

ESTABLISHED 1853.

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ILLUSTRATED

CATALOGUE AND PRICE LIST

FOR

= 1908 =

THE T. F. RANDOLPH CO.

Manufacturers, Importers and Dealers in

Surveyors' and Engineers'

Instruments and Supplies.

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Sole Manufacturers of

Randolph's Patents.

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232 East Fifth St., One-half Square East of Post-office,

CINCINNATI, OHIO.

# The Greatest Surveyors' Compasses Ever Made.

Fig. 1, Patent Telescope Compass, has proved, after years of use, the Most Accurate, Most Speedy, Most Desirable Surveyor's Compass ever manufactured.

It has become so popular and well known that it needs but little explanation.

Fig. 1 represents a compact, accurate Vernier Compass, with Telescope complete, selling at a small advance over the ordinary sight compass. A cut of the Plain Compass would show same without Vernier E.

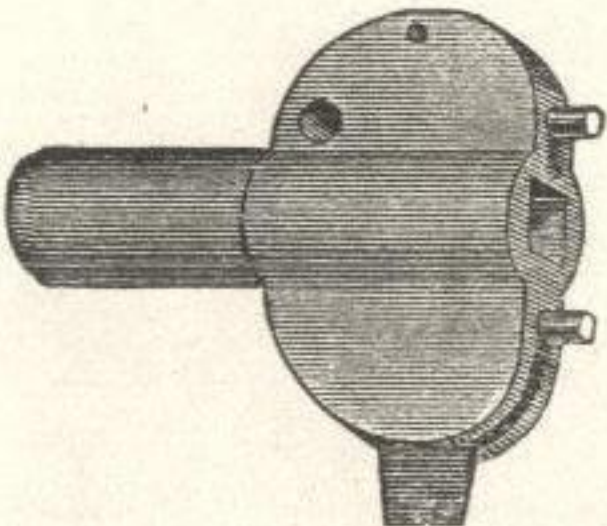
The following explanation with reference to the cut will enable any surveyor to understand it. The telescope is detached when in the box for carrying it, similar to ordinary sights, and the whole instrument, except the staff mounting, or tripod head, fits into a sole-leather box, eight inches square by five inches deep outside, and is carried by a strap over the shoulder, and can be carried while the instrument is in use without inconvenience. Weight of box, two pounds.

**EXPLANATIONS OF THE TELESCOPE COMPASS.** The head A is the focus screw for the telescope; B is the adjustment of the cross wire; C is the needle lifter screw, which operates through the lower plate, not shown in the cut. D is a rack movement for the vernier—the clamp head is near this with a shoulder on the outside but not shown in the cut; E is the variation vernier, reading to minutes; F is the outkeeper operated at edge of the plates; the levels are entirely protected, being covered by the lower plate, and adjustable from the face of compass; the bearing of the center spindle is  $1\frac{5}{8}$  inches long, but not shown in the cut, and is fastened by a spring pin working in a slot and clamp screw. The compass can be used on tripod or Jacob Staff. The needle circle is divided into  $\frac{1}{2}$  degrees. The center of the telescope is in a parallel line with the zeros and over the center of Compass and zeros. The Telescope is  $7\frac{1}{2}$  inches long with a power of 20 diameters and revolves both ways for back and forward sights; its detachment from Compass for boxing is as simple as the ordinary sights, the screws being operated by the two pins on key; the screws fit through the bottom plate and will unscrew only far enough to let the standards drop off the steady pins, and should be left at this point, as in screwing them up tight when standards are not on they press against top plate. The adjustment of the cross wires is made between two points, as follows: The instrument being level, bisect some point with the vertical wire, revolve Telescope one-half around on its axis, and the opposite direction from the first object to another distant point; turn the instrument one-half around on its axis, until the vertical wire bisects the first object observed, turn the Telescope as before, and see if it again bisects the second point observed. If it does, the adjustment is right; if not, one-quarter the error is corrected by moving the cross wire, one-quarter by moving the instrument on its socket, and one-half by moving one of the points observed. Adjustments of levels same as sight compass, page 14.

The many advantages of the above instrument are, in the first place, the simplicity of construction; second, telescope instead of ