State Fair. At the fair of the Ohio Mechanics' Institute, held in this city in 1858, he was, after a most scrutinizing examination by competent judges, awarded a medal for his theodolite transit, Y level, Dumpy level, and surveyors' compasses. At the United States Agricultural Fair, held at Cincinnati in September, 1860, he was awarded silver medals for a theodolite and surveyors' compass. He also received first premium silver medals at the Cincinnati Industrial Expositions, 1871-74. Mr. Randolph, in addition to his own manufactures, carries a large stock of imported goods, and also second-hand instruments, which he has put in through repair. All kinds of instruments are promptly repaired. The products of this house are appreciated everywhere by engineers and surveyors, and Mr. Randolph controls a large trade. For twenty years the city was built with his instruments.

There is a T. F. Randolph & Brother transit in the Gurley Museum. It has a 9" telescope, a 6-3/4" beveled limb, a single vernier and 4-3/4" vertical needle. It was made between 1870 and 1880. It is engraved: T. F. Randolph & Brother Cincinnati, O.

JAMES REED (1792 - 1878)
JAMES REED & CO. (1847 - 1878)

Pittsburgh, Penna.

James Reed was born in Washington, Pennsylvania April 10, 1792. He died in Pittsburgh June 5, 1878.

He is first listed in the Pittsburgh directories in 1847 as a watch mr & jeweller.

In 1850 it is James Reed & Co., which continues through the 1882-83 Pittsburgh directory.

Gurley repaired a Reed Surveyor's Compass on May 3, 1864.

In the U. S. Geological Survey, Washington, D. C., exhibit of surveying instruments is a transit No. 393. It has a 6" needle and a 12" telescope.

The Michigan Historical Society of Lansing, Michigan has a surveyor's compass #111. It is 15" overall with a 6" needle.

EDWARD SAMUEL RITCHIE (1814 - 1895)

New Bedford, Mass.

Boston, Mass.

Brookline, Mass.

He was born in Dorchester, Massachusetts August 14, 1814.

The Boston, Mass. directories list him as follows: 1839 Palmer & Ritchie hardware 8 Union Ashur C. Palmer Edward S. Ritchie. This partnership exists until 1842. From 1842 to 1849 he was in business in New Bedford. Ritchie, Edward S. ship chandlery and hardware.

The 1850 Boston directory lists: Chamberlain & Ritchie, philosophical instrument makers Nathan B. Chamberlain Edward S. Ritchie This partnership exists thru 1854. Mr. Ritchie is without a partner until 1862. 1862-64 Ritchie Edw. S. & Co. (John Kehew) philosophical and nautical instruments. 1866 Ritchie Edward S. & Son (Thomas P. Ritchie).

Thomas Pope Ritchie was born in New Bedford August 11, 1842. He died in Newton Highlands February 13, 1914.

1867 Ritchie Edward S. & Sons (Thomas P. & John)

John Ritchie was born in New Bedford January 5, 1844. He died in Brookline September 30, 1902.

1872 Ritchie Edward S. & Sons (Thomas P. John & Andrew Montgomery).

Andrew Montgomery Ritchie was born in New Bedford February 6, 1849. He died in Brookline on December 25, 1916.

In 1886 the company moved to Brookline, Mass. All of the sons continued with the business until their deaths.

On the death of Andrew Montgomery Ritchie in 1916, his son, Andrew Eliot Ritchie (October 16, 1878 January 21, 1935) (he was born in Brookline and died in New York City) ran the business until his death in 1935.

The business was sold on March 19, 1937 to T. S. & J. D. Negus of New York City, who sold it to the Sherman brothers on May 15, 1953, who moved the business to Pembroke, Massachusetts.

E. S. Ritchie & Sons in their 1891 catalog on page 105 describe, with prices, the various surveyor's compasses, transits, and Y levels that they were manufacturing at that time, though most of the catalog describes the various nautical compasses and philosophical instruments that they were manufacturing in that period.

Edward S. Ritchie invented the induction coil; he was the first one to make a marine compass where the weight of the magnets were not supported by the pivot, but floated in alcohol. When the famous Monitor was completed and ready to sail its iron clad construction and turret caused the compass to always point to the turret. Mr. Ericson called on Mr. Ritchie for assistance. Mr. Ritchie went to New York and worked without sleep for over twenty four hours. He overcame the difficulty so that the Monitor was able to sail for Hampton Roads in time to battle the Merrimac on March 9, 1862.

Edward Samuel Ritchie died at Newton, Massachusetts on June 1, 1895.

RESUME

1839-1842 Palmer & Ritchie hardware (Ashur C. Palmer and Edward S. Ritchie) Boston. 1842-1849 Edward S. Ritchie, ship chandlery and hardware New Bedford, Mass. 1850-1854 Chamberlain & Ritchie, philosophical instrument makers (Nathan B. Chamberlain and Edward S. Ritchie) Boston. 1854-1862 Edward S. Ritchie, philosophical instruments Boston. 1862-1864 Edward S. Ritchie & Co. (John Kehew) Philosophical and nautical instruments Boston.

The following years they were listed as philosophical and nautical instrument makers, in Boston.

1866 Edward S. Ritchie & Son (Thomas P. Ritchie) 1867 Edward S. Ritchie & Sons (Thomas P. & John) 1872 Edward S. Ritchie & Sons (Thomas P. John and Andrew Montgomery).

In 1886 they moved their factory to Brookline, Mass.

1886-1937 E. S. Ritchie & Sons. 1937-1953 Controlled by T. S. & J. D. Negus, New York City.

May 15, 1953 to date E. S. Ritchie & Sons Inc. Nautical Instruments, Pembroke, Mass.

Sources of Material:

Mr. John R. Marvin Denver, Colorado, Mr. A. Eliot Ritchie, Jr., Medfield, Mass. Mr. Burton L. Sherman, Pembroke, Mass. M. H.

Bonner Reference Department/, New Bedford Public Library, New Bedford, Mass.

Boston and Brookline Directories 1839-1935 Division of Vital Statistics, The Commonwealth of Massachusetts (Vol. 455 Page 336 No. 202 for Edward Samuel Ritchie).

BENJAMIN RITTENHOUSE (1740 - 1825)

Philadelphia, Penna.

"Benjamin Rittenhouse was born in Norriton township, now Montgomery County, Pa., about 1740; and died in Philadelphia August 31, 1825. He was working as late as 1819.

From 1776-1778 he was superintendent of a gun factory, maintained by the state of Pennsylvania. He sat in the Assembly of Pennsylvania from 1784 to 1788 and was appointed commissioner to survey the Schuylkill River in 1789. In 1792, he became associate judge to the court of common pleas of Montgomery County. His surveyor's chain made by order of Congress in 1796 has been in the standard of the United States land office ever since. He was a brother of David Rittenhouse."

He advertised for an apprentice in 1786.

There are photographs in the Gurley Museum of the following described compass made by Benjamin Rittenhouse.

The Historical Society of Pennsylvania Surveyor's Vernier Compass Length o.a. 13-1/4" 5" Needle No level vials. It is engraved "Made by Benjamin Rittenhouse".

Atwater Kent Museum 15 South 7th Street, Philadelphia. Surveyor's Vernier Compass Length o.a. 14" Needle 5" 1 Level Vial. It is engraved Benjⁿ Rittenhouse, Philadelphia.

The Franklin Institute Surveyor's Vernier Compass, No level vials Length o.a. 14" needle 5" Engraved on compass north end of compass swing arm "Benj. Rittenhouse".

Buffalo Historical Society, Buffalo, N. Y. Surveyor's Vernier Compass Length o.a. 13" Needle 5-1/4" 2 Level vials Engraved B. Rittenhouse Pennsylvania.

James E. Chessor, Centerville, Tenn. Surveyor's Plain Compass. It is engraved "Benjamin Rittenhouse Fecit Anno 1790" no level vials.

United States National Museum U.S.N.M. No. 310.815 Surveyor's Plain Compass Engraved "B. Rittenhouse" 16" o.a. 5" needle no level vials. Also engraved A. Ellicott.

Valley Forge Historical Society, Valley Forge, Penna. Surveyor's Plain Compass. It is 15" overall, The needle is 6" long, one circular level vial. It is engraved "Benjamin Rittenhouse Fecit Anno 1790".

The Ohio State Museum, Columbus, Ohio Surveyor's Plain Compass, It is engraved "Made by Benjamin Rittenhouse 1787" It is 13-1/4" overall Needle 5-1/16" No level vials.

The Henry Ford Museum, Dearborn, Michigan Surveyor's Plain Compass It is 15" overall needle 5-3/8" No level vials. It is engraved "Made by Benjamin Rittenhouse Philad^a County".



Benjamin Rittenhouse Surveyor's Plain Compass
Photograph courtesy Ohio State Museum.

DAVID RITTENHOUSE (1732 - 1796)

Philadelphia, Pennsylvania

David Rittenhouse, was born at Paper Mill Run, Roxborough township, near Germantown, Philadelphia County, Pennsylvania on April 8, 1732. He died in Philadelphia June 26, 1796.

His first public service was a boundary survey for William Penn in 1763-64 to settle a dispute with Lord Baltimore. He laid out on the ground, the twelve mile radius around Newcastle, Delaware which forms the boundary between Pennsylvania and Delaware. So accurate was the work that it was accepted by Mason and Dixon. In 1770 he removed to Philadelphia. He was employed as a surveyor between 1779 and 1786 on boundary surveys and commissions involving Pennsylvania, Delaware, Maryland, Virginia, New York, New Jersey and Massachusetts--over half the British colonies in America. He was the first one in America to put spider web in the focus of his telescope. He was professor of astronomy in the University of Pennsylvania and served on its board of trustees. He made and repaired instruments for Washington. Franklin consulted him on various occasions. For Jefferson he standardized the foot by pendulum measurements in a project to establish a decimal system of weights and measures. He was appointed the first director of the Mint by Washington on April 14, 1792 and served until June 1795. He was painted by Peale and Trumbull, a marble bust was made by Ceracchi and a bronze medal by Barber, engraver of the Mint.

At Franklin's death he was elected president of the American Philosophical Society on January 7, 1791 and by re-election until his death.

DAVID RITTENHOUSE AND THE COMPASSES HE MADE FOR GEORGE WASHINGTON

David Rittenhouse lived sixty-four years, from 1732 to 1796. For thirty-five years he was an obscure countryman in Norriton township, a farmer, maker of clocks and mathematical and surveying instruments, and local surveyor. From childhood he had a curious mind. He read, figured, and tinkered. He mastered mathematics, astronomy, and Newton's Principia. He designed and made the first declination arc for a surveyor's compass.

A transit of Venus was due to occur in June 1769. For the American Philosophical Society he built and equipped the Norriton observatory. When the observations were reported and the results were calculated, Rittenhouse was an astronomer of international reputation. Influential friends persuaded him to move into Philadelphia in 1770.

After the Revolution, Rittenhouse, a scholar and citizen of the Republic, became president of the Philosophical Society, fellow of the Royal Society, trustee of the University of Pennsylvania, surveyor of state boundaries, and first director of the Mint.

David Rittenhouse has been dead one hundred and sixty-six years (1962) but Rittenhouse clocks still strike the hours. Some of his surveyor's compasses, which now are precious museum pieces have been fortunately preserved for the admiration of present day instrument makers. The orrery is still a marvel of the mechanician's art. On the hillsides at Norriton, around State House Square, and in the halls of the Philosophical Society his spirit lingers. Streets, Parks, a social club, a school and a scientific body bear his name.

Among the surveyor's compasses that bear his name, the best known are the two that he made for George Washington.

The New York State Library in Albany, N.Y. has a D. Rittenhouse, Philadelphia Surveyor's Vernier Compass. It is 13-1/2" overall with a 5" Vertical Needle.

In the cover of the box that contains this compass is the following label: "The instruments contained in this box, together with case of protracting instruments in a Shageen case, two surveyor's chains & the wooden pins used with the same were the property of General Washington and used by him when a very young man.

These instruments descended to my father, Col. William A. Washington (the General's oldest nephew) and from him to me, and by me presented to my son, Lewis W. Washington, February 10, 1854.

G. WASHINGTON

Georgetown, D. C.
February 10, 1854"

This compass was authorized to be purchased by the Legislature of the State of New York by the act called the Supply Bill passed April 26, 1871. It was deposited in the New York State Library as the property of the state in the latter part of the year 1873.

A complete report concerning this Compass and its acquisition may be found in the "Annual Report of New York State Library" for 1873 pages 140 to 146.

The Smithsonian Institution in Washington, D. C. has a surveyor's Vernier Compass. It is 14" overall with a 5-1/2" needle. It is engraved "Rittenhouse Philadelphia". It has no level vials.

The documentation that supports the attribution that the Rittenhouse compass was used by Washington is a letter from Mr. Wilcomb E. Washburn, Curator, Division of Political Economy, Smithsonian Institution, to the writer of this article under date of 22 December 1960. "There is, in the possession of the Division of Political History, a bound volume of original manuscript letters entitled: "The Cor-

respondence relating to the Surveyor's Compass of Gen. George Washington, made and presented to him by David Rittenhouse, the Philosopher and Mechanic, of Philadelphia, 1782. Which was given by the Farmer of Mount Vernon to Captain Samuel Duval, the County Surveyor of Frederick County, Maryland, 1795, and had passed through the hands of William Hobbs & Son, 1815, and of Captain George Riner, 1852, into the possession of Anthony Kimmel, all of Linganore, Frederick County, Maryland." Mr. Kimmel informed the President of the Historical Society of Pennsylvania in December, 1850, that he possessed the compass, and presented his correspondence with George Washington Parke Custis, the grandson of Martha Washington, to confirm his view."

Other David Rittenhouse Surveyor's Compasses that are not mentioned in the text: The Historical Society of Pennsylvania, Philadelphia Pennsylvania, Surveyor's Vernier Compass. Engraved D. Rittenhouse Norriton Fecit. Length overall 14", Needle 5-1/2", No level vials.

Germantown Historical Society Philadelphia Pennsylvania, Surveyors Plain Compass. Length overall 13-1/8", Needle 4-3/8", No level vials. Engraved Rittenhouse, Philadelphia.

Historical Society of Montgomery County, Norristown Pennsylvania, Surveyor's Level 21" overall. Engraved D. Rittenhouse Philadelphia.

There is also in the Smithsonian Institution in Washington D. C. a large Zenith Telescope Cat. No. 152078 made by David Rittenhouse for Andrew Ellicott.

In the Gurley Museum is a large David Rittenhouse compass with an unusual history. Mrs. Grace R. Armstrong (Armstrong's Old Mill Shop) wrote under date of April 22, 1960 that "they had bought several years ago, from a "runner", who had recently cleaned out an old attic in Germantown, Pennsylvania, a large compass in a black walnut box. It was found, by cleaning, that the name David Rittenhouse Philadelphia appeared on the needle circle. There was a hole in the bottom of the box so that it could be set on a Jacob Staff When the compass was used." The Compass is set in gimbals which take the place of level vials.

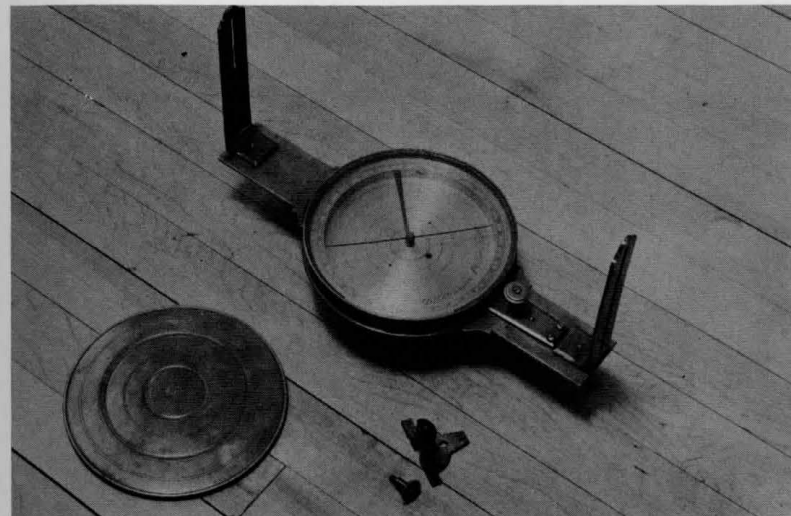
The "box" was made of black walnut with handles on the ends by which it could be carried. The outside diameter of the needle circle is 11", the diameter of the divisions and engraved figures is 9-3/4". The needle circle is in quadrants. There is a bowl on the bottom of the compass which has eight pounds of lead in it to lower the center of gravity and also to make it swivel more easily. The needle is 8" long. Mrs. Armstrong ends her letter as follows:

"Alas! On December 27, 1955 at 4:00 A.M. we lost everything including the compass".

However, it was learned from Mrs. Armstrong that there had been a photograph of the compass taken some time before the fire and that

a few pieces of the compass had been salvaged. Mrs. Armstrong was advised that if those parts were sent to W. & L. E. Gurley that it might be possible to reconstruct the compass. She sent the needle circle, engraved with the words "David Rittenhouse Philadelphia", the 8" needle, which had not lost its magnetism, one of the brass carrying handles, and its holding bolt and nut, a portion of triangular supporting piece of the vernier and sight, one of the gimbals and one of the connecting rods between the inner and outer gimbals.

With the aid of the photograph and the salvaged pieces, the Gurley factory was able to reconstruct the David Rittenhouse compass as shown in the illustration.



David Rittenhouse Compass in the New York State Library



Reconstructed David Rittenhouse Surveyor's Compass in Gurley Museum.

RITTENHOUSE AND EVANS

It is assumed that Benjamin Rittenhouse and Evans were partners in Philadelphia making the two compasses described below though a search of Philadelphia directories from 1785 to 1830 reveal any such partnership.

The Historical Society of Pennsylvania has a Rittenhouse and Evans surveyor's vernier compass. It is 15-1/4" overall with a 6" needle. It has one level vial and no sights. On the bezel cover is engraved "The property of Andrew Porter (1743 - 1813) and afterwards of Robert Brooke (1770 - 1821).

The surveyor's vernier compass in the Smithsonian Institution in Washington D. C. is 14" overall with a 5" needle and 1 level vial.



Rittenhouse & Evans Surveyor's Vernier Compass
Photograph courtesy of Smithsonian Institute

RITTENHOUSE AND POTTS

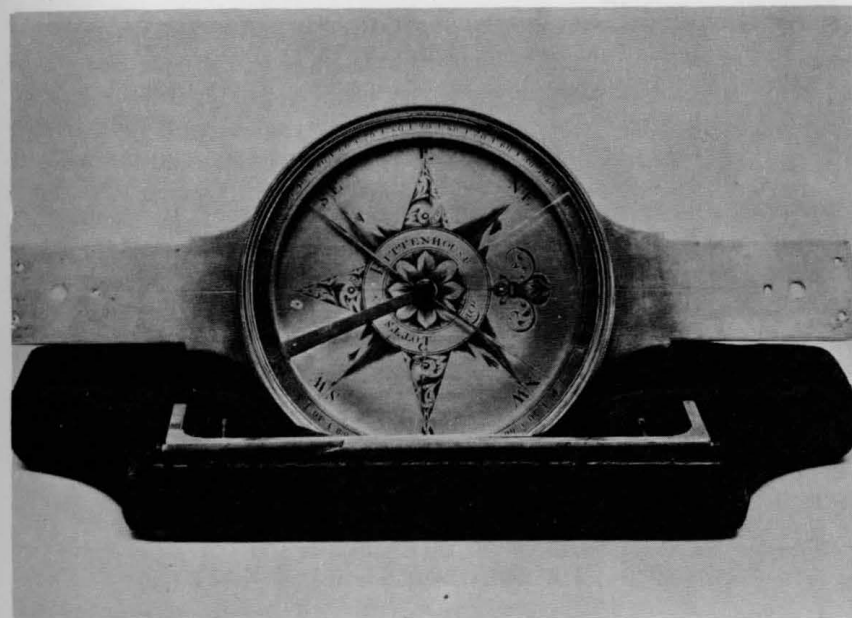
It is assumed that Benjamin Rittenhouse and W. L. Potts were partners in making the three surveyor's compasses described below and also that they were made in Philadelphia.

Diligent search in the Philadelphia directories from the first one issued to 1825 reveal no mention of this firm.

The American Philosophical Society in Philadelphia has a Rittenhouse and Potts surveyor's plain compass.

In the H. F. duPont Winterthur Museum, Winterthur, Delaware is a surveyor's plain compass. It is 14" overall with a 4-7/8" needle and no level vials.

There is a Rittenhouse and Potts surveyor's vernier compass privately owned in Waterloo, Illinois. It has two level vials.



Rittenhouse & Potts Surveyor's Plain Compass
Photograph courtesy, Henry Francis duPont Winterthur Museum.

JOHN ROACH (1813 - 1891)

New York City
San Francisco, California

He was born in Cork, Ireland on April 19, 1813. He is first listed in the New York City directories in the 1833-34 edition, "Philosophical inst. maker", 116 White.

In 1841-42 he is listed as Roach & Warner, philosop inst. 293 Broadway, Henry Warner was his partner. From 1843 to 1855 he is variously listed as an optician and maker of surveying instruments.

According to the San Francisco CALL of March 20, 1891, he arrived in California on May 1, 1855.

He is listed in the San Francisco directories from 1858 to 1891, usually as an optician. He has an advertisement in the 1861 directory and the 1873 directory has him listed as an optician and mathematical instrument maker.

He was succeeded by Joseph C. Sala.

He died in San Francisco on March 19, 1891.

There is privately owned in Gloucester, Massachusetts a surveyor's plain compass 11-3/4" overall with a 4-3/8" needle and 2 level vials. It is engraved: J. Roach New York.

The Mackay School of Mines Museum in Reno, Nevada has a Roach instrument used in surveying the Sutro Tunnel. It consists of two optical tubes at ninety degrees, the longer on trunnions, on a single center, the whole mounted on a screw adjusting plate on a two-foot-tripod.

Gurley has serviced two Roach instruments. A Vernier Compass from Ellenville, N. Y. in 1886. A 4" Engineers Transit from Albany, N. Y. in 1910.

There is a John Roach, New York surveyor's vernier compass in the Museum of the Michigan State University at East Lansing, Michigan. It is 13" overall with a 4-5/8" needle.

ROBINSON, BURNHAM & CO.

Danvers, Massachusetts

Burnham, of the firm of Robinson, Burnham & Co., Danvers was doubtless one of the Essex Family of that name. They were watch and mathematical instrument makers, June 24, 1831.

Henry Wyckoff Belknap's Artists and Craftsmen of Essex County Massachusetts, page 90.

MICHAEL RUPP (1818 - 1899)

New York City

He was born in France in 1818. He died in Brooklyn, New York on November 12, 1899.

He came to the United States in 1829 and to New York City in 1844.

New York City Directories: 1844-45 Rupp, Michael h. 40 Forsyth 1844-53, Gregg & Rupp, mathematical instruments William T. Gregg Michael Rupp, 1853-1899, Rupp, Michael mathematical instruments.

There is privately owned in Buckfield, Maine a plain compass made by M. Rupp New York. It is 14-1/2" overall with a 5" needle.

R. RUTT & SON
Richard Rutt (1799 -)

Baltimore, Maryland

He was born in England in 1799.

Baltimore Directories: 1842, Rutt, Richard & Son, mathematical and optical instrument maker. 1845, Rutt, Richard, mathematical instrument maker. 1853-54 Rutt, Richard, mathematical and optical instrument maker, 10 Thames See Card. 1858-59 Rutt, Richard mathematical instrument maker.

He is listed in 1850 (7th) Federal Census City of Baltimore, Richard Rutt, age 51, male, Profession, Math Inst Maker born England. He came to the United States after 1830 because he had a daughter 20 years old who was born in England.

R. RUTT & SON,
MATHEMATICAL AND OPTICAL
INSTRUMENT MAKERS
TO THE U. S. GOVERNMENT,
10 THAMES STREET,

Feli's Point.

Watches and Jewelry repaired; Chronometers correctly rated by transit; Sextants, Quadrants, Telescopes, Compasses, Binnacles made, repaired or exchanged; Brass Work cleaned, the whole done properly and on reasonable terms.

R. R. solicits a share of public patronage.

CHARLES RYHINER

St. Louis, Missouri

He is listed in the 1838-39 St. Louis directory as a mathematical instrument maker at 26 Chestnut.

This address is next door to Jacob Blattner, who is listed in the 1840-41 directory at 24 Chestnut.

The Missouri Historical Society of St. Louis, Missouri has a surveyor's compass, engraved Charles Ryhiner, St. Louis.

It is 16" overall with a 6" needle.

JOHN C. SACK (1823 -)

San Francisco, California

He is first listed in 1858 directory, no occupation, same address as Thomas Tennett, Battery Street. From 1861 thru 1888 he is listed as an instrument maker with Thomas Tennett, Battery Street. From 1889 thru 1895 he is apparently by himself at #4 California Room 7. In 1895 his residence is given as 540-1/2 - 15th.

He is not listed in the 1896 directory. The Federal Census of 1880 lists him as being 57 years old and born in Germany.

GEORGE N. SAEGMULLER (1847 - 1934)

Washington, D. C.
Rochester, N. Y.

George N. Saegmuller was born in Neustadt, Germany on February 12, 1847. He came to America in 1870, just before the Franco-German War.

He was employed by William Wurdemann until he went to work at the U. S. Coast & Geodetic Survey office. While still in the Coast & Geodetic Survey in Washington, he founded, with his two brothers-in-law, Camill Fauth and Henry Lockwood, Fauth & Co. Later Mr. Saegmuller bought out Henry Lockwood and then about 1888, he bought out Camill Fauth. Around 1900 he changed the firm's name to George N. Saegmuller.

In 1905 he combined with Bausch & Lomb Optical Company in Rochester, N. Y. Shortly afterwards Bausch & Lomb and Saegmuller combined with Carl Zeiss of Jena, Germany.

He left Bausch & Lomb Optical Co. in 1926.

While in Washington he manufactured astronomical and engineering instruments. The dividing engine which he designed and constructed himself and used for graduating the circles for both the astronomical

and engineering instruments, was extremely accurate.

During this period, he did a great deal of work for the navy and the naval observatory. He took out numerous patents, probably the two best known were the Solar Attachment and the Bore Sight.

He had three sons: John Leonard, who was trained in the L. Tesdorph factory; Frederick B., a graduate (CE) of the University of Virginia; George M., a graduate (Ph D) of the University of Jena, Germany.

He died in Arlington, Virginia on February 12, 1934.

JOSEPH CHARLES SALA (1841 - 1916)

San Francisco, California

He was born in Italy March 9, 1841. In California 54 years. Died in San Francisco February 24, 1916

San Francisco Directories: 1861 Sala, Joseph C., instrument maker with John Roach r 720 California, 1891, Sala, Joseph C., instrument maker with John Roach 429 Montgomery. 1895, Sala, Joseph C., surveyor instruments, 429 Montgomery. 1913, Sala, Joseph C., mgr. scientific instruments and agt. W & L. E. Gurley (Troy, N. Y.) 48, 2nd Advertisement in the 1913 directory states that the business was established in 1855.

1915, Sala, Jos. C. (Julia) mfg. scientific instruments 48, 2nd.

HORACE SAWYER (1811 - 1889)

New York City (1835 - 1854)
Yonkers, N. Y. (1854 - 1889)

He was born in Bolton, Massachusetts on February 22, 1811.

He lived in Bolton until he became of age when he went to New York City and learned his trade, that of a mathematical instrument maker, in which he became extremely skillful. He is first listed in the New York City directory of 1835-36, living at 214 Bleeker Street.

He was a member of the firm of Sawyer & Hobby from 1840 to 1854 in New York City at 156 Water Street.

In the spring of 1854 he moved to Yonkers, N. Y., where he established himself as a maker of mathematical instruments until his death on March 16, 1889.

New York City Directories: 1835-37 Sawyer, Horace, 214 Bleeker, 1837-39 Sawyer, Horace, 2 Grove (Street). 1839-41 Sawyer, Horace, 142 Maiden Lane h(ouse 2 Grove (Street). 1849-52 Sawyer, Horace, 159 Water h Brooklyn. 1853-54 Sawyer, Horace, surveyor's instruments, 156 Water, h. 117 Schermerhorn, Brooklyn.

www.compleatsurveyor.com

Yonkers Directories: 1859-60 Sawyer, Horace, Instrument maker Union place. 1881-82 Sawyer, Horace, Mathematical instrument maker h Union pl. 1888-89 Sawyer, Horace, mathematical instrument maker 185 Woodworth Ave.

References: Bolton, Massachusetts Vital Records to 1850. Death Certificate, Department of Public Health, Yonkers, N. Y.

There is a Sawyer & Hobby Surveyor's Vernier Compass in the Gurley Museum. Underneath the needle circle is inscribed 9-3-49, meaning that it was finished about September 3, 1849 in New York City.

Gurley has serviced from 1870 to 1930, one transit, 1 level and 2 compasses made by Horace Sawyer.

SAWYER & HOBBY (1840 - 1854)

New York City

Horace Sawyer (1811 - 1889)

Jonathan T. Hobby (1813 - 1883)

1840-1854 Sawyer & Hobby Surveyor's Instruments 156 Water See separate histories of Horace Sawyer and Jonathan T. Hobby.

There is a Sawyer & Hobby Surveyor's Vernier Compass in the Gurley Museum. It is 16-3/4" overall, 6" needle. It has two pairs of sights at right angles to each other. 6" high on the sides, 8-1/2" high on the direct line of N & S. It has two level vials.

There is a Sawyer & Hobby Transit owned privately in Rutland, Vermont. It has a 4" needle, 5-1/4" limb with two verniers and an 8" telescope.

From April 12, 1866 to November 30, 1910 Gurley serviced 9 transits, 4 levels and a 6" Vernier Compass made by Sawyer & Hobby. The Vernier Compass is in the Gurley Museum.

WILLIAM ALBERT SCHMOLZ (1827 - 1891)

San Francisco, California

He was born in Stuttgart, Germany, October 17, 1827 and died in San Francisco January 30, 1891.

San Francisco Daily Herald of October 17, 1853 has an advertisement of the firm of Schmolz and Knus located at 119 Montgomery Street.

San Francisco Directories (NYSL): 1857 Schmolz, William, U. S. Surveyor's instrument maker, 118 Mont'y 2nd floor res S. Post between Kearny and Dupont. 1858 Schmolz, William, 118 Montgomery Street Has advertisement on page 245. 1861 Schmolz, William, U. S. Surveyor and mathematical instrument maker 430 Mont. and corner U. S.

Branch Mint dwl 129 Post Has advertisement in the 1861 directory 1877 At 420 Montgomery. 1891 At 420 Montgomery.

He patented an improvement to the Burt Solar on December 24, 1867 Letters Patent No. 72,687. From September 2, 1874 to its expiration on December 24, 1884 W. & L. E. Gurley paid Mr. Schmolz \$5.00 royalty for each Burt Solar that was sold.

Gurley serviced a Schmolz Transit in 1910 that was owned in Elmira, New York.

558

SAN FRANCISCO DIRECTORY.

WM. SCHMOLZ, MATHEMATICAL INSTRUMENT MAKER.

The above Firm, established a long time since, is so well known among Surveyors and Engineers in California, Oregon, Utah and Mexico, that it does not need any further recommendation.

Surveyors and Engineers, before making any purchases, will do well to examine first the

LATELY IMPROVED INSTRUMENTS,

From the best Makers in Philadelphia, France and Germany, for sale by Mr. Schmolz.



TRANSIT INSTRUMENTS, THEODOLITES, SOLAR COMPASSES

LEVELING RODS, CHAINS,

'Y' LEVELING INSTRUMENTS, MINING INSTRUMENTS,

MOUNTAIN BAROMETERS, ASSAY SCALES, THERMOMETERS,
HYDROMETERS, SPECTACLES, ETC.

Having learned my business in the best European Establishment, where only examined Surveyors and Engineers are admitted to six years' apprenticeship, and been actively engaged since that time in the same line, for the last twenty years. All important work on this Coast is done in my workshop—being most complete in its arrangement, and as good as any in Europe.

INSTRUMENTS REPAIRED in a Workmanlike Manner

And ADJUSTED ACURATELY, by

Wm. Schmolz, 430 Montgomery St., San Francisco

CHARLES SCHOTT ST. (1821 - 1903)
CHARLES SCHOTT JR. (1856 - 1934)

Nashville, Tennessee

Charles Schott, Senior, was born in Heidelberg, Germany on August 14, 1821. He came to America in the early forties and is first listed in the Nashville directory in 1854 as "C Schott, instrument maker until 1882 when the listing is Schott & Co., mathematical instrument makers (Charles Sr. and Charles Jr.) 48 S. College. In 1892 he is listed in the Nashville directory as asst. Chancellor Vanderbilt University.

In his obituary published in the Nashville American on September 4, 1903, it states that he died on September 3, 1903 and also "at the time of the foundation of Vanderbilt University, Mr. Schott was appointed custodian of the costly apparatus used in the school of physics and was the immediate assistant of former Chancellor Garland in the demonstrations before the classes. Previous to his coming to America, Mr. Schott made instruments in several foreign countries and was a versatile speaker of five languages."

Charles Schott, Junior, was born in Nashville on August 26, 1856. He is first listed in the Nashville directory in the 1878 issue as an instrument maker with his father at 48 S. College.

Both Senior and Junior are listed in the Nashville directories until their deaths.

The obituary of Charles Schott, Jr. in the Nashville American of January 27, 1934 states that he died on January 26, 1934 and that he was "chief mechanical repairman for many years at the Vanderbilt University. Until his retirement about ten years ago he maintained a repair shop on Third Avenue near Commerce Street."

The State of Tennessee Library & Archives 7th Avenue, North Nashville states that the first directory of Nashville was issued in 1853 and that Charles Schott was first listed in 1854.

Certificates of Death from the Division of Vital Statistics, State Department of Health, State of Tennessee, in Nashville are included in our records.

Gurley repaired a Schott Leveling Instrument in 1863 and in August 1866 we made two special leveling vials for the Schotts.

ALEXANDER C. SCHUMAN (1872 - 1921)
A. C. SCHUMAN & SON (1921 - 1926)
Alexander Charles Schuman (1841 - 1926)
George Ernest Schuman (1874 - 1956)

Louisville, Kentucky

Alexander Charles Schuman was born in Louisville on December 1, 1841. He died in Louisville on May 9, 1926.

George Ernest Schuman, his son, was born in Louisville on November 20, 1874 and died there November 18, 1956.

Louisville directories 1865 - 1890 Schuman, Alexander C., mathematical optical and philosophical instrument maker. In the 1890 issue on page 1395 is his advertisement "Sign of the Compass".

In 1895 he advertises on page 1559, without the "Sign of the Compass".

In 1905 he advertises on page 1866. In the same issue there is Schuman, Geo. E. instrument maker with A. C. Schuman.

In 1916 Schuman, A. C. & Son (A. C. and G. E. Schuman) instrument mfr.

1927-1940 Schuman, Geo. E. engineering instrument repairs.

SIGN OF THE

"COMPASS."
A. C. SCHUMAN,

MANUFACTURER OF
Mathematical, Optical and Philosophical
Instruments, Engineers' In-
struments Repaired and
Adjusted.

MODELS for New Inventions Made
★ ★ ★ and Developed.

Northeast Cor. Fourth and Jefferson Sts.
Entrance on Fourth Street.

Alexander C. Schuman was in business for over 55 years and his son George E. was in business for about 60 years.

Gurley serviced on A. Schuman Level that came from Louisville, Kentucky on September 2, 1878.

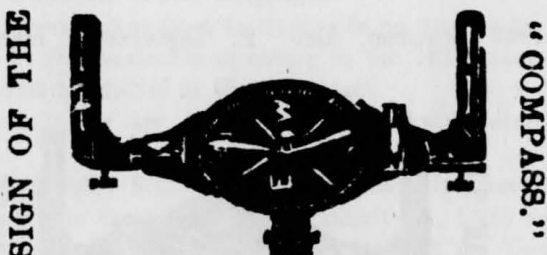
JOHN L. SCHUMAN (1842 -)

Louisville, Kentucky

Louisville directories: In the 1867-68, 1869 and 1870 John L. Schuman is listed as a porter. In the 1871 issue he is listed as a confectioner. 1872-79, Schuman, John, instrument maker. 1880, Schuman, John L. mathematical instrument mfg. and model maker. In this issue he advertises on page 788 "Sign of the Compass".

The June 1, 1880 Federal Census of Louisville records that he is 38 years old and was born in Kentucky.

The advertisements of J. L. Schuman in the 1880 issue and A. C. Schuman in 1890 issue of the Louisville directories suggests that they may have been brothers. No record has been found of John L. Schuman since 1880.



J. L. SCHUMAN,

Manufacturer of

Mathematical, Optical and Philosophical Instruments, Engineers' Instruments Repaired and Adjusted.

MODELS

For New Inventions made and Developed.

Brands and Stamps Cut to Order, All Orders from a Distance Promptly Attended to.

Northeast cor Fourth and Jefferson sts. Entrance on Fourth st.

ROBERT SCOTT

New York City

1853-54 Scott, Robert, maker of transits, levels and compasses 163 West 30th.

See Hunt & Scott file

F. & J. SEELHORST (1876 - 1887)

Frederick Seelhorst (1813 - 1887)

Julius Seelhorst (1844 - 1900)

Philadelphia, Pennsylvania

Philadelphia directories: 1867 to 1887 Seelhorst F. & J. instrument makers.

Frederick Seelhorst was born in Italy in 1813 and died in Philadelphia May 1, 1887.

Julius Seelhorst was born in Philadelphia in 1844 and died in Philadelphia April 9, 1900.

SEILER INSTRUMENT & MFG. CO. INC. (1956 - C)

Eric H. Seiler, President, St. Louis, Missouri

Eric P. Seiler, Vice President

Eric H. Seiler was born in Jena, Germany, April 30, 1899.

He served his apprenticeship with Carl Zeiss Institute in Jena. He came to St. Louis in 1923 being employed by the Wissler Instrument Works. In 1924, he was made superintendent. In 1944 he moved with the Wissler company to Milwaukee.

In 1945 he returned to St. Louis and founded the Seiler Company.

On July 1, 1956, the ownership was changed to a family corporation.

Eric P. Seiler was born in St. Louis on March 1, 1928.

PLINY SEXTON (1796 - 1881)

Palmyra, New York

He was born in Springfield, Massachusetts on January 31, 1796.

He lived in Palmyra from 1819 until his death on March 26, 1881.

There is an extended biography of his life in the Wayne County Journal of March 31, 1881.

The Gurley Museum has a Surveyor's Vernier Compass. It is engraved, P. Sexton Palmyra. It is 16" overall with 5-3/4" needle. It has one level. The sights are 6-7/8" high.

ROLAND H. SHEA (1829 -)

Brooklyn, New York
New York City

The Brooklyn directory lists Shea, Roland H. mathematical instrument maker 29 Front (Ward 2) The 1850 (August 15, 1850) Federal Census, Vol. 30, lists in Brooklyn (Ward 2) p 195, Rowland Shay, 21, Born in Ireland, instrument maker. Ann Shay 19 Ireland.

The New York City directories of 1853-1854, Shea Roland H 167 Broadway h Hoboken, 1854-1855, Shea Roland H. 167 Broadway h Brooklyn (Boerum n Pacific). He is not in the 1856 directory.

In New Bern, N. C. there is a "Y" Level Roland H. Shea, Maker, 82 Wall St. New York. There is in the case a label William T. probably Gregg 110 Wall St.

ROBERT LUDLOW SHAW (1813 - 1876)

New York City

He was born in New York City in 1813. He died in New York City October 23, 1876. He is buried in Trinity Church Cemetery in New York City.

New York City Directories: 1836-37 Shaw, Robert L. math inst. 222 Water h 144 Rivington. 1837-45 Frye & Shaw, math inst. 222 Water 1845-47 Shaw Robert L. math inst. 222 Water h 25 Hamilton. May 1, 1858 to May 1, 1867 Shaw Robert L 119 Beekman & 222 Water. 1876-77 Shaw Robert L. math inst 110 Wall h 38 W. 46th.

CHARLES J. SHAIN (1822 - 1891)

Philadelphia, Penna.

He was born in New York State in 1822.

He is first listed in the Philadelphia directory in 1851. 1851 Shain, Charles J. mathematical instrument maker 72 Dock (Joseph Knox was a mathematical instrument maker in 1851 at 72 Dock) In 1855 he is listed as a partner of Knox & Shain, mathematical instrument makers, (Joseph Knox & Charles J. Shain) 46-1/2 Walnut. He is listed with Joseph Knox as Knox & Shain until 1876. In 1877 he is listed without a partner. From 1878 to 1891 he is a partner of Knox & Shain (Henry M. Knox and Charles J. Shain).

Charles J. Shain died in Atlantic City, N. J. on November 23, 1891. See Knox & Shain

GEORGE SHILLING (1844 - 1917)

Washington, D. C.

His will, Number 23584, in part reads as follows: "I, George Shilling, born May 16, 1844, at Hamar, on Lake Njosen, Norway, of Erik Shilling, a silversmith and farmer, and Martha Shilling, who was formerly Martha Hansen, do after saying that I learned my trade as mathematical instrument maker in Kristiania, Norway, sailing there from August 22, 1867, leaving a brother Hans and sisters Karen and - - - - - and arriving in New York, in the United States September 9, of the same year, where in 1871, I married Jensine Ericsson of Kristiania, Norway, pursuing my trade later in Washington, D. C., in 1875, having there made the first invented "Periscope" in about 1902."

He died in Washington on March 10, 1917.

Smithsonian Institution has a 10" gradienter, no needle, made about 1865.

Cornell University, Civil Engineering Department, Ithaca, has a Meridian Transit. No compass needle, no horizontal limb.

Length of telescope 35" Overall length of horizontal axis 19" Has two 4" and one 5.5" Vertical Circles.

JONATHAN SIMPSON (1787 - 1863)

Bardstown, Kentucky

He was born in Virginia November 2, 1787, the son of Thomas Simpson and Abigail Moore, He is listed in his father's Bible as J. Moore Simpson.

Mrs. Margaret M. Bridwell of Louisville, Kentucky in the magazine "Antiques" for November 1947, lists Jonathan Simpson of Bardstown as one of the silversmiths who made excellent handwrought silverware in Kentucky before 1820. He also made a grandfather's clock for William Heavenhill, the first white child born in Nelson County, Kentucky.

The Republican, Bardstown, Ky. October 3, 1844 ran the following

"TO THE PUBLIC

It is industriously circulated through the country that I have quit my business, and keep no shop.

COME AND SEE!

Politically, men claim the privilege of lying, and have reasoned themselves into a belief that it is a virtue. We need not complain of politicians departing from the truth, when professing Christians do not hesitate one moment to tell a lie, then swear to it. I can appeal to a

www.compleatsurveyor.com

goodly number of citizens of Bardstown whether I am industrious or not.

COME AND SEE!

I shall keep on hand a constant supply of SILVERWORK of my own manufacture-warranted to be as good as any manufactured in the United States, and at the Cincinnati prices. My necessities compel me to labour as much as ever I did. I have a few Surveying instruments on hand, which I will sell very low.

He made his will on April 10, 1863, while he was living in Madison, Indiana. It was probated there in November 1863 and in Nelson County (Bardstown, Kentucky) in December 1863. He died at his residence in Madison, Indiana on November 25, 1865 and is buried in Bardstown.

The Kentucky Historical Society, Frankfort, Kentucky has a surveyor's vernier compass. It is 13-3/4" overall with a 5" needle.

The Missouri Historical Society, St. Louis, Missouri, has a round compass 9" in diameter with a 6" needle. It was used in St. Louis in 1823.

WILLIAM SMALL

Baltimore, Maryland

Baltimore directories: 1822-23 Small, William, mathematical instrument manufacturer 44 S. Gay adv. on page 253. 1824 Small, William, mathematical instrument maker 56 Pitt f.p. 1827 not listed.

CORDIAL SMITH

In the Connecticut Historical Society Museum in Hartford, Connecticut is a brass surveyor's compass. It has folding sights, is 10" overall with a 5-1/4" needle. It is engraved Cordial Smith 1775 made for Ebe^r Burr 1776

STACKPOLE & BROTHER (1851 - 1910)

William Stackpole (1819 - 1895)

Robert Stackpole (1823 - 1873)

New York City

William Stackpole was born in Ireland in 1819. His death occurred on October 21, 1895 in Brooklyn, N. Y.

Robert Stackpole was born in Ireland in 1823 and died in Brooklyn on July 22, 1873. Both William and Robert came to Baltimore, Maryland with their parents in 1833. They came to New York City in 1843.

New York City directories: 1843-48 Stackpole, William, mathemat-

ical instruments. 1849-1851 Not listed. 1851-1863 Stackpole & Bro. math insts. William Stackpole Robert Stackpole, 1863-1910 Stackpole & Bro., math inst 41 Fulton Stackpole, William.

The New York Daily Tribune, for Tuesday, October 22, 1895, page 7, column 4 states: William Stackpole, for nearly a quarter of a century the maker of nautical instruments, from whom the U. S. government has bought all its supplies in that particular line and who since 1856 had a store at 41 Fulton Street, New York City, died yesterday (Oct. 21) at 210 St. John's Place, Brooklyn in which city he had lived for many years. He was 76 years old. He was born in Ireland and came to America in 1833 with his parents when 14 years old settling in Baltimore where he was apprenticed to a manufacturer of mechanical engineering instruments. When he was 25 years old he came to New York where he was engaged in business with his brother Robert, making surveying and nautical instruments. He belonged to St. Augustine's Catholic Church, 6th Avenue and Sterling Place. He was survived by a widow and had no children.

In the Civil Engineering Department of Cornell University in Ithaca, New York, there are: 1 compass, 1 compass-transit, 2 transits and 2 theodolites made by Stackpole & Brother.

The Smithsonian Institution in Washington, D. C., has a S & B transit. It has a 14" telescope and 3" needle.

In the Gurley Museum there is a Stackpole & Brother transit, serial 2195. It has a 11" telescope, a 6-1/8" limb and 4-1/4" needle.

BENJAMIN STANCLIFFE (1782-1834)

Philadelphia, Pennsylvania

Philadelphia Directories

1817, Stancliffe, Benjamin, optician, philosophical and mathematical instrument maker 14 Walnut

There are no 1832 or 1834 Philadelphia directories

1833, Stancliffe, Benjamin, optical, philosophical and mathematical instrument maker 118 S. Front

He died September 7, 1834, aged 52.

There is privately owned in Schenectady, N. Y. a Surveyor's Vernier Compass engraved

B. Stancliffe Philad^a

Warranted

It has no sights. It is 15-1/4" overall, 5-5/8" needle.

STANCLIFFE & DRAPER (1830-1833)

Benjamin Stancliffe (1782-1834)
Edmund Draper (1805-1882)

Philadelphia, Pennsylvania

The Franklin Institute in Philadelphia has a Stancliffe & Draper 16" Y Level.

In 1874 Gurley serviced a 17" Y Level made by Stancliffe & Draper. It was the property of the N.Y.C. & H.R.R. in Albany.

Benjamin Stancliffe is first listed in the Philadelphia directory of 1817, as an optician, philosophical and mathematical instrument maker at 14 Walnut. He is last listed in 1833 as a mathematical and optical instrument maker at 118 S. Front. There is no 1834 Philadelphia directory. He is not listed in the 1836 directory.

Edmund Draper was born in Philadelphia in 1805 and is first listed as an instrument mfg. in 1833 at 80 S. 3rd.

Stancliffe & Draper are not listed in any Philadelphia directory as partners.

It is, therefore, assumed that they may have been in partnership between 1830 and 1833.

LEO R. STRASSBERGER (1847-1883)

Chicago, Illinois

Chicago Directories

He was born in Germany on March 19, 1847 and died in Chicago on May 11, 1883.

Chicago Directories

1881-1883, Strassberger, Leo R. instrument maker (successor to Nickle & Strassberger).

1884 Heer & Seelig, successor to Leo R. Strassberger.

He was a customer of Gurley in 1880.

JOHN H. TEMPLE (1812-1877)

Boston, Mass.
West Roxbury, Mass.

John H. Temple was born in Princeton, Massachusetts on October 4, 1812, and died in West Roxbury, July 25, 1877. Leaving the farm at eighteen, he engaged in Sterling, Massachusetts in the manufacture of chairs; at twenty he entered the service of Nathan B. Chamberlain, maker of philosophical instruments, and soon came with him to Boston, working with him two or three years; then commencing business for himself about 1838, he began the manufacture of philosophical and school apparatus, and afterwards that of mathematical instruments. He is first listed in the Boston directories of 1839 at 11 Cornhill. In 1866 he moved to West Roxbury, where he remained until his death. During his lifetime he built about one hundred instruments, mostly transits and levels. Finding great difficulty in getting the circles for his instruments satisfactorily divided, he became impressed with the idea that he could make an engine that would do his work better than he could get it done elsewhere. After giving the subject much thought, he began the construction of a thirty-six inch dividing engine about 1852. He had never seen a dividing engine, and so far as known, never saw any other than that he made. He spent all his spare time for twenty years, many sleepless nights, and much money upon his engine, but had the satisfaction of using it for dividing his instruments for a few years after completion. Mr. Temple was, without question, the finest workman in his department in this country, and in his engine he will live to future generations.

Excerpts from Buff & Berger Catalog of 1879.

After his death, Buff and Berger bought this engine from his widow. When Buff and Berger dissolved partnership, the Temple engine became in the possession of C. L. Berger & Sons.

James E. Moody (1848-1913) who was employed by Temple assembled the incomplete instruments after Temple's death and sold them locally. Moody also repaired transits, levels and alidades. He is reputed to have been a very skillful instrument maker.

In the Gurley Museum is a transit made by John H. Temple. It is a transit which was used on the Hoosac Tunnel in the 1870's (North Adams, Massachusetts). It has a 28" telescope, with a 5-1/4" vertical circle, the standards are 16" high. It is engraved

J. H. Temple
Maker
Boston
1

SAMUEL THAXTER (1796 - 1822)
SAMUEL THAXTER & SON (1822 - 1921)

Samuel Thaxter (1769 - 1842)
Joseph H. Thaxter ()

Boston, Massachusetts

Samuel Thaxter was born in Hingham on December 13, 1769. He died in Boston April 20, 1842.

He is first listed in 1796 Boston Directory as a mathematical instrument maker. In the 1822-23 edition, Thaxter, Samuel & Son (Joseph H.)

The 1886 edition of the Boston directory has an advertisement that the business (Samuel Thaxter & Son) was established on State Street in 1770.

The business was established by William Williams who advertised in the Boston Gazette and County Journal on March 12, 1770. He was located at the head of Long Wharf. Samuel Thaxter was also located at the head of Long Wharf, probably about 1792. Samuel Thaxter married William Williams' daughter, Polly Hilger on June 14, 1792.

J. TRUNDY

Portsmouth, New Hampshire

The New Hampshire Historical Society in Concord, New Hampshire has a wood compass with holes 5/8" in diameter with splines for the sights which are missing.

It has a paper card, with a brass hand stamped figures needle circle 3/8" wide and 1/4" deep. It has an unusual wide needle that is 5" long. It is engraved, J. Trundy, Maker, Portsmouth, N. H.

J. C. ULMER CO. (1893-1894)
ULMER & HOFF (1894-1901)
J. C. ULMER & CO. (1901-1906)
THE J. C. ULMER COMPANY (1906- C)

John Christian Ulmer (1863-1950)
Edward Hoff ()

Cleveland, Ohio

John Christian Ulmer was born near Stuttgart, Germany on December 26, 1863, His death occurred in Cleveland on April 2, 1950.

He was educated in Stuttgart and in Cuyahoga Falls, Ohio. He

served his apprenticeship with the American Machine Co. in Cuyahoga Falls.

In 1893 he formed his own company for the manufacture of engineering, surveying and scientific instruments.

From 1894 to 1901 the firm was known as Ulmer & Hoff. Mr. Hoff retired in 1901 on account of ill health.

The J. C. Ulmer Co. was incorporated in July 1906. Mr. Ulmer was president of the company until 1942 when he retired.

The following quotation is from J. C. Ulmer & Co.'s 1904 catalog page 5:

"The great importance of accurate graduations is well known to every Engineer and Surveyor. We have our own automatic graduating engine built by Mr. Brightly, late of Heller & Brightly, in the year 1890; this engine he built for his own use and he spared neither time nor expense to make it as nearly perfect as possible; it embodies all the improvements that his many years of practical experience and constant use of this delicate class of instrument could suggest to him. It is a great improvement, both in accuracy and construction, over the one used by him while with the firm that he was associated with for so many years, that engine, as many of our readers know, has stood the test of years with perfect satisfaction; further comment therefore as to ours is unnecessary.

Not only is perfect graduation of the Horizontal Limb, Vertical Circle and Arc necessary, but they must be perfectly centered as well; for this purpose we use a special centering device by which a variation of 0.00002 of an inch is readily determined."

In 1942 when Mr. Ulmer retired, The J. C. Ulmer Company was split into two companies. The J. C. Ulmer Company is now (1962) engaged in making tools, jigs fixtures and special machinery. The other company Surveying Instrument Company is now engaged in repairing surveying instruments and field equipment and renting transits and levels. Neither of the companies now have the dividing engine. It was sold several years ago.

In the Gurley Museum is a J. C. Ulmer Transit. It has a 9" telescope, 5-3/4" limb and a 3-1/2" needle. It was made about 1900. It is engraved J. C. Ulmer & Co. Cleveland, O. 712.

PETER VIERBUCKEN (1873-1906)

Washington, D. C.

He was born in Russia on March 7, 1837.

He was employed as an instrument maker in the Coast and Geodetic Survey shops in 1862.

At the time of his death on August 18, 1906, he was Secretary of the German American Building Association #8.

THOMAS WALL (1797-1854)

Cleveland, Ohio

In the Cleveland directory of 1845-46 he is listed as Maker of philosophical instruments.

In 1853 he is listed as manufacturer of Mathematical Instruments.

He died in Cleveland on July 24, 1854.

The remains of Thomas Wall and his family were removed from Erie Street Cemetery, December 16, 1915, to Highland Park Cemetery, lot #697, section # 2. This lot was given in exchange for the lot in Erie Street.

There is no marker on the grave.

The Western Reserve Historical Society has a Thomas Wall brass Surveyor's Compass. Length overall 14-3/4" Needle 5-3/4" 1 level vial, a needle lifter and sights. It is from the Coe house on Coe Ridge and was used by a surveyor in the Coe family, a pioneer family in Western Reserve.

HENRY WARE (1810 - 1885)

Cincinnati, Ohio

He was born in Montpelier, Vermont in 1810. He died in Cincinnati, Ohio, August 25, 1885. He is buried in Spring Grove Cemetery in Cincinnati.

Henry Ware first appears as a listing in the Cincinnati directory for 1839-40 as follows:

Ware, Henry (ver.) Math. Inst.-mkr., at Shawk's boards, corner 5th & Sycamore. From 1839 through 1853, Ware is listed in the Cincinnati directories in much the same way as above though various changes of home address appear. In 1855 and 1856, the firm is listed: Ware & Hireman (Hy. W. & Jno. H. H.) math, & philso. & optical instr. mkr., 25 E. 4th., h. 240 Longworth. In 1857, there is no listing, but Ware's name appears alone from 1858 as an optician and mathematical instrument manufacturer on East Fourth Street with his last home address being 106 Broadway.

Gurley serviced his instruments from 1870 through 1892.

On April 30, 1864 he ordered a transit.

HERBERT J. WAREHAM (1833 - 1916)

Philadelphia, Penn.

He was born in England in 1833. He died in Philadelphia March 10, 1916.

Philadelphia directories: 1868 to 1895 Wareham, Herbert J. inst. mkr. h 905 N. 10th.

He was a brother of Robert Wareham.

ROBERT WAREHAM (1825 - 1892)

Philadelphia, Pa.

He was born in England in 1825 and died in Philadelphia on December 29, 1892.

He is listed in the Philadelphia directories from 1867 to 1891. 1867, Wareham Robert, mathematical instruments 226 Pearl h 424 Marshall 1891, Wareham, Robert, mathematical instruments, 402 Locust h 424 Marshall.

He served his apprenticeship with Edmund Draper and was his foreman at the time of Draper's death in 1882.

He was a brother of Herbert J. Wareham.

Joseph Wareham, father of Robert, signed a will on July 13, 1844; "for my son Robert One Hundred Dollars per annum, in addition to the Board Wages of One Hundred Dollars allowed by his master Edmund Draper".

The will was proved October 14, 1844.

Gurley serviced a Wareham 5" Surveyor's Vernier Compass in 1910 that came from Waterville, Pennsylvania.

HENRY WARNER (1810 -)

New York City

New York City directories: 1834-1840, Warner, Henry, brass turner 1841-1845, Roach & Warner philos inst 105 Fulton John Roach Henry Warner. 1846-1857, Warner, Henry, mathematical instrument maker 68 Fulton h 77 Butler, Brooklyn.

WARREN-KNIGHT COMPANY (1912 - C)

J. Henry Warren (1877-1961)

Henry R. Knight (1874-1945)

Philadelphia, Penna.

The Warren-Knight Company was founded in 1912 and was chartered in Pennsylvania April 8, 1913.

Henry R. Knight, the son of Henry and Caroline R. Knight, was born in Philadelphia on December 6, 1874. On account of ill health, Mr. Knight retired from the company in 1923.

He died on May 7, 1945 in Germantown and is buried in Fairhill Meeting Graveyard.

J. Henry Warren was born in Philadelphia on June 27, 1877.

He died in Wyncote, Pennsylvania on September 26, 1961.

There is a Warren-Knight transit in the Gurley Museum. It has a 11" telescope 6-1/8" limb, no needle, serial 1606. It was made in 1919.

www.compleatsurveyor.com

THOMAS WATSON (1832 - 1906)

Detroit, Michigan

He was born in England, December 11, 1831. He died July 15, 1906, and is buried in Woodmere Cemetery, Detroit.

He is listed as a partner of Burt & Watson in the Detroit directory of 1857-58. 1859, Watson, Thomas, mathematical instrument maker 34 Montcalm.

SQUIRE WHIPPLE (1804 - 1888)

Squire Whipple was born in Hardwick, Massachusetts, on September 16, 1804. He died in Albany, New York on March 15, 1888. He was graduated from Union College in 1830 with an A.B. degree, and in his span of life of nearly eighty-four years, he was a successful civil engineer, author and inventor.

In 1846 he invented what he called his "trapizodal truss" which was used in bridges built during the succeeding generation.

He was the author of two books:

1, "A Work upon Bridge Building" consisting of two Essays, one Elementary and General, the other giving Original plans and practical details for Iron and Wooden Bridges, printed in Utica, N. Y., by H. H. Curtiss in 1847.

2. "An Elementary and Practical Treatise on Bridge Building" which was printed in New York City in 1872.

The first iron railroad bridge of considerable span (146 feet) was designed by Whipple who used his truss design in 1852 on the line of the Rensselaer and Saratoga Railroad near Watervliet, New York.

While living in Albany he manufactured and sold surveyor's instruments. Gurley has no record of servicing any instrument that Whipple made. He was made an Honorary Member of the American Society of Civil Engineers on May 6, 1868.

An interesting story of Squire Whipple's life and his portrait are found on pages 83 and 84 of Richard S. Allen's book "Covered Bridges of the Northeast". There is an obituary of Squire Whipple on page 231 of the Engineering News of March 24, 1883.

DAVID WHITE INSTRUMENT CO. (1895 - C)

Milwaukee, Wisconsin

The David White Company was organized as a partnership in 1895 by David White and Charles Klaweither. Incorporation occurred on June 22, 1912. David White retired in 1920. He was born in Hungary September 26, 1874. He died in Milwaukee on March 16, 1941. The David White Company bought the Wissler Instrument Company of St. Louis in 1929 and moved it to Milwaukee in 1944.

On August 10, 1956 the name was changed to its present style.

PEREGRINE WHITE (1747 - 1834)

Woodstock, Connecticut

Peregrine White was born in Woodstock on August 13, 1747 and he died there in 1834.

He was a namesake and direct descendent of the first white child born in Cape Cod Harbor in 1620.

He was a silversmith and clockmaker, also a maker of surveyor's compasses. Brooks Palmer "The Book of American Clocks" Illustration 58 depicts a clock made by Peregrine White.

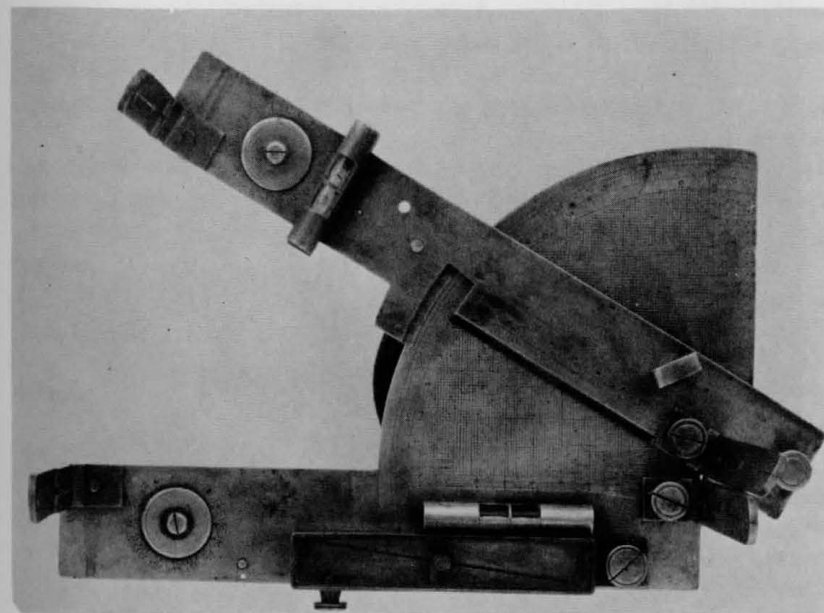
In the Old Sturbridge Museum in Sturbridge, Massachusetts there are two brass surveyor's plain compasses - One is 11" overall, with a 5" needle, engraved: Peregrine White, Woodstock. The other is 12" overall, with a 4-1/2" needle, engraved: P. White.

FRANCIS WHITELEY

Stanardsville, Virginia

Francis Whiteley patented on December 6, 1836 "Whiteley's Mathematical Instrument". Patent No. 99. At that time he was living in Stanardsville, Virginia.

There is privately owned in Charlottesville, Virginia a Francis Whiteley compass. It is engraved #147, which is shown below.



Philadelphia, Penna.

Thomas Whitney advertised in the Federal Gazette of April 12, 1798, as from London, and "moved from 72 (late Mr. Gould's) to No. 74 South Front Street where he makes various instruments in the most approved and accurate manner." Whitney did not depend solely on the sale of instruments for his income. Bunting by the piece was sold, writing slates and razors, silversmith's anvils and files; pen-knives and sailor's pocket knives, sissors and bone moulds - whatever they may be - could all be purchased at the shop of Thomas Whitney from London.

The 1800 and 1801 Philadelphia directories list Whitney, John, mathematical instrument maker and optician 74 S. Front. The name John is evidently a mistake. In the 1802 directory Whitney, Thos., mathematical instrument maker, 95 S. Second. Thomas Whitney is listed in the Philadelphia directories from 1802 to 1824 as a mathematical instrument maker, although Gurley has repaired a compass marked, "Thos. Whitney, Phil^a 1828."

Thomas advertised in 1819 in Paxton's Philadelphia Annual Advertiser. In the 1820 issue of Whitely's Annual Advertiser he states that he has made over 500 surveyor's compasses in the past thirteen years and that he is situated on North Sixth Street, near the Mill Pond, one mile from Philadelphia.

In the Wm. J. Young's file is a copy of the indenture of William James Young to Thomas Whitney of the township of N. Liberties, County of Philadelphia dated the thirtieth day of January 1813.

Thomas Whitney died on July 30, 1823 at his residence near Philadelphia, according to Paulson's American Daily Advertiser of Thursday morning, August 7, 1823.

In the Gurley Museum is a Surveyor's Vernier Compass. It is 14-1/4" overall 5" needle. It is engraved Thos. Whitney Maker Philadelphia. Underneath the staff socket is inscribed: No. 109 1810.

The Franklin Institute has a Whitney Surveyor's Vernier Compass. Length overall 14" Needle 5" 1 level vial.

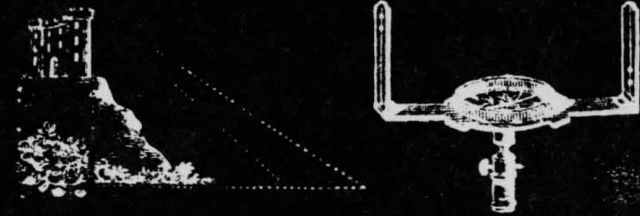
The Chicago Historical Society has a Whitney Surveyor's Vernier Compass. It is 14" overall with a 5-1/8" needle.

There is privately owned in Clifton, N. J. a Whitney Surveyor's Compass. The label is marked "1817".

There is privately owned in Bristol, Pennsylvania a Whitney Surveyor's Vernier Compass. (The sights are missing). It is engraved Thos. Whitney, Philadelphia, Pa., On the underside of the compass is engraved No. 63 1810. Length overall is 14", with a 5" needle.

www.compleatsurveyor.com

Whitely's Philadelphia Annual Advertiser.



THOMAS WHITNEY,

Mathematical Instrument Maker,

*North Sixth street, near the Mill Pond, one mile from
Philadelphia,*

Presents his sincere thanks to his friends and the public, and respectfully soliciting the continuation of their favours, wishes to inform them, that he has devoted his attention principally to the making of

SURVEYING COMPASSES,

For more than thirteen years past, and has made about *five hundred* of them, the good qualities of which are well known to many Surveyors, in at least sixteen of the States and Territories of the Union.

THOMAS WHITNEY, continues to make SURVEYING COMPASSES, of all the constructions in general use, and also for Vertical and horizontal angles, leveling, &c. newly projected, and other Instruments made to drawings or descriptions; improved Protractors, Gunner's Calibers, and Quadrants, Standard Measures, Surveying Chains, Magnets, Pocket Compasses, with various other Instruments and apparatus.

Also has for Sale,

Cases of Drawing Instruments, Pasometers, or Reflecting Semicircles, Polygonographs, Globes, &c.

N. B. Orders will be thankfully received, and promptly attended to, if left at No. 105, North Second street, at Messrs. McAllisters, No. 48, Chesnut street, where the Instruments are for sale, or at his House and Manufactory, North Sixth street.

Instruments carefully clean'd and repaired.

ELIJAH WHITON (1799 - 1871)

Groton & Hingham, Mass.

Elijah Whiton was born in Hingham, Mass on March 6, 1799 and died there on February 10, 1871.

He was a manufacturer of wooden ware at Groton, Massachusetts, and later at Hingham, where he resided. The history of Hingham, Massachusetts, (p. 436) says of him "A man of rare mechanical ability and inventor of various machines, several of which have been patented and have been found highly useful. He was active in political life, and was a man of great energy of character, persevering in whatever he undertook and carrying it out to a successful issue."

Gurley serviced a compass made by Whiton, received from Ennis, Texas in 1874.

Prof. William B. Plank of Lafayette College, Dept of Mining and Metallurgical Engineering, Easton, Pa. wrote under date of February 20, 1940 that they have an instrument made by E. Whiton, Groton, Mass. No. 33 in the Markle Museum.

In the Gurley Museum there is a Whiton semicircumferenter which is privately owned. The arc has a radius of 4-1/2", the stationary pair of sights are 15-1/4" overall, the movable part of sights are 14" overall. There are two level vials, one is 4-1/4" long and the other is 1-7/8" long. The needle is 6-1/2" long, the ends are marked N and S. The movable pair of sights are engraved:

E. Whiton		Groton
N. 4	Maker	Ms
		1824

WILLIAM WILLIAMS (1748 - 1792)

Boston, Massachusetts

Boston Directory: 1789, Williams, William, mathematical instrument maker, head of Long Wharf, house in Quaker lane Williams, William, mathematical instrument maker d. in Boston yesterday, aged 44 Columbian Centinel January 14, 1792.

His tomb is in the Central Burying Ground in Boston.

He advertised in Boston Gazette and Country Journal.

Supplement page column 1 for Monday March 12, 1770.

Mathematical Instruments.
William Williams
 Mathematical Instrument Maker,
 Has to sell at his Shop in King-Street, two Doors East of
 the Sign of Adm'ral Vernon, near the Head of the
 Long-Wharf. BOSTON.

A Large Assortment of Hadley's and Davis's Qua-
 drants, hanging and standing Compasses, in Brass
 and Wood; Gauging and Surveying Instruments; Cases
 of Instruments, large and small Perspective Glasses, in
 Ivory, Wood and Fish-skin, plotting Scales and Protract-
 ors, Gunter Scales and Dividers, Surveyors Chains, Ar-
 tificial Magnets with Cases, Sand Glasses from 2 Hours
 to 2 Minute, Instruments of a new Construction to mea-
 sure Boards, Quarter Waggoners, Atkinson's Epitome,
 Willibo's ditto, Patrons Navigation, Seamens Assitants,
 Callenders, Mariners Compasses rectified, Young Man's
 Companion, Journal Books, Ink-Powder, Quills & Paper,
 an Assortment of Brass Pocket Compasses with & with-
 out Cards, Box Rules, Slates and Pencils, Penknives,
 Jack knives, &c.

All Sorts of Mathematical Instruments are made and
 repaired by the above William Williams. Those who
 will favour him with their Cust. may depend upon be-
 ing well used, and have their Work done with Fidelity
 as J. Dinatch

Boston Gazette & Country Journal March 12, 1770

GEORGE W. WILSON (1821 - 1910)

Concord, New Hampshire

He was born in Bradford, Vermont between 1821 and 1823. He died in Concord on September 25, 1910.

He is listed in the Concord, N. H. directories from 1864 through 1901.

He is listed under various captions, as general repair shop, optician, optical instruments, optical and mathematical machinist and sewing machine repairs.

There is a Wilson Surveyor's Cross in the Gurley Museum, made probably about 1890.

GEORGE WINZER (1837 - 1905)

St. Louis, Missouri

George Winzer was born in Germany April 1, 1837. He died in St. Louis July 12, 1905.

The Gurley Museum has an 18" "Y" Level. It is engraved Geo. Winzer, Maker, St. Louis, Mo. 624.

ADOLPH WISSLER (1866 - 1926)

St. Louis, Missouri

He was born in St. Louis August 10, 1866 and died there January 9, 1926.

He is first listed in the 1881 St. Louis directory: Wissler, Adolph, machinist, r. Cass & Prairie, In 1900 Wissler, Adolph, Surveying Instruments. In 1905 Wissler Instrument Works 613 A Pine. In 1935 Wissler Instrument Co. Charles Rottweiler, Pres. The mathematical instrument shop department of Blattner & Adam was sold to Wissler in 1891. In 1929 the David White Company of Milwaukee, Wisconsin acquired the company, but did not move it to Milwaukee until 1944 where it was merged with the David White Company.

KONRAD WUGER

St. Louis, Missouri

St. Louis Directories: 1854-1855 Wuger, Konrad, mathematical instrument maker 112 S. 2nd. 1857-60 Wuger, Konrad, mathematical instrument maker 63 n. 2nd r. same. 1861-63 no directories. 1864-1865 not listed.

The Nebraska State Historical Society, Lincoln, Nebraska has a K. Wuger, St. Louis, Mo. Surveyor's Compass 16" o. a. needle 5-15/16" long.

WILLIAM WURDEMANN (1811 - 1900)

Washington, D. C.

"Mr. William Wurdemann, who died yesterday (2-22-1900) quite suddenly of pneumonia at his residence on Capitol Hill, was identified with this city since 1834. Mr. Wurdemann was born in Bremen, Germany, December 24, 1811. He studied at Heidelberg, came to this country and entered the United States Coast Survey in 1834 as assistant to Professor Ferdinand Rudolph Hassler, a Swiss scientist who was the first superintendent of the "Survey of the Coast". Hassler was born in Switzerland October 6, 1770 and died in Philadelphia November 20, 1843. After several years there of Survey work his scientific and inventive ability determined Mr. Wurdemann to improve the instruments then in use. He resigned from the Survey and became an extensive manufacturer of Astronomical and Geodetic Instruments. The Wurdemann inventions in that line became famous both in this country and in Europe. Mr. Wurdemann in fact, was the pioneer in the United States of that branch of manufacture and his inventions have never been excelled."

(Clipping from a Washington, D. C. newspaper)

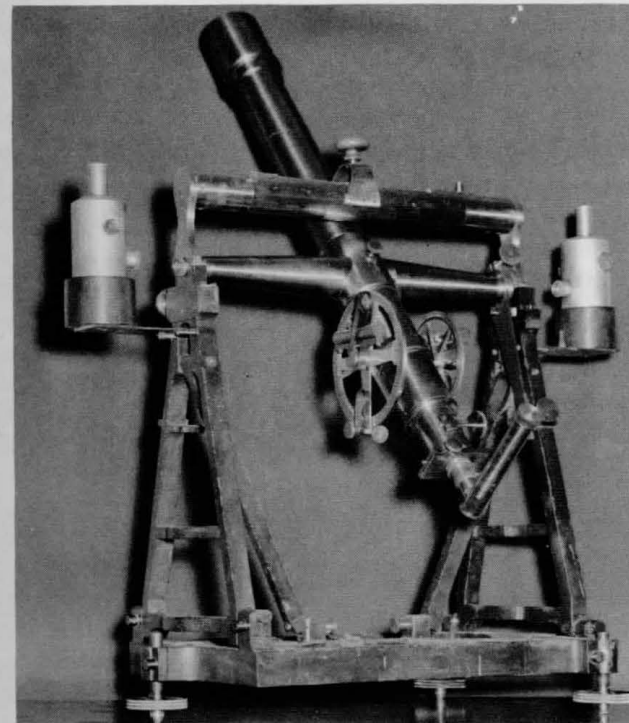
Mr. Wurdemann constructed a 30 inch automatic dividing engine. It was built entirely of steel and iron and so designed that by a proper arrangement of gears it could cut either degree or centesimal graduations. He shipped the dividing engine to Gustav Heyde in Dresden, Germany where it was completed in the Heyde shop. Heyde was making one for his own use at the same time that Wurdemann shipped his nearly completed engine to Heyde. Mr. Wurdemann graduated the limbs of the first Buff and Berger transits, and in 1899 he sold the engine to C. L. Berger & Sons.

He patented an instrument for measuring distances September 11, 1849, Patent No. 6709. He is said to have been the first to build the tachymeter in America, about 1860.

Civil Engineering Department, Cornell University, Ithaca, N. Y. has a Wm. Wurdemann Meridian Transit No. 13. No horizontal limb. Length of telescope 26", 16.5" out to out of standards. Two 4" diameter vertical circles reading to 1 minute divisions.

The Smithsonian Institution in Washington, D. C. has a Wm. Wurdemann Transit, catalog number 314633. It has a 11" telescope and a 4-1/2" needle.

The illustration is a Meridian Telescope No. 7, made by Mr. Wurdemann that is in the Bureau of Land Management, Department of the Interior, Washington, D. C.



Wm. Wurdemann Meridian Transit

WILLIAM J. YOUNG (1825 - 1866)
WILLIAM J. YOUNG & CO. (1867 - 1870)
WILLIAM J. YOUNG & SONS (1871 - 1880)
YOUNG & SONS (1881 - 1918)

Philadelphia, Pennsylvania

William James Young, who was born in Scotland in 1800, was indentured to Thomas Whitney of the township of Northern Liberties, County of Philadelphia, Pennsylvania, by and with the consent of his father, William Young, on January 30, 1813. This indenture is illustrated on page 176

Philadelphia Directories

William J. Young is first listed in the Philadelphia directories in 1825 as a mathematical instrument maker at 224 South Second Street. From 1837 to 1855 he was at 9 Dock. From 1855 to 1918, William J. Young and the various Young companies were at 43 North Seventh Street. In 1918 the company was taken over by Keuffel & Esser and the patterns and equipment were moved to Hoboken, New Jersey. 1825-1866 the listing is, Young, William J. mathematical instrument maker. 1867-1870, Young, William J. & Co. (William J. Young, Thomas N. Watson and Charles S. Heller.) 1871-80, Young, William J. & Sons (Alfred and T. Benton) 1881-1882, Young & Sons (Alfred). 1882-1918, Young & Sons (Alfred C.)

William J. Young had two sons, Alfred who was born in Philadelphia in 1832. His death occurred March 31, 1882. T. Benton, the other son, the record of his birth and death are yet (1962) to be found, was associated with the firm from 1871 to 1880, though he is listed as a mathematical instrument maker in the 1881 and 1882 directories living at 916 N. 13th Street.

The grandson, Alfred Cantrell was also born in Philadelphia on January 15, 1861. He died May 5, 1918.

William J. Young died in Philadelphia on July 4, 1870.

From the Fifth edition of the catalog of Young & Sons dated April 1878, a copy of which is part of the Library of Mr. W. H. Bolter, Keuffel & Esser Co., Hoboken, New Jersey, is taken the following paragraphs.

"The earlier manufacture of the Transit instrument was, for want of conveniences, attended with many difficulties. The art of Graduation had as yet made little progress, and the introduction of the Transit called for nearer approach to perfection. The first Graduating machines were extremely primitive, consisting simply of a circular plate of about 18 inches in diameter, upon which degrees and half degrees were marked off, either by mechanical sub-divisions, or from

a similar plate. The one in the establishment of W. J. Young bears the name of ADAMS, MAKER, LONDON, and consists of such a plate as we have described.

Such were the means of graduation in 1820. Mr. Young started, as soon as he commenced business in 1820, the construction of an engine of twenty-four inches in diameter, worked by an endless screw and treadle; and shortly after introduction of the Transit commenced another of twenty-six inches diameter, for finer work, in which a new and important principal of construction for these engines were introduced. A few years afterwards, this same machine was rendered Automatic, and is yet doing active duty, second to none outside of the establishment for accuracy.

The completion of the large forty-eight inch Graduating Engine, W. J. Young, which he intended to be the perfect engine of the world, completed a line of Graduating engines, which, for completeness of range, is certainly not equalled here, perhaps not in any establishment in Europe."

It is interesting to note that the will of William J. Young Philadelphia County Will Book 68 page 343 begins

First -- Pay all debts and funeral expenses

Second --I give and bequeath to my son, Alfred my large graduating machine which was made for him.

The following paragraphs are taken from the Fifteenth Edition of Young & Sons catalog dated January 1, 1896. A copy of this catalog is in the Gurley Museum Library.

"William J. Young invented the transit instrument in 1831, a long stride in the improvement of engineering appliances; and that it retains today its almost identical first form, proves the value of its introduction and the good judgment of the inventor. The English Theodolite, capable of performing the same work, was not in favor with the earlier American engineers, its workings being slow and inconvenient, and its use attended with many discomforts."

"Messrs. Young lately built a Graduating Engine costing \$7,000, and four years were occupied by three of their best workmen in testing and correcting it, that it might be, as intended, a manual of precise scientific mechanism, and enable them to guarantee their astronomical instruments as the finest work of the class produced in this country, and equal to the best European work; instruments with circles as large as forty-four inches can be graduated on their engines. In their line of manufactures, Young & Sons admittedly lead the trade in the United States, and with confidence in their superiority, can request the attention of colleges, institutions of learning, civil and mining engineers, and private parties to their facilities and ability to produce perfect work in their specialties.

-Balch Mining Interests of the United States."

"With this edition, we present to the Civil Engineers of this and, foreign countries, a more complete view of our line of Circular Graduating Engines. From this they may be able to judge of our capacity, both positive and comparative, to insure accuracy in the most important part of their instruments; also to judge of the labor and expense we have incurred that the work may be faithfully performed, and be such as they can implicitly rely upon.

These Engines have all been made in our establishment. They represent a cost greater, we believe, than the combined cost of all the Graduating Engines in our country; and of themselves a cost greater than the combined cost of all the instrument establishments of this city.

They are: A Foot Engine, of 22 inches diameter, used for Protractors, Needle Rings, and such work requiring heavy graduations, but not especial accuracy.

An automaton Engine, of 24 inches diameter, upon which is placed finer work, and which is capable, by late test, of finer graduations than any similar engine of this country.

The large Automaton Engine, 48 inches diameter, which is intended for the finest astronomical and other work, and which is unequalled and unapproached by any such engine here. Upon this engine we now graduate our Engineers' Transits, etc."

"In the year 1831, the first Transit was made by William J. Young. It was graduated to read by vernier to 3 minutes, it being in early days a favorite idea of inventor that graduations of 3 minutes could be easily read to one minute, and was less perplexing to use. The instrument had an outkeeper for tallying the outs of the chain, and a universal or round level. The needle was about 5 inches; the telescope 9 inches, of low power. The standards were of almost identical pattern now used by some makers."

In the preface of William A. Burt's "A Key to the Solar Compass and Surveyor's Companion" it states, "A model of this instrument was made in the year 1835, by the inventor, in order to test its principles, and the latter part of the same year, the first Solar Compass was made, under his direction and supervision, by William J. Young of Philadelphia, Pennsylvania.

There are in the Gurley Museum and in the Smithsonian Institution, replicas of the Burt Solar Compass which were made in the Gurley factory in 1961. The dimensions of these models were obtained from a photograph of the original patent drawing.

The Delaware County Historical Society, 410-12 Market street, Chester, Pennsylvania and the Tama County Historical Society, Court House, Toledo, Iowa, each has a W. J. Young surveyor's compass. The Oklahoma Historical Society, Historical Building, Oklahoma has a Wm. J. Young & Sons surveyor's compass. The Blair County

Historical Society, 2616 - 5 Avenue, Altoona, Pennsylvania and the Historical Society of Western Pennsylvania, 4338 Bigelow Blvd., Pittsburgh 13, Pennsylvania each has a W. J. Young transit.

The fire of May 1862 destroyed many of the Gurley records, but it is interesting to note that from January 1863 the records are quite complete. Since that time, many W. J. Young and Young & Sons transits, levels and compasses have been serviced in the Gurley factory.

In the Gurley Museum are two transits, one with a Smith Solar Attachment. They are engraved as follows:

Young & Sons
Trade Mark
Made by
Y & S Dept.
Keuffel & Esser Co.
New York
Serial 88090
9" telescope, 5" limb
3-1/2" needle

Young & Sons
Philadelphia
Smith Solar Attachment
Serial 8589
9" telescope, 4-3/4" limb
3-1/4" needle



The first American Transit made by William J. Young in Philadelphia
Photo Courtesy Keuffel & Esser Co. Hoboken, New Jersey

www.compleatsurveyor.com

His Indenture

Witnesseth That William Jones Young by and with the consent of his father William Jones (deceased)

HATH put himself, and by these Presents, he said William Jones Young DOTH voluntarily, and of his own free Will and Accord, put himself Apprentice to Thomas Whiting of the County of Chester, State of New York, to learn his Art, Trade, and Mystery, and after the manner of an Apprentice to serve from the Day of the Date hereof, for and during, and to the full end and Term of seven years

next ensuing. During all which Term, the said Apprentice his said Master faithfully shall serve, his Secrets keep, his lawful Commands every where readily obey. He shall do no damage to his said Master, nor see it to be done by others, without letting or giving notice thereof to his said Master. He shall not waste his said Master's Goods nor lend them unlawfully to any. He shall not commit Fornications, nor contract Matrimony within the said term. He shall not play at Cards, Dice, or any other unlawful Game, whereby his said Master may have damage. With his own Goods, nor the Goods of others, without licence from his said Master, he shall neither buy nor sell. He shall not absent himself Day nor Night from his said Master's Service, without his leave. He shall not haunt the House, Tavern, Play, or any other place, but in all things behave himself as a faithful Apprentice ought to do during the said Term, and the said Master shall use the utmost of his Endeavours to teach or cause to be taught or instructed the said Apprentice in the Trade or Mystery of a Mathematical Instrument Maker, and procure and provide for him sufficient Meat, Drink, Weaving Apparel, Lodging and Washing, fitting for an Apprentice, during the said Term of seven years, and at the expiration of the said Term to have Christy Sellers Lawfull Heirs of the United States of America as freeborn Citizens of the said State

AND for the true Performance of all and singular the Covenants and Agreements aforesaid, the said Parties bind themselves each unto the other, firmly by these Presents. IN WITNESS whereof, the said Parties have interchangeably set their Hands and Seals hereunto. Dated the 1st day of January Annoque Domini, one thousand, eight hundred and 42

Sealed and delivered in the Presence of
James J. [unclear]
John [unclear]
W. J. Young
W. J. Young

Adams, George; *Mathematical Instrument Maker to his Majesty and Optician to His Royal Highness, the Prince of Wales: Geometrical and Graphical Essays*: Published by the Author, London 1791.

Barrows, John Stuart; *Fryeburg, Maine, A Historical Sketch*; Fryeburg Pequawket Press, 1938.

Bartlett, Dr. G. Hunter; *Benjamin Ellicott*; Buffalo Historical Society, proceedings page 35, Vol. XXVL Buffalo, N. Y.

Bausch & Lomb Optical Company, Rochester, N. Y.; *Metro-Manual, A Handbook For Engineers*: 1915.

Bedini, Silvio A.; *A Compass Card By Paul Revere?*: The Yale University Library Gazette, Vol. 37, Number 1, July 1962.

Bennett, Archibald F.; *A Guide For Genealogical Research*: The Deseret News Press, Salt Lake City Utah, 1951.

Benny, C. J.; *The History And Genealogy Of The Prentice or Prentiss Family In New England 2nd Edition*: Boston 1883.

Bishop, J. L.; *A History Of American Manufacturers*: New York 1868.

Breed, J. Howard; *A Record Of The Descendents Of Allen Breed, Who Came To America From England In 1630*: The Evans Printing House, Philadelphia, 1932.

Brown, Alan S.; *William Austin Burt, Michigan's Master Surveyor*: Michigan Academy of Science, Arts and Letters; Western Michigan University, Vol. XLVII, 1962. (1961 meeting)

Browning, Edward Franklin; *The Brownings In America, 1621 to 1908*: Newburg, N. Y. Journal Print, 1908.

Burstyn, Harold L.; *At The Sign Of The Quadrant*: The Marine Historical Association, Inc., Mystic, Connecticut 1957.

Burt, William A.; *A Key To The Solar Compass And Surveyor's Companion*: D. Van Nostrand Company, New York. 1909.

Cary, A. Merwyn; *American Firearms Makers*: Thomas Y. Crowell Co., N. Y. 1953.

Chaffin, William Ladd; *History Of The Town Of Easton, Massachusetts*: J. Wilson & Son, Cambridge, Mass. 1886.

Chandlee, Edward E.; *Six Quaker Clock Makers*: Historical Society of Pennsylvania, Philadelphia, 1943.

Colton, George W.; *The Genealogical Record Of The Descendents Of Quartermaster George Colton*: Wickersham Printing Co., Lancaster, Pa. 1902.

Conrad, Henry C.; *Old Delaware Clock Makers 1898* p. p. 6-8; Historical Society of Delaware, Wilmington, Delaware.

Cope, Dr. Thomas D.; *Charles Mason And Jeremiah Dixon*: The Scientific Monthly, June 1946, Vol. LXII p. p. 541-544. *A Clock Sent Thither By The Royal Society*: Proceedings of the American

Philosophical Society, Vol. 94, No. 3, June 20, 1953. *The Jersey Quadrant Used In Pennsylvania*: Proceedings of the American Philosophical Society, Vol. 97, No. 5, October 1953. *Local Natural Philosophers Who Counseled The Boundary Surveys During The 1760's*: Proceedings of the Pennsylvania Academy of Science p. p. 36-42 Vol. XXIX 1955. *Degrees Along The West Line, The Parallel Between Maryland And Pennsylvania*: Proceedings of the American Philosophical Society; Vol. 93, No. 2, 1949. *David Rittenhouse, Physicist*: Journal of the Franklin Institute; Vol. 215, No. 3, March 1933. *Some Local Scholars Who Counseled The Proprietors Of Pennsylvania And Their Commissioners During The Boundary Surveys Of The 1760's*: Proceedings of the American Philosophical Society; Vol. 99, No. 4, August 1955. *When The Stars Interrupted The Running Of A Meridian Line Northward Of The Delmarva Peninsula*: Proceedings of the American Philosophical Society, Vol. 100, No. 6, 1956. Dr. Thomas D. Cope and H. W. Robinson; *When The Maryland-Pennsylvania Boundary Survey Changed From A Political And Legal Struggle Into A Scientific And Technological Project*: Proceedings of the American Philosophical Society, Vol. 98, No. 6, December 1954.

Currier, John J.; *History Of Newburyport, Massachusetts*: Newburyport; Author 1906.

Davis, J. B.; *The History Of Solar Surveying Instruments*: Author's Edition, Cleveland, Ohio 1900.

Dow, George F.; *Arts And Crafts In New England, 1704-1775*: Topsfield, Massachusetts, Wayside Press, 1927.

Fitts, Rev. James Hill; *History Of Newfields, N. H.; 1638-1911*: The Rumford Press, Concord, N. H. 1912.

Ford, Edward; *David Rittenhouse, Astronomer Patriot 1732-1796*: University of Pennsylvania Press Philadelphia, 1946.

Frizzell, Martha McD and others; *The Second History Of Charlestown, N. H.*: Courier Printing Co., Littleton, N. H. 1955.

Gillingham, Harrold E.; *Some Early Philadelphia Instrument Makers*: The Pennsylvania Magazine of History and Biography; Vol. LI, No. 3, 1927.

Greenleaf, James; *The Greenleaf Family*: Frank Wood, Printer, Boston, Mass. 1896.

A. R. H.; *Jeremiah Dixon's Theodolite*: The Geographical Journal, Vol. XLVII, No. 1 January 1916.

Hoopes, Penrose R.; *Connecticut Clockmakers Of The Eighteenth Century*: Hartford, Connecticut, E. V. Mitchell, 1930.

International Publishing Co., Publishers 1886, Boston, Cincinnati and Chicago.

"In Memoriam;" *William Gurley Troy*, N. Y. 1890. Leake, I. O.; *Memoirs Of the Life and Times Of General John Lamb*: Joel Munsell, Albany, 1850.

Magee, D. F.; "Grandfather's Clocks: Their Making And Their Makers In Lancaster County": Paper read before the Lancaster Historical Society, Lancaster, Pa. 1953.

Mathews, Catherine Van Cortlandt; *Andrew Ellicott, His Life And Letters*: The Grafton Press, New York, 1908.

McPherson, Hannah E. (Weir); *The Holcombes, Nation Builders*: Washington, D. C. 1947.

Merdinger, Commander Charles J.; Civil Engineers Corps, United States Navy; *Surveying Through The Ages*: The Military Engineers Vol. XLVI, No. 310 and 311.

Morey, Florence; *Dr. Samuel A. Bemis*: Appalachia, June 1958.

Multhaus, Dr. Robert P. Howell, Preston and McGrath Jr.; *Holcomb, Fitz, and Peate*: United States National Museum, Bulletin 228, Washington, D. C. 1962.

Myers, James Thorn; *History Of The City Of Watervliet, New York*: Watervliet, N. Y. 1910.

Nugent, Paul C.; *Plane Surveying*: John Wiley & Sons 1902.

Orcutt, Samuel; *History Of The Town Of New Milford And Bridge-water, Connecticut, 1703-1882*: Hartford, Ct.; Press of Case, Lockwood & Brainard Co., 1882.

Platt, G. Lewis; *The Platt Lineage*: Thomas Wittaker, N. Y. 1891. Pilgrim Hall; *Benjamin Warren*: Pilgrim Society, Plymouth, Massachusetts, 1962.

Pope, Charles H.; assisted by Katherine Peabody Loring; *Loring Genealogy*: Murray & Emery Co., Cambridge, Mass. 1917.

Prentice, Charles F.; *Legalized Optometry And The Memoirs Of Its Founder*: Casperian Fletcher Press, Seattle, Washington, 1926.

Rees, Abraham, *The Cyclopaedia Or Universal Dictionary Of Arts, Sciences And Literature*: Published by Samuel F. Bradford, Philadelphia. 1810.

Report of the Record Commissioners of Boston, Massachusetts: *Boston Marriages, 1700 - 1751. Boston Marriages, 1752 - 1809.*

Robinson, H. W.; *Jeremiah Dixon (1733-1779) A Biographical Note*: Proceedings of the American Philosophical Society, Vol. 94, No. 3. June 20, 1953.

The New England Historical and Genealogical Register, Boston, Mass., Vol. LXXXVI January 1932, pages 6 to 31: *Benjamin Hanks And Some Of His Descendents.*

Rubincam, Milton and Stephenson, Jean; Editor and Associate Editor; *Genealogical Research, Methods And Sources*: The American Society of Genealogists, Washington D. C. 1960.

Saunderson, Rev. Henry J.; *History Of The Town Of Charlestown, N. H.*; Printed for the town; The Claremont Manufacturing Co. Claremont, N. H., 1867.

Smith, Frank; *The Genealogical History Of Dover, Massachusetts*:

- Dover, Mass., The Historical and Natural History Society, 1917.
 Tracy, John C.; *Surveying, Theory And Practice*: John Wiley & Sons Inc., New York 1947.
 Waller, Adolph E.; *Dr. John Locke, Early Ohio Scientist (1792-1856)*: The Ohio State Archaeological and Historical Quarterly, Vol. LV, No. 4 pp 346-373.
 Weise, A. J.; *History Of The City Of Troy, N. Y.*: William H. Young, Troy, 1876.
 Whiton, Augustus Sherrill; *The Whiton Family In America: The Whiton Family Associations*, 1932.

CITY DIRECTORIES REVIEWED

- Albany, N. Y. from 1813
 Baltimore, Maryland from 1796
 Boston, Mass. from 1789
 Brooklyn, N. Y. from 1822
 Chicago, Illinois from 1844
 Detroit, Mich. from 1837
 Hartford, Conn. from 1850
 Long Island, N. Y., 1867 - 1873
 New England from 1869
 New York City, N. Y. from 1786
 Philadelphia, Penna from 1785
 Portland, Maine from 1846
 Rochester, N. Y. from 1827
 San Francisco, Calif. from 1850
 St. Louis, Mo. from 1840
 Troy, N. Y. from 1829
 Utica, N. Y. from 1817

NEWSPAPERS

- Troy, New York
 The Northern Budget and Troy Budget From June 19, 1798 Vol 11 to December 27, 1839. Not complete between these dates.
 The Troy Sentinel Vol. 1 No. 1 from July 5, 1825 to December 25, 1832.
 Vol. I No. 1 from July 5, 1825 to December 25, 1832.
 The Troy Daily Whig merged with the Troy Sentinel and Troy Press. July 1, 1834 to December 29, 1837.
 Boston Gazette & Country Journal, Boston, Mass., March 12, 1770.
 Newport Mercury, Newport, Rhode Island, November 13, 1786.
 Dunlap's American Daily Advertiser, Philadelphia, Pa., June 4, 1792.
 Aurora General Advertiser Philadelphia, Pa., October 13, 1797.
 Federal Gazette, Philadelphia, Pa., April 12, 1798.

- Poulson's American Daily Advertiser, Philadelphia, Pa., May 20, 1829.
 The Baltimore American and Commercial Advertiser, Baltimore, Maryland November 11, 1834.
 The Republican, Bardstown, Kentucky, October 3, 1844.
 San Francisco Daily Herald, San Francisco, Calif., October 17, 1853.
 The Cincinnati Daily Gazette, Cincinnati, Ohio, July 11, 1856.
 The Detroit Advertiser, Detroit, Michigan, October 23, 1858.
 Cincinnati Enquirer, Cincinnati, Ohio May 15, 1873.

SOME OF THE PATENTS RELATING TO SURVEYING INSTRUMENTS

- 1737, Rowland Houghton; *Land Can Be Surveyed With Greater Ease*: 7 years, Boston, Massachusetts.
 November 4, 1816, Benjamin Hanks; *Moulding And Casting Bells*: West Troy, N. Y.
 1829, William A. Burt; *Typographer*: Mt. Vernon, Michigan.
 July 22, 1833, Julius Hanks; *Hoop Compass*. Troy, N. Y.
 February 25, 1836, William A. Burt; *True Meridian Finding*: Mt. Vernon, Michigan. Later it was called *Burt Solar Compass*.

Patent Numbers:

- 99; December 6, 1836; Francis Whitely; *Compasses, Quadrants And Protractors*: Stanardsville, Virginia.
 519; January 20, 1837, James McCann; *Circumferenter*: New Market, Virginia.
 2280 December 12, 1842, Benjamin H. Benton; *Improvement In Surveying Instruments*: Lisbon Institution, Virginia.
 4675; July 31, 1846, Samuel Kern; *Compasses*: Near Strasburg, Virginia
 6709; September 11, 1849, William Wurdermann; *Instrument For Measuring Distances*: Washington, D. C.
 7477; July 2, 1850, John Locke; *Collimating Level*: Cincinnati, Ohio.
 7510; July 16, 1850, John Locke; *Surveyor's Compass*: Cincinnati, Ohio.
 16,002; November 4, 1856, William A. Burt; *Altitude Instrument*: Mt. Vernon, Michigan.
 18,608; November 10, 1857, J. M. Lilley; *Altitude Instrument*: Greenville, Virginia.
 55,285; June 5, 1866, William Gurley; *Water Spreading Nozzle*: Troy N.Y.
 69,450; October 1, 1867, Kuebler & Seelhorst; *Method Of Adjusting Eyepieces And Objective Lenses In Telescopes*: Philadelphia, Penna.
 72,687; December 24, 1867, William Schmolz; *Improvement In Solar And Transit Instruments*.

- 117,184; July 18, 1871, Benjamin Smith Lyman; *Improvements In Solar Compasses*: Philadelphia, Penna.
- 202,916; April 23, 1878, Alfred Young; *Improvement In Tripod Heads For Surveying Instruments*: Philadelphia, Penna.
- 205,481; July 2, 1878, William Gurley; *Improved Tripods For Surveying Instruments*: Troy, N. Y.
- 205,742; July 9, 1878, W. & L. E. Gurley; *Improved Telescope Attachment*: Troy, N. Y.
- 216,759; June 24, 1879, Theodore F. Randolph; *Improvement In Surveying Instruments*: Cincinnati, Ohio.
- 232,309; September 14, 1880, Benjamin H. Smith; *Meridian Attachment mm Transit-Instruments*: Philadelphia, Penna.
- 234,331; November 9, 1880, Theodore F. Randolph; *Compass Box*: Cincinnati, Ohio.
- 234,332; November 9, 1880, Theodore F. Randolph; *Telescope Attachment To Surveyor's Compasses*: Cincinnati, Ohio.
- 264,061; September 12, 1882, Henry Blattner; *Surveyor's Transit*: St. Louis, Missouri.
- 270,679; January 16, 1883, Robert M. Jones; *Solar Attachment, Transits-Instruments*.
- 282,117; July 31, 1883, Theodore F. Randolph; *Surveyor's Compass*: Cincinnati, Ohio.
- 297,164; April 22, 1884, Theodore F. Randolph; *Surveyor's Level*: Cincinnati, Ohio.
- 353,406; November 13, 1886, William Gurley; *Telescopic Hand Level*: Troy, N. Y.
- 360,805; April 5, 1887, William Gurley Estate; *Telescopic Hand Level*: Troy, N. Y.
- 423,894; March 25, 1890, Edward W. Arms; *Solar Surveying Instrument*: Troy, N. Y.
- 470,076; March 1, 1892, Theodore F. Randolph; *Transit*: Cincinnati, Ohio.
- 705,970; July 29, 1902, Orville F. Shattuck; *Solar Attachment For Transit Instruments*: Denver, Colorado.
- 745,110; November 24, 1903, John S. J. Lallie; *Solar & Vertical Attachment Transits*: Denver, Colorado.
- 1,005,829; October 17, 1911, William F. Gurley; *Illuminating Device*: Troy, N. Y.
- 1,191,936; July 27, 1916, Edward W. Arms; *Surveying Instruments*: Troy, N. Y.
- 1,234,520; July 14, 1917, Adolph Wissler; *Combination Level And Transit*: St. Louis, Missouri.
- 1,864,895; June 28, 1932, Willard L. Egy; *Vernier*: Troy, N. Y.
- 1,923,193; August 22, 1933, Charles I. Day, Willard L. Egy, Charles E. Smart; *Frames For Transits*: Troy, N. Y.
- 1,958,512; May 15, 1934, Willard L. Egy, Charles E. Smart; *Surveying Instruments*: Troy, N. Y.
- 2,316,573; April 13, 1943, Willard L. Egy; *Instrument Cases*: Troy, N. Y.

THE MAKERS OF SURVEYING
INSTRUMENTS IN AMERICA
SINCE 1700

By
CHARLES E. SMART
Retired Chairman of the Board of Directors
W. & L. E. Gurley
Troy, New York
and
Curator, Gurley Museum, Charles E. Smart
Collection of Surveying Instruments

Volume II

REGAL ART PRESS
Troy, New York
1967

FOREWORD

In the years between 1962 and 1967 over seventy not previously recorded manufacturers of surveying instruments and additional material on more than thirty manufacturers already recorded has been received by the author. It was thought, then, that a second edition should be published. The help of those listed below on this page and those mentioned in the text is gratefully acknowledged in making possible the printing of Volume II.

Troy, New York
November 19, 1967

Charles E. Smart

ACKNOWLEDGEMENTS

Kenneth A. Hancox and Clinton Meneely should have been in the 1962 list.

The following persons were in the 1962 list and should be in the 1967 list for their continuous help since 1960.

Silvio A. Bedini	Donald A. Hutslar
Ward H. Bolter	Alfred C. Young
Willard L. Egy	and especially to my
Arthur H. Frazier	wife and able assistant
Jeanette S. Grimm	Isabell H. Smart

Credit is due Charles S. Parsons, Goffstown, New Hampshire for the number of photographs sent to the author, six of which are reproduced in Volume II.

Note: Volume I comprises pages i to xxiv and page 1 to page 182.
Volume II comprises pages xxv and xxvi and page 183 to page 266.

ABBOTT-MCKAY CORPORATION (1924 - 1929)

Page 1 (q.v.)

Boston, Massachusetts

Everett W. Abbott (1886 - 1936) was born at Everett, Massachusetts 22 March 1886. He died at Newton, Massachusetts 31 August 1936. He is buried in Maple Grove Cemetery, Randolph, Maine.

Arthur Frederick Probst was born at Brooklyn, New York 10 June 1878 and died at Needham, Massachusetts 21 December 1952. He is buried in Needham Cemetery.

JOHN AVERY (1762 - 1834)

Page 3 (q.v.)

Bridgewater, New York

John Avery, son of John and Anna Miner was born at Stonington, Connecticut 2 July 1762, perhaps a soldier in the Revolutionary War. About 1796 he moved to Bridgewater. John Avery was listed as a goldsmith. He died at Winfield, New York in 1834 and is buried in Fairview Cemetery in Bridgewater.

Reference:

The Groton Avery Clan by E. M. and Catherine H. T. Avery, Cleveland, Ohio 1912. Vol. 1 Pages 212 and 345.

JOHN BAILEY (1751 - 1823)

Page 4 (q.v.)

Hanover, Massachusetts

The history of John Bailey as described on page 4 is now rewritten as follows:

The genealogies as written by John Stetson Barry in his "Historical Sketches of the Town of Hanover, Mass." require an explanation. The given name John begins in the Bailey family as John 1, who came from Weymouth to Scituate in 1670, died 1718. John 2, born at Scituate 1673, died at Hanover 1752, John 3, born at Hanover 1703 died 1778, John 6, son of John 3 born at Hanover 1730, married Ruth Randall 1750 died 1810. John 11, son of John 6 and Ruth Randall born at Hanover 6 May 1751, pages 200, 201, 202. John 11 married 1. Ruth Ellis, 2. Mary Hill, 3. Tabitha Olney of R. I.

He was a natural mechanic, a man of great ingenuity and a successful inventor. He was a clock maker by trade and a manufacturer of compasses. Many of his clocks still exist in the town. From John S. Barry's "History of Hanover" (1853).

The third paragraph on page 4 applies to John 6.

John Bailey 11 died at Hanover 28 January 1823 as stated in paragraph 1 on page 4.

Reference:

A Historical Sketch of the Town of Hanover, Mass., with Family Genealogies by John S. Barry, Boston: Published for the author by Samuel G. Drake. 1853.

JOHN AYLESWORTH BAILEY (1819 - 1888)

Page 4 (q.v.)

Detroit, Michigan
Marquette, Michigan

John Aylesworth Bailey was born at Crown Point, New York, 18 March 1819 and died at Marquette, 22 January 1888.

Reference:

Correspondence with Mr. Ernest H. Rankin, Executive Secretary, The Marquette County Historical Society, Marquette, Michigan.

JEDEDIAH BALDWIN (1768 - 1849)

Norwich, Connecticut;
Northampton, Massachusetts;
Hanover, New Hampshire;
Fairfield, New York;
Morrisville, New York;
Rochester, New York

Jedediah Baldwin was born at Norwich, 29 March 1768, the son of Jabez and Lydia Barker Baldwin. He may have been an apprentice of Thomas Harland of Norwich. On 18 April 1791 he married "Nabby" Jones also of Norwich. That same year he moved to Northampton where he was in partnership with Samuel Stiles, the firm being Stiles & Baldwin for less than a year. 4 July 1792 the partnership was Baldwin & Storrs which also lasted but a short while because Baldwin had moved to Hanover according to an advertisement in *Spooner's Journal* 7 October 1793.

In 1811 he left Hanover to settle at Fairfield, New York. He was at Morrisville for two years 1818-20. He is listed in the Rochester directories from 1827 to the 1849-50 issue. The 1827 directory has two listings "Householders" and "Boarders". Jedediah is listed under "Boarders" page 38 as: Baldwin, Jedediah, clerk, A. Reynolds meaning that he was boarding with A. Reynolds.

In 1834 he is listed as WatchMaker, John St. and also the same in 1838 the address is No. Washington St.

In the 1841 directory he is listed as clock repairer, 40 No. Washington and in 1844 through 1849-50 he listed b. 40 John. 40 John Street was

the home of one of his daughters. He died at Rochester on 28 June 1849 and is buried in Mount Hope Cemetery in Rochester.

There is privately owned in Vermont a wooden surveying compass with a brass compass circle. It is 13" overall with a 4 3/4" needle. It is engraved Jed. Baldwin, Hanover, N.H. It is said to have been used in making the original surveys of Hanover, New Hampshire.

References:

The Baldwin Genealogy from 1500 to 1881, by Charles Candee Baldwin Cleveland, Ohio, 1881, page 276.

Silversmiths of Rochester by Joan Lynn Schild, published by the Rochester Museum of Arts and Sciences, Rochester, New York, 1944.

Library Bulletin, June 1940, the Baker Library, Dartmouth College, Hanover, New Hampshire. The Bulletin contains excerpts from the day book of Jedediah Baldwin, goldsmith; who was the second postmaster of Hanover.

Correspondence with Miss Maude D. French of Hanover, New Hampshire.

Correspondence with Mr. Charles M. Dunlavey, Administrative Assistant, Department of Public Works, Mount Hope Cemetery, Rochester, New York.

The 6 July 1791 issue of the *Hampshire Gazette*, Northampton, Mass. spells the name Jedidiah, while all other references spell the name Jedediah. This spelling in the *Hampshire Gazette* may have been a printer's error.

Hampshire Gazette July 6, 1791
Courtesy American Antiquarian Society
Worcester, Massachusetts

CLOCK & WATCH MAKING & REPAIRING.

Together with

JEWELRY in its various branches.

THE Subscriber most respectfully informs the inhabitants of the town of Northampton, the towns adjacent, and the public at large, that having served a regular apprenticeship (with that well known workman, Mr. Thomas Harland from London) in the above Branches of business, he now proposes carrying them on, in the town of Northampton, at the Brick house, a few rods West of Elijah Hunt Esqrs.—He hopes for the Patronage and Employ of those who may have occasion for his labor in those Branches, but expects such favors no farther than he may be found by his fidelity, punctuality and moderate charges, to merit them.

JEDEDIAH BALDWIN.

N. P. Old Gold, Silver, Copper, Brass, Pewter, and Lead, will be gratefully received for any of the above-mentioned articles, and a generous price given.

EDWARD PRINCE BANKS (1811 - 1892)

Portland, Maine

He was born at Pejepscot, later called Danville and now (1892) a part of the present city of Auburn, Maine, 22 November 1811, the fourth son of Dr. Elias and Lucretia (Prince) Banks.

He came to Portland in January 1826 and was apprenticed to Henry S. Pearson (1789-1878) to learn the watchmaker's and mathematical instrument trade. He made such good progress that Mr. Pearson gave him the rest of his time in 1832.

He has an advertisement in the 1834 Portland Directory stating that he is a nautical and mathematical instrument maker.

From 1837 to 1857, Mr. Banks was in partnership with Wm. H. H. Hatch as jewelers in Portland.

From 1857 to 1870 he was in business for himself. He then was a U.S. Customs Storekeeper for seven years.

In 1882 he moved to Somerville, Massachusetts. He died 17 September 1892 at the United States Marine Hospital in Somerville where his son, Dr. Charles E. Banks, was a physician.

BERGER

Louis Herman Berger died at Dorchester, Massachusetts 14 April 1965.

William Albert Berger died at Franklin, New Jersey 8 January 1963.

BLUNT & CO. (1868 - 1872)

New York City

William S. Blunt (1837 - 1903)

Francis M. Nash

John Gowans (1832 - 1882)

William Sinclair Blunt was born at Brooklyn, New York 21 September 1837 and died at Palmerton, Pennsylvania 7 March 1903. See page 12.

John Gowans was born in Scotland in 1832. He was a watchmaker in Jersey City, New Jersey from 1862 through 1871; also of the firm of Blunt & Co. from 1868 through 1872. He is listed in the New York City Directories from 1876 to 1882 as watches and jewelry in alternate years. He died at New York City 6 August 1882.

In the Gurley Museum is a Blunt & Co., New York, Transit No. 316.

The horizontal limb is 6-1/4", 10-1/4" telescope and a 4-5/8" vertical needle.

The gift of Buff & Buff Mfg. Co., Jamaica Plain, Mass. There is another Blunt & Co. Transit No. 860 privately owned in California.

BLUNT & NICHOLS (1866 - 1868)

New York City

Edmund Blunt, junior (1842 - 1894)

Francis M. Nash

John Henry Nichols (1811 - 1898)

Edmund Blunt, junior was born at Brooklyn, New York 8 June 1842 and died there 24 January 1894.

John H. Nichols was born at Salem, Massachusetts 12 June 1811 and died there 16 November 1898.

"In August 1866, Blunt, Nash and Nichols took over the business of E. & G. W. Blunt and the firm name was changed to Blunt & Nichols. The sale of books, charts and instruments was carried on by the new company. In the fall of 1868, Blunt & Nichols became Blunt & Company."

"At the Sign of the Quadrant" by Harold L. Burstyn (1957) page 90.

There is privately owned in Perth Amboy, New Jersey a surveyor's plain compass with a 5-3/4 inch needle. It is engraved Blunt & Nichols N.Y.

The Gurley Museum has a Blunt & Nichols Transit Serial 572. Limb 6-1/8", Telescope 9-1/4", Vertical Needle 4-1/4", Vertical Circle, brass with an inlay of silver 7/32" wide for divisions and figures. It is engraved Blunt & Nichols New York.

THOMAS SALTER BOWLES (1785 -)

Page 14 (q.v.)

Portsmouth, New Hampshire

In the 1821 directory of Portsmouth, N.H. there is listed - Samuel Bowles, a mathematical instrument worker.

According to a transcript of The records of the 3d or Independent English Church in Portsmouth, New Hampshire, (1758-1831), compiled and indexed by Priscilla Hammond (Concord, N.H., 1941) (typescript), p. 16, "Thos. Salter Bowles," the son of Samuel and Hannah Bowles, was baptized at this church on 29 May 1785.

In addition to the T.S. Bowles wood compass owned in Connecticut there is one owned at Perth Amboy, New Jersey. It is engraved T. S. Bowles. It has a 4-1/4" needle and is made of wood.

www.compleatsurveyor.com

Thomas S. Bowles, Mathematical Instrument Maker,

Respectfully informs his friends and the public in general, that he has taken a shop in Daniel-street, directly opposite Mr Charles Peirce's book-store, where he makes and sells every article in the above branch on the lowest terms,

viz—

SEXTANTS, Quadrants, Azimuth and brass Compasses, wood and haring Compasses Telescopes, Callipers, Gauging Rods Board Rules, Wain Sticks, &c. with a variety of surveyors Instruments.

N. B. Quadrants and Compasses cleaned and repaired in the best manner.

Cash given for old brass and copper Kettles. Portsmouth, May 31.

PORTSMOUTH ORACLE May 31, 1806
Photograph courtesy Charles S. Parsons
Goffstown, New Hampshire

SAMUEL BROWNING (1778 - 1864)

Boston, Massachusetts
Baltimore, Maryland

Samuel Browning was born in England 1 November 1778. As recorded on page 21, he is listed in the Boston directories from 1803 to 1841.

He is listed in the Baltimore directories from 1840-41 through the 1847-48 issue as a mathematical and nautical instrument maker.

He died at Baltimore 1 April 1864 and is buried in the Forest Hills Cemetery, Jamaica Plain, Massachusetts.

There is privately owned in California a surveyor's vernier compass. It is engraved "Browning, Baltimore". It is 14-13/16" overall, the needle is 5-1/4" long.

SAMUEL BROWNING & SON

Samuel Browning (1778 - 1864)
Samuel S. Browning (- 1835)

Boston, Massachusetts

Samuel Browning married Eunice W. Roulston in 1802. They had several children, Mary E. born 21 August 1804, died 4 September 1894 and Samuel S. perhaps born in 1803.

Samuel S. is listed in 1825 and 1826 Boston directories as a mathematical and optical instrument maker, Atkinson (street) h. 282 Washington, while Samuel is listed at 67 Broad h. 282 Washington.

He died 4 May 1835. All the Brownings mentioned above are buried in Forest Hills Cemetery.

A. BUCKHAM

There is privately owned at Delmar, New York, a surveyor's vernier compass. It is 15-3/4" overall, the needle is 6-1/4". It has two level vials. It is engraved 'A. Buckham'.

ABEL BUELL (1742 - 1822)

New Haven, Connecticut

Abel Buell, son of John and Abigail Chatfield Buell was born at Killingworth, Connecticut 1 February 1742 and died at New Haven 10 March 1822.

References:

Abel Buell of Connecticut, Silversmith. Type Founder and Engraver. By Lawrence C. Wroth. Middletown: Wesleyan University Press. 1958.

History of the Buell Family in England & America. Albert Welles. New York: 1881.

The Connecticut Historical Society, Hartford, Connecticut, has a surveyor's plain compass engraved BUEL NEW -- HAVEN "W" is left of North.

Correspondence with Mr. Thompson R. Harlow, Director, The Connecticut Historical Society.

NATHAN B. CHAMBERLAIN (1810 - 1878)

Boston, Massachusetts

He was born at Brookfield, Massachusetts on 13 April 1810. He died at Newton, Massachusetts on 15 June 1878.

The Buff & Berger catalog of 1879 states that John H. Temple entered the employment of Nathan B. Chamberlain of Sterling, Mass. in 1832 and soon came to Boston with him.

Nathan B. Chamberlain is first listed in the Boston directory of 1832 as a machinist at 9 School Street.

In 1834 he is listed as a philof. ap. makr. at 9 School St. which continues to 1850.

In the 1850 Boston directory is listed Chamberlain & Ritchie philosophical instrument makers 313 Washington St. This partnership continues through 1854.

He did not have a partner from 1855 to 1860.

1860, Chamberlain, Nathan B. & Sons
(H.B. & W.O.)

Henry B. and Walter O.

They are listed as philosophical instrument makers.

This partnership was continued until 1884. The Boston directory of 1885 lists Henry B. Chamberlain with the Atlas Chemical Company. Walter O. Chamberlain is listed at the same address as his brother.

Walter O. Chamberlain was born in Boston 7 August 1834 and died there 30 May 1918.

In the Collection of Historical Scientific Instruments of Harvard University is a surveyor's compass. It is 14-1/2" overall. The needle is 4-5/8" long. It is engraved Chamberlin & Ritchie, Boston.

CHAMBERLAIN & RITCHIE (1850 - 1854)

Nathan B. Chamberlain (1810 - 1878)

Edward S. Ritchie (1814 - 1895)

Pages 134, 135 (q.v.)

Boston, Massachusetts

TIMOTHY CHANDLER (1762 - 1848)

Page 29 (q.v.)

Concord, New Hampshire

"He was born at Concord 25 April 1762. His father, Timothy, died when young Timothy was eight years old. He was adopted by his father's friend, Major Jonathan Hale. Major Hale moved to Connecticut and took Timothy with him when he was about 16 years old. After a couple of years Timothy walked back to Concord. The name of Timothy Chandler appears in a 1797 "List of Continental Soldiers".

He became one of the most prominent citizens of Concord being a leader in many constructive projects. In 1829 he retired from business and the clockmaking business was taken over by his son Abiel."

'Surveyor's Compasses of a peculiar construction, and well approved by the best Judges: Ball and Socket do; Merrill's Quadrants'

Photograph from page of *New Hampshire Patriot*

June 3, 1815, courtesy Charles S. Parsons

Timothy died 9 August 1848. There are no known existing surveyor's compasses made by Timothy Chandler.

Reference:

Paper read at a meeting of the National Association of Watch and Clock Collectors, Swampscott meeting May 1959 by Charles S. Parsons, Goffstown, New Hampshire.

TIMOTHY CHANDLER
HAS for sale at his Manufactory, a few rods south of the Printing Offices, **Gold & Silver Work** of his own manufacturing, made of good metal and warranted, viz.
Gold Beeds, Rings and Knobs; Silver Table, Tea, Salt and Mustard Spoons, Silver Cream Ladles, Sugar Tongs, Thimbles, Scissors chains, Watch chains, Sleeve Buttons, and Clasps, &c.
—ALSO—
An assortment of Jewelry.
[This he buys and sells.]
—ALSO—
Plated Candlesticks, Spoons & Sugar Tongs, Brass Candlesticks, and Skimmers; Eight-day Clocks, and Time Pieces.
He has been at great pains to make a *Time Piece*, which he would recommend to the public: this he thinks superior to any that has been invented, not even excepting Willard's celebrated Patent: this gentleman lays the emphasis of his eulogium of his *Time Piece on a long pendulum—mine is longer.* Is likewise very portable—the case being less than three feet in length, and not one foot wide. It has some peculiarities not known to belong to any others. It will be accompanied with printed directions, pointing out these peculiarities, which will enable any person of common ingenuity to set it up so it may go, and also to take it apart.

New Hampshire Patriot June 3, 1815
Photograph courtesy Charles S. Parsons
Goffstown, New Hampshire

GARDNER ASAPH CHURCHILL (1839 - 1896)

Boston, Massachusetts

He was born at Dorchester, Massachusetts 26 May 1839 and died at Gloucester, Massachusetts 20 August 1896. He is buried in the Milton Cemetery, Milton, Massachusetts.

He is first listed in the Boston directories in 1858 as a clerk. He is listed in the 1859-1860 directory as a partner of Loring and Churchill.

A Loring & Churchill surveyor's vernier compass is being used (1965) by a surveyor in Vermont.

The compass is 15" overall, with a needle 5-1/2" long, the sights are of different heights, 7-25/32 & 7-11/16", evidently one having been broken and repaired. The compass is engraved:

Loring & Churchill Boston

FREDERICK HARVEY CLARK (1811 - 1866)

Danbury, Connecticut
New York City
Memphis, Tennessee

Frederick Harvey, son of James and Elizabeth Starr Clark was born at Danbury February 1811.

He is listed as a watchmaker in the New York City directories from 1829 to 1834. The first edition of the Memphis directory issued in 1849 lists him as a jeweler. He is so listed until 1866.

He died in Memphis 21 January 1866 and is buried in the Starr mausoleum in the Wooster cemetery at Danbury.

There is privately owned in Jackson, Mississippi a surveyor's vernier compass engraved F. H. Clark Memphis Tenn It is 14-1/2" overall, with a 4-3/4" needle, the sights are 5-11/16" in height. The owner's grandfather used this compass from 1884 to 1896 as county surveyor in Trinity County Texas.

References:

A History of the Starr Family of New England by Burgis P. Starr Hartford, Conn. 1879. Correspondence with Mrs. Margaret H. Talbot, Mr. and Mrs. William I. Hill, Miss Emily I. Huyler and Miss Bettye H. Ellison.

WM. CLARK & SON (1837: 1845 - 1846)

Page 31 (q.v.)

Philadelphia, Pennsylvania

There is privately owned in Gilboa, New York, a Wm. Clark & Son, Philada, Pa. surveyor's plain compass. It is 15" overall, 6" needle, 2 level vials.

WILLIAM TOMPKINS COMSTOCK (1842 - 1910)

New York City

William Tompkins⁷, son of David Close⁶ and Elizabeth A. Tompkins Comstock was born at Redding, Connecticut 14 July 1842.

He received a B.A. degree at Yale University in 1865 and a M.A. degree in 1868.

He is listed in the 1872-73 New York City directory: maps, 36 Vesey, h. Brooklyn. 1878-79 and May 1, 1880, books 97 Warren, h. 83 Lexington. 1881-82 publisher, 194 Broadway, h. Conn. 1882-1884, publisher, 6 Astor Place, h. 256 W. 55th. Newark, N.J. was his home at 244 Summer Avenue in 1910. He died there 16 January 1910.

There are two known levels, both engraved: William T. Comstock 6 Astor Place New York. One was serviced in New Jersey in 1964, the other is owned in Canada, Fenella, Ontario. The following information was furnished by Mr. Ward H. Bolter, Hoboken, New Jersey in a letter dated 3 September 1964. "It appears to be a very elementary form of farm level, mounted in wyes. It has no other optics than an objective, the eye-piece is merely a peep hole. It has 4 screw leveling head, but only 2 of the screws are adjustable, the other 2 are spring loaded. The circle is graduated to 10 degrees, there is no vernier.

The level in Canada has a 14" telescope and "it stands on 3 feet".

The trivet on both instruments can be unscrewed and placed on a tripod.

William T. Comstock was granted Patent No. 294,014 on a Leveling Instrument, 26 February 1884. He describes it as follows: "This invention relates to an improved leveling-instrument, which is designed more particularly to be used by builders and others who are not accustomed to handle the complicated field instruments."***** "I prefer for simplicity to mark only whole angles on plate C and tenths of angles on the right and left of the zero of plate D. In this way tenths of angles may be conveniently read.

I claim as my invention --

1. The combination, in a level, of lower graduated plate, C, with base-plate B, and with thumb-screws f f and pins g g. having shoulders h and springs i, substantially as for the purpose specified. He goes on to claims 2 and 3 which are not being enumerated".

The Comstock Genealogy states that W. T. Comstock published architectural and medical books.

Reference:

A Comstock Genealogy, Descendants of William Comstock of New London, Connecticut who died after 1662. 10 Generations. Edited by Cyrus B. Comstock. New York: The Knickerbocker Press. 1907

ARI DAVIS (1811 - 1885)

Princeton, Massachusetts
Boston, Massachusetts
Lancaster, Massachusetts
Lowell, Massachusetts

Ari Davis⁷, son of Daniel⁶ and Betty Blood Davis was born at Princeton, Massachusetts 18 May 1811.

He is listed in the Boston directories:

1834 Davis, Ari, astronomical apparatus 87 Washington.

1835 Davis, Ari, machinist h. Lancaster.

1837 and 1838, not listed.

1839-1845, Davis, Ari, philosoph instru, 11 Cornhill; 19 Court Sq. 75 Court; h. 5 Norwich.

In 1855 he is listed in Lowell directory, Philosophical Apparatus mfg h. 52 Appleton.

In 1865 and 1866, the Lowell directories list Davis, Mrs. Ari h. 52 Appleton, in 1868, David, Mrs. Ari, h. Church St.

The next Lowell directory to list Ari is 1881, he boards with his brother, Asahel. He died in Lowell 15 August 1885 and is buried in Lowell Cemetery.

He was an inventor and the following patents are in his name. There may be more patents to his credit:

Dovetailing Boards Lancaster, Mass. 6 September 1833

Mitering Boards Princeton, Mass. 21 August 1839

Stop Clock Boston, Mass. 16 October 1839

Vapor Apparatus with his brother Asahel, Lowell 15 January 1856 Patent No. 14129.

Dovetailing Boards Lowell 26 February 1856 Patent No. 14307.

References:

The Book of American Clocks: Brooks Palmer 1959

"Davis, Ari, Boston Ca 1840. Mfr and R. Chron., surveyor's inst., etc. Elias Howe was apt (Mitman)."

Elias Howe went to Cambridge early in 1837, and then a little later in the same year to Boston to become an apprentice of Ari Davis, a watchmaker primarily, but also a maker of surveying instruments and also scientific instruments for Harvard professors. "Dictionary of American Biography" Vol. IX, pages 284 and 285 (1932).

Elias Howe was in the shop of Ari Davis until 1844 "The National Cyclopaedia Biography" Vol. IV.

Elias Howe was 18 years old when he came in contact with Ari Davis, a maker of mariners' and scientific instruments.

Many inventors are off in their ways, but Davis was queer even for an inventor.

Inventors often went to Ari Davis to ask his advice about models they had made. Sometimes he helped them and sometimes he shouted at them in anger, for he was one of the noisiest men in Boston.

His clothes, too, were characteristically loud and unusual, for Davis prided himself on wearing the most outlandish, voluminous and gaily colored garments.

"A Popular History of American Invention". New York: Charles Scribner's Sons 1924, pages 382 and 383.

History of the Town of Princeton, County of Worcester Commonwealth of Massachusetts by Francis Everett Blake. Published by the town. 1915.

WILLIAM C. DAVIS (1813 -)

Page 36 (q.v.)

New York City

William C. Davis, the son of William and Edna Davis was born at New York City, in 1813. He is first listed in the 1835 - 1836 New York City directory and last listed in the 1878 - 1879 New York City directory at 302 Pearl Street New York City and h. 974 Fulton Street, Brooklyn, New York.

WILLIAM DEAN (- 1797)

Page 36 (q.v.)

Philadelphia, Pennsylvania

The Clark County Historical Society Memorial Auditorium, in Springfield, Ohio has a surveyor's plain compass. It has no level vials. It is 13-1/2" long with 5" needle. It is engraved

DEAN

PHILADA

The following names are rudely scratched upon the cover of the instrument: Jno. C. Symes, Aug. 10, 1778; I. Ludlow, 1791; Henry Donnel, July 24, 1794; Jonathan Donnel, 1796; John Dyherthy; Thomas J Kizer, 1838; David J Kizer, '78.

Reference:

A letter dated 3 January 1963 from Donald A. Hutslar, Ohio State Museum, Columbus, Ohio.

DANIEL DOD (1778 - 1823)

Mendham, New Jersey

The Ft. Laramie National Monument in Ft. Laramie, Wyoming has an interesting surveyor's compass.

There is an old tag with the compass which reads as follows: "Miner's Compass. Found by Lieut. J. G. Reeves, Co. "C" 11th O.V.C. on upper Sweetwater River 1862 while scouting after hostile Indians (John G. Reeves, Lancaster, Ohio.) The 11th cavalry was serving in the West during the Civil War."

The compass card is engraved "Made for Richard Loveridge by Daniel Dod -- Mendham."

On pages 138, 139 and 140 of a book whose title page reads "Genealogies of the Male Descendants of Daniel Dod of Branford, Conn. a native of England. 1646-1863 by Bethiel L. Dodd, M.D. and John R. Burnet Newark, N.J. Printed at the Daily Advertiser Office 1864 is the following quotation:

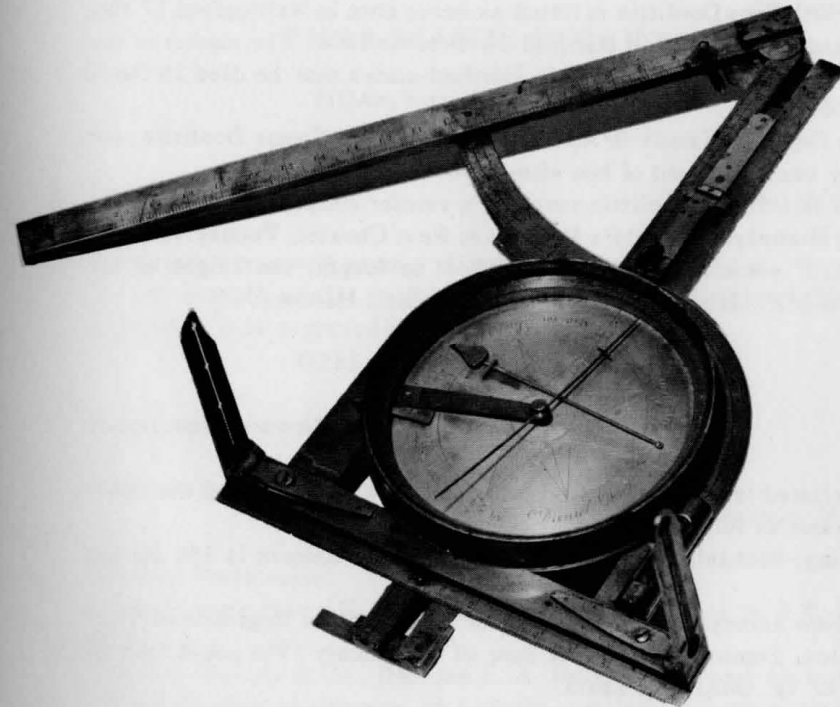
"Daniel Dod, son of Lebbus, was like his father, a man of rare mathematical and mechanical genius. The sketch of his life given below is by his relative, John Dod Ward of Jersey City.

Daniel Dod was born 8 September 1778 in the northern part of Virginia; his parents were, however, natives of Newark, New Jersey. The family returned to New Jersey during his early youth, and fixed their residence in Mendham, Morris County, where Daniel was bred, by his father, to the business of clock and watch maker, mathematical instrument maker and land surveyor; and in every vocation to which he directed his attention acquired superior skill.

Besides his extensive acquaintance with theoretical and practical mechanics, his mathematical acquirements were such, that when Queen's (now Rutgers) College, was resuscitated, it was proposed to offer him the mathematical chair.

He removed to Elizabethtown in 1812, when, at the desire of Col. Aaron Ogden, he commenced and carried on, for several years, the building of steamboat machinery, with such success, that boats at Kingston and Sacketts' Harbor on Lake Ontario -- Philadelphia -- Norfolk, Virginia -- Mobile, Alabama -- and New Orleans, were furnished with steam engines of his construction; and the steamship "Savannah", the first vessel which ever crossed the Atlantic by the aid of steam, was furnished with machinery designed and principally constructed by him at his works; though some of the heaviest wrought iron work was made at Speedwell, near Morristown, by Stephen Vail, and some of the heavier iron castings were made in New York.

He was killed by the bursting of a boiler, on board the steamboat "Patent", in the East River on 9 May 1823."



Daniel Dod (1778-1823)

Mendham, New Jersey

This unusual Surveyor's Compass was found on the Upper Sweetwater River by Lieut. J.G. Reeves in 1862 while scouting for hostile Indians. Now in the Ft. Laramie National Monument in Ft. Laramie, Wyoming. Photograph courtesy National Park Service, Mid West Region, Omaha, Nebraska

JAMES DOOLITTLE

Pages 37 and 38 (q.v.)

Hartford, Connecticut

He took over his father's (Enos Doolittle) business in 1802 (Hoopes, page 66) and is listed in 1839 as Bell Founder in the Hartford directory.

James married Sarah Parsons of Hartford 13 June 1809. She died 1 May 1874 and is buried in Old North Cemetery along with four children (1814-1827).

"Doolittle Family in America" (Wm. F. Doolittle, Cleveland, Ohio, 1901-1908) Enos Doolittle is listed as being born in Wallingford 17 May 1751, and having died in Hartford 26 October 1804. The marker in the Center Church Burying Ground in Hartford states that he died 26 October 1806.

"The Doolittle Family in America" does not list James Doolittle, nor can any trace be found of him after 1840.

There is a James Doolittle surveyor's vernier compass in the Chester County Historical Society's Museum in West Chester, Pennsylvania. It is 14-1/2" overall, the needle is 5-3/4" in length, the height of the sights 6-1/2". It is engraved "James Doolittle Hartford."

MICHAEL DOWLING (1790 - 1853)

Newark, New Jersey

He is listed in the Newark directories from 1842-1843 through the 1849-1850 issue as follows:

Dowling, Michael, math instrument maker, one address is 158 Market Street.

The New Jersey State Department of Health, State Registrar of Vital Statistics, Trenton, N. J. under date of 24 January 1966 could find no record of Mr. Dowling's death.

The Mt. Pleasant Cemetery Co., Newark, N.J. in letters dated 13 and 17 September 1965 state that Michael Dowling was interred in single grave 16 May 1853 and that he was 63 years old at the time of his death.

There is privately owned in Monticello, Arkansas a surveyor's vernier compass engraved M. Dowling, Newark, New Jersey. It is 14" overall, has a 5-3/4" needle and 6-3/4" sights.

CLEMENT DUHAMEL (1818 -)

New Orleans, Louisiana

According to the 1870 Federal census of New Orleans C. Duhamel 52 years of age was born in France (about 1818). He was an optician at

111 Canal Street. He is listed in the New Orleans directories from 1850 to 1886 as an optician.

On page I, 1875 New Orleans directory he advertised:

C. Duhamel Optician and Manufacturer of Surveying Instruments, Spectacles, Glasses of all kinds, scientifically adjusted to fit weak eyes, Optical, Mathematical and Scientific Instruments. No. 111 Canal Street, next to Bank of America.

There is privately owned in Urbana, Illinois a surveyor's vernier compass. It is 14" overall, with a 4-3/4" needle. It is engraved C. Duhamel New Orleans.

EWIN & HEARTTE (1833 - 1836)

William Ewin (- 1886)

Isaac T. Heartte (1785 - 1836)

Page 45 (q.v.)

Baltimore, Maryland

There is a surveyor's vernier compass, privately owned at ? It is 16" overall, needle is 5-13/16" long, height of sights 6-3/4" .2 level vials. It is engraved Ewin & Heartte Baltimore.

HERMAN E. FESSEL

Chicago, Illinois

Chicago Directories:

1858, Fessel, Henry E. math inst maker, 132 S. Water, h. 5 W. Washington.

1859-60. Fessel & Co., (Herman E. & Julius Wickesser) locksmiths. 1859 (adv) Fessel, Herman, 66 LaSalle, repairer of mathematical and philosophical instruments.

1864, Fessel, Henry E., sewing machine repairer 85 West Randolph. 1865-66, Fessel, Herman E., (H.E. Fessel & Co., H.E.F. & Thaddeus S. Reeve) Machinists.

1868-69, Fessel, Herman E. machinist and model maker, 72 W. Randolph.

1870, Fessel, H. E., broommaker 71 W. Randolph, r. 71 W. Randolph. There is a dumpy level in Cambridge, Massachusetts engraved: E. H. Fessel Maker Chicago.

ADOLF FRESE CORPORATION (1904-C)

Adolf Frese (1861 - 1914)
Arthur Frese (1887 - 1945)

Los Angeles, California

Adolf Frese was born at Barmen, Germany 21 June 1861. He came to the United States as a child and became a citizen 25 October 1887. He died 8 March 1914 at Los Angeles.

Arthur Frese was born at Rochester, New York 20 August 1887. He died 10 October 1945.

The Frese Optical Company, jobbers for optical instruments and supplies and manufacturers of engineering instruments was established in 1891 in Los Angeles. Incorporation took place March 23, 1904 under the name of Adolf Frese Corporation. The Corporation discontinued the manufacture of engineering equipment about 1925.

There is an 18" Wye Level, Serial 843 engraved Frese 843 Los Angeles in the Gurley Museum.

LOUIS FRIGERIO, JR. (1825 - 1875)

New Orleans, Louisiana

Louis Frigerio was listed in the New Orleans directories from 1858 through 1875 as a nautical and optical instrument maker. In 1881 he is listed: Frigerio, Louis, nautical and mathematical instrument maker, 50 Chartres. After this line is the following: Frigerio, Mrs. Catherine 283 Bayou Road. In 1875 Mr. Frigerio was living at 283 Bayou Road, Mrs. Frigerio continues to be listed through 1904 as optician at various addresses, in 1904 at 1015 Canal. It is believed that after Mr. Frigerio's death on 25 May 1875, Mrs. Frigerio was the proprietor until 1904.

A surveyor's vernier compass engraved: "Louis Frigerio Jr. New Orleans" is privately owned in Austin, Texas. It is 14-1/2" overall, length of needle 5-7/8", 2 level vials, the sights are missing.

References:

Correspondence with Miss Mary Kay Burns, Head, and staff Louisiana Division, New Orleans Public Library, New Orleans, Louisiana and the dimensions of the instrument from the owner of the compass.

BENJAMIN CLARK GILMAN (1763 - 1835)

Exeter, New Hampshire

He was born at Exeter 8 July 1763, the son of Major John and Jane Deane Gilman. He married Mary Thing Gilman, his cousin in 1788. He

died at Exeter on 13 October 1835. He was the 7th generation in America.

In September 1943 issue of "Antiques" is an excellent article concerning Benjamin C. Gilman entitled, "An Ingenious Yankee Craftsman" by Frank O. Spinney.

In the New Hampshire Historical Society's Museum is a paper compass card 5" in diameter on which is printed B. C. GILMAN. EXETER, NEW HAM^P.

References:

"Antiques" September 1943.

A Genealogical and Biographical Record of that branch of the family of Gilman, descended from the Honorable Counsellor John Gilman of Exeter, N. H. with which is incorporated some account of his ancestors and the English Branch of the Gilman family. Albany: Compiled by Arthur Gilman. Printed for the use of the family by J. Munsell, 1863.

JOHN GOWANS (1832 - 1882)

Jersey City, New Jersey
New York City

He was born in Scotland in 1832.

He is listed in 1858 as a watchmaker in the New York City Directory. From 1862 through 1871 he is listed as a watchmaker in the Jersey City, New Jersey directories, of the firm of Blunt & Co. in New York City directories from 1868 through 1872. The New York City directories from 1876 to 1882 list him as watches and jewelry in alternate years.

He died at New York City 6 August 1882.

HANS EDGAR GRABAU

New York City

Hans Edgar Grabau is listed in the New York City directories from 1892 to 1904 as a math. inst. mkr. He lived in Hoboken, from 1895 to 1904.

A transit engraved H. E. Grabau Maker N. Y. No. 109 was serviced in Baltimore in 1966. The Limb was 6-1/4" diameter.

Correspondence with Mr. K. B. Dedier, Baltimore, Maryland.

GEORGE B. GRAVES (1792 - 1873)

Winchester, Virginia

George B. Graves was born in Loudoun County June 1792.

"Amemorandum of articles belonging to the estate of Goldsmith Chand-lee deceased, sold the 10th day of the 4th month 1821, 66 items were purchased by George Graves for the sum of \$268.94-3/4 or 17% of the total sale of \$1607.48-3/4", pages 110 - 117, Six Quaker Clock Makers by E. E. Chandlee."

It is believed that the above George Graves was George B. Graves and that he made a portion of his vernier compasses from some of the parts bought at this sale.

The compass cover is engraved Wm. S. Marye Hillside Page Co. Va. William Staige Marye is buried in a small family graveyard about three miles from Luray, Virginia. The Marker at the grave is inscribed W. S. Marye Died Dec. 21 1895 age 54 years. Mr. Marye was a carpenter and a surveyor. Assuming that he was at least twenty five years old when he bought the compass, then it could be assumed that this particular compass was made about 1860.

The George B. Graves vernier compass in the Gurley Museum of Surveying Instruments is the gift of Mr. Cecil E. Hanson of Pasadena, California.

It is 14-13/16" overall, length of needle 5-7/8", one level vial, out-keeper 0 - 16, sights are 6-1/2" in height.

Mr. Graves died near Winchester 29 January 1873.

References:

Correspondence with Mrs. Lucy R. Hardesty of Berryville, Virginia, Mrs. Elizabeth K. Fox and Mr. Robert D. Huffman of Luray, Virginia.

JAMES GREEN (1817 - 1896)

Pages 52 and 53 (q.v.)

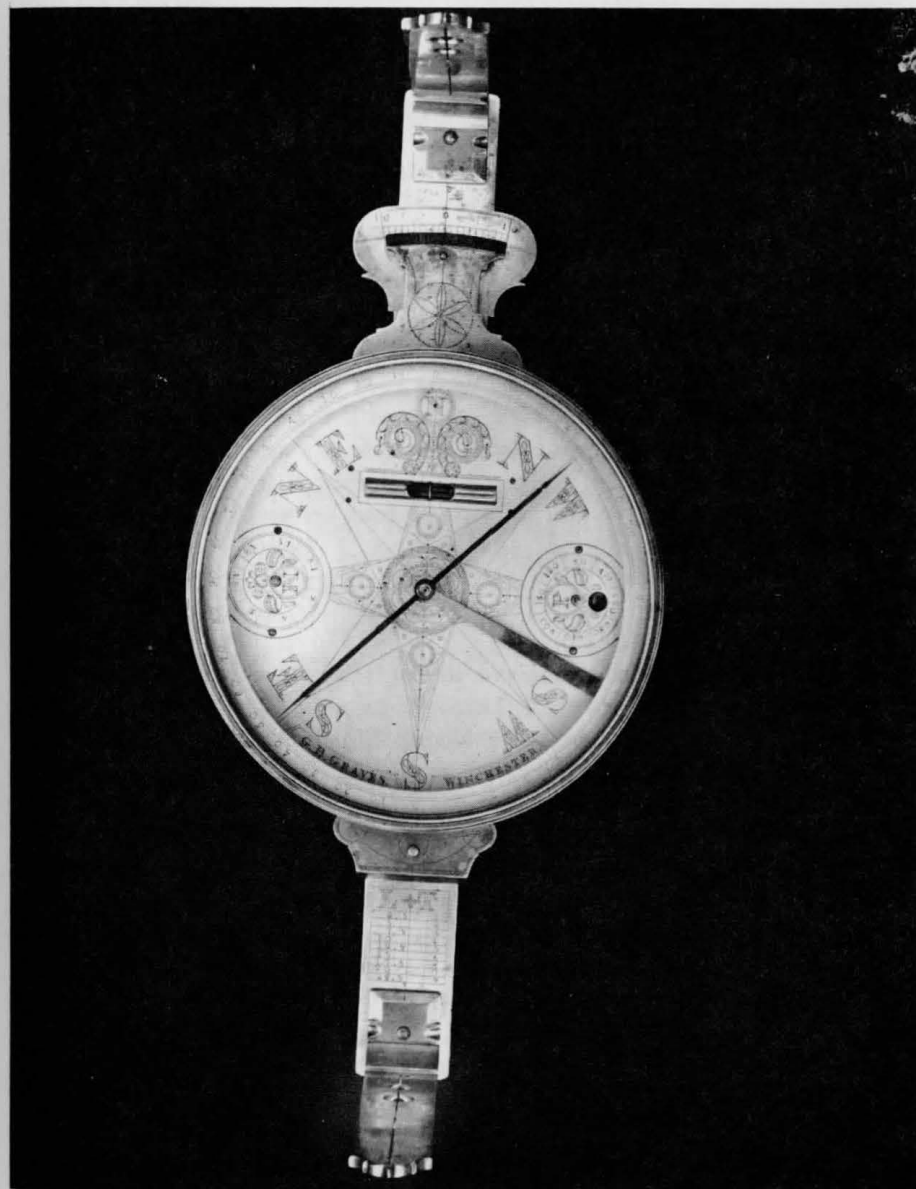
Baltimore, Maryland
New York City

James Green, the son of Samuel and Sarah Green was born at London, England in 1817. He was in the United States 72 years and in New York City 46 years. He died at New York City 12 June 1896.

THOMAS GREENOUGH, JR. (1738 - 1775)

Page 57 (q.v.)

Thomas Greenough, Jr. died at Westford, Massachusetts, 11 August 1775.



www.compleatsurveyor.com

George B. Graves Surveyor's Vernier Compass

WILLIAM THEODORE GREGG SR. (1817 - 1887)

New York City
Brooklyn, N.Y.
Norwich, N.Y.

WILLIAM THEODORE GREGG JR. (1850 - 1916)

New York City

William Theodore Gregg, Sr. was born in Buttevant, Ireland 2 July 1817. He came to the United States in 1818 with his parents, Richard and Catherine Gregg. He was left an orphan at an early age.

He is listed as a partner of Gregg and Rupp in the New York City directories from 1844 to 1853. In August 1846 he married Betsy Smith in Norwich. On March 20, 1857 he united with the First Congregational Church in Norwich and was dismissed from this church in 1862 to the Reformed Protestant Dutch Church in Herkimer, New York.

It is assumed that he was in Norwich from before 1857 to 1862. The New York State directory of 1859 lists W. T. Gregg mathematical instrument maker, living in Norwich. There is privately owned in Perth Amboy, New Jersey, a surveyor's plain compass in mint condition. It is engraved W.T. Gregg Norwich, N.Y. It is 15" overall, with a 5" needle.

He and his wife were received in the Herkimer church on April 18, 1863 and dismissed on July 2, 1865. He is said to have worked in an arms factory during this period, probably the Remington Arms Company in Ilion, which is three miles from Herkimer. His home was a station for the "Underground Railroad".

From May 1, 1866 to May 1, 1887 he is listed in both the Brooklyn and New York City directories as a mathematical instrument maker. During this period he lived in Brooklyn where "He had a small observatory with a powerful telescope. He had a wide reputation with noted astronomers for the fine brass work that he made for their instruments."

He died at Brooklyn 29 November 1887. He is buried in Green-Wood cemetery in Brooklyn. His son, also, William Theodore Gregg was born at Brooklyn 3 October 1850. He was associated with his father under the name of Gregg & Son from 1873 to 1891 when he went to Yonkers, N.Y. where he was engaged in the real estate and insurance business. He died 8 March 1916 and is buried in the Oakland cemetery in Yonkers.

References:

Directories of Brooklyn, New York City, Yonkers, New York and New York State.

Correspondence with Mrs. Katherine B. Lauderdale, Miss Marion Fennell, Miss Laura Wedge, Miss Louise W. Turpin, Mr. C. R. Carter, Mr. Denis B. O'Sullivan, Mr. Forest L. Decker and Mr. Charles E. Crandall.

BENJAMIN KING HAGGER (1769 - 1834)

Page 64 (q.v.)

Boston, Massachusetts
Baltimore, Maryland

A brass surveyor's plain compass is privately owned in New York State.

It is 15-1/2" overall, the length of the vertical needle is 5-3/8", the outkeeper registers from 0 to 16, the sights are 7-1/4" in height. It is engraved "Hagger Baltimore." It is assumed that Benjamin K. Hagger made the compass.

WILLIAM HART (1734 - 1812)

Page 79 (q.v.)

Portsmouth, New Hampshire

"William Hart, late mathematical and instrument maker of this town, died 13 January 1812 aged 78. He is buried in North Cemetery".

The above sentences are found on page 20 of the book, whose title is "Portsmouth and Newcastle, New Hampshire, Cemetery Inscriptions. Abstracts from two thousand of the Oldest Tombstones by Arthur Horton Locke". The book was privately published by Mr. Locke in 1907 at Portsmouth.

ALBERT ALFRED GROSSMANN (1885 - 1965)

St. Paul, Minnesota

Albert A. Grossmann, son of Robert and Louise Grossmann was born at Berlin, Germany 8 June 1885.

He came to St. Paul in 1891 and with the exception of being in Milwaukee for six years, he spent the rest of his life in St. Paul.

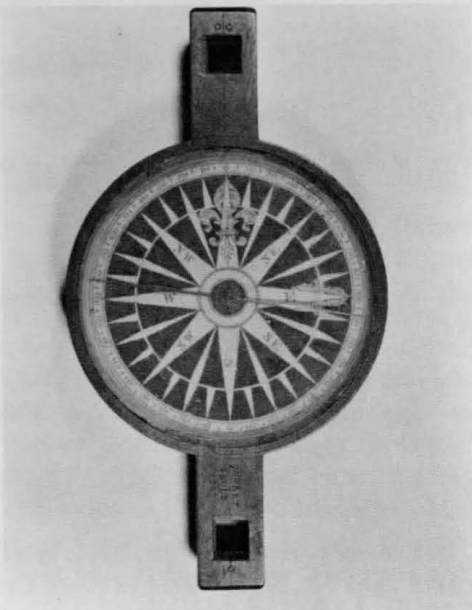
He served his apprenticeship with Arnold Kuhlo, page 99 (q.v.) and was employed by David White Instrument Co., page 164 (q.v.) for several years.

Mr. Grossmann founded the Grossmann Instrument Works in 1912, retiring in 1952; during the years he made a number of transits, some of which are now located in St. Paul and the vicinity.

He invented the Grossmann TRU-LINE-SCOPE and sold thousands of them, he made them in lots of 500 at a time. He did a great deal of work for the government and during World War II received a citation for his excellent work.

References:

Correspondence with his daughter, Mrs. June M. Peterson, Mr. Cecil E. Hanson, Mr. Robert E. Hoag, The St. Paul Public Library and St. Paul directories in the New York State Library at Albany, New York.



William Hart (1734 - 1812) Fecit 1809 Portsmouth, New Hampshire
 Surveyor's Plain Compass (Wood) No sights. In the New Hampshire
 Historical Society's collection, Concord, New Hampshire
 Photograph courtesy Charles S. Parsons, Goffstown, New Hampshire

HEER & SEELIG (1884 - 1892)
 Peter Heer (1857 - 1838)
 Roman Seelig (1848 - 1924)

Page 80 (q.v.) Chicago, Illinois

PETER HEER (1892 - 1896)
 Peter Heer (1857 - 1938)

Page 80 (q.v.) Chicago, Illinois

The Gurley Museum has an 18" Wye Level. It is engraved Peter Heer
 Chicago Serial 130.

PETER HEER & CO. (1896 - 1906)
 Peter Heer (1857 - 1938)

Page 80 (q.v.) Chicago, Illinois

JOHN HEILIG (1765 - 1841)

Germantown, Pennsylvania

John Heilig, the grandson of Hendrick Heilig who came from Hanover, Germany in 1720, was born at Germantown 4 March 1765 and died there 7 April 1841. He was buried in St. Michael's Evangelical Lutheran Church Yard on April 9, Good Friday, 1841.

In 1841 Germantown was a separate town in Philadelphia County. Hendrick Heilig was an uncle by marriage to David Rittenhouse. John Heilig was a clock maker and silversmith and was the first silversmith in Germantown.

There is privately owned in Pennsylvania a surveyor's vernier compass. It is engraved John Heilig Germantown. It has an elaborately engraved dial. It is 16" overall, with a 5-7/8" needle.

FRANK HEITZLER (1904 - 1905)

HEITZLER INSTRUMENT CO. (1910 - 1912)

Frank Heitzler (-)

Denver, Colorado

Frank Heitzler is first listed in the June 1, 1904 Denver directory Heitzler, Frank, Engineering Instruments. 734 - 19th
 From June 1, 1906 to June 1, 1910 he is listed

WEISS & HEITZLER

mfrs. surveying instruments 734 - 19th

In 1911 and 1912 he is listed

HEITZLER INSTRUMENT CO. (Frank Heitzler) mfrs. surveying instruments. 734 - 19th

THE HEISELY FAMILY

Frederick (1759 - 1843) Lancaster, Pennsylvania
 George Jacob (1789 - 1880) Fredericktown, Maryland
 Frederick Augustus (1792 - 1875) Harrisburg, Pennsylvania
 Pittsburgh, Pennsylvania

Frederick Heisely

Frederick Heisely, the son of Frederick and Mary Gardner Heisely was born in Lancaster County, Pennsylvania, 17 October 1759.¹ He enlisted in Captain Jos. Howell's Company, 2nd Pa. Regiment, Colonel

Stewart in command, 9 September 1778, and was in service during the Jersey campaign of 1778. On the roll of Captain Howell's Company, there bears the remark opposite his name, "on command Philadelphia"²

It is assumed that when he was discharged from the Army, he became an apprentice of George Hoff of Lancaster. He married Catharine Juliana Hoff, daughter of George and Justina Margareta Schneitzel Hoff, 6 November 1783³ and moved to Frederick, Maryland. While there he made the town clock.

"In 1807 the old town clock of Frederick Town was placed in the tower from which it marked the hours in loud tones. It was made in Frederick by Frederick Heisely".⁴ The tower clock is now in the Smithsonian Institution.

His two sons were born at Frederick: George Jacob, 29 November 1789,⁵ and Frederick Augustus, 3 July 1792.⁶

In 1793 the Heisely family moved back to Lancaster, Frederick becoming a partner of his father-in-law George Hoff, for about eight years, making surveyor's instruments, land compasses and projectors.³

About 1811, the family moved to Harrisburg. Frederick became a prominent citizen of Harrisburg, being Treasurer of Dauphin County from 1827 to 1829. He was in business with his son George J. from 1811 until Frederick retired.⁶

He first bought property in Harrisburg in 1817.⁷ He is only listed in the 1839 Harrisburg Directory, living with George J. at 2nd and Chestnut Streets.⁶

There are two known compasses made by Frederick while he was in Fredericktown, Maryland: one is in the Ohio State Museum, Columbus, Ohio; the other is privately owned in Perth Amboy, New Jersey. They are engraved F. Heisely Fredktown. In the David Rittenhouse Room at the Audubon and Wildlife Sanctuary in Audubon, Pennsylvania, there is a surveyor's plain compass engraved: F. Heisely Harrisburg⁹. The Henry Ford Museum in Dearborn, Michigan has a surveyor's plain compass engraved: Heisely & Son Harrisburg.¹⁰

Frederick Heisely died 12 March 1843 and is interred in the Harrisburg Cemetery.¹¹

George Jacob Heisely

There is a hiatus in the history of the Heisely family from 1801 to 1811. However, it is assumed that George was an apprentice of his father because the firm of Heisely & Son was established in Harrisburg about 1811.

George Jacob Heisely, who had been a member of the Maryland Militia before coming to Harrisburg, joined the Harrisburg Volunteers, Captain Walker's Company, First Regiment, First Brigade, Pennsylvania Militia, 29 August 1814. On the roster of this Company are the names of Ferdinand

and George Durang. The Company marched to the defense of Baltimore. After the bombardment of Fort McHenry on the thirteenth and fourteenth of September, 1814, Francis Scott Key wrote "The Star Spangled Banner". According to a legend in the Heisely family, a copy of the verses reached the Pennsylvania Militia.

The Durang brothers who were actors and singers asked Heisely, a flute player, to set the verses to music. He played through his "tune book" and they chose the tune of "To Anacreon in Heaven". The Militia Company went to Baltimore a few days later and the Durang brothers sang this anthem on the stage of the Holliday Street Theatre.⁵ It is now our National Anthem.⁶

George J. Heisely was discharged from the service of the United States at Baltimore, 5 December 1814. He was also in Captain Charles Carson's Company of Home Guards when Pennsylvania was invaded by General Lee's army in 1863.⁶

George H. Eckhardt in the 1955 edition of his book "Pennsylvania Clocks and Clockmakers, Page 214, states "The town clock in Waynesburg, Greene County, Pennsylvania was made by George J. Heisely". However, this clock suffered the same fate as did his father's town clock in Frederick, Maryland: it was replaced by a clock made in New York City in 1926 and again modernized in 1952.¹²

George J. is listed in the Harrisburg directories from 1839 to 1880.⁸ He first bought property in Harrisburg in 1831.⁷

At Camp Martius in Marietta, Ohio is a surveyor's plain compass engraved: G. Heisely Harrisburg.¹³

George Jacob Heisely died at Harrisburg, 27 June 1880, and is interred in the Harrisburg cemetery.¹¹

Frederick Augustus Heisely

The first knowledge of Frederick A. Heisely is obtained from a certificate that states that he was drafted in the Maryland Militia in 1814.

In the files of the General Services Administration, National Archives and Records Services in Washington, D.C., are the following:

1. Treasury Department
Third Auditor's Office Nov. 12, 1842

Upon examination of the Muster Rolls of Captain Huston and Green's Company of Maryland Militia, it appears that Frederick A. Heisely entered the service on the 23rd July 1814 as a Private and on the Rolls up to 13 October 1814 he is remarked, "on furlough since 27 Sept. 1814". No evidence appears of his having been wounded.

Peter Hagner Aud

Pension Office
War Dept.

2. Frederick City Sept. 15, 1843

It is hereby certified that Frederick A. Heisely, a Private or Non-Commissioned Officer in the Company of Captain James F. Huston, of the First Regiment of Maryland Militia in the service of the United States, received a wound from a musket ball near the hipjoint on the 24th August 1814, while retreating before the British Army near to Blandensburg, Maryland. -- On the 30th of the same month I was called to visit him at his father's residence in this place and having made an unsuccessful effort to extract the ball, was under the necessity of healing the wound over it. The lodgment of the ball in the neighborhood of the joint has been a source of great inconvenience; and at times of suffering ever since. -- He having removed to Pennsylvania, I have not seen him for many years, but have been informed that his decrepitude increases as he advances in years.

Wm. Tyler, M.D.

also

declares he was a Sergeant in the Company commanded by Captain James F. Houston in the First Regiment of Maryland Drafts commanded by Col. John Ragan in the war with Great Britain, declared by the United States, on the 18th day of June 1812. That he was drafted at Fredericktown in the State of Maryland on or about the month of April or May 1814 (the exact time not recollected) for the term of six months and continued in actual service in said war for the term of six months and was Honorably Discharged at Annapolis on or about the third day of January 1815 or as will appear by his original Certificate of Discharge as on file in the Pension Office.

It is assumed that Frederick A. served an apprenticeship with his father. That F.A. made surveyor's compasses is evidenced by the fact that there are two surveyor's plain compasses; one in the Gurley Museum and one in the Blair County Historical Society Museum in Altoona, Pennsylvania.¹⁴ They are both engraved:

F.A. Heisely

Harrisburg

To date (1967), none have been found that he made in Pittsburgh. It is believed that F.A. left Harrisburg in 1836 because he sold his property in that town that year having purchased it in 1826.⁷

He is first listed in the 1837 Pittsburgh Directory. He has an advertisement in that Directory which illustrates a surveyor's compass stating that he also makes clocks and watches. The 1839 Directory lists:

Heisely, F.A., Watch and Instrument Mfg., 6 St. Clair, bet. Penn. and Liberty.

From 1844 on, he is listed intermittently until 1872-3 when the listings cease.¹⁵ His name is among the first to be recorded of the members of the First Lutheran Church of Pittsburgh as he was elected an Elder of the congregation on the date of its organization 15 January 1837.¹⁶

As noted, he received a pension of \$8.00 per month. The certificate was issued 7 February 1844.

Frederick Augustus Heisely died 21 May 1875. He is interred in the Allegheny Cemetery in Pittsburgh.¹⁷

2679.

Pennsylvania Pittsburgh Roll

Frederick A. Heisely
Private

Captain Houston's company of the Maryland Militia

Ratio of disability, total

Date of discharge,

Time of obtaining the testimony,

Enrolled on the Roll of Pittsburgh

at \$ — Dollars per month, to commence on
1st February 1844

Certificate of Pension issued the 7th of Feb.
1844 and sent to Hon. A.
Ramsay, Secy of Refugees & Invalids

Arrears to 1st of March 1844 5.06

Federal all as ending 1st Sep. 48.00

\$53.06

Issued the 24th April 1846
Revd. Book 244. 2. p. 131

www.compleatsurveyor.com

References:

1. Mrs. C.E.C. Smith, D.A.R. Admittance Paper 1905.
2. General Services Administration September 9, 1778.
3. D.F. Magee, Grandfather's Clocks, Lancaster County Historical Society, April 6, 1917.
4. History of Frederick County, Maryland, P. 174, by T.J.C. Williams and Folger McKinsey, L.R. Titsworth & Co., 1910. C. Burr Artz Library, Frederick, Maryland, by Josephine P. Etchinson, Administrator.
5. History of Dauphin County, Pennsylvania by Luther Reily Kelker, Custodian of Division of Public Records of Pennsylvania. The Lewis Publishing Company 1907, New York, Chicago.
6. History of the Counties of Dauphin and Lebanon in the Commonwealth of Pennsylvania by William Henry Egle, M.D., M.A., Philadelphia. Evarts & Peck 1883.
7. Dauphin County Courthouse Records.
8. The Harrisburg Directories beginning in 1839, then 1842, 1843, 1845. There are copies in the Pennsylvania State Library in Harrisburg. The Dauphin County Historical Society have the 1864, 1869, 1874-5 issues. The New York State Library in Albany has the 1880 issue. All these were consulted.
9. Correspondence with Mr. J. d'Arcy Northwood, Curator, Audubon Shrine and Wildlife Sanctuary, Audubon, Pennsylvania. 15 October, 1960.
10. Correspondence with Mr. Frank Davis, Curator of Communication, The Henry Ford Museum, Dearborn, Michigan. 29 March 1965.
11. Harrisburg Cemetery Association Records.
12. Correspondence (1965) with the Commissioners of Greene County, Waynesburg, Pennsylvania.
13. Correspondence with Mr. Donald A. Hutsler, Assistant Curator, The Ohio Historical Society, The Ohio State Museum, Columbus, Ohio. 14 December 1964.
14. Correspondence with Mr. J.J. Hauser, Secretary, Blair County Historical Society, Altoona, Pennsylvania. 25 April 1959.
15. Correspondence with Miss Dorothy English, Librarian, Pennsylvania Division, Carnegie Library of Pittsburgh. 18 February and 1 March 1963. Pittsburgh Directories. Notation of his pension, church affiliation, and obituary in the Pittsburgh Gazette of 22 May 1875.
16. Correspondence with Miss Mary Elizabeth Hamilton, Secretary, The First Lutheran Church, Pittsburgh. 3 May 1963.
17. Allegheny Cemetery (Pittsburgh) Records.

I wish to thank the persons mentioned above for their assistance in making this history possible. Also, Miss Cornelia F. Tillman, Curator, The Historical Society of Dauphin County; Mrs. Helen S. Snyder, Miss Mildred Spangler of the Harrisburg Public Library, Mrs. Richard J. Miller, great-great-granddaughter of George J. Heisely, Mr. Harry Sanders of the Harrisburg Cemetery Association, Mrs. Helen Walton, Secretary, Zion Lutheran Church, Mr. Donald H. Kent, staff, Pennsylvania Historical and Museum Commission, all of Harrisburg, Mr. Edward R. Dax, Librarian, Lancaster Free Public Library, Lancaster, and Mr. Frederick O. Lyter, Deland, Fla.

The author has photographs of the compasses made by Frederick Heisely. Fredericktown and Harrisburg, G. Heisely, Harrisburg, F.A. Heisely, Harrisburg, Heisely & Son, Harrisburg (2).

HEWITT & SON (1850 - 1853)

New York City

Thomas Hewitt

Horatio T. Hewitt (1825 -)

Thomas Hewitt is first listed in the 1841-42 New York City directory as a cabinet maker, 552 Broadway, h. 21 Vandam. He continues to the 1848-49 edition listed as a bedstead manufacturer. In the 1849-50 edition he is listed as a cabinet maker, 160 Duane.

The 1850-51 and the 1852-53 editions of the New York City directories lists Hewitt & Son, nautical inst makers, 180 Water, h. Newark. The 1854-55 lists Hewitt, H.T. nautical instruments, 180 Water h. Brooklyn. May 1, 1856 lists Hewitt, H.T. chronometers, 180 Water, Hewitt, Thomas h. England. May 1, 1857 is the same except, Hewitt, Thomas h. London.

The 1858 Brooklyn directory lists, Hewitt, H.T. naut and math instrument maker, Green Ave n Carlton. The May 1, 1862 New York City directory lists Hewitt, Horatio T. chronometers, 180 Water, h. Green Ave., Brooklyn.

Newark, New Jersey directories list from 1863 to May 1, 1892 Horatio T. Hewitt chronometers. From 1876 he is listed at 104 N. Seventh.

The June 1, 1880 Federal Census of Newark list Hewitt, Horatio T. 104 North Seventh Street, Age 55. Place of birth England. The place of death and date have not been found.

There is privately owned in Connecticut a surveyor's vernier compass engraved Hewitt & Son New York. It is 15-3/4" long, 5-3/4" needle, sights are 7-3/4" in height and there are two level vials.

JOHN HOFF (1776 - 1819)

Lancaster, Pennsylvania

John Hoff, son of George and Justine Margarett Schneitzel Hoff was born at Lancaster in 1776. He was in business with his father for many years, but for a period in 1800 he ran a business for himself as a clock and watchmaker. When George Hoff died in 1816 he bequeathed all the tools of his clockmaking business to his son John at a valuation of thirty-four pounds, the balance of his estate to his six children.

John became active and prominent in Lancaster's business and public affairs and was the second cashier of the Farmer's Bank in Lancaster. He died in 1819.

There are two known surveyor's plain compasses made by John Hoff. The one in the Chester County Historical Society's Museum at West Chester, Pennsylvania is 14" overall, the needle 5-3/8" long, the sights are 5-3/8" in height. It is engraved John Hoff Lancaster. The other one at York, Pennsylvania is 13-13/16" overall, the needle is 5-3/8" long, there are no sights. It is engraved John Hoff Lancaster Pa. Both instruments have two level vials.

References:

Grandfathers' Clocks: Their Making and Their Makers in Lancaster County, Pennsylvania, read before the Lancaster County Historical Society by D.F. Magee on April 6, 1917. Vol. XLIII No. 5 Third Printing.

The dimensions of the John Hoff surveyor's compass in West Chester were obtained through the courtesy of John S. Watson, Assistant Registrar, The Hagley Museum, Wilmington, Delaware.

WILLIAM F. HOLSKE (1822 - 1881)

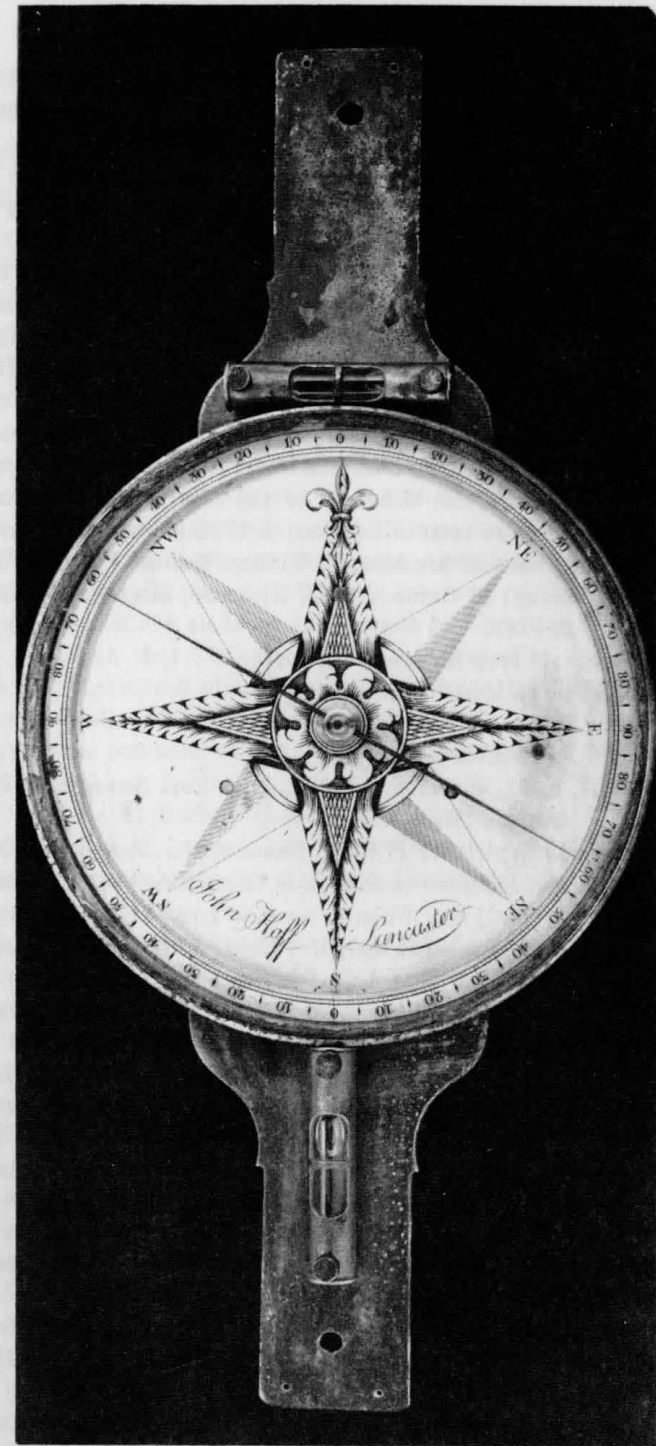
New York City

William Frederick Holske was born in Germany in 1822. He came to America in 1861 and is first listed in the May 1, 1861 New York City directory as: brass, h. 364 Ninth.

He continues to be listed in the New York City directories to 1880 as a model mkr., machinist and models at various addresses. The May 1, 1879 directory lists Holske Machine Co., 279 Cherry. The Brooklyn May 1, 1880 directory lists, Holske, William F., model maker, Park Row, New York City, h. 486 Herkimer St.

He died 17 May 1881 at Brooklyn.

There is privately owned at Pasadena, California a Holske Wye Level. It is 17" overall, and is engraved W.F. Holske 9 Chambers Str. New York. No New York directory has Mr. Holske listed at this address. Gurley repaired a Holske level, in 1886 that came from Mt. Carroll, Illinois.



John Hoff (1776 - 1819)

Lancaster, Pennsylvania
Surveyor's Plain Compass -- Owned in York, Pennsylvania

THE HURTIN FAMILY

The following is in part from "History of the Huguenot Emigration to America", by C. W. Baird D.D. Vol. 1, page 289, note 4.

Le Seur Guillaume Huertin, a member of the Huguenot family of La Rochelle, France, a Master in the King's Navy died on a voyage to the East Indies. He married Suzanne Crosset. They had a son:

1. Guillaume I, born in La Rochelle, died in New York City 1718, married at Bristol, England, 2 January 1678 to Elizabeth, widow of Jean Bertrand, mariner. He fled from France to England 1668-69 and in 1710-11 came to New York with wife and son, Guillaume, a lad of 11.
2. Guillaume II, born in Bristol, England, 12 November 1699, married 6 May 1727 in the German Lutheran Church in Broadway, New York City, Susanna Sibylle, daughter of the Rev. Joshua Kocherthal, deceased. She was born in London, in 1706. About the time of his marriage he changed his name to William Hurtin. He died in Newark, New Jersey, 27 October 1765. His wife, Susanna Sibylle also died there in 1785.

Their children all born in New York City:

Elizabeth, b. 18 March 1728.

Susane, b. 26 April 1729.

Charles, b. 5 February 1731.

3. William III, b. 21 November 1732; d. New York November 1799.

Louise, b. 6 July 1736.

Joshua, b. 24 September 1738; d. Newark, N.J. August 1780.

Christian Hurtin could have been born at either New York City or Newark, New Jersey, about 1743. When he went to live in Goshen, New York is not known though he married Margaret Gale before 1775 as their son, John Gale, was born about that time. Margaret was the daughter of Dr. John Gale, who was born in Goshen 18 August 1731, died there 21 September 1806. Dr. Gale's wife was Ann Jones, daughter of David Jones "late of Queens' County, N.Y." Both Dr. and Mrs. Gale mention their daughter, Margaret Gale Hurtin in their wills, made respectively, May 3, 1806 and October 25, 1803, probated October 13, 1806 and March 30, 1808. The date of Mrs. Hurtin's death has not been determined.

On the twenty sixth day September One Thousand Seven Hundred and Eighty Five, Christian Hurtin of the State of New York and Alexander Eagles of the County of Essex and State of New Jersey, gave bond as administrators of the estate of Susannah Hurtin, deceased. The signatures of Alexander Eagles and Christian Hurtin are plainly set forth on the administration documents. Christian Hurtin is in the 1790 Federal Census of Goshen.

Dr. George Barton Cutten in his book, "Silversmiths and Watchmakers of New York (outside of New York City)" privately printed in 1939, states that Christian Hurtin advertised in 1792 and 1793.

The History of Orange County (by E.M. Ruttenber and L.H. Clark, Philadelphia, 1881) state that St. James Episcopal Church in Goshen was organized March 27, 1801. Christian Hurtin was elected a vestryman at that time.

The Presbyterian Church of Goshen records, page 93, "Christian Hurtin died December 2, 1830, age 87 (Episcop)." John Gale Hurtin was a member of the Presbyterian Church, though probably his father was a communicant of St. James Episcopal Church.

The Independent Republican, published in Goshen, Orange County (N.Y.) Monday December 6, 1830, Vol. XVI No. 923 had the following in its obituary column:

OBITUARIES

On Tuesday evening, Mr. Christian Hurtin, of this village, aged about 86 years. The deceased was one of our most respectable citizens, extensively known as such. In his good old age, he has gone down to his grave "like as a stock of corn, fully ripe, cometh in its season."

There are privately owned in Virginia two surveyor's compasses, #8 made in 1788 and #39 made in 1811, made by Christian Hurtin-Goshen.

It is presumed that Christian Hurtin was buried in the Presbyterian Church Burying Ground which was located where the County Clerks' office now stands (1966). It was laid out in 1721. The remains of this cemetery were removed to Slate Hill Cemetery which was incorporated 8 October 1861.

Miss Gertrude A. Barber, Graveyard Inscriptions in Orange County, N.Y., 1930, Vol. II, page 1, gives the following report which no doubt supplies the reasons why the marker at Christian Hurtin's grave cannot be found:

'Slate Hill Cemetery, located to the rear and side of the Old Slate Hill Baptist Church, one of the oldest churches in Orange County. Services have not been held in this church for many years. The cemetery is in terrible condition, many of the stones are sunken into the ground. The town of Slate Hill was formerly known as Brookfield. Slate Hill Cemetery formerly known as Brookfield Cemetery.'

In addition to references found in the text other sources of information were obtained from correspondence with Mr. Harry H. Smith, Goshen, N.Y., William E. Drost, Elizabeth, New Jersey, Mr. Edwin A. Battison of Arlington, Virginia and a number of letters from Miss Elizabeth Horton, New Hampton, New York.

The following books were consulted: The Book of American Clocks, Brooks Palmer; Silversmiths of New Jersey, Carl M. Williams; The Book of Ghosts, Herbert D. and Francis R. Halsey.

The wills of William Hurtin of Newark, New Jersey and Christian Hurtin of Goshen and the letters of administration of Joshua Hurtin and Susanna Hurtin have been examined to substantiate certain parts of the text.

Balzac says that 'Historians are privileged liars,' so where the writer had the choice of selecting between different versions he has chosen the one that seemed most logical to him.

Charles E. Smart
February 6, 1966

Tuesday, January 15, 1793

Vol. IV. Numb. 208

THE GOSHEN REPOSITORY AND WEEKLY INTELLIGENCER

CHRISTIAN HURTIN

Clock and Watch-Maker

Returns his sincere thanks to his friends throughout the country, for all the kindnesses he has received from them and assures them that he will endeavor to merit a continuance of their favors, by a steady attention to his business, which they may rely on, he perfectly understands, notwithstanding, the ungenerous reports that have been industriously propagated by some inconsiderate people, whose aspersions are founded on envy, falsehood, ignorance and self-conceit and are so far from giving him any uneasiness that he only pities their weakness and despises their malice.

He requests the public in general, to remember that since the War, there has been a great many very bad Watches dispersed through the country and that they are commonly put to rougher usage by owners of them than their construction will bear and that the best of Watches from the smallest of the work will not bear much hard usage, and ought to be used with more care and tenderness than they usually are by those who carry them, Watches are often stopped by a sudden stamp of the foot, jumping off a horse, a hair getting in the work, and many other ways, which are scarcely observable by the bearers of them. Persons of judgment and consideration will not lay the blame on the Watchmaker who last repaired them when he does not deserve it.

If any Watches that have been repaired by me (and are well made) should not perform through any neglect or oversight of mine, by being returned within a year after, shall be carefully rectified gratis.

Goshen, January 15, 1792.

N.B. Surveying compasses made and repaired and the highest price given for old silver and brass.

LEVI HUTCHINS (1761 - 1855)

Concord, New Hampshire

Levi Hutchins, son of Gordon and Dorothy Stone Hutchins was born at Harvard, Massachusetts 17 August 1761.

Levi and his brother Abel were apprenticed to Simon Willard from 1783 to 1786. On completion of their apprenticeship they were given a grandfather's clock which they had made under the supervision of Mr. Willard.

Levi then went to Abington, Connecticut where he was employed for about eight months. He was in partnership with his brother Abel from 1786 to 1807 in Concord.

"The Autobiography of Levi Hutchins by his youngest son" (Charles Hutchins, Printer, of Cambridge, Massachusetts) printed by Riverside Press in 1865 was a privately printed edition. The autobiography states on page 184, Levi Hutchins "happily departed from this world on the 13th day of June 1855, aged 93 years, 9 months and 26 days".

There are no known existing surveyor's compasses made by Levi Hutchins.

References:

1. Antiques Magazine, July 1929, page 46, by Hazel E. Cummin. Correspondence and photograph from Charles S. Parsons, Goffstown, New Hampshire.

Levi Hutchins,
CLOCK-MAKER,
INFORMS his friends and the public,
that he has erected a shop, back of his
dwelling house, opposite Gale's tavern in Con-
cord, where he carries on the business of making
CLOCKS, of different kinds, and will always
be ready to attend to the applications of those
who may please to employ him. He will also
make Surveyors Compasses, and other Instru-
ments necessary for surveying.
All applications will be promptly
attended to, and every favour gratefully ac-
knowledged.
Concord, 12 mo. 4, 1804.

COURIER OF NEW HAMPSHIRE
19 December 1804
Photograph courtesy Charles S. Parsons

C. C. HUTCHINSON (1883 - 1940)

Charles C. Hutchinson (1832 - 1913)

Boston, Massachusetts

He was born at Boston 6 November 1832, the son of Henry and Lavinia Stevens Hutchinson.

He served his apprenticeship with Frederick W. Lincoln Jr. of Boston.

He is first listed in the Boston directory 1 July 1853 at 136 Commercial Street, the same address as Mr. Lincoln's.

In 1858 he became a partner and the firm became F. W. Lincoln Jr. & Co.

Mr. Hutchinson became the sole owner on 1 June 1883 and the name of the firm was changed to C. C. Hutchinson. The firm was listed as such from 1883 to 1940 in the Boston directories.

He died at Federal Point, Florida 13 March 1913 and is buried in the cemetery at Winthrop, Massachusetts.

In the Department of Civil Engineering, University of Utah, Salt Lake City, Utah is a transit whose telescope is missing. The compass card is engraved C.C. Hutchinson Boston, Mass. The length of the needle is 4", the diameter of the horizontal limb is 5.8".

EDMUND KANDLER ()

Chicago, Illinois

He is listed in the Chicago directories in 1894 and 1895 as a partner of Seelig and Kandler, makers of surveying instruments.

In 1896 he is listed in the Chicago directory as Kandler & Gaertner (Edmund Kandler and William Gaertner).

In 1897, 1898 and 1899 he is listed as a model maker.

In 1900 he is listed as Kandler & Co., model makers.

There is a Seelig and Kandler Chicago, transit No. 536 near Boston, Massachusetts

THOMAS KENDALL (1786 - 1831)

Oxford, Massachusetts
Millbury, Massachusetts
New Lebanon, New York

Thomas⁵, son of Rev. Thomas⁴ and Ruth Waters Kendall was born at Foxborough, Massachusetts 3 August 1786.

He learned the trade of blacksmith and machinist. He was the proprietor of the Oxford Central Manufacturing Company at Oxford which failed after a short existence. He then went to his father's farm at Millbury for recuperation and while there conceived the idea of making a cheap thermometer. Mr. Kendall invented a machine which graduated the scale of each instrument exactly to match the caliber. At the time of his death foreign manufacturers were almost out of business. He did not patent this machine but kept it a secret for many years, in fact until after his death.

In Thomas' *Massachusetts Spy or Worcester Gazette* of 25 February 1817, the following advertisement appeared:

"Thomas Kendall, Jr., Millbury, Mass., manufactures Thermometers of all kinds used by gentlemen, distillers, dyers, and those who make use of lead or oil in tempering steel. Also makes surveying compasses, scale protectors, spirit levels, and engraved mechanics' tools ----- goods forwarded by Post Riders.

THOMAS KENDALL, Jr."

He moved from Millbury to New Lebanon in June 1820, taking his father, the Rev. Thomas, whose wife Ruth had died in 1818, Thomas, Jr.'s second wife whom he had married in 1819, seven children, six by his first marriage and one by his second marriage.

Mr. G.F. Daniels in his history of Oxford states that Thomas, Jr. died 10 December 1831. The history of Millbury states that he died in Albany, N.Y. the same date and is buried in New Lebanon. To date (1967) his burial place has not been found by the writer.

At the junction of routes 20 and 22 at New Lebanon is the following marker:

KENDALL SHOP

First Thermometer made in the United States

Produced on this Site

State Education Department

1932

The KENDALL SHOP was built in 1833. It was continued by John Kendall, (b. 1810) and the family until 1892, the year that John died, when it was permanently closed.

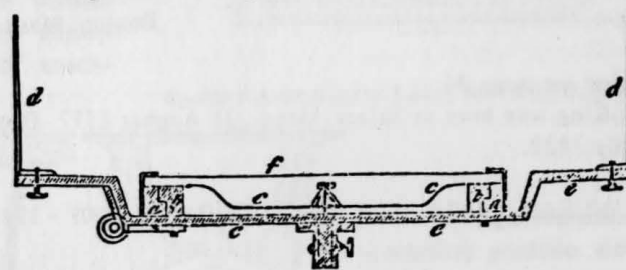
In The American Journal of Science and Arts, Vol. XIX — January 1831, conducted by Benjamin Silliman, M.D. LL.D. was the following article concerning "Notice of improvements in the Surveyor's Compass, constructed by Thomas Kendall, of New Lebanon, N.Y."

ART. XII.—*Notice of improvements in the Surveyor's Compass, constructed by THOMAS KENDALL, of New Lebanon, N. Y.*

THE object of the artist in the construction of this instrument has been to simplify and unite in one instrument, of moderate price, all that is necessary or convenient in common practice. The improvement, in the form of the needle, has been before the public more than twenty years, and is approved by all who have become acquainted with it. By giving it the form represented in the figure, the advantages of having the points of the needle in a line with the point of the pivot on which it rests, and of having the centre of gravity very low, are secured; the needle settles with more uniformity, and the vibrations of the lower part of the needle continue, and are plainly seen some time after the points are apparently at rest, giving the assurance that the needle is free and has settled correctly. Contrary to the theories and practice of many, Mr. Kendall has uniformly made his needles with their weight as far removed from the center as circumstances would admit, on the principle that attraction is according to the quantity of matter and acts on the needle as a lever, and experience has confirmed the correctness of this opinion. Needles on this plan have been frequently called for by those who were dissatisfied with their old needles, the weight of which was greater near the centre. For ascertaining correctly the variations in degrees and minutes, two limbs are united, one within the other; the outer limb is stationary, being secured fast to the bar of the compass, with a graduation upon it of twenty degrees each side of the meridian line; the inner limb, on the outside of which is a nonius graduation to five minutes, which comes in contact with the graduation on the outer limb, and on the inside, the usual graduation for the needle, the glass covers both limbs, protecting from the atmosphere and giving the nonius graduation the advantage of being silvered and retaining its whiteness. In this construction the advantage is gained of being assured that the centre of the limbs, centre of motion of the inner limb and needle, and the centre of the graduations are one and the same.*

A level is attached to the compass, and a graduation for taking altitudes, by which the practitioner, when his compass is level and fitted to his course, is enabled to take the level or angle of ascent or descent of any object in his course, from his station, without any additional machinery or adjustment; to effect this, two apertures are made for the eye in one of the sights, one at the top, for looking down hill, and one at the bottom, for looking up hill; these apertures are the centre of arches of which the other sight is a tangent, and there is a graduation on each side next to the eye to correspond with the degrees of the arches; by looking through the small aperture, the point of the graduated sight, in a line with the object, gives the true angle required.

The annexed figure, in connexion with the above description, will sufficiently explain the instrument. The artist is now making arrangements to be ready to execute orders at very short notice, for compasses containing all or parts of the improvements, as may be wanted. Also to graduate the sights of old compasses for taking altitudes.



The figure represents the compass as if dissected by a line through the centre. a outer stationary limb; b inner moveable limb; c needle; d sights; e bar of the compass; f glass.

* With a very little additional expense and variation, this instrument may be transformed into a Theodolite having two pairs of sights, one pair attached to the outer limbs, which is to be moveable and the inner limb stationary.

References:

- History of the Town of Oxford, Massachusetts with Genealogies and Notes On Persons and Estates by George F. Daniels. Oxford: Published by the Author with the co-operation of the Town. 1892. pp. 564, 565.
- Centennial History of the Town of Millbury, Massachusetts including Vital Statistics 1850 - 1896. Published under the direction of a Committee appointed by the Town. Millbury: 1915. pp. 443, 444.
- History of Columbia County, New York with Illustrations and Biographical Sketches of some of the Prominent Pioneers. Franklin Ellis Philadelphia: Everts and Ensign 1878.
- Vital Records of Foxborough, Massachusetts to the year 1850. Published by The New England Historic Genealogical Society at the charge of the Eddy Town-Record Fund. Boston, Mass. 1911.

KEUFFEL & ESSER CO. (1867-C)

Hoboken, New Jersey

W. J. D. Keuffel (1838 - 1908)

Hermann Esser (1845 - 1908)

Page 93 (q.v.)

Hermann Esser was born at Wuppertal-Elberfeld, Germany, 30 December 1845. He retired from Keuffel & Esser Company in 1902. He was back in Bad Godesberg am Rhein, Germany 23 April 1902. He died there 16 April 1908.

Correspondence with Mr. Ward H. Bolter, Hoboken, New Jersey.

GEDNEY KING (1777 - 1839)

Boston, Massachusetts

Correction for page 94:

Gedney King was born at Salem, Mass., 31 August 1777. Died at Boston 18 July 1839.

KINKEAD MANUFACTURING COMPANY (1907 - 1921)

Boston, Massachusetts

Richard Kinkead ()

K.M.C. were not makers of surveying instruments and they should not be included in this book, however, there are two reasons why they are included. First, sooner or later someone will write to the author, "I have just seen a Kinkead Mfg. Co.'s Architects Level. I do not find it listed in your book." Second, it is an unusual history of one business that was successful until electric motors replaced long lengths of shafting in many mills throughout the whole United States and many foreign lands.

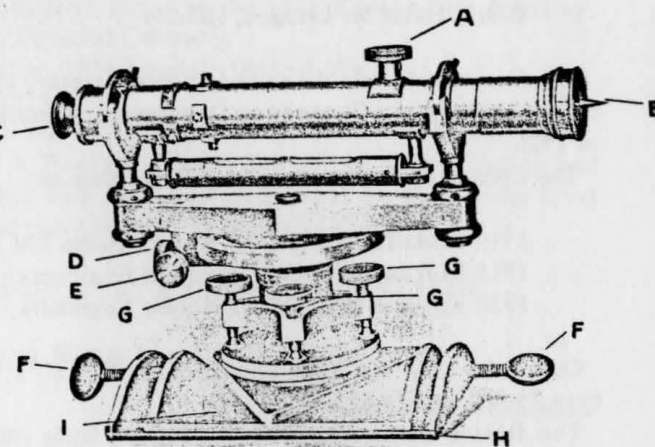
On October 29, 1901, Richard Kinkead, Lawrence, Massachusetts was granted patent No. 685455. "Instrument for hanging and lining up shafting."

On April 5, 1907 the Kinkead Manufacturing Company was incorporated under the laws of Massachusetts, first in Lawrence, Massachusetts, shortly afterwards it moved to Boston. The last meeting of the company was held in Boston January 17, 1921.

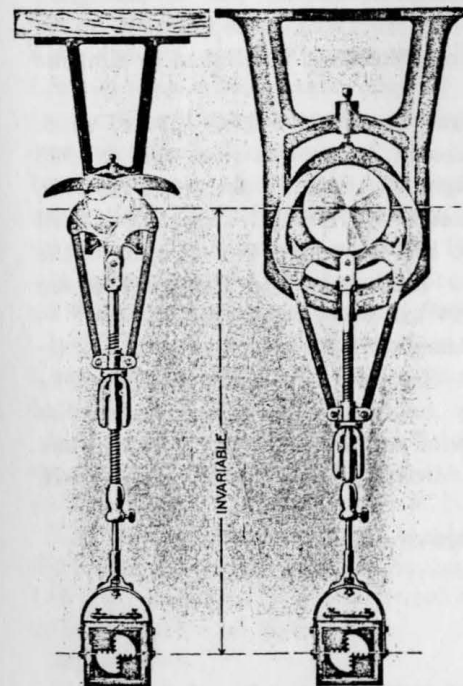
THE OUTFIT.

What is the Kinkead Method and Device?

THE Kinkead Device consists essentially of a special improved, guaranteed Engineer's Level, built especially for this work, with 11" telescope, 1 1/2" object glass, with specially fine ground lenses; three inch horizontal circle with vernier and patent adjustments and attachments.

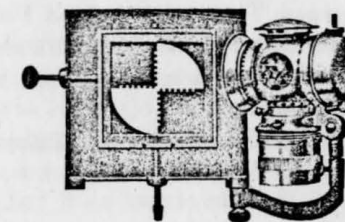


Special Architect's Level for Aligning Shafting



Portable Target Showing Compensating Adjustment

An improved patented self-centering portable shaft target with compensating adjustment which not only invariably finds the center of the shaft but remains invariable, irrespective of the change in size of shafting and the variations due to change in diameter.



Back Target

The officers and directors were at that time:

President, Archie C. Burnett, Waban
Treasurer, George W. Loggie, Lexington
Clerk, Hazel M. Bridges, Malden

The Corporation was dissolved by the Secretary of the Commonwealth of Massachusetts, Corporation Department, Boston, Chapter 213, Act of 1925.

The Company was listed in Boston directories:

1910 Kinkead Mfg. Co. 7 Water Room 308
1915 Kinkead Mfg. Co. Friction Engineers 141 Milk
1920 Kinkead Mfg. Co. Friction Engineers 45 High

Gurley in 1964 and 1966 serviced two K.M.C.'s Levels, Serial numbers 25,000 and 26,671.

The Boston directories had yielded so little information about the corporation that two friends in Boston were contacted. Mr. Loomis Patrick of the law firm of Weston Patrick & Stevens, who supplied the incorporation and dissolution information, and Mr. Wm. M. Gallagher, Vice President of Buff and Buff Mfg. Co., who loaned a copy of the booklet "The Aligning and Leveling of Shafting," published by Kinkead Mfg. Co., Boston, Mass. 1912.

Mr. John A. Griffin, librarian of the Lawrence Public Library wrote on April 21, 1967 that in the Lawrence directories from 1898 to 1905 was listed Richard Kincaide Millright, 81 Haverhill Street. In the 1906 directory was listed Richard Kinkead, 81 Haverhill Street. On April 29, 1967, Mr. Griffin wrote that he had contacted the officials of the Town of Methuen, Massachusetts. They had found Richard Kinkead listed in Methuen directories in 1909 and every other year to 1919.

Mr. Griffin also contacted Mrs. Margaret Ketler, Librarian of the Nevins Memorial Library at Methuen. She sent him a clipping from *The Methuen Transcript* printed Friday June 20, 1919, which stated that Hope Lodge, I.O.O.F. held a memorial service on Sunday morning June 15. Among the members that had died during the year was Richard Kinkead.

No other records of Mr. Kinkead are available.

THOMAS E. LANDER ()

Kansas City, Missouri

Thomas E. Lander is first listed in the 1901 Kansas City directory, Foreman, Columbian Optical Company.

1905 instrument maker. 1916 Landale Optical Mfg. Co.

He is listed until 1925.

The Gurley Museum has a 20" Wye Level with 4" Horizontal Circle.

Gurley exchanged a Russian Transit No. 10124 which Gurley had taken in trade in 1963 with Mr. Cecil E. Hanson for the Lander level which Mr. Hanson had purchased 23 February in Kansas City.

F. W. LINCOLN JR. & COMPANY (1839 - 1883)

Frederick Walker Lincoln, Jr. (1817 - 1898)

Boston, Massachusetts

Frederick Walker Lincoln, Jr. was born at Boston on February 27, 1817 according to his monument in Mt. Auburn Cemetery in Cambridge, Massachusetts. His grandmother was Deborah Revere, daughter of Paul Revere. When he was thirteen years old, he was apprenticed to Gedney King and his son and successor, Charles Gedney King. In 1839 Mr. Lincoln went in business for himself. He continued for forty-three years as a maker of nautical and surveying instruments. In 1883 he sold the business, F. W. Lincoln Jr. & Co., to Charles C. Hutchinson who had been a partner since 1858. He continued the business under the firm name of C. C. Hutchinson until his death in 1913. The firm was then taken over by his successors until 1940 under the same name.

In December 1857, Mr. Lincoln became Mayor of Boston. He was elected Mayor each year serving until December 1864.

In 1882 he accepted the position of Manager of the Boston Storage Company, the position he held at the time of his death on 13 September 1898.

In the collection of Historical Scientific Instruments at Harvard University in Cambridge is a transit with a 10 1/2" telescope with a 4 1/2" needle. It is engraved F. W. Lincoln Jr. & Co. Boston No. 907.

The Gurley Museum has a Lincoln transit, the gift of the Buff and Buff Mfg. Co. Jamaica Plain, Massachusetts. The beveled limb is 6 1/4", 9" telescope, 3 3/4" vertical needle. It is engraved F. W. Lincoln Jr. Boston on the top plate.

Reference:

History of the Lincoln Family: An account of the Descendants of Samuel Lincoln of Hingham, Mass., 1637-1920. Compiled by Waldo Lincoln, A. B., President of the American Antiquarian Society, Worcester. Commonwealth Press 1923.

LORING & CHURCHILL (1859 - 1860)

Boston, Massachusetts

Henry William Loring (1807 - 1885)

Gardner Asaph Churchill (1839 - 1896)

Page 105 (q.v.) and (G. A. Churchill)

A Loring & Churchill surveyor's vernier compass is being used (1965) by a surveyor in Vermont.

The compass is 15" overall with a needle, the sights are of different heights, 7-25/32" and 7-10/16". There are two level vials at right angles to each other.

The compass is engraved "LORING & CHURCHILL BOSTON".

Lowell & Senter (see page 247)

McAllister & Baretta (see page 247)

B. L. MAKEPEACE INC. (1919 - C)

1266 Boylston St., Boston, Massachusetts

Bertrand L. Makepeace (1872 - 1946)

Mr. Makepeace was born at Foxboro, Massachusetts 13 July 1872, the son of Pliny I. and Carrie J. Cooke Makepeace and first appears in the Boston directories as a salesman in 1894.

He started in business for himself in September 1895. The company was incorporated in January 1919 under Massachusetts laws.

During World War I the company manufactured apparatus and instruments for the U.S. Navy. After the Armistice the company moved to Cambridge where they manufactured the "Loxo" Level and some light-weight transits until about 1929. They still service these instruments. The surveying instrument business was discontinued in 1932.

On June 1, 1931 the Makepeace Company bought the Frost & Adams Co., an old established firm in Boston who dealt in artists' supplies. Frost & Adams was founded in 1835 and incorporated in 1895.

Mr. Makepeace died 14 August 1946 and is buried in the Mansfield Spring Brook Cemetery in Mansfield, Massachusetts.

THOMAS MENDENHALL

Lancaster, Pennsylvania

While dates of the birth and death and where they occurred of Thomas Mendenhall are yet to be found by the writer, however the known facts concerning Mr. Mendenhall surround an interesting character.

It is a fact that history records that he was living in Lancaster at Penn Square, the intersection of King and Queen Streets in 1774 and at that time he contributed 15 shillings to the relief of Boston in 1774.

According to Carl W. Dreppard "American Clocks and Clock Makers, page 254, Mendenhall, Thomas, Lancaster, Pa., 1770-1780: Philadelphia after 1785;" George H. Eckhardt "Pennsylvania Clocks and Clockmakers, page 218; Mendenhall, Thomas, Lancaster, Pa., Clock, Watch and Instrument Maker advertised in 1775" also Alfred Cox Prime "The Arts and Crafts of Philadelphia, Maryland and South Carolina 1786 to 1800, page 230," "Thomas Mendenhall repaired clocks and mathematical instruments in a shop on King and Queen Streets in the borough of Lancaster in 1775."

The 1790 Federal Census of Philadelphia, page 233 lists Mendenhall, Thomas, merchant, Strawberry Alley; the 1791 directory lists Mendenhall, Thomas, merchant, 28 Strawberry Alley.

The Chester County Historical Society, West Chester Pennsylvania has a surveyor's vernier compass engraved, Thomas Mendenhall No. 4 made for James Webb, June, Lancaster, Pa. The compass is 15-3/4" overall, length of needle 5-1/2", height of sights 5-5/8".

The dimensions of the Thomas Mendenhall compass were obtained through the courtesy of John S. Watson, Assistant Registrar, The Hagley Museum, Wilmington, Delaware.

"The History of the Mendenhall Family" by Thomas A. Mendenhall, Greenville, Ohio: Charles R. Kemble Press, Greenville, Ohio lists 4 Thomas Mendenhalls that does not identify the Thomas that is being sought.

ANDREW MENEELY (1802 - 1851)

Pages 108 and 109 (q.v.)

West Troy, New York

The Gurley Museum purchased in 1966 of a resident in Florida, a surveyor's vernier compass No. 1656.

It was used by her Grandfather who lived in Kingston, New York. He was born in 1836 and died in 1910.

This compass is 15-3/4" overall, 5-11/16" needle, 7-1/2" sights, and a 7-1/2" limb with a vernier. A double reading level vial on the plate and a level vial placed vertically on the north sight, provide the means to use the compass as a level.

ANDREW MENEELY'S SONS (1852 - 1863)

Watervliet, New York

Edwin Andrew Meneely (1828 - 1887)

George Rodney Meneely (1831 - 1915)

The Troy directories did not list the West Troy inhabitants until the 1853-54 issue which contains the following:

Meneeley, Andrew's Sons, bell founders, broad between canal and buffalo.

In the 1856-57 Troy directory, it is spelled Meneely.

Edwin Andrew Meneely and George Rodney Meneely were sons of Andrew and Philena Hanks Meneely both born at West Troy, Edwin Andrew 12 November 1828 and George Rodney 15 May 1831. Both died there, Edwin Andrew 18 January 1887 and George Rodney 23 October 1915.

There is privately owned in Roosevelt, New Jersey, a surveyor's vernier compass, engraved: A. Meneely's Sons, West Troy, N.Y.

It is 15-1/2" overall, needle 5-7/8" long, the sights are 7-1/2" in height. It has an outkeeper.

PHINEHAS MERRILL (1767 - 1815)

Stratham, New Hampshire

Phinehas⁶ son of James⁵ and Sarah Ford Merrill was born at Stratham 8 July 1767.

He married Phebe Wiggin born 1 March 1765.

"Phinehas was widely known as a civil engineer, his surveys of lands are pronounced by modern surveyors as very accurate. Published a map of the town in 1793, also about 1800 a map of Exeter and a map of the state. He taught all the schools in town for a good many years."

History of Rockingham and Strafford Counties, New Hampshire with Biographical Sketches. By D. Hamilton Hurd, Philadelphia: J. Lewis & Co., 1882.

Phinehas published 4 editions of "The Scholar's Guide to Arithmetic" being a collection of the most USEFUL RULES by Phinehas Merrill. The second and fourth editions state "corrected and improved by the Author." Published according to Act of Congress, printed at Exeter by Henry Ranlet and sold at his office. P. Merrill, Stratham, N. Hampshire, Dec. 1794. Fourth Edition Henry Ranlet 1802. Stratham, N. H., Nov. 1802.

Gazetteer of the State of New Hampshire. Compiled from the best authorities by Eliphalet and the late Phinehas Merrill Esq. Exeter, printed by C. Norris & Co. for the authors 1817.

Eliphalet Merrill, Northwood, June 1817. These 3 books are in the New York State Library in Albany.

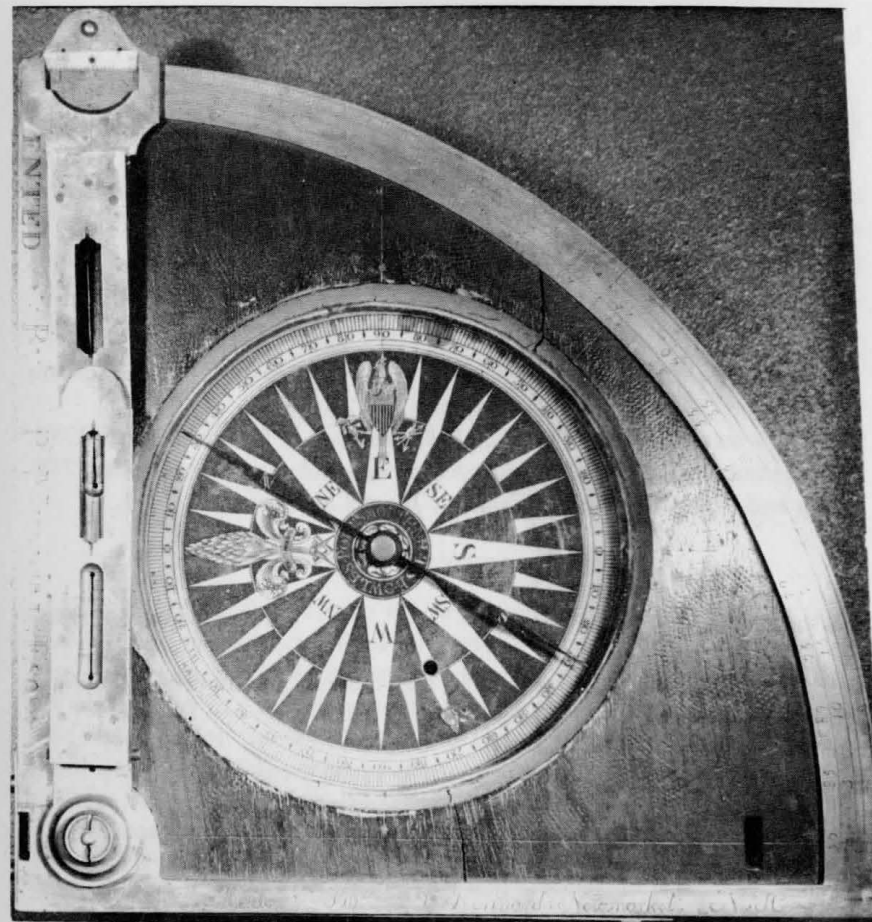
Phinehas Merrill died at Stratham 31 January 1815.

In the Currier Gallery of Art, Manchester, New Hampshire and in the Dartmouth Museum at Hanover, New Hampshire are two quadrants made by John Kennard of Newmarket. Both have the caption "Invented by P. Merrill Esq. Timothy Chandler (p. 190) advertised in the June 3, 1815 issue of the *New Hampshire Patriot* that he made Merrill's quadrants.

References:

Photograph, courtesy Charles S. Parsons, Goffstown, New Hampshire; Pages 126, 127, and 128 Early American Scientific Instruments and Their Makers by Silvio A. Bedini, Washington 1964.

Phinehas Merrill's ancestry date and the place of death from Merrill Memorial by Samuel Merrill, Cambridge, Massachusetts 1917-1918 courtesy Mrs. Russell B. Tobey, Librarian, New Hampshire Historical Society Library, Concord, New Hampshire.



Merrill's Quadrant. Invented by Phinehas Merrill. Made by John Kennard, New Market, N.H. Instrument is in the Currier Gallery of Art, Manchester, New Hampshire. Photograph courtesy Charles S. Parsons, Goffstown, N. H.

MONARCH INSTRUMENT COMPANY

New York City

The Gurley Museum has a transit, engraved Monarch Instrument Company, New York, Serial 153.

It has a 6-1/4" limb, 11-1/2" telescope, 4-1/2" needle. It is a gift of Mr. John R. Bemis, Concord, Massachusetts. He states (16 February 1965) that it was bought by his father many years ago.

No trace has been found of this company, however it is thought that it might have been made by E. G. Soltman (1880-1915).

JAMES E. MOODY (1848 - 1913)

Pages 111 and 112 (q.v.)
Neponset, Massachusetts
Boston, Massachusetts

The Gurley Museum has two transits made by Mr. Moody. The first one has no vertical circle nor vertical arc. The horizontal limb is 5-1/2" in diameter, 9-1/8" telescope, and a 3-3/4" needle.

The second one is different only that the needle is 3-5/8" long.

They are engraved "Jas. E. Moody - Maker, Boston, Mass." and are the gift of Buff & Buff Mfg. Co., Jamaica Plain, Mass.

ANDREW NEWELL (1752 - 1798)

Page 112 (q.v.)
Boston, Massachusetts

Andrew was born either 1750 or 1752. He died at Boston 29 July 1798. He married Abigail Bridges of Andover, Massachusetts 21 October 1779. They had several children, Charles, Joseph and possibly John.

CHARLES NEWELL (1783 - 1809)

Page 112 (q.v.)
Boston, Massachusetts

Charles was born at Boston 1783 and died at his mother's house at Reading, Massachusetts 10 July 1809.

PHILANDER NOBLE (1772 - 1845)

Westfield, Massachusetts

Philander⁵, son of Daniel⁴ and Anna Norton Noble was born at Westfield 30 April 1772 and died there 27 February 1845. In 1798 he was in Pittsfield as a silversmith. "He was then and later a clockmaker and a very ingenious workman."

References:

History and Genealogy of the family of Daniel Noble of Westfield, Massachusetts. Compiled by Lucius Manlius Boltwood. Hartford, Conn: Privately printed, 1878. Correspondence with J. Peter Spang III, Associate Curator, Heritage Foundation, Deerfield, Massachusetts.

There is privately owned in Massachusetts a surveyor's plain compass. It is engraved, Made by Philander Noble October 1839 AE 69 Westfield.

JOHN OAKES (1818 - 1910)

New York City

He was born at Bloomfield, New Jersey 22 November 1818 and died at Glen Ridge, New Jersey 5 March 1910.

He is listed in the New York City directories from 1848 to 1896 as a dealer in charts and a manufacturer of nautical instruments. He retired about 1896.

There is owned in New Jersey a surveyor's plain compass engraved "John Oakes, New York". It is made of brass, 14-3/4" overall, with a needle circle to take a 5-1/2" needle. It has at right angles to each other, on each side of the compass card, two level vials. The sights, the bezel glass, bezel ring and needle are missing.

HENRY SLEEPER PEARSON (1789 - 1878)

Portland, Maine

Henry Sleeper Pearson, son of David and Elizabeth Sleeper Pearson was born at Newburyport, Massachusetts 23 May 1789. He died at Portland 30 August 1878. He is listed in the Portland directories from 1823, which was the first one issued to 1875, as a mathematical instrument and watch maker. In 1877 he is listed as a watch and nautical instrument maker with William Senter & Company of Portland.

There is privately owned in Perth Amboy, New Jersey a surveyor's plain compass. It is 13-1/2" overall with a 5" needle. It is engraved, Henry S. Pearson, Portland, Me.

Reference:

Genealogy of the Greenleaf Family by J. E. Greenleaf, Boston, Mass. 1896.

HERMAN PFISTER (1847 - 1911)

WILLIAM HENRY PFISTER (1875 - 1935)

Cincinnati, Ohio

Herman Pfister was born at Schaffhausen, Switzerland 10 November 1847, the son of Henry and Dorothea Pfister. When he first came to America, he stayed with a brother in Missouri.

He is first listed in the 1870 Cincinnati directory as: Pfister, Herman, instrument maker. h. 129 W 5th. With the exception of the 1874-1875 issue he is listed in the Cincinnati directories from 1870 as an instrument maker to the 1877-1878 issue when he is listed as: Whitcomb, R. & Co. (R.W. and Herman Pfister), manufacturers of Surveying and Engineering Instruments, 119 W 5th, Room 6. 1879-1880 Pfister, Herman, manufacturer of Surveying and Engineering Instruments, 119 W 5th. He is listed through the years as a manufacturer of Surveying and Engineering Instruments. In 1911 he advertised in the Cincinnati directory: Herman Pfister, Manufacturer of Surveying and Engineering Instruments, Architects Levels and Inventor's Models made to order. All kinds of repairing promptly done.

He died at Cincinnati 14 December 1911 and is buried in the Cemetery of Spring Grove, Cincinnati, Ohio.

In 1895 Wm. H. Pfister is listed as an instrument maker in the Cincinnati directory. In 1905 as Foreman with Herman Pfister (his father). In the 1912 Cincinnati directory, the name, Wm. H. Pfister is substituted for Herman Pfister. The rest of the advertisement has no changes.

William Henry Pfister was born at Cincinnati 29 July 1875, the son of Henry and Mary Buchanan Pfister. He died there 22 January 1935. He also is buried in the Cemetery of Spring Grove.

References:

Correspondence with Mrs. Rebe Shepard Pfister, Cincinnati, Ohio 10 February 1967.

There are two known theodolites made by Herman Pfister, one is in the Butler County Historical Society and Museum at Hamilton, Ohio, the other is in the Smithsonian Institution at Washington, D. C.

JONAS H. PHELPS (1809 - 1865)

Pages 116, 117, 118 (q.v.)

Troy, New York
Westport, Connecticut

There is privately owned in Connecticut a surveyor's vernier compass engraved, "J. H. Phelps Troy N.Y."

It is 15-3/4" overall with a 6" needle. The cardinal letter W is left of north.

THE POOL FAMILY (1770 - 1904)

Easton, Massachusetts

A continuation and review of pages 127 and 128.

John⁶, son of Samuel⁵ and Ruth Fullerton Pool was born at Abington, Massachusetts 11 May 1770. He married Mary Brown. He was a Selectman, a Town Clerk and a Treasurer and held other offices in Easton. His death occurred at Easton 1 May 1865.

John⁷, son of John⁶ and Mary Brown was born at Easton 12 January 1796. The Poole History states, "He was a manufacturer of nautical and surveyor's instruments". He died 12 September 1865.

Horace Minot⁷, son of John⁶ and Mary Brown Pool was born at Easton 9 August 1803. The Poole History states, "He was a manufacturer of nautical and surveyor's instruments". He died at Easton 1 November 1878.

Nahum⁷, son of John⁶ and Mary Brown was born at Easton 9 January 1798, died there 30 January 1853.

Harrison⁷, son of John⁶ and Mary Brown was born at Easton 8 March 1816 and died there 6 August 1869.

John Murray⁸, son of John⁷ and Zibbeah (Zibaina) Packard Pool was born at Easton 13 September 1824 and died there 11 March 1904. Poole's History states, "He was a manufacturer of nautical instruments".

There are a number of Pool surveying instruments privately owned and in museums.

The East India Marine Hall, Peabody Museum, Salem, Massachusetts has a surveyor's plain compass. It is engraved, J. & H.M. Pool - Easton Mass.

The Clark County Historical Society, Springfield, Ohio has a small Rosewood cased Pocket Compass. It is engraved, J. & H.M. Pool Easton-Mass., "1840" is scratched in the case.

There is privately owned in Troy, New York a surveyor's plain compass. It is engraved, H.M. Pool Easton-Mass.

Also in the Clark County Museum is a surveyor's plain compass. It is engraved in script H.M. Pool - Easton.

In the Gurley Museum are two engineer's transits, the gift of Buff and Buff Mfg. Co., Boston, Mass. Both are engraved, H.M. Pool - Easton, Mass. One has a beveled limb 6-1/4" diameter, 10-1/2" telescope, 4" unusual needle; both ends turn up at right angles to the needle, about one-eighth inch from the end and one-eighth inch high.

The other Pool transit is a conventional transit, with a 6-1/4" limb, a 10" telescope and a 4" needle.

There is privately owned in Easton, Mass. a H.M. Pool, Easton-Mass. transit and carpenter's level.

There is privately owned in New Hampshire a surveyor's plain compass engraved in script.

H. M. POOL & BROTHERS
Easton, (Ms)

It is not known whether another brother, Harrison⁷ (1816-1869) may have been in the business with John⁷ and Horace Minot⁷ and thus result in the manufacture of the above described compass.

Reference:

The History of Edward Poole of Weymouth, Mass. (1635) and his Descendants by Murray Edward Poole. A.B. Press of the Ithaca Democrat 1893, was consulted. However, "Copy of Record of Death, Town of Easton, Mass." records were used in case they did not agree with Mr. M.E. Poole's records.

W. L. POTTS

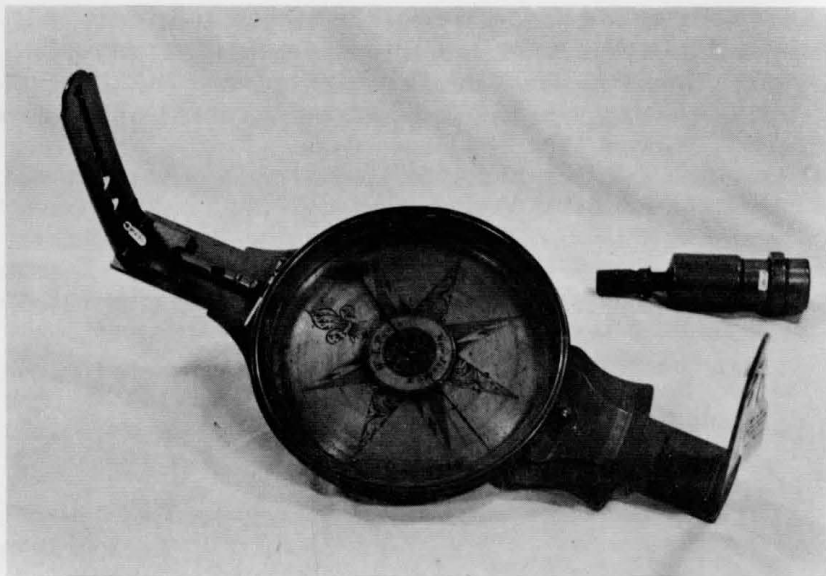
Page 129 (q.v.)

New Jersey

This is the second surveyor's vernier compass made by W. L. Potts that is known to exist, yet during the past eight years no trace of Mr. Potts has been found although a most diligent search for him has been made.

Mr. David P. Wheatland, Curator of the Collection of Historical Scientific Instruments at Harvard University has generously supplied the photograph of this instrument in order that it may be illustrated.

It is 14-1/2" overall with a 5" needle. The sights are 6-1/2" high and there are two level vials.



L. M. PRINCE CO. (1872-C)

L. M. Prince (1850 - 1918)

There is privately owned in Ohio a surveyor's vernier compass. It is engraved "L. M. Prince, Maker No. 300". The length overall is 16", the needle is 5-3/4" long. Two level vials and an outkeeper.

Reference:

Correspondence with Donald A. Hutslar, The Ohio State Museum, Columbus, Ohio.

JAMES REED (1792 - 1878)

Page 134 (q.v.)

Washington, Pennsylvania
Pittsburgh, Pennsylvania

The Alliance Historical Society in Alliance, Ohio has a surveyor's vernier compass engraved "J. Reed, Washington, Pa."

The length overall is 14-1/2", length of needle 6".

The above mentioned compass gives evidence that James Reed commenced to make compasses in his home town before coming to Pittsburgh in 1847.

RITTENHOUSE AND COMPY

Philadelphia, Pa.?
Norriton, Pa.?

In the Museum Building at New Salem Park, Illinois is a surveyor's vernier compass engraved Rittenhouse and Comp^y. There is no such listing in the Philadelphia directories. From the examination of nine Benjamin Rittenhouse compass photographs and three David Rittenhouse compass photographs, the writer is lead to believe that this compass was made in Norriton at about the time David Rittenhouse made the compass for George Washington (page 141). The Benjamin Rittenhouse compass cards are nicely engraved and quite ornate, the compass cards before David went to Philadelphia are simple in comparison.

This compass is said to be the one Abraham Lincoln used in his survey work and that he bought this compass second hand. The dimensions are as follows: 13-1/2" overall, 5" needle, 1 level vial. Lincoln Lore published by Lincoln National Life Foundation, No. 250, Fort Wayne, Indiana, January 22, 1934, Dr. Louis A. Warren Editor. A part of the article Lincoln the Surveyor follows:

The thorough mathematical training which Lincoln had received during his Indiana school days came to good advantage, as is evident from an autobiographical sketch, written in the third person, which reveals how rapidly he was able to acquire the rudiments necessary to begin his duties.

The surveyor of Sangamon offered to depute to Abraham that portion of his work which was within his part of the county. He accepted, procured a compass and chain, studied Flint and Gibson a little and went at it. This procured bread, and kept soul and body together.

One of the books Lincoln used was The Theory and Practice of Surveying by Robert Gibson. The original copy of the volume he studied, which was published in 1814, is said to contain his autograph on several pages.

The Title Page of the 1814 edition of "The Theory and Practice of Surveying by Robert Gibson is shown on page 239. This copy was taken from the title page of a leather bound book in the New York State Library at Albany.

Abraham Lincoln submitted a report of the first survey he is known to have made. The certificate reads as follows:

1834, Jan. 14 Surveyed for Rupel Godby, the details follow:

Chainman	J. Calhoun L.L.C.
Hercules Demming	by A. Lincoln

www.compleatsurveyor.com



Rittenhouse & Co. Compass

THE
THEORY AND PRACTICE
OF
SURVEYING;

CONTAINING

*All the Instructions requisite for the skilful practice
of this Art.*

BY

ROBERT GIBSON.

ILLUSTRATED BY COPPER-PLATES;

WHOLE CORRECTED, NEWLY ARRANGED, AND GREATLY ENLARGED

WITH USEFUL SELECTIONS,

AND A NEW SET OF ACCURATE

MATHEMATICAL TABLES,

By *D. P. ADAMS,*

TEACHER OF THE MATHEMATICS.

NEW-YORK :

PUBLISHED BY EVERT DUYCKINCK,
NO. 102 PEARL-STREET.

G. Long, printer.

1814.

LOUIS RUCKERT (1852 - 1910)

St. Louis, Missouri

Louis Ruckert, son of Herman and ? Ungar Ruckert was born in Germany 29 March 1852.

He is first listed in the St. Louis directory issued in 1890 as a clerk. April 1, 1897 with Keuffel & Esser, 708 Locust. In 1900 drawing material, surveying and mathematical instruments; 3rd floor, Room 50, Olive s.w. corner 4th.

From 1901 to 1910, Mr. Ruckert was President of the L. Ruckert Co. He died at St. Louis 1 November 1910.

In the 1920's a L. Ruckert Co., St. Louis, Mo. transit was repaired in Denver, Colorado. Mr. Joseph E. Dietzgen, President of the Eugene Dietzgen Co. of Chicago, Illinois believes that the Ruckert transits were made by Peter Heer at Chicago about 1900.

Gurley repaired a Ruckert transit serial 886 in March 1930.

JOHN C. SACK (1823 - 1895)

Page 146 (q.v.)

San Francisco, California

He was born at Nurnberg, Bavaria, 12 March 1823 and died at San Francisco 20 September 1895.

Reference:

San Francisco Examiner -- September 21, 1895 p. 7, c. 7.

CHARLES A. SAXE (1825 - 1898)

Philadelphia, Pennsylvania

Charles A. Saxe was born in Russia in 1825. He is listed in the Philadelphia directories from 1856 to 1898 as a mathematical instrument maker.

He was the inventor of the Shifting Center, Patent No. 21982 - 14 February 1858.

Be it known that I, Charles A. Saxe of the City of Philadelphia, State of Pennsylvania have invented a new and useful machine for moving the center or the Axes of Surveying Instruments to wit: (Surveyor's Compasses, Transits, Theodolites and Solar Compasses) or to move the Plummet which is attached to the center or axes to any of these names instruments exactly above the given point in the ground, without moving any of the three legs on which the whole instrument rests, also without unscrewing the screws, with which the instrument is enabled to assume a horizontal position.

Assigned to James W. Queen & Co., (James W. Queen and Samuel L. Fox) 10 September 1867 for \$75.00; assigned to William and Lewis E. Gurley on the same date for \$75.00.

Charles F. Helffricht was a witness to the patent application, page 82 (q.v.).

In 1871 he is listed as a partner in the firm of Brelefield & Co. (Francis Brelefield and Charles A. Saxe).

In 1959 there was repaired in Philadelphia a transit which was engraved "Haitman and Saxe Philadelphia." The label on the transit box states that the firm was located at Eighth and Chestnut Streets.

He died 1 September 1898 and is buried in Westminster Cemetery at Bala-Cynwyd, Pennsylvania.

SCHUYLER, HARTLEY & GRAHAM (1854 - 1880)

New York City
San Francisco, California

Jacob Rutsen Schuyler (1816 - 1887)

Marcellus Hartley (1828 - 1902)

Malcolm Graham (1822 - 1889)

Mr. Schuyler was born at Belleville, New Jersey 23 February 1816, son of Colonel Arent and Catherine Van Rensselaer Schuyler.

He entered business in 1833 as an employee of Young, Smith & Co. at 4 Maiden Lane. He became a member of the firm in 1847. In 1854 he became the senior member of the firm of Schuyler, Hartley & Graham at 13 Maiden Lane.

This firm dealt in hardware, fancy goods, guns, military and Masonic goods. At various times they were located at 13, 17 and 19 Maiden Lane. They also made surveying equipment both in New York City and San Francisco.

Mr. Schuyler retired in 1878. He died at Bergen Point (now Bayonne, New Jersey) 4 February 1887.

Mr. Hartley was born at New York City 28 September 1828, the son of Robert Milham and Catherine Munson Hartley. He first worked for Francis Tomes & Sons, 6 Maiden Lane, then for Young, Smith & Co. at 2 & 4 Maiden Lane until 1854 when the firm of Schuyler, Hartley and Graham was formed. In 1880 it became Hartley & Graham. In 1900 the firm was M. Hartley Company. Mr. Hartley died 8 January 1902 at New York City.

Mr. Graham was born at Jersey City, New Jersey 26 August 1832, the son of John Lorimer and Emily Clason Graham.

His business career commenced with Young, Smith & Co. In 1854 he became a partner of Schuyler, Hartley & Graham. Mr. Graham died at Sea Bright, New Jersey 18 December 1899.

In the New York City directory 1863-64 Schuyler, Hartley & Graham were located at 19 Maiden Lane, New York City, 6 Mary's Row, Birmingham, Scotland and 15 Rue d'Enghein, Paris, France. They were also located in San Francisco, California.

The New York City directory 1854-55 (Rode) lists Schuyler, Hartley & Graham, as importers and wholesale dealers in military goods, guns, pistols, cutlery, plated ware, jewelry and fancy goods, 13 Maiden Lane.

There is privately owned in Washington, D.C. a surveyor's vernier compass. It is engraved, S. H. & G., New York. It is 12-1/2" overall, 3-3/4" needle, 5-1/2" sights.

References:

New York City directories 1852-53 to 1903, *New York Times* 5 February 1887 for Schuyler, 9 January 1902 for Hartley and 18 December 1889 for Graham.

JOHN SCOTT (1752 - 1801)

Chambersburg, Pennsylvania

Kline's Weekly Gazette, Carlisle, Pennsylvania issue of November 18, 1801 has the following announcement:

"Chambersburg, Nov. 11

Died

On Tuesday, the 10th inst. at Chambersburg, John Scott Esquire, in the 49th year of his age." There follows "Tribute of Respect by a Friend," nearly a column long.

No record of Mr. Scott's birthplace, date of birth nor where he is buried has been found. On July 30, 1864 Brigadier General John McCausland of the Confederate Army and his brigades burned Chambersburg which may account for the paucity of records of Chambersburg before that time.

John Scott was a maker of clocks and surveyor's compasses.

Of his surviving works known; one tall clock, painted dial, eight day, Chip. Style, was sold from the Mendenhall Collection at Philadelphia in 1926. It is pictured in *Antiques Magazine*, November 1926.

A surveyor's plain compass is owned by the Stark County Historical Society in Canton, Ohio. It is 14-3/4" overall, 5" needle, no level vials, sights are missing, Chestnut dug-out case, Outkeeper numbered 1 to 16. Used by Bezael Wells in making the original survey of Canton, Ohio in 1805.

There is owned in Mt. Vernon, Ohio a surveyor's plain compass, 14" overall, 5-1/8" needle, no level vials. It is marked:

Jal Crossan
Scott

Chamberstown F.n ° (Five pointed star)

Mr. Robert Bray Wingate, Reference Librarian at the Pennsylvania State Library, Harrisburg, wrote under date of 20 March 1963. "The settlement was variously known as Falling Spring; Benjamin Chambers'; Chambers Fort; Chambers' Town. The latter name was used until the founding of Franklin County in 1784. After that time the town was officially named Chambersburg". History of Franklin County, Pa., page 451. Prof. J. Fraise Richards. 1887.

ROMAN SEELIG (1895 - 1905)

Roman Seelig (1848 - 1924)

Page 80 (q.v.)

Chicago, Illinois

SEELIG & SON (1905 - 1917)

Roman Seelig (1848 - 1924)
Edward F. Seelig (1905 - 1916)

Chicago, Illinois

Edward F. Seelig, son of Roman and Anna Herr Seelig was born at Chicago 13 October 1878. He died there 16 August 1916.

Roman Seelig was retired at the time of his death in 1924.

SEELIG & KANDLER (1893 - 1895)

Roman Seelig (1848 - 1924)
Edmund Kandler ()

Chicago, Illinois

There is a Seelig and Kandler transit No. 536 near Boston, Massachusetts. No details are available.

SHANAHAN & LOEBER (1853 - 1856)

181 William Street, New York City

James M. Shanahan (1824 - 1885)

Charles Loeber (1826 - 1906)

Wilson's Business Directory, New York City, 1853-54 lists Shanahan & Loeber in large type, page 246: "Makers of Theodolites, Transits and Levels, etc."

Shanahan, James M. is listed in New York City directories from 1853 to 1872, but only to 1856 as a maker of surveying instruments, he is listed in the Brooklyn directories to May 1, 1886. He was born in Ireland in 1824, came to America in 1850. He died at Brooklyn 3 March 1885.

Charles Loeber is listed in Wilson's Business directory, 1854-55, math inst mkr 181 William, h. 110 Gold Brooklyn. The 1855-56 New York City directory lists: Loeber, Charles, optican 50-1/2 Fulton. The 1857-58 New York City directory and the 1860 Brooklyn directory list him as a mathematical instrument maker. The May 1, 1873 New York City directory lists: Loeber, Charles, mathematical instruments, Fulton St., 18 Rush, Brooklyn. He may have worked for Stackpole & Bro. who were making surveying instruments at 41 Fulton Street from 1856 to 1910. His will dated 10 March 1884 has for a witness Robert E. Stackpole living at 2 Varick Place in New York City. The New York City directory for 1884 and 1885 does not list Mr. Stackpole at that address.

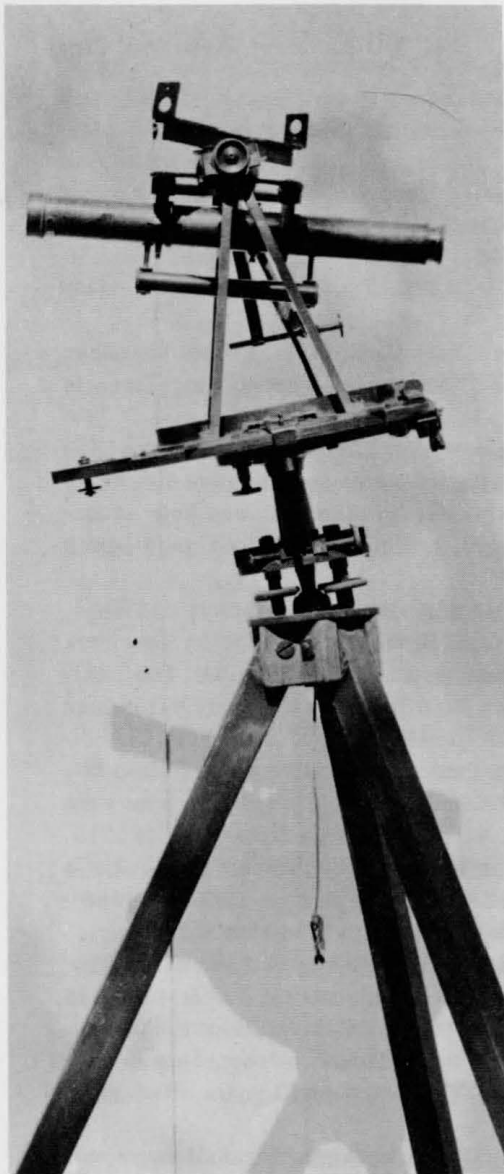
Charles Loeber is listed from May 1, 1886 to May 1, 1893 in the New York City and Brooklyn directories as an instrument maker living in Brooklyn. He is not listed after 1903 in the Brooklyn directories.

He was the son of Johann and ? Schlichtrossl Loeber, born in Germany 17 January 1826, lived in Brooklyn for over 50 years, died there 9 August 1906.

There is privately owned in Pasadena, California a transit engraved: Shanahan & Loeber 181 William St. N.Y. It has a 6-1/2" limb, a 10" telescope and a 4-1/4" needle.

JOSEPH SHIRK (1820 - 1902)

Churchtown, Pennsylvania
Union Grove, Pennsylvania



Joseph Shirk was born near Churchtown 30 January 1820, the son of Peter and Sarah Sensesig Shirk. He was taught surveying by an uncle. He improved his uncle's transit and then made his own between 1841 and 1848.

The Philadelphia Inquirer Magazine of January 31, 1965 had an article written by Wayne E. Homan of Reading, Pennsylvania and a cut of Mr. Shirk's instrument now owned by his granddaughter.

He made his first survey 15 April 1841 and his last on 21 January 1901.

He died 19 August 1902, at the foot of Turkey Hill, which is near Union Grove in Lancaster County, formerly known as Spring Grove.

Joseph Shirk (1820-1902)

Union Grove, Pennsylvania

Surveyor's Transit made by Mr. Shirk; owned by his granddaughter.

Photograph courtesy Wayne E. Homan, Reading, Pennsylvania

LOWELL & SENTER (1836 - 1870)

Portland, Maine

Page 106 (q.v.)

Abner Lowell (1812 - 1883)

William Senter (1813 - 1888)

Abner Lowell was born at Portland 12 January 1812. He served his apprenticeship with Oliver Gerrish who came from Portsmouth, New Hampshire in 1823. Gerrish was a famous watch and clock maker.

William Senter was born at Portsmouth, New Hampshire 11 October 1813. He came to Portland in 1828 and also served his apprenticeship with Oliver Gerrish. In 1834 Mr. Lowell went in business for himself and two years later Mr. Senter became associated with him. In 1870 the partnership was dissolved and each went in business for himself.

Mr. Lowell continued in business until 1877. He died 26 February 1883.

Mr. Senter continued in business until his death. His nephew, William Senter Jr. joined him in 1875, the firm becoming William Senter & Co. Mr. Senter was mayor of Portland for two terms, 1880 to 1882. He died 22 December 1888.

There is privately owned in New Jersey a surveyor's plain compass. It is 12" overall, with a 4-1/2" needle. It is engraved: Lowell & Senter Portland Me.

MCALLISTER & BARETTA

In the early 1920's there was repaired at Denver, Colorado a transit which bore the name of McAllister & Baretta.

Reference:

Correspondence with Surveyors Service Company, Costa Mesa, California, 15 May 1967.

HERMAN LOUIS SILVER (1864 - 1937)

Los Angeles, California

Herman L. Silver, son of Herman and Eliza M. Post Silver, was born at Peru, Illinois 9 July 1864. He is first listed in the 1900 Los Angeles directory: Silver, Herman L., Asst Cashier, S T & T Co., In 1918, Surveying Instruments, Rebuilding and Repairs a Specialty. In 1923, Manufacturers agent. The certificate of death states that he last worked in 1935 as a draftsman in an aircraft factory. He died at Los Angeles 21 November 1937.

There was repaired in Denver in the 1920's a builders level engraved: H. L. Silver, Los Angeles, California.

Reference:

Correspondence with the Surveyor's Service Co., Costa Mesa, California 15 May 1967.

E. G. SOLTMANN (1880 - 1915)

E. G. SOLTMANN INC. (1915-C)

New York City

Gustav Soltmann is first listed in the New York City directories in the 1857-58 issue as a grocer and from the 1860 to the 1880-81 issue as a math. inst. maker.

He was born at Hamburg, Germany 30 August 1823. He came to America about 1852. The City of New York certificate records his death 24 April 1892, his name Carl Gustav Soltmann.

His son, Edward Gustave Soltmann Sr. was born at New York City 14 June 1856. He founded the business of E. G. Soltmann in 1880. He is listed in the 1879-1880 New York directory as clerk, living at the same address as his father 422 E. 53rd. He owned manufacturing plants in Germany prior to World War I for manufacturing surveying instruments, tee squares and other drafting material. He was forced into bankruptcy in 1915, later he paid off 100 cents on the dollar.

E. G. Soltmann Inc. was chartered 15 September 1915 as a New York Corporation. Edward Gustave Soltmann Sr. died 8 January 1927 at New York City.

Edward Gustave Jr., grandson, was born at New York City 17 December 1887. He continued the business after his father's death until his death 11 December 1961 at New Rochelle, New York.

E. George Soltmann, great grandson of Carl Gustav Soltmann is now (1965) President of E. G. Soltmann Inc. in New York City.

The Gurley records indicate that E. G. Soltmann and E. G. Soltmann, Inc. purchased surveying equipment from 15 October 1894 to 28 April 1950.

There is privately owned in Pennsylvania an Architect's Level. It is engraved: E. G. SOLTMANN = NEW YORK No. 365. It has a 10-1/2" telescope, the level vial case is 6" long, the horizontal circle has 4 - 90° segments with a vernier that reads to 5 minutes.

WILLIAM E. STIEREN (1835 - 1887)

Pittsburgh, Pennsylvania

He was born in Prussia in 1835. He came to Pittsburgh in 1863 and is listed as an optician and mathematical instrument maker from that time to 1888.

He died at Philadelphia, Pennsylvania on 6 May 1887.

There is a surveyor's vernier compass privately owned in Wellsville, Ohio. It is 14-1/2" in length with a 5" needle. It is engraved W. E. Stieren, Pittsburgh, Pa.

NATHAN STORRS (1768 - 1839)

Northampton, Massachusetts

Nathan, the fourth generation of the Storrs family in America, the second son of Amariah and Mary Gillett Storrs was born at Mansfield, Connecticut 7 August 1768. ¹ He is said to have served his apprenticeship with Jacob Sargeant (1761-1843) in Springfield, Massachusetts. ² He advertised in the *Hampshire Gazette*, Northampton 6 July 1791 that 'He was lately from New York'. He is not listed in the New York, Massachusetts or Connecticut 1790 Federal Census. His first shop was on King Street. Later he moved to Shop Row, now the store of E. J. Gare & Son. ³ He was a co-partner of the firm of Baldwin & Storrs in Northampton who advertised 4 July 1792. The firm was dissolved 7 January 1794, Jedediah Baldwin (1768-1849) having left for Hanover, New Hampshire, the latter part of 1793. ⁴

James Russell Trumbull's, *History of Northampton, Massachusetts, Since Its Settlement in 1654*, Northampton 1902 Press of Gazette Printing Co. in Vol. II page 533, has this item: "In December 1791, Nathan Storrs, clockmaker, together with other people (who are named) were warned out of town 'who lately come into this town for the purpose of abiding and not having the town's consent therein'. The law had been in force since the colony was established and at times had been enforced." That Mr. Storrs did not leave town is evidenced from the fact that he was in Northampton on 4 July 1792.

In January 1827, Mr. Storrs formed a co-partnership with Benjamin E. Cook. The firm name was Storrs & Cook. The firm continued until 1 January 1834. Mr. Storrs, being in poor health sold his interest to Mr. Cook and retired. ⁵

COME AND SEE,
Nathan Storrs,
 CLOCK & WATCH-MAKER.
 Lately from New York.

TAKES this means of informing the Public, that he has established his business in Northampton, nearly opposite Mr. Lynn's Inn, where he carries on the various branches of CLOCK & WATCH business, as China Clocks, that play a number of different tunes. Warranted eight day Clocks, and a various number of different kinds of Time-Pieces also warranted: Watches, Surveyors Compasses, Brass Joints for Chaises, Boxes do. Harness Buckles, Ornaments, Sleigh-Bells, Swords and Hangers mount d. Gold Beads, Silver table and tea Spoons, Spangle shoe and knee Buckles, of the newest fashion, Silver and Plaited do. And as he has a complete set of Tools, he can supply any Gentleman with whatever movement should be wanting to either Clocks or Watches:

ALL which will be performed at said shop, and afforded at the most reasonable rate, and pay made easy as possible. Has on hand and ready for sale, an elegant assortment of watch Chains, Seals, Keys, &c.

N. B. CASH given for old Silver, Brass and Copper.

July 6, 1791.

Hampshire Gazette, Northampton, Massachusetts
 July 6, 1791

Courtesy, American Antiquarian Society
 Worcester, Massachusetts

There are several evidences of his handiwork still in existence. There is privately owned in Massachusetts a very fine cherry cased tall clock. The dial is engraved Nathan Storrs/Northampton.⁶ In the Parker and Russell Shop of the Heritage Foundation in Deerfield, Massachusetts is a plain surveyor's compass. There is engraved on the compass card Nathan Storrs/Northampton. It is made of brass, the overall length is 11-11/16".⁷

Probably the N. Storrs/Utica tall clock in the Metropolitan Museum of Art in New York City was made by Nathan Storrs, though no evidence can be found that he was ever in Utica. This clock is illustrated in Brooks Palmer's, *The Book of American Clocks*, Ill. 46.

His nephew, Shubael Storrs (1778-1847) also born at Mansfield, Connecticut, was in Utica from 1803 until his death in 1847. It is known that Shubael worked for other people in Utica until 1808 when he went into business for himself.⁸

In the basement of the store of E. J. Gare & Son in Northampton is the bellows, forge, anvils and tools that Mr. Storrs used to make his spoons and other silverware.⁹

Nathan Storrs died at Northampton on 31 July 1839. He is buried in the Bridge Street Cemetery beside his wife Sarah. The inscription on his monument is: "Nathan Storrs Died July 31, 1839 - 76 years old."¹⁰

References:

- 1 The Storrs Family by Charles Storrs, Privately Printed, New York 1886.
- 2 Northampton Business Directory and General Advertiser 1860-1861 Northampton: Trumbull & Gere 1860. Information concerning Trumbull's History of Northampton and docustat copy of Northampton Business Directory and General Advertiser furnished by Stanley Greenberg, Reference Librarian, Forbes Library, Northampton.
- 3 Ibid.
- 4 Spooner's Journal 7 October 1793.
- 5 Northampton Business Directory and General Advertiser.
- 6 Correspondence with Dr. Amos G. Avery, Ledyard, Connecticut.
- 7 Correspondence with Mr. Henry N. Flynt and his staff, President, Heritage Foundation, Deerfield, Massachusetts.
- 8 The Storrs Family by Charles Storrs.
- 9 Seen by the writer, September 8, 1965.
- 10 Correspondence with Mr. Ralph R. Martin, Cemetery Foreman, Northampton.

SHUBAEL STORRS (1778 - 1847)

Utica, New York

Shubael Storrs, the son of Ebenezer and Lois Southworth Storrs was born at Mansfield, Connecticut 13 December 1778.

He went to Utica in 1803 and was in business for himself in 1808 as a silversmith and mathematical instrument maker.

He is listed in the first directory issued in Utica in 1817 as a Gold & Silversmith 30 Genessee St.

The next directory was issued in 1828. He is listed as a watchmaker, his nephew Charles (1800-1839) as a silversmith both at the same address, 30 Genessee h. Catherine.

In 1829 Storrs & Davies, jewelry and military stores 30 Genessee, also Storrs, Shubael, mathematical instrument mr. 30 Genessee.

Storrs, Charles (Storrs & Davies) 30 Genessee r Mary e John. Davies, Thomas (Storrs & Davies) 30 Genessee r Mary e John from 1832 to 1837-38, Storrs, Charles (Storrs & Oliver B. Cooley).

Storrs & Cooley, spectacle manufacturers, silversmiths and jewelers.

www.compleatsurveyor.com

Storrs, Elia A. (1808 - ?) brother of Charles, silversmith bds C. Storrs.
Storrs, Shubael, mathematical instrument maker. From 1839-40 to 1846-47 he is listed at various times as truss maker, compass maker and surveyor's compass maker.

He died at Utica 29 July 1847.

There are no known surveyor's compasses made by him.

References:

Utica directories and "The Storrs Family" by Charles Storrs. New York: Privately printed. 1886.

EBENEZER TALBOT (1810 - 1902)

Windsor Locks, Connecticut
East Granby, Connecticut

He was the son of Ebenezer and Lucy Combs Talbot, born according to State of Connecticut Statistical Records 20 November 1810, according to the West Avon Congregational Church records 19 November 1810 at Farmington, now Avon, Connecticut.

He probably made the level described below around 1860, because on 26 May 1863 he sold the land and buildings in Windsor Locks "except the small building in the rear built and lately used by me as a shop".

The records seem to indicate that when he sold his property in Windsor Locks in 1863 he bought land and buildings in East Granby and moved there about that time. Ebenezer's wife Narcissa Holcomb Talbot died in East Granby in 1885 and in 1890 Ebenezer sold his property in East Granby.

He may have gone at that time to Windsor Locks to live with relatives because his Statistical Records states that the information contained in this record was given by "Miss Talbot, Windsor Locks".

At the time of his death on 8 May 1902 Ebenezer Talbot was living on Elm Street, Windsor Locks, Occupation, Mechanic. He is buried in the family lot in Elm Grove Cemetery, Windsor, also designated as the Poquonock Cemetery, Poquonock, Connecticut.

There is privately owned in New Jersey a Builder's Level. "The body is a brass casting which contains a single longitudinal spirit level and a telescope. It is mounted on a tripod by means of three leveling screws. It is variously marked 'Improved builder's level warranted. E. Talbot No. 6 Windsor Locks, Ct.' Ebenezer Talbot."

References:

Statistical Record issued by the State of Connecticut, State Department of Health. Correspondence with Mr. Robert T. Silliman, Chairman of the Cemetery Committee of the Elm Grove Cemetery, Windsor and the professional research of Mrs. Margaret H. Talbot: Sundry Vital Records of East Granby by A. C. Bates 1947.

SAMUEL THAXTER (1792 - 1822)

SAMUEL THAXTER & SON (1822 - 1916)

S. THAXTER & SON (1822 - 1916)

Samuel Thaxter (1769 - 1842)

Joseph Helyer Thaxter (1801 - 1835)

Samuel Thaxter Cushing (1821 - 1882)

Abby C. Cushing (1822 - 1907)

Herbert Risteen Starratt (1865 - 1950)

Boston, Massachusetts

The following is a revision and continuation of page 160 of the history of Samuel Thaxter and Samuel Thaxter & Son.

Samuel Thaxter, son of Samuel and Bathsheba (Lincoln) Thaxter was born at Hingham, Mass. 13 December 1769. He died at Boston 20 April 1842 of typhus fever and was buried in the Hingham Cemetery, Hingham, Mass. 21 April 1842. He married Polly Mary Helyer 14 June 1792. They had seven children: Joseph Helyer Thaxter born 13 February 1801. He died at West Needham 24 March 1835. They had a daughter, Sarah Helyer who married William L. Cushing 18 May 1817.

Samuel Thaxter did not leave a will. Mary Thaxter, wife of Samuel Thaxter, signed an affidavit on 2 May 1842, that she wished to have Adam W. Thaxter Jr., Samuel's nephew, administer the estate.

Samuel Thaxter Cushing, the son of William L. and Sarah Helyer Cushing was born at Boston 24 August 1821. The 1843 Boston directory states that S. T. Cushing has taken over the business of Samuel Thaxter & Son.

He married Abby C. who was born at Templeton, Mass. 8 November 1822. He died 26 January 1882 at Boston and his widow Abby C. Cushing (A. C. Cushing) managed the business until 1905 when Herbert Risteen Starratt became manager. Mrs. Cushing died at Salem, Mass. 8 March 1907.

Mr. Starratt was born at Liverpool, Nova Scotia 4 April 1865. He is first listed in the Boston directories in 1884 as a clerk at 125 State Street (S. Thaxter & Son) and continues to be listed as such until 1905, when apparently he purchased control.

The last entry in the Boston directory is 1916 of the company, Samuel Thaxter & Son (H. R. Starratt) 28 Central Street.

He is listed in 1950 Boston directory as a salesman for Kelvin White 90 State Street. He died at Charlton, Mass. 29 March 1950.

ADOLPH TIENSCH (1820 - 1897)

Cincinnati, Ohio
Louisville, Kentucky
Memphis, Tennessee

Adolph Tiensch was born at Baden-Baden, Germany 18 August 1820. He is first listed in the 1849-50 and 1850-51 Cincinnati, Ohio, directories, Mathematical, Philosophical and Optical Instrument Maker; in the Louisville, Kentucky directories in 1852 as a mathematical instrument maker at A. C. Harig's. Harig, Augustus C., firm Harig and Jones locksmiths and safe-makers.

In the 1855-56 issue of the directory he has an advertisement on page 239: A. Tiensch, manufacturer of mathematical, philosophical and optical instruments, Third Street, opposite the Post Office. He is also listed in 1859-60 issue of the Louisville directory. While he is not listed in the Memphis directory until 1867, there is evidence that he was in Memphis in 1860. This is born out by the fact that his son, Gustav Adolph (below) lived in Memphis ninety years. Adolph Tiensch is listed through the 1895 issue of the Memphis directory, mathematical and optical instruments. He died at Memphis 5 December 1897 and is buried in Elmwood Cemetery in Memphis.

There is privately owned in Bastrop, Louisiana, a surveyor's vernier compass. It is 16" overall, 5.95" needle, 7.2" sights and level vials. The compass is engraved A. TIENCH, Louisville, Ky. In the top of the case is a printed label:

TIENSCH & STANCLIEF
Manufacturers of
Mathematical, Philosophical
and Optical Instruments

88 Third St., near Post Office, Louisville, Ky.

Stanclief is not listed in any Louisville directory from 1832 through 1870.

There is privately owned in Montgomery, Alabama, a Wye Level engraved A. Tiensch, Memphis, Tenn.

GUSTAV ADOLPH TIENSCH (1853 - 1949)

Memphis, Tennessee

He was born at Louisville, Kentucky, the son of Adolph and Theresa Cordes Tiensch 4 May 1853.

He moved to Memphis with his father in 1860 and is first listed in the 1871 directory as an instrument maker with A. Tiensch.

He is listed in the Memphis directories through the 1936 edition "Tiensch Gus A., (Mary) instrument maker, surveying and engineering instruments, levels, transits and compasses, repairing and adjusting solicited."

He died at Memphis 10 April 1949 and is buried in Elmwood Cemetery in Memphis.

JOHN TRUNDY (1800 - 1873)

Page 160 (q.v.)

Portsmouth, New Hampshire

He was born at Portsmouth 29 June 1800. In Brewster's Rambles about Portsmouth, Second Series, by Charles W. Brewster 1869, he is listed as a pupil at Eleazer Taft's school from 1805 to 1814 on page 320.

He is listed in the Portsmouth directories as follows: 1851 Trundy, John, mathematical instrument maker, 18 Bow, h. 49 Hanover. 1860-61 Trundy, John, Gas Co. Agent, 50 Bow, h. 40 Hanover.

He died at Portsmouth 23 March 1873 and is buried in South Cemetery.

In the New Hampshire Historical Society's Museum is a surveyor's compass engraved, "J. Trundy, Maker, Portsmouth, N. H." It is 11-1/4" overall with a 5" needle, which is unusually wide.

VICTOR INSTRUMENT CO.

New York City

The Victor instruments were made in Germany by Edward G. Soltmann (1856-1927) previous to World War I.

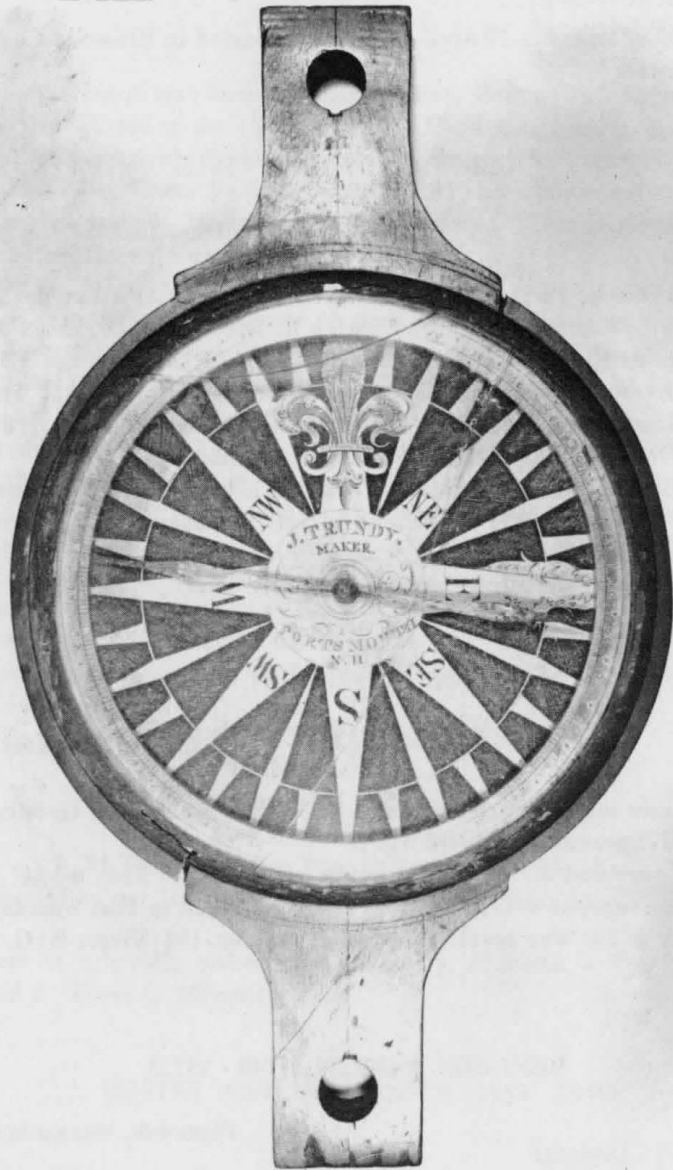
Gurley serviced a "Victor" transit in 1961. No. 224. 6-1/4" limb, 14-1/2" telescope. 4-1/2" needle. There is owned in Port Washington, New York a 20" Wye level. It is engraved No. 198 Victor E. G. Soltmann N. Y.

BENJAMIN WARREN (1740 - 1825)

Plymouth, Massachusetts

In the Streeter Collection of Weights and Measures at Yale University in New Haven, Connecticut is a wood surveyor's compass which is 15" overall with a 5-1/2" needle, the sights made of a lighter kind of wood are 4-1/4" high. The printed compass card is paper. Around the center rim is printed "Made and sold by Benjamin Warren Plymouth, New Eng^d."

www.compleatsurveyor.com



John Trundy (1800-1873) Portsmouth, New Hampshire
 In the New Hampshire Historical Society's Museum, Concord, New Hampshire.
 Photograph courtesy Charles S. Parsons, Goffstown, New Hampshire

There were five generations of Warrens in Plymouth before 1800, all named Benjamin. It is believed that the Benjamin born in 1740, the son of Rebecca (Doty) Warren and Benjamin Warren II, is the maker of the compass mentioned above.

He was married on 7 January 1763 to Jane Sturtevant of Kingston, Massachusetts. A son, also named Benjamin, was born in 1766. Benjamin Warren (3) died at Plymouth 12 June 1825.

References:

Pilgrim Hall, Pilgrim Society, Plymouth, Massachusetts; A compass card by Paul Revere? by Silvio A. Bedini in the Yale University Library Gazette Volume 37 Number 1 July 1962. Mrs. Clara M. Giar, Clerk, Board of Cemetery Commissioners, Town of Plymouth, Massachusetts.

PAUL WEISS (1864 - 1943)

Denver, Colorado

Paul Weiss, son of Johannes and Elise Borlin Weiss, was born at Basel, Switzerland 8 July 1864. He came to America in 1881. He landed in Halifax, Nova Scotia because the boat was badly hit by a storm at sea. He soon made his way to New York City where he spent six years in the confectionery business.

In 1887 he went to Chicago where he entered his uncle's, Louis Boerlin, optical business. While in Chicago he met Dr. Charles E. Walker of Denver who induced Mr. Weiss to move to Denver which he did in 1890.

He is first listed in the 1891 Denver directory: Weiss, Paul, optician with Alfred W. Ward, optician, 1634 Lawrence. In 1894 he went in business for himself which continued until his death, 19 February 1943, quite separate from the following instrument firms: On 4 March 1904 he entered into a partnership with Frank Heitzler to make surveying and mathematical instruments, the firm name being Weiss and Heitzler at 734 - 19th Street, later 1606 Curtis Street. The partnership was dissolved and the business was discontinued in June 1910.

In 1902 he was appointed Swiss Consul for Denver which continued for many years.

In 1914 Mr. Weiss founded the Weiss Instrument Co. to make surveying instruments and prism binoculars at 1622 Arapahoe Street. Associated with him were Guido Halfell and Henry Brautigam. In 1921 the Weiss Instrument Company's officials were Paul Weiss, Pres., Mgr. T. T. Guerin, Sec'y.

The Weiss Instrument Company is listed in Denver directories through 1925 at 700 - 1731 Arapahoe Street.

References:

Denver directories, correspondence with Mr. William C. Weiss, son of Mr. Paul Weiss, Denver Sunday newspaper 26 June 1932, and The Public Library of the City and County of Denver, Mrs. Barbara Conroy, Head, Sociology and Business Department.

RASSELAS PRINCE WHITCOMB (1808 - 1884)

Cincinnati, Ohio

W. & L. E. Gurley's "Day Book No. 2, May 1862-July 1865" has the following entry:

November 13, 1863

E. F. Guild Wolcott, Wayne Co. N.Y.

Orders Transit Compass (Whitcomb, maker) repaired.

Sent back Nov. 19th.

In compiling the history of Herman Pfister of Cincinnati, I found that Mr. Pfister bought the business of R. Whitcomb in 1878, "because Mr. Whitcomb was becoming too old to continue with it". Perhaps he was, but as a matter of fact he had made enough money to retire to Florida.

The Cincinnati directories list him as follows:

1851-52 Whitcomb, Rasselas, 121 Walnut, boarding at 103 West Fifth.

1855 Whitcomb, R. inst. mkr. 137 W. 5th.

1856 Whitcomb, Rasselas, math. inst. mkr. n.w.c. 5th & Plum.

1857 Whitcomb, Rasselas, math. inst. mkr. s.w.c. 5th & Race.

He is not listed in 1858.

1859 same as 1857.

He continues to be listed off and on until 1877-1878 Whitcomb, R. & Co., (R. W. and Herman Pfister) Manufacturers of Surveying and Engineering Instruments, 119 W. 5th Room 6.

The following biography of Mr. Whitcomb was found on page 122, Whitcomb Family in America, A Biographical Genealogy by Charlotte Whitcomb, Minneapolis, Minnesota: October 1904.

Rasselas Prince Whitcomb⁷, son of Dr. Winslow⁶ and Margaret Ellis Whitcomb, was born 8 December 1808, Pottsdam, N.Y., in early manhood was a civil engineer and surveyor and he was in the United States Government employ during which time he surveyed part of the Territory of Wisconsin. Later he went to Cincinnati, Ohio where he lived some forty years; his business in this city was the manufacture of mathematical instruments. He was very successful financially and stood high in the Masonic order. He was married to Elizabeth English; he died at Umatilla, Fla. 7 June 1884". They had five boys.

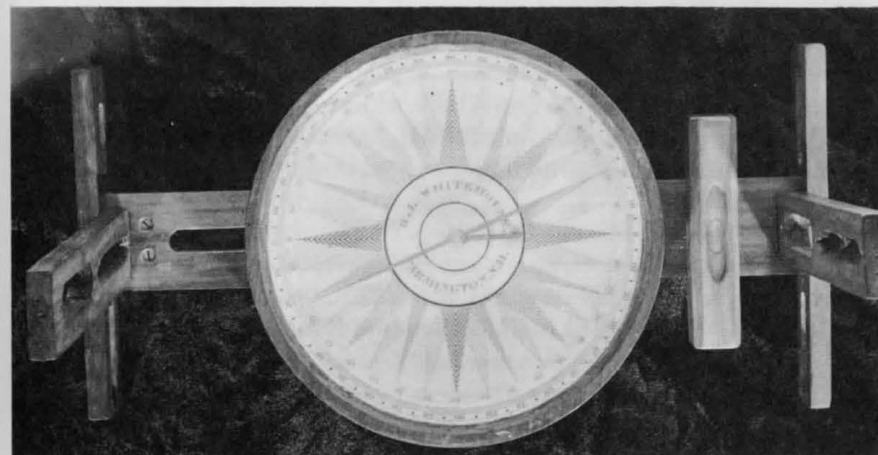
HON. GEORGE LEIGHTON WHITEHOUSE (1797 - 1887)

Farmington, New Hampshire

George Leighton Whitehouse, son of Nathaniel and Annie Leighton Whitehouse, was born at Middleton, N.H. 6 January 1797.

In 1815 he entered as an apprentice in a cotton factory in Union Village, Wakefield, staying two summer seasons teaching winters. He farmed with his father until 1824 in Middleton, then was a grocer in Farmington until 1827, when he became a deputy sheriff of the county serving until 1833. He was elected register of deeds of the county in 1833 holding the office until 1839. Dover was the county seat and while there as register of deeds he made the first map of the town.

From 1839 to 1871 he was engaged in surveys for railroads and canals in New Hampshire and Massachusetts. He was a member of the New Hampshire legislature in 1830 and again in 1856-57. His varied activities included judge of the court of common pleas from 1841 to 1855. He was a land surveyor for 60 years. As captain in the New Hampshire militia he served in the War of 1812¹ for which service he received a pension of \$8.00 per month up to the time of his death 19 November 1887. He is buried in Pine Grove Cemetery in Farmington.



G. L. Whitehouse Compass

He patented a leveling rod for surveying on 22 August 1876 (Patent No. 181, 384). Gurley had a wood cut of this rod in their 1880 catalog. It was priced at \$8.00.

There are three known surveyor's compasses made by Mr. Whitehouse. The one owned in New Jersey is wooden construction. It is 11" long with a 4-3/4" needle. It is marked "G.L. Whitehouse Farmington, N.H."

The second compass is owned in New Hampshire. It is marked "G.L. Whitehouse."

The third surveyor's compass is made of wood. It has a printed mariner's compass card. The inner section is printed "G.L. Whitehouse Farmington, N.H." The compass is 10-7/8" overall, with a 4-7/8" needle. There are two sights, one is 5-3/8" in height, the other is 5-1/2" in height. They extend below the wood plate and are held in position by wood plugs. There are two wood level vial cases. The longitudinal one is adjustable. The needle lifter is made of brass wire. This compass was loaned by J. Phillip Rich, Lake Elmore, Vermont for photographic purposes.

A more extended history of the Hon. G. L. Whitehouse was printed in the *Farmington News* 25 November 1887, p. 2, col. 5: A copy was sent to the author by Mr. Charles S. Parsons of Goffstown, N. H.

¹ He was 13 years old in 1812. May have been his father.

ALEXANDER TARBELL WILLARD (1774 - 1850)

Ashburnham, Massachusetts
Ashby, Massachusetts

"Alexander Tarbell Willard, the son of Jacob (1734-1808) a farmer living in Ashburnham near the Ashby town line and his wife Rhoda Randall Willard of Stowe, Mass. was born at Ashburnham 4 November 1774. He lived there from his birth until 1800 when he moved to Ashby. He made a variety of clocks and, in addition, he made and sold surveyor's equipment including theodolites. From 1812 until 1836 he was postmaster of Ashby."

He died at Ashby 4 December 1850.

The New Ipswich Historical Society of New Ipswich, New Hampshire has a surveyor's vernier compass. It is 12-1/2" overall with a 4-1/8" needle. It is engraved WILLARD. W is left of North. The hinged sights are 4-1/4" high. There are two rows of figures on the needle circle. The inner circle is graduated and figured 0-90 in quadrants. The outer circle is graduated and figured 10 to 360 clockwise. This compass was used by Jesse Stearns (1784-1886) who lived most of his mature years in New Ipswich.

Reference:

Willard Genealogy, Sequel to Willard Memoir. Materials gathered chiefly by Joseph Willard and Charles Wilkes Walker. Edited and completed by Charles Henry Pope, Boston, Mass. Printed for the Willard Family Association 1915. Murray and Emery Co., Kendall Square, Cambridge.

LEWIS J. WOHNLICH (1845 - 1932)

Detroit, Michigan

He was born in Switzerland 25 April 1845 and died at Detroit, Michigan on 21 September 1932.

He is listed in the 1872 Detroit directory.

In 1873 he advertised in the Detroit directory that he was the successor of William Cicero Grant at 55 Woodward Avenue.

He is listed in the Detroit directories until the 1922-1923 issue. The Detroit directories were not consulted after this issue.

His death certificate states that he was retired at the time of his death. He is buried in the Evergreen Cemetery in Detroit.

YOUNG, SMITH & CO. (1833 - 1845)

SMITH, YOUNG & CO. (1852 - 1857)

Henry Young (1792 - 1874)

William Henry Smith (1803 - 1869)

Samuel Porter Williams (1807 - 1877)

Jacob Rutsen Schuyler (1816 - 1887)

2 and 4 Maiden Lane, New York City

This interesting and complicated history commences with Henry Young, son of Alexander and Anne Slasson Young, born at Sing-Sing, New York 15 December 1792.

He is first listed in the 1817-1818 New York City directory, living at Cedar, c. Broadway; June 1819, 58 Courtlandt and June 20, 1820, hardw. & military st., 4 Maiden Lane.

The 1830-31 directory lists, Young (Henry) & Co. This firm continues long after 1874 with James H. Young, his son as a partner.

Young, Smith & Co. are listed from 1834 to 1845.

Smith, Young & Co. are listed from 1852 to 1857.

The 1850-51 directory lists Young, Henry, Pres. Man Gas Co. This indicates that Mr. Young is in addition to other responsibilities, the President of the Manhattan Gas Company. From 1858 until his death 21 October 1874, he maintained an estate at Sing-Sing (now Ossining), New York.

William Henry Smith was born at New Rochelle, New York 31 January 1803. He is first listed in the 1830-31 New York City directory, Smith, William H. military stores, 4 Maiden Lane, h. 58 Courtlandt. This is the same address as Henry Young had in June 1819.

New York Business Directory for 1841-42 (J. Doggert) "Smith, Wm. H. see Young, Smith & Co." Young (Henry), Smith (William H.) & Co., (Samuel P. Williams) Military goods, 4 Maiden Lane. William H. Smith is also a partner of Smith, Young & Co. from 1852 to 1857. From 1858 until his death in New York City, 19 July 1869, he is listed Smith, William H. & Son (James R.) or Smith, William H. & Sons (James R. and Lewis Bayard) as importers at various addresses, 2 Maiden Lane and 77 William Street.

Samuel Porter, the third son of Rev. Samuel Porter⁶ and Mary Hanford (Webb) Williams was born at Mansfield, Connecticut 5 August 1807. He died at New York City 3 August 1877. He settled in New York City in 1828 where he engaged in the mercantile business.

He is first listed in New York City directories in the 1837-1838 issue "hardware, 4 Maiden Lane". He may have been a partner of Henry Young & Co. before that time. He is listed the same from 1838 through 1843 issues. As mentioned above Mr. Williams was a member of the firm of Young, Smith & Co. in 1842. In 1843-1844 issue he is listed; hardware, 17 Maiden Lane. In the 1844-1845 thru the 1846-1847 issue, "hardware, 19 Maiden Lane." The 1848-1849 issue, imp. 19 Maiden Lane. From 1850 thru 1875 he is listed at 74 Broadway, 29 Maiden Lane, 15 John and finally when he retired, 34 West 20th Street where he died.

Jacob Rutsen Schuyler was employed by Young, Smith & Co. in 1833. He was a partner from 1847 to 1854 when he became senior partner in the firm of Schuyler, Hartley & Graham at 13 Maiden Lane.

There is privately owned in Pasadena, California a surveyor's vernier compass, length overall 16", needle 5-3/4", engraved Smith, Young & Co. New York.

References:

Correspondence with Miss Greta Cornell, Director, Ossining Historical Society, Ossining, New York. New York City directories 1817 to 1880. *The Republican* (newspaper) Sing-Sing, New York 29 October 1874. The Hyde Genealogy, or the Descendants in the female, as well as the male, line from William of Norwich (Connecticut) by R.H. Walworth 1864. The Ancestors and Descendants of Ezekial Williams of Wethersfield (Connecticut) 1608-1907. Compiled by Mary Dyer (Williams) McLean, privately printed 1907. Certificate and Record of Death No. 270717; Samuel Porter Williams: No. 30136; James Hyde Young: No. 38609; William Henry Smith.

GEORGE W. WILSON (1821 - 1910)

Page 169 (q.v.)

Concord, New Hampshire

Mr. Wilson is buried in Elmwood Cemetery, Northfield, Vermont.

Mr. Gerald R. Hyde, Bedford, New Hampshire was instrumental in procuring the Wilson Surveyor's Cross for the Gurley Museum.

BIBLIOGRAPHY

- Avery, E.M. and Catherine H.T. *The Groton Avery Clan*. Cleveland, Ohio: 1912.
- Baird, Charles W. *History of the Huguenot Emigration to America*. New York: Dodd Mead & Company. 1885.
- Baldwin, Charles C. *The Baldwin Genealogy from 1500 to 1881*. Cleveland, Ohio: Printed by The Leader Printing Co. 1881.
- Barber, Gertrude A. *Graveyard Inscriptions in Orange County, New York*. Typescript. 1950.
- Bates, Albert C. *Sundry Vital Records of and pertaining to the present town of East Granby, Conn. 1737-1886*. Hartford: 1947.
- Bedini, Silvio A. *Early American Scientific Instruments and Their Makers*. Smithsonian Institution, United States National Museum, Bulletin 231. Washington, D.C., 1964.
- Blake, Francis E. *History of the Town of Princeton, County of Worcester, Commonwealth of Massachusetts*. Published by the town: 1915.
- Boltwood, Lucius M. *History and Genealogy of the Family of Thomas Noble of Westfield, Massachusetts*. Compiled by Lucius Manlius Boltwood. Hartford, Conn.: Privately Printed. 1878.
- Brewster, Charles W. *Rambles about Portsmouth. Second Series*. Portsmouth, N.H.: Printed and Published by Lewis W. Brewster. 1869.
- Comstock, Cyrus B. *A Comstock Genealogy. Descendants of William Comstock of New London, Conn., who died after 1662. 10 Generations*. Edited by Cyrus B. Comstock. New York: The Knickerbocker Press. 1907.
- Cummin, Hazel E. *Levi and Abel Hutchins*. Antiques. (July 1929, page 46).
- Cutten, Dr. George B. *Silversmiths and Watchmakers of New York* (outside of New York City). Privately Printed. 1939.
- Daniels, George F. *History of the Town of Oxford, Massachusetts, with Genealogies and Notes on Persons and Estates*. Oxford: Published by the Author, with the co-operation of the town. 1892.
- Dictionary of American Biography, Vol. IX. New York: Charles Scribner's Sons. 1932.
- Dodd and Burnett. *Genealogies of the Male Descendants of Daniel Dod of Branford, Conn., a native of England*. Newark, New Jersey: Printed at the Daily Advertiser Office. 1864.
- Doolittle, William F. *Doolittle Family in America*. Cleveland, Ohio: Press of the National Printing Co., Cleveland. 1901-1908.
- Dreppard, Carl W. *American Clocks and Clockmakers*. Boston: Charles T. Branford Company. 1958.

Egle, William H. *History of the Counties of Dauphin and Lebanon in the Commonwealth of Pennsylvania*. Philadelphia: Everts & Peck. 1883.

Ellis, Franklin. *History of Columbia County, New York, with illustrations and Biographical Sketches of some of the Prominent Pioneers*. Philadelphia: Everts and Ensign. 1878.

Farmington News. Farmington, New Hampshire.

Foxborough, Massachusetts, Vital Records to year 1850. Published by The New England Historic and Genealogical Society. Boston, Mass. 1911.

Gibson, Robert. *The Theory and Practice of Surveying by Robert Gibson*. Whole Corrected, Newly arranged and greatly Enlarged by D.P. Adams. Teacher of Mathematics. New York: Published by Evert Duyckinck. 1814.

Gilman, Arthur. *A Genealogical and Biographical Record of that branch of the family of Gilman, descended from the Honorable Counsellor John Gilman of Exeter, N.H.*, with which is incorporated some account of his ancestors and the English Branch of the Gilman family. Compiled by Arthur Gilman. Printed for the use of the family by J. Munsell. Albany: 1863.

Halsey, Herbert D. and Francis R. *The Book of Ghosts*. Privately Printed by H.D. and F.R. Halsey. 1937.

Hammond, Priscilla. *The Records of the 3rd or Independent English Church in Portsmouth, New Hampshire*. 1758-1831. Compiled and indexed by Priscilla Hammond, Concord, N.H. (Typescript) 1941.

Hurd, D. Hamilton. *History of Rockingham and Strafford Counties, New Hampshire, with Biographical Sketches*. Philadelphia: J. Lewis & Co. 1882.

Hutchins, Charles. *The Autobiography of Levi Hutchins*, by his youngest son. Privately printed Cambridge, Mass.: Riverside Press. 1865.

In Memoriam. *William Gurley*. Troy: Privately Printed. 1890.

Kelker, Luther R. *History of Dauphin County, Pennsylvania*. New York, Chicago: The Lewis Publishing Company. 1907.

Leake, Isaac Q. *Memoir of the life and times of General John Lamb*. Albany: Joel Munsell. 1850.

Lincoln Lore. Lincoln National Life Foundation, No. 250. Fort Wayne, Indiana: January 22, 1934. Dr. Lewis W. Warren, Editor.

Lincoln, Waldo. *History of the Lincoln Family. An account of the descendants of Samuel Lincoln of Hingham, Mass., 1637-1920*. Worcester: Commonwealth Press. 1923.

Locke, Arthur H. *Portsmouth and New Castle, New Hampshire Cemetery Inscriptions*. Abstracts from two thousand of the Oldest Tombstones. Portsmouth: Privately printed by Mr. Locke. 1907.

McLean, Mary Dyer (Williams). *The Ancestors and Descendants of Ezekial Williams of Wethersfield, Conn. 1608-1907*. Privately Printed. 1907.

Merrill, Samuel. *Merrill Memorial*. Cambridge, Mass. 1917-1918.

Mendenhall, Thomas A. *The History of the Mendenhall Family*. Greenville, Ohio. Charles R. Kemble Press. 1912.

Millbury, Massachusetts, Centennial History of the Town including Vital Statistics. 1850-1896. Published under the Direction of a Committee appointed by the Town. Millbury: 1915.

National Cyclopedia of American Biography. New York: James T. White & Co., 1897.

Palmer, Brooks. *The Book of American Clocks*. New York: MacMillian Co. 1959.

Parsons, Charles S. *Timothy Chandler*. Paper read at a meeting of the National Association of Watch and Clock Collectors at Swampscott, Mass. meeting held in May 1959.

Poole, Murray E. *The History of Edward Poole of Weymouth, Mass. (1635) and his Descendants*. Ithaca, N.Y.: A.B. Press of the Ithaca Democrat. 1893.

Pope, Charles H. *Willard Genealogy, Sequel to Willard Memoir*. Materials gathered chiefly by Joseph Willard and Charles W. Walker. Edited and completed by Charles Henry Pope. Boston: Printed for the Willard Family Association. Murrey and Emery Co., Cambridge. 1915.

Popular History of American Invention. New York: Charles Scribner's Sons. 1924.

Prime, Alfred C. *The Arts and Crafts of Philadelphia, Maryland and South Carolina 1786 to 1800*. Series 2. Topsfield, Mass.: Walpole Society, 1929.

Republican, The. Sing-Sing, 29 October 1874.

Richards, Prof. J. Fraise. *History of Franklin County, Pa.*, Chicago: Warner Beers & Co. 1887.

Ruttenber, E.M. and Clark, L.H. and a corps of Biographical Writers. *History of Orange County (New York)*. Philadelphia: Press of J.B. Lippincott & Co. 1881.

Spinney, Frank O. *An Ingenious Yankee Craftsman* Antiques, (September 1943).

Starr, Burgis P. *A History of the Starr Family of New England from the ancestor Dr. Comfort Starr, who emigrated to Boston, Mass. in 1635*. Hartford, Conn.: The Case, Lockwood & Brainard Co. Print. 1879.

Storrs, Charles. *The Storrs Family*. New York: Privately Printed. 1886.

Trumbull, James R. *History of Northampton, Mass., Since its Settlement in 1654*. Northampton: Press of Gazette Printing Co. 1902.

Trumbull & Gere. *Northampton Business Directory and General Advertiser*, Northampton, Mass. 1860-1861.

Walworth, R.H. *The Hyde Genealogy or the Descendants in the female as well as the male line from William of Norwich (Conn.)* Albany: J. Munsell. 1864.

Welles, Albert. *History of the Buell Family in England and America*. New York: 1881.

- Whitcomb, Charlotte. *Whitcomb Family in America*. Minneapolis, Minnesota: 1904.
- Williams, Carl M. *Silversmiths of New Jersey 1700-1825*. Philadelphia: George S. MacManus Co. 1949.
- Williams, T.J.C. and McKinsey, Folger. *History of Frederick County, Maryland*. Hagerstown, Maryland: L.R. Titsworth & Co. 1910.
- Wroth, Lawrence C. *Abel Buell of Connecticut, Silversmith, Type Founder & Engraver*. Middletown, Conn.: Wesleyan University Press. 1958.

Since 1864 Gurley has repaired the following instruments but to date, March 1968, no trace has been found of the makers:

- Albany, New York, 28 July 1864, Wood & Laisdell Transit
- Whitehall, Michigan, 18 June 1867, Sungas Transit
- Ennis, Texas, 7 April 1874, Thiton Compass
- Deadwood, Dakota, 8 August 1879, Theodolite, W.C. Cox, Maker
- Rhinebeck, New York, 7 October 1879, Telescopic Compass, Cornwall, Maker
- Pittsfield, Massachusetts, 5 August 1882, Elliott Theodolite
- Galveston, Texas, 23 May 1885, Frank, Milwaukee, Transit
- Galveston, Texas, 9 February 1887, Schnitzer, New York, Transit
- Starkville, Mississippi, 28 October 1885, Elliott Theodolite
- Henderson, Kentucky, 12 June 1886, Heinsch Vernier Compass
- Sheffield Scientific School, New Haven, Connecticut, 21 April 1888, Becker Transit
- Roanoke, Virginia, 7 May 1930, Wright and Hooke 4" Plain Compass

INDEX

- Abbott, Everett W., 1, 183
-McKay Corporation, 1, 183
- Adam, Frank, 10
Frank Electrical Co., 10
- Adams, Maker, London, 173
George, 177
- Ainsworth, Alfred W., 1
Robert G., 1
William, 1
W. Co., 1
Wm. & Sons, 1
- Allegheny Cemetery, 211, 212
- Allen, John, 2
Richard S., 164
- Alliance Historical Society, 237
- Aloe, Albert S., 2
A.S. Co., 2
Hernstein & Co., 2
Sadock, 2
S. & Son, 2
- Antiques*, 115, 155, 201, 219, 243
- American Antiquarian Society, 185
- American & Commercial Daily Advertiser*, 19
- Anderson, C.G., 6
- Andrews, Charles, 3
Charles J., 3
Rev. Robert, XXI
Robert E., 3
Robert F., 3
& Sons, 3
- Arms, Dr. Edward W., 61
- Armstrong, Mrs. Grace R., 140
- Ars Navigandi*, 18
- Artz, C. Burr Library, 212
- Ashby, Thomas, 27
- Audubon Shrine and Wildlife Sanctuary, 81, 208, 212
- Aurora General Advertiser*, 59, 180
- Avery, Anna Miner, 183
Dr. Amos G., 251
- Avery, Catherine H.T., 183
Clan, The Grotton, 183
E.M., 183
John, 183
- Backus, Maj. Ebenezer, 90
- Bacon, Austin, 112
- Baird, Charles W., 216
- Bailey, John, 1, 183
John, 2, 183
John, 3, 183
John, 6, 183
John, 11, 183, 184
John A., 4, 24, 184
Mary Hill, 183
Ruth Ellis, 183
Ruth Randall, 183
Tabitha Olney, 183
- Baker Library, Hanover, New Hampshire, 185
- Balch, Thomas H., 4
Mining Interests of the United States, 173
- Baldwin, Charles C., 185
Nabby Jones, 184
Lydia Barker, 184
Jabez, 184
Jedediah, 184, 185
& Storrs, 184, 249
- Ballard, Mehitable, 5, 64
Samuel, 5, 64
- Baltimore (Maryland) American*, 17, 18, 66
- American & Commercial Advertiser*, 64, 181
- Baltimore Cemetery, 115
- Bank of America, 199
- Banks, Dr. Charles E., 186
Edward P., 186
Dr. Elias, 186
Lucretia Prince, 186
- Baptist Church, Old Slate Hill, 217
- Barber, Miss Gertrude, 217
- Barrows, John S., 49, 177
W. P., 131
- Barry, John S., 183, 184

Bartlett, Dr. G. Hunter, 43
 Bates, Albert C., 252
 Battell, Captain, 29
 Battison, Edwin A., 217
 Bausch, Edward E., 5
 George, 5
 John J., 5
 J & Co., 5
 & Lomb, 5
 & Lomb Optical Co., 5, 177
 Beckmann, The L. Co., 6
 Louis Jr., 6
 Louis Sr., 6
 Bedini, Silvio A., V, 92, 177,
 XXVI, 257
 Beer, Samuel T., 6
 Samuel T. & Co., 6
 Belknap, Henry W., 144
 Bemis, John R., 232
 Samuel, 6
 Samuel A., 6, 7
 Bendix Aviation Corporation, 15
 Bennett, Archibald F., 177
 Benny, C.J., 177
 Berger, C. Louis, 7, 8, 21, 22
 C.L. & Sons, 7, 102, 154
 Louis H., 7, 8, 186
 William A., 7, 8, 46, 186
 Bertie, George, 8
 Bertrand, Elizabeth, 216
 Jean, 216
 Bester, Harvey, 8
 Owen H., 8
 Biggs, Thomas, 9, 32
 Bird, John, XXI
 Bishop, J.L., 177
 Blackson, Walter, 27
 Blair County Historical Soc., 81, 211
 Blake, Francis E., 195
 Blakslee, Ziba, 9
 Blattner & Adam, 10, 11, 170
 Henry, 10
 Jacob, 9, 10
 Louise, 10
 Bluhm, Joseph, 51
 Blunt, Edmund, 11, 12, 13
 Edmund Jr., 11, 12, 187
 Blunt, Edmund M., 11, 115
 E. & G.W., 11, 12
 G.W., 11, 12, 13
 Joseph, 115
 William S., 11, 12, 186
 & Co., 11, 13, 186, 201
 & Nichols, 11, 13, 187
 Bolter, Ward H., XXVI, 193, 224
 Boltwood, Lucius M., 233
Boston Budget, 72
Boston Gazette, 54, 56, 58, 88
Gazette and County Journal, 168
 Storage Co., 227
 Bostonian Society, 40
 Bostrom-Brady Mfg. Co., 14, 51
 Ernest A., 14
 Bowles, Hannah, 187
 Samuel, 187
 Thomas S., 14, 187
 Brady, Isaac A., 14
 Brandis, Frederick E., 14, 15
 Henry, 14, 15
 William, 14, 15
 F & Co., 14
 F.E. Sons & Co., 14
 Brautigan, Henry, 257
 Breed, Aaron, 15
 J. Howard, 177
 Breithaupt, F.W. & Son, 7
 Brelefield & Co., (Francis Brele-
 field and Charles A. Saxe), 242
 Brewington, M.V., V, 52, 94
 Brewster, Charles W., 255
 Bridge Street Cemetery, 251
 Bridges, Hazel M., 226
 Bridwell, Mrs. Margaret M., 155
 Brightly, Charles E., 82, 161
 Brookfield Cemetery, Goshen,
 N.Y., 217
Brooklyn Daily Eagle, 41
 Brown, Alan S., 177
 Bush G., 17
 Edmund, 17, 20
 Edmund & Son, 17
 John, 17
 Captain John, 61
 John T., 19

Brown, John Jr., 61
 John G., 17, 19
 Mercy, 37
 Sally, 37
 & Heartte, 19
 & Hunt, 17, 20
 Browning, Edward F., 177
 Mary E., 189
 Samuel, 21, 188
 Samuel S., 189
 & Son, 21, 189
 Brunson, Amber N., 21
 Instrument Co., 21
 Bryan, Alexander, XX
 R., 34
 Bryant, Carl R., 29
 Buckham, A., 189
 Buell, Abel, 189
 Abigail C., 189
 John, 189
 Buff & Berger, 7, 21, 22, 159
 Catalog, 190
 Carl W., 8, 22
 George L., 7, 21, 22
 Henry A., 22
 & Buff Mfg. Co., 8, 22, 186,
 227, 232, 235
 Buffalo Historical Society, 43
 Burnap, Daniel, 22, 23
 Burnet, John R., 196
 Burnett, Archie C., 226
 Burnham, 144
 Burns, Mary K., 200
 Burr, Ebe^F, 156
 Burstyn, Harold L., 11, 12
 115, 177, 187
 Burt, Alvin, 23
 Austin, 23
 John, 23, 24
 J. & W., 24
 Solar Compass, 23
 Wells, 23
 William, 23, 24, 25
 William A., 23, 24, 177
 & Bailey, 4, 24, 25, 33
 & Watson, 24, 25, 33, 164
 Butler County Historical Society
 and Museum, 234
 Calhoun, J., 238
 Camp Martius, 82, 209
 Carleton, Osgood, 113
 Carnegie Library of Pittsburgh, 212
 Carson, Captain Charles, 209
 Carter, C. Ross, 204
 Henry, 100
 Center Church Burying Ground, 38, 198
 Meeting Graveyard, 27
 Central Burying Ground, 168
 Chaffin, William L., 177
 Chamberlain, Henry B., 190
 Nathan B., 134, 159, 189, 190
 Nathan B. & Sons, 190
 Walter O., 190
 & Ritchie, 134, 190
 Chandlee, Benjamin Jr., 25
 Benjamin III, 26
 Edward E., 26, 27, 177, 202
 Ellis, 26
 Goldsmith, 26, 27, 28, 202
 Isaac, 26, 29
 Chandler, Abiel, 29, 190
 Timothy I, 190
 Timothy II, 190, 231
 Charles II of England, XXI
 Chester County Historical
 Society's Museum, 198, 299
 Chickering, Nathaniel, 29
 Chilton, D., XXI
 Churchill, Gardner A., 105, 192, 228
Cincinnati Daily Gazette, 102
Enquirer, 48
 Type Foundry, 48
 Circumferenter, XV
 Clark County Historical Soc., 195, 235
 Elizabeth Starr, 192
 Frederick H., 192
 Horatio, 30
 James, 192
 John, 30
 L. H., 217
 Robert, 31
 William, 31

Clark & Son, 31
 Wm. & Son, 192
Claypole's American Advertiser, 44
 Clements, Timothy, 48
 Cobb, Eleanor, 108
 Cole, Humphrey, VIII
 Colton, George W., 31, 177
 Levi, 31, 32
 Columbia Co., N.Y., History of, 223
 Compass, Single Plate, XVII
 Vernier, XVIII
 Comstock, Cyrus B., 193
 David C., 193
 Elizabeth A. Tompkins, 193
 William, 193
 William T., 193
 Condry, Benjamin, 9, 32
Connecticut Courant, 37
Gazette, 89
 Historical Society, 189
 State of, State Department of
 Health, Statistical Records, 252
 Conrad, Henry C., 34, 177
 Conroy, Mrs. Barbara, 258
 Cook, Benjamin, 249
 Cooke, Frank, 128
 Thos. & Sons, 7, 22
 Cooley, Oliver B., 251
 Cooper Institute, 41
 Cooperstown Farmer's Museum, 57
 Cope, Dr. Thoma XX, XXI, 177, 178
 Cornell, Miss Greta, 262
Courier of New Hampshire, 219
 Crandell, Charles E. 204
 Crosset, Suzanne, 216
 Crosman, Charles, 25, 33, 51, 52
 Crossan, Jal, 244
 Crow, George, 33
 Cummin, Hazel E., 219
 Currier Gallery of Art, 231
 John J., 178
 Cushing, A.C., 253
 Abby C., 253
 Samuel T., 253
 Sarah H., 253
 William L., 253
 Custis, George W.P., 140
 Cutten, Dr. George B., 216
 Daniels, George F., 221
 Danner, Jacob, 34
 Jacob S., 35
 Dannerin, Elizabeth, 34
 Dartmouth College Museum, 231
 Dauphin County Court House Records, 212
 County Historical Society, 212, 213
 Davenport, Ann, 35
 James M., 35
 Mary, 35
 Michael, 35, 36
 Mrs., 35
 S., 35
 William, 35, 36, 82
 Davies, Thomas, 251
 Davis, Ari, 194
 Asahel, 194
 Betty Blood, 194
 Daniel, 194
 Edna, 195
 Frank, 212
 J.B., 50, 87, 178
 William, 195
 William C., 36, 110, 111, 195
 Dax, Edward R., 213
 Dean, William, 36, 195
 Decker, Forest L., 204
 Declination, Magnetic in the
 United States, XXII, XXIII
 Demming, Hercules, 238
Detroit Advertiser, 4, 25, 52, 181
Free Press, 4
Post and Tribune, 51
 Didier, K.B., 201
 Dietzgen, Eugene, 37
 Eugene Co., 37
 Eugene Co. of Delaware, 37
 Eugene Co. Factory, 37
 Joseph E., 241
 Dixon, Jeremiah, XX
 Dod, Daniel, 195, 196, 197
 Lebbus, 196
 Dodd, Bethiel, M.D., 196
 Dodge, William E., 77

Donnel, Henry, 195
 Jonathan, 195
 Doolittle, Asenath, 38
 Elizabeth, 38
 Enos, 37, 38, 198
 Isaac, 37, 38
 Isaac Jr., 38, 39
 James, 38, 198
 Joseph, 38
 Sarah P., 198
 William F., 198
 Dorsey, Philip, 39
 Dow, George F., 178
 Dowling, Michael, 198
 Draper, Edmund, 39, 40, 96, 158, 163
 & Knox, 39, 40
 Dreppard, Carl W., 229
 Drost, William E., 217
 Duhamel, Clement, 198, 199
Dunlap's American Daily Advertiser, 36
 Dunlavey, Charles H., 185
 Dupee, John, 29, 40
 Durang, Ferdinand, 209
 George, 209
 Duval, Captain Samuel, 140
 Dyherty, John, 195
 Eagles, Alexander, 216
 East India Marine Hall, Peabody
 Museum, 235
 Eckel, Frederick, 12, 13, 40, 90
 & Imhof, 13, 41
 Eckhardt, George H., 229
 Edwards, R., 23
 Rudolph, 23
 Egle, William H., 212
 Egy, W. Leo, XXVI
 Eichner, Laurits C., 17
 Ellerbe, Frank H., 41, 42, 99
 Ellicott, Andrew, XXI, 42, 140
 Benjamin, 42, 43
 Joseph, 43
 Elliott, Byron K., 43
 B. K. Co., 43
 Blue Print Co., 43
 Ellis, Franklin, 223
 Ellison, Bettye H., 192
 Elm Grove Cemetery, 252
 Elmwood Cemetery, 23, 254, 255
 Emerson, Jacob H., 34
 Emery, Samuel, 44
 English, Miss Dorothy, 212
 Ericsson, John, 135
 Erie Street Cemetery, 162
 Esser, Hermann, 98, 224
 Etchinson, Josephine P., 212
 Evans, 142
 George, 44
 Everts & Peck, 212
 & Ensign, 223
 Evergreen Cemetery, 261
 Ewin & Heartte, 45, 199
 John, 45
 William, 45, 199
 Ewing, Rev. Dr. John, XXI
 Fairfax, Lord, 3
Fairfield Gazette, 70
 Fairview Cemetery, 183
 Farlow, C.F., 5
 Farr, Joseph, 46
 Joseph Jr., 46
 Fauth, Camill, 45, 146
 & Co., 5, 45, 87, 105
 Fawcett, W. H., 24
 Fennell, Marion Miss, 204
 Fessel, E.H., 199
 Herman E., 199
 Fitts, Rev. James H., 178
 Flynt, Henry N., 251
 Ford, Edward, 178
 George Jr., 47
 George Sr., 47
 Henry Museum, 208
 Forest Hill Cemetery, 79
 Hills Cemetery, 188, 189
 Ft. Laramie National Monument,
 197
 Foster, James Jr., 47
 Fort McHenry, 209
 Fox, Mrs. Elizabeth K., 202
 Samuel L., 131, 242
 Foxborough, Vital Records of, 223
 Franklin, Benjamin, 75
 Institute, 57, 83, 121

- Frazier, Arthur H., XXVI
 Freeman, R. B., 118
 French, Miss Maude D., 185
 Frese, Adolph, 200
 Adolph Corporation, 200
 Arthur, 200
 Optical Co., 200
 Frigerio, Louis Jr., 200
 Frizzell, Martha Mc., 80
 Frost & Adams, 228
 Frye, Addington D., 49, 154
 Joseph, 48
 Gaertner, William, 220
 Gale, Margaret, 216
 Dr. John, 216
 Gallagher, Wm. M. Jr., 226
 Gallup Map & Supply Co., 21
 Gardam, Frederick W., 49, 50
 Joseph, 49, 50
 William, 49, 50
 William & Son, 49
 W. & Son, Inc., 50
 Gare, E.J. & Sons, 249, 251
 Gavatt, Wm., XII
 Geier, James, 51
 & Bluhm, 51
 General Services Administration
 National Archives and
 Record Services, 209, 212
 Gerrish, Oliver, 247
 Gerry, Captain Roger G., 115
 Giar, Mrs. Clara N., 257
 Gibson, Robert, 238
 Giles, Edward, 13
 Gillingham, Harrold E., 33, 42, 178
 Gilman, Arthur, 201
 Benjamin C., 200, 201
 Jane Deane, 200
 Honorable Counsellor John, 201
 Major John, 200
 Mary Thing, 200
 Geographical Journal, XXI
 Godby, Rupel, 238
 Goldbacker, Max, 51
*Goshen Repository and Weekly
 Intelligencer*, 218
- Gould, John, 59
 William, 59
 Gowans, John, 11, 186, 201
 Grabau, Hans E., 201
 Graham, Emily Classon, 242
 John L., 242
 Malcolm, 242, 243
 Granary Burying Ground, 88
 Grant, William C., 25, 51, 52, 261
 & Crosman, 51, 52
 Graves, George B., 202, 203
 Gray, John G., 131, 132
 Green, James, 19, 52, 53, 54, 202
 Samuel, 202
 Sarah, 202
 Greenbert, Stanley, 251
 Greene County, Commissioners of
 Pennsylvania, 212
 Greenleaf, James E., 178, 233
 Stephen, 54, 55, 56
 Greenough, Thomas, Jr., 57, 202
 Thomas, Sr., 57
 Green-Wood Cemetery, 204
 Greenwood, Clarke, 58
 Family, 58
 Isaac, 58, 115
 Isaac Jr., 58
 John, 58
 Gregg, Catherine, 204
 Richard, 204
 William T. Jr., 58, 204
 William T. Sr., 58, 204
 & Rupp, 58, 59
 Grey, Daniel, 106
 Sarah, 106
 Griffin, Bryan, 59
 John A., 226
 Grimm, Jeanette S., XXVI
 Grossmann, Albert A., 205
 Louise, 205
 Robert, 205
 Guerin, T.T. 257
 Guild, E.F., 258
 Gurley, Clarissa, 60
 Ephraim, 60
 Lewis E., 60, 62, 116, 117, 118
- Gurley Museum of Surveying
 Instruments, 2, 15, 174
 Museum Library, 173
 William, 60, 61, 62, 116, 117,
 118
 William F., 60, 62
 W. & L. E., 2, 11, 40, 60, 61, 62,
 63, 64, 108, 242, 258, 260
 H.A.R., (A. R. H.), 178
 Hagger, Benjamin K., 5, 19, 64, 66, 205
 Benjamin K. & Son, 65, 66
 John W., 65
 Mary, 93
 William G., 64, 65
 & Bro., 65
 Hagley Museum, The, 214, 229
 Hagner, Peter, 209
 Haitman & Saxe, 242
 Hale, Major Jonathan, 190
 Halfell, Guido, 257
 Halsey, Francis Reboul, 217
 Herbert Drake, 217
 James, 67
 John, 68
 Joseph, 68
 Hamilton, Miss Mary E., 212
 Hamlin, William, 68, 69
 Hammond, Priscilla, 187
Hampshire Gazette, 185, 249, 250
 Hancox, Kenneth A., XXVI
 Hanks, Alice Hovey, 72, 73
 Alpheus, 60
 A. & T., 75, 77
 Benjamin, 69, 70, 71, 77, 108
 Benjamin & Son, 71
 Horatio, 72, 73, 108
 Julius, 60, 71, 73, 77, 108
 L.B. & Niles, 72
 Oscar, 75, 77, 78
 Rodney, 108
 Truman, 71
 & Gurley, 60
 Hanna, John, 79
 Mfg. Co., 51, 79
 Hansen, Martha, 155
 Hanson, Cecil E., 202, 227
- Hardesty, Mrs. Lucy R., 202
 Harig, A. C., 254
 Augustus C., 254
 & Jones, 254
 Harland, Thomas, 70
 Harlow, Thompson R., 189
 Harris, Harriett H., 68
 Harrisburg Cemetery, 208, 212, 213
 Public Library, 213
 Volunteers, 208
 Hart, Charles C., 118
 William, 79, 205, 206
 Hartley, Catherine M., 242
 Marcellus, 41, 242, 243
 Robert M., 242
 Harvard University: Historical
 Scientific Instruments, 190, 227, 236
 Hasham, Stephen, 80
 Hassam, Stephen, 79, 80
 Hassler, Ferdinand R., 12
 Hatch, Wm. H.H., 186
 Hauser, J.J., 212
 Hays, Gordon, 118
 Heartt, Isaac T., 19, 45, 199
 Heartt's Lunar Tables, 19
 Heavenhill, William, 155
 Heck, Lewis, 118
 Heer, Peter, 80, 205, 241
 Peter & Co., 205
 & Seelig, 80, 158, 205
 Helig, Hendrick, 207
 John, 207
 Heinrich, Carl, 81
 Carl Co., 81
 Heitzler, Frank, 207, 257
 Mfg. Co., 207
 Heller, Charles S., 82, 83, 172
 & Brightly, 82, 83, 92, 161
 Heisely, Frederick I., 207
 Frederick II., 81, 207, 208
 Frederick A., 81, 207, 208, 211
 George J., 81, 82, 207, 208
 Mary G., 207
 & Son, 208
 Hellfricht, Charles F., 82, 242
 William, 35, 82

Helyer, Polly, (Mary), 253
 Heritage Foundation, 233, 250, 251
 Hernstein, William H., 2
 Hewitt, Horatio T., 213
 Thomas, 213
 & Son, 213
 Higbee, Lester C., IV
 Hilgard, J.E., 13
 Highland Park Cemetery, 162
 Hilger, Polly, 160
 Hill, Mr. and Mrs. W.I., 192
 Hingham Cemetery, 253
 Hiremann, Jno. H.H., 162
 Hitchcock, Caroline W., (Hanks), 71
 Hobbs, James, 84
 William & Son, 140
 Hobby, Jonathan T., 84, 147, 148
 Hoff, Catherine J., 85
 Edward, 160
 George, 81, 84, 85, 214
 John, 85, 214
 Justina M.S., 208, 214
 Holcomb, Amasa, 85, 86
 Amasa M., 86
 Holland Purchase, 43
 Holliday Street Theatre, 209
 Holloway, Robert, 26
 Holmes, Glenn D., 87, 100
 Joseph W., 86, 87
 Holske, William F., 214
 Machine Co., 214
 Homan, Wayne E., 246
 Hooker, William, 12
 Hoopes, Penrose R., XV, 9, 23, 26,
 38, 39, 71, 101, 178, 198
 Hoover, R.J., 6
 Hoosac Tunnel, 159
 Horton, Miss Elizabeth, 217
 Houghton, Rowland, 88
 Houston, Captain James F., 210
 Howe, Elias, 194
 Howell, Captain Jos., 207
 Huertin, Le Seur Guillaume, 216
 Guillaume I, 216
 Guillaume II, 216
 Huffman, Robert D., 202
 Hunt, Harvey W., 20, 88
 Thomas, 89
 & Scott, 89, 153
 Hunter, Hugh W., 89
 Huntington, Gurdon, 89, 90
 Hurd, D. Hamilton, 230
 Hurtin, Charles, 216
 Christian, 216, 217, 218
 Elizabeth, 216
 John G., 216, 217
 Joshua, 216, 217
 Louise, 216
 Margaret G., 216
 Susanna S.K., 216, 217
 Susane, 216
 William, 217
 William III, 216
 Huston, Captain, 209
 Hutchins, Abel, 219
 Charles, 219
 Dorothy, 219
 Gordon, 219
 Levi, 219
 Thomas, XXI
 Hutchinson, C.C., 220, 227
 Charles C., 220, 227
 Henry, 220
 Lavinia S., 220
 Hutslar, Donald A., XXVI, 195, 212, 237
 Huyler, Miss Emily I., 192
 Hyde, Gerald R., 262
 Joseph, 14
 Imhof, Herman, 90
 Independent English Church, 187
Independent Republican, 217
 Ingham, North, 90
 Iszard, Charles F., 91, 131
 -Warren Co., 91
 James, Daniel, 77
 & Drinker, 33
 Jones, Ann, 216
 David, 216
 John, 91
 Johnson, Sir William, XXI
 Kahler, Edward, 92
 Max E., 92

Kandler, Edmund, 220
 & Co., 220
 & Gaertner, 220
 Kathrinus, Augustus, 118
 Kegelman, George, 92
 William, 92
 Kehew, John, 134
 Kelker, Luther R., 212
 Kendall, John, 221
 Ruth W., 221
 Shop, 221
 Rev. Thomas, 221
 Thomas Jr., 221, 222
 Kennard, John, 92, 231
 Kent, Donald H., 213
 Kern, Samuel, 35
 Ketler, Mrs. Margaret, 226
 Keuffel, W.J.D., 93, 224
 & Esser Co., 93, 172, 175, 224
 Key, Francis Scott, 209
 Kimmel, Anthony, 140
 King, Benjamin, 64, 93
 Charles G., 94, 105, 227
 Daniel, 93, 94, 95
 Frederick W., 95
 F.W. & R., 54, 95, 107
 Gedney, 94, 224, 227
 Gedney & Son, 94, 227
 Mary, 64
 Mehitable, 64
 Richard, 95
 Robert, 95
 Samuel, 95
 Kinkead, Richard, 224, 226
 Mfg. Co., 224, 226
 Kizer, David J., 195
 Thomas J., 195
 Klaweither, Charles, 164
Kline's Weekly Gazette, 243
 Knight, Frank C., 39, 96
 Frank C. & Co., 96
 Henry R., 96, 163
 Knus, 148
 Kocherthal, Joshua, 216
 Susanna Sibylle, 216
 Kokosky, Herman, 6
 Kolesch, Heinrich A., 97
 Percy A., 97
 & Co., 13, 97
 Krodel, Franz, 98
 Kubel, Edward, 98
 Ernest P., 98
 Kuebler, William J., 98
 & Seelhorst, 98, 153
 Kuhlo, Arnold, 99
 & Ellerbe, 99
 Mfg. Co., 99
 Kutz, Erasmus A. Jr., 100
 Erasmus A. Sr., 99, 100, 115
 Lallie, John S.J., 100
 Instrument Co., 100
 Lamb, Anthony, 100, 101
 John, 100, 101
 Lancaster County Historical
 Society, 85
 Lancaster Free Public Library, 213
 Landale Optical Mfg. Co., 227
 Lander, Thomas E., 227
 Lauderdale, Mrs. Katherine B., 204
 Laudonet, Mary, 34
 Leadbeater, Helen M., 49
 Leaf, Richard D., 15
 Leake, Isaac Q., 101, 178
 Ledder, Gottfried G., 101
 & Probst, 101
 Lee, General Robert E., 209
 LeMonier, M., XXI
 Leupold, Frederick, 101
 & Volpel, 101
 Level, Dumphy, XIV
 Wye, XIII
 Lewis Publishing Co., 212
 J. & Co., 230
 Library, The Public, of the City
 & County of Denver, Colo., 258
 Lietz, Adolph, 102, 132
 A. Co., 102
 Lincoln, Abraham, 238
 Frederick W. Jr., 227
 F.W. Jr. & Co., 227
 Waldo, 227
 Lloyd, Ann, 68

Locke, Arthur H., 205
 Dr. John, 102, 103, 104
 Lockwood, Henry, 45, 105, 146
 Loeber, Charles, 105, 245
 Johann, 245
 ? Schlichtrossl, 245
 Loggie, George W., 226
 Lohmeyer, J., 7
 Lomb, Henry, 5
 Loosli, Dimond H., 105
 D.H. Co., 105
 Lord Baltimore, XX
 Loring, Katherine P., 179
 Henry W., 105, 228
 & Churchill, 105, 192, 228
 Loveridge, Richard, 196
 Loxo Level, 228
 Lowell, Abner, 106, 247
 & Senter, 106, 247
 Cemetery, 194
 Lucas, R Jun., 27
 Lukens, John, XXI
 Ludlow, I., 195
 Lunar Tables, Heartte's, 19
 Lutheran Church, First, Pitts-
 burgh, Pa., 211, 212
 German, New York City, 216
 Zion, Harrisburg, Pa., 213
 Lyter, Frederick O., 213
 McAllister & Baretta, 247
 McCann, James, 106
 McCausland, Brig. Gen. John, 243
 McKay, Thomas W., 1
 McKinsey, Folger, 212
 McLean, Mary D. (W), 262
 McPherson, Hannah E., 179
 Mackenzie, Caleb, 106
 Mackey Print Paper Co., 43
 Madison, Rev. James, XXI
 Magee, D.F., 47, 85, 179, 212, 214
 Magnetic Declination, XXII
 Magneto-Astronomical Clock, 103
 Mahn, Herman, 106
 & Co., 106, 107
 Makepiece, Bertrand L., 228
 B.L. Co., 228
 Makepiece, Carrie J.C., 228
 Pliny I., 228
 Manhattan Gas Co., 261
 Mansfield Spring Brook Cemetery, 228
 Maple Grove Cemetery, 183
 Marquette County Historical Society, 184
 Martin, Ralph R., 251
 Marvin, John R., 135
 Marye, William S., 202
 Maryland Militia, 209
 Mason, A.T., 27
 Charles, XX
 & Dixon Line, XX, XXI, 25, 42
 Massachusetts Spy or Worcester
 Gazette, 221
 Mather, Rev. Cotton, 67, 68
 Mathews, Catherine V.C., 179
 Megary, Alexander, 107
 Meister, Edward, 95, 107
 Mendenhall, Thomas, 228, 229
 Thomas A., 229
 Meneely, Andrew, 72, 108, 109, 110, 229
 Andrew James, 108
 Clinton, 110, XXVI
 Edwin Andrew, 230
 George Rodney, 230
 Philena H., 230
 Andrew's Sons, 230
 & Son, 108
 & Oothout, 109, 110
 Merdinger, Commander Charles J.,
 VIII, 179
 Merrill, Eliphalet, 230, 231
 George W., 110, 111
 James, 230
 Memorial, 231
 Phebe W., 230
 Phinehas, 230, 231
 Robert, 110, 111
 Robert & Son, 110, 111
 Robert & Sons, 110, 111
 R. Sons, Inc., 110, 111
 & Davis, 111
 Samuel, 231
 Sarah F., 230
 Merryweather, Henry, 25

Metropolitan Museum of Art, 250
 Millbury, History of the Town of, 223
 Miller, John G., 106
 Mrs. Richard J., 213
 Milton Cemetery, 192
 Missouri Historical Society, 146
 Monarch Instrument Co., 232
 Moody, James E., 111, 112, 159, 232
 Morey, Mrs. Florence, 7, 179
 Morris, Robert, 42
 Mt. Auburn Cemetery, 227
 Mount Carmel Cemetery, 34, 35
 Hope Cemetery, 15, 185
 Mt. Pleasant Cemetery, 198
 Multhauf, Dr. Robert P., 179
 Myers, James T., 179
 Nicholas, 112
 Narins, Charles S., 8
 Nash, Francis M., 11, 186, 187
 National Park Service, Midwest
 Region, Omaha, Nebraska, 197
 Needham Cemetery, 183
 Negus, T.S. & J.D., 135
 New Bedford Public Library, 136
 Newell, Abigail B., 232
 Andrew, 112, 232
 Charles, 112, 232
 John, 232
 Joseph, 112, 113, 232
 & Browning, 21, 113
 & Son, 113
 New England Historical and
 Genealogical Register, 71, 179
 New Hampshire Historical
 Society Library, 231
 Historical Society Museum, 206
 New Hampshire Patriot, 191, 231
 New Ipswich Historical Society, 260
Newport Mercury, 93, 95, 180
New York Daily Tribune, 157
 New York Historical Society, 4
 New York Optical Works, 11
New York Packet, 101
 New York State Library, 139
New York Times, 243
 Nichols, John H., 187
 Noble, Anne N., 232
 Daniel, 232, 233
 Philander, 232
 North Cemetery, 205
 Northampton Business Directory
 & General Advertiser, 251
Northern Budget, 73, 180
 Norton, Elijah, 114
 Northwood, J. d'Arcy, 212
 Noyes, William, 39
 Nugent, Paul C., 102, 179
 Oakes, John, 233
 Oakland Cemetery, 204
 Ogden, Col. Aaron, 196
 D.B., 115
Ohio State Journal, 124
 Ohio State Historical Society, 212
 State Museum, 212
 Old North Cemetery, 198
 Oothout, Jonas V., 109, 110
 Orange County, History of, 217
 Orcutt, Samuel, 179
 Ossining Historical Society, 262
 O'Sullivan, Denis B., 204
 Oxford, History, Town of, 221, 223
 Central Manufacturing
 Company, 221
 Page, John, XXI
 Palmer, Ashur C., 134
 Brooks, 7, 9, 29, 194, 217, 250
 Park, Austin F., 118
 Sydney W., 118
 Parker & Russell Shop, 250
 Parsons, Charles S., XXVI, 188,
 191, 206, 219, 231, 260
 Pate, Capt. H.C., 61
 Patent, (steamboat), 196
 Patrick, Loomis, 226
 Patten, George, 114
 Richard, 17, 19, 20, 114, 115, 116
 Peabody Museum, 44, 67
 Pearson, David, 233
 Elizabeth S., 233
 Henry S., 186, 233
 Pease, Seth, 30
 Penn, William, XX

- Pennsylvania Gazette*, 33
 Pennsylvania Historical and
 Museum Commission, 213
 Pennsylvania Home Guards, Captain
 Charles Carson's Company, 209
 State Library, 212, 244
 Pension Office, War Department, 210
 Pfaltz, J. William, 116
 Pfister, Dorothea, 234
 Henry, 234
 Herman, 234, 258
 William H., 234
 Mrs. Rebe Shepard, 234
 Phelps, Anson, 77
 Jonas H., 60, 116, 117, 118,
 119, 234
 & Gurley, 60, 116
 & Gurley's, 60, 116, 117, 118,
 119
Philadelphia Gazette, 44
 Inquirer Magazine, 246
 Phillips, Henry, 118
 Pierson, Edward, 118
 Pike, Benjamin Jr., 120, 121, 122
 Benjamin Sr., 120
 Benjamin & Son, 121
 Benjamin & Sons, 122
 Daniel, 121, 122, 123
 Gardiner, 122
 Pike's Benjamin Son, 123
 Pilgrim Society, Pilgrim Hall,
 Plymouth, Massachusetts, 179, 257
 Pine Grove Cemetery, 128, 259
 Pioneer Instrument Co., 15
Pittsburgh Gazette, 212
 Plank, Prof. William B., 168
 Platt, Augustus, 123, 124
 Benjamin, 124, 125, 126, 127
 Calvin, 123
 G. Lewis, 179
 William A., 124
 Pool, Harrison, 235, 236
 Horace M., 127, 128, 235, 236
 Horace M. & Bros., 235
 Mary B., 235
 John, 235, 236
 Pool, John M., 127, 128, 235
 Nahum, 235
 Ruth F., 235
 Samuel, 235
 Thomas, 128
 Ziibbeah, (Zibaine P.), 235
 Poole, Murray E., 236
 Pope, Charles H., 5, 179, 260
 Poquonock Cemetery, 252
 Potter, John, XVI, 128
 Potts, W.L., 129, 143, 236
*Poulsen's American Daily
 Advertiser*, 35, 166
 Prentice, Charles F., 130, 179
 James, 130
 James & Son, 130
 James & Son Co., 130
 Presbyterian Church, Goshen, N.Y., 217
 Prime, Alfred C., 229
 Prince, Louis M., 131, 237
 L.M. Co., 131, 237
 Probst, Arthur F., 1, 101
Public Ledger, Philadelphia, 14
 Putnam, General Isarel; 70
 Pye, Lewis, 131
 Queen, James W., 131, 132, 242
 James W. & Co., 131, 132, 242
 & Co., 131, 132
 -Gray Co., 131, 132
 Queen's College, 196
 Quincey, J., 58, 132
 Ragan, Col. John, 210
 Rahsskopff, Carl, 132
 Ramsden, Jesse, 8
 Randolph, James F., 133
 Theodore F., 133
 T.F. & Co., 133
 Rankin, Ernest H., 184
 Record Commissioners of Boston
 Massachusetts, 179
 Reed, James, 134, 237
 James & Co., 134
 Reeding, Alfred, 132
 Rees, Abraham, VIII, 179
 Reeves, Lieut. J.G., 196, 197
 Remington Arms Co., 204
 Repsold, A & G., 7
Republican, The, 155, 181, 262
 Revere, Deborah, 227
 Paul, 71, 227
 Reynolds, A., 184
 Rich, J. Phillip, 260
 Richards, Prof. J. Fraise, 244
 Rickey, Joseph M., 124
 Riner, Captain George, 140
 Ritchie, A. Elliot Jr., 135
 Andrew M., 134, 135
 Edward S., 7, 134, 135, 136
 Edward S. & Co., 134
 Edward S. & Son, 134
 Edward S. & Sons, 134
 John, 134, 135
 Thomas P., 134, 135
 Rittenhouse, Benjamin, 136, 137,
 142, 143, 237
 David, XVII, XXI, 42, 71, 136,
 139, 140, 141, 207, 237
 David Rittenhouse Room, 208
 & Co., 237
 & Evans, 142
 & Potts, 143
 Riverside Cemetery, 111
 Roach, John, 144, 147, 163
 Robinson, H.W., XXI, 179
 Burnham & Co., 144
 Rochester Museum of Arts and
 Sciences, 185
 Rottweiler, Charles, 170
 Roulston, Eunice W., 189
 Royal Geographical Society
 of London, XXI
 Royal Society, Philosophical
 Transactions for 1768, XXI
 Rubicam, Milton, 179
 Ruckert, Herman, 241
 Louis, 241
 ? Ungar, 241
 Rupp, Michael, 58, 59, 145
 Rural Cemetery, Albany, 71, 108
 Rutgers College, 196
 Rutt, Richard, 145
 R & Son, 145
 Ruttenber, E.M., 217
 Ryhiner, Charles, 146
 Sack, John C., 146, 241
 Sacramento County Historical
 Society, 25
 Saegmuller, Frederick B., 147
 George M., 147
 George N., 5, 45, 105, 146, 147
 John L., 8, 46, 147
 Sala, Joseph C., 144, 147
 Sanders, Harry, 213
San Francisco Examiner, 241
 Daily Herald, 148, 181
 Sargeant, Jacob, 249
 Saunderson, Henry H., 80, 179
 Savannah, (steamship), 196
 Sawyer, Horace, 147, 148
 & Hobby, 147, 148
 Saxe, Charles A., 241
 Schild, Joan L., 185
 Schmidt Label & Lithographic Co., 132
 Schmolz, William A., 148, 149
 Schott, Charles Jr., 150
 Charles Sr., 150
 Schubart, G., 7
 Schuman, Alexander C., 151
 A.C. & Co., 151
 George, 151
 Schuyler, Colonel Arent, 242
 Catherine Van Rensselear, 242
 Hartley & Graham, 41, 242, 262
 Jacob R., 41, 242, 243, 261, 262
 Scott, John, 243
 Robert, 89, 153
 Searle, Edward P., 118
 Seegar, Christian, 7
 Seiler, Eric H., 153
 Eric P., 153
 Instrument and Mfg. Co., 153
 Seelhorst, Frederick, 98, 99, 153
 Julius, 153
 Seelig, Anna H., 244
 Edward F., 244
 Roman, 80, 244
 & Son, 244
 & Kandler, 220, 244

Semi-Circumferenter, XVI
 Sensensy, Hannah, 34
 Dr. Peter, 34
 Senter, William Jr., 106
 William Sr., 106, 247
 William & Co., 106, 233
 Sexton, Pliny, 153
 Seymour, David L., 77
 Shain, Charles J., 96, 97, 154
 Shanahan, James M., 245
 & Loeber, 245
 Sharpe, Clarissa, 60
 Shaw, Alexander, 89
 Robert, 49, 154
 Shea, Roland H., 154
 Sheppard, Jack, 100
 Sherman, Burton L., 135
 Shilling, Erik, 155
 George, 155
 Martha, 155
 Shirk, Joseph, 246
 Peter, 246
 Sarah S., 246
 Sibley, Asa, 90
 Silliman, Robert T., 252
 Silver, Eliza M. P., 247
 Herman, 247
 Herman L., 247
 Simpson, Abigail M., 155
 Jonathan, 155, 156
 Thomas, 155
 Sissons, Jonathan, XIII
 Slate Hill Cemetery, 217
 Small, William, 156
 Smart, Isabell H., XXVI
 Smith, Betsy, 204
 Mrs. C.E.C., 212
 Cordial, 156
 Frank, 29, 179
 G., 27
 Harry H., 217
 James R., 262
 Lewis B., 262
 Seba, 103
 William H., 261, 262
 William H. & Son, 262
 Smith, William H. & Sons, 262
 Young & Co., 261
 Smithsonian Institution, 208, 234
 Snyder, Mrs. Helen S., 213
 Soltmann, Carl Gustav, 248
 E. George, 248
 Edward G. Jr., 248
 Edward G. Sr., 232, 248, 255
 E.G. Inc., 248
*South Carolina Gazette &
 Public Advertiser*, 31
 South Cemetery, 255
 Natick Historical Society, 40
 Spang, J. Peter III, 233
 Spangler, Miss Mildred, 213
 Spinney, Frank O., 201
Spooner's Journal, 184, 251
 Spring Grove, Cemetery of, 133, 162, 234
 Stackpole, Robert, 156, 157
 Robert E., 245
 William, 156, 157
 & Bro., 14, 22, 156, 157, 245
 Stanclief, 254
 Stancliffe, Benjamin, 157, 158
 Starbuck, Charles, 60
 Nathaniel, 60
 & Gurley, 60
 Starbucks & Gurley, 60
 Stark County Historical Society, 243
 Starr, Burgis P., 192
 Starratt, Herbert R., 253
 Stearns, Jesse, 260
 Steinhauer, Captain, 115
 Stevens, Benjamin, 48
 J.C., 102
 Stevenson, Jean, 179
 Stewart, Col., 208
 Stieren, William E., 249
 Stiles, Samuel, 184
 & Baldwin, 184
 St. James Episcopal Church, 217
 St. Michael's Evangelical
 Lutheran Church Yard, 207
 Storrs, Amariah, 249
 Charles, 251, 252
 & Cook, 249

Storrs & Cooley, 251
 & Davies, 251
 Ebenezer, 251
 Elia, 252
 Lois S., 251
 Mary G., 249
 Nathan, 249, 250, 251
 Sarah, 251
 Shubel, 250, 251, 252
 Strassberger, Leo R., 80, 158
 Streeter Collection of Weights and
 Measures, (Yale University), 255
 Sullivan, General John, XXI
 Surveyor's Service Co., 248
 Symes, Jno. C., 195
 Taft, Eleazer, 255
 Talbot, Ebenezer Jr., 252
 Ebenezer Sr., 252
 Lucy C., 252
 Miss, 252
 Mrs. Margaret H., 192, 252
 Narcissa H., 252
 Taylor, Henry, 118
 John W., 118
 Teckritz, Richard E., 14
 Temple, John H., 8, 112, 159, 190
 Tesdorpf, L., 8, 46
 Tennessee Library & Archives,
 The State of, 150
 Thaxter, Adam W. Jr., 253
 Bathsheba L., 253
 Joseph H., 160, 253
 Mary H., 253
 Polly Hilger, 160
 Samuel Jr., 160, 253
 Samuel Sr., 253
 Samuel & Son, 160
 S. & Son, 253
 Sarah H., 253
 Thayer, H. Emmons, 118
 Theodolite, VIII, IX, X, XI
 Tiensch, Adolph, 254
 Gustav A., 254
 Mary, 255
 Theresa, 254
 Tillman, Cornelia F., 213
 Titsworth, L.R. & Co., 212
 Toby, Mrs. Russell B., 231
 Tomes, Francis & Co., 242
 Tracy, John C., 180
 Traffer, John, 118
 Transit, XII
 Treasury Department, Third
 Auditor's Office, 209
 Trinity Church Cemetery, 154
Troy Daily Whig, 77, 109, 180
Sentinel, 72, 74, 75, 77, 180
 True Meridian Finder, 23
 Trumbull, James R., 249
 Trundy, John, 160, 255
 Turpin, Miss Louise W., 204
 Tyler, Wm. M.D., 210
 Ulmer, John C., 160, 161
 Upham, Thos., 7
 Utah, University of, Department
 of Civil Engineering, 220
 Vail, Stephen, 196
 Vanderheyden, Jacob D., 75
Vermont Gazette, 30
 Victor Instrument Co., 255
 Vierbuchen, Peter, 161
 Volans, Joseph, 33
 Volpel, Adam, 101, 102
 Walker, Captain, 208
 Dr. Charles E., 257
 Charles W., 260
 Waller, Adolph E., 103, 180
 Walton, Mrs. Helen, 213
 Walworth, R.H., 262
 Ward, Alfred W., 257
 John D., 196
 Ware, Henry, 162
 & Hiremann, 162
 Wareham, Herbert J., 162
 Joseph, 163
 Robert, 162, 163
 Warner, Henry, 144, 163
 Warren, Benjamin, 255
 J. Henry, 91, 163
 Jane S., 257
 -Knight Co., 96, 163
 Dr. Louis A., 238

Warren, Rebecca D., 254
 Washington, George, XXI, 3, 27,
 138, 139, 140, 237
 Lawrence A., 27
 Lewis W., 139
 Martha, 140
 Watson, John S., 214, 229
 Thomas, 25, 164
 Thomas N., 172
Wayne County Journal, 153
 Wedge, Miss Laura, 204
 Weise, A.J., 180
 Weiss, Elise B., 257
 Paul, 257
 & Heitzler, 207, 257
 Instrument Co., 257, 258
 Johannes, 257
 William C., 258
 Wells, Bezabel, 243
 William, 47, 48
 & Foster, 48
 Welles, Albert, 189
 Western Reserve Historical
 Society, 3, 23
 Westminster Cemetery, 242
 Whipple, Squire, 164
 Whitcomb, Charlotte, 258
 Elizabeth E., 258
 Margaret E., 258
 Rasselas P., 258
 R. & Co., 234, 258
 Dr. Winslow, 258
 White, David, 164
 David Instrument Co., 164
 Kelvin, 253
 Peregrine, 165
 Whitehouse, Annie L., 259
Farmington News, 259
 George L., 259
 Nathaniel, 259
 Whiteley, Francis, 165
 Whitney, John, 166
 Thomas, 166, 167
 Whiton, Augustus S., 180
 Elijah, 168
 Wickesser, Julius, 200
 Wightman, Thomas, 112
 Willard, Aaron, 79
 Alexander T., 260
 Jacob, 260
 Joseph, 260
 Rhoda R., 260
 Simon, 219
 Williams, Carl M., 217
 Mary H.W., 262
 Rev. Samuel P., 262
 Samuel P., 261, 262
 T.J.C., 212
 William, 160, 168, 169
 Wilson, George W., 169, 262
 Wingate, Robert B., 244
 Winzer, George, 169
 Wissler, Adolph, 2, 10, 170
 Instrument Co., 164, 170
 Instrument Works, 170
 Wohnlich, Lewis J., 261
 Woodlawn Cemetery, 202
 Woodmere Cemetery, 51
 Wooster Cemetery, 192
 Wright, Joel, 81
 Wroth, Lawrence C., 189
 Wuger, Konrad, 170
 Wurdermann, William, 8, 45, 146, 170, 171
 Wyatt, Henry, 118
 Yale University Library Gazette, 257
 Young, Alexander, 261
 Alfred, 172, 173
 Alfred C., XXVI
 Anne S., 261
 Benton T., 172
 James H., 261, 262
 Henry, 261
 Henry & Co., 261, 262
 & Son, 172
 & Sons, 39, 172, 173, 174, 175, 176
 Smith & Co., 242, 243, 261, 262
 William J., 166, 172, 173, 174, 175, 176
 William J. & Co., 82, 172
 Zeiss, Carl, 146, 153
 Zenith Sector, XXI

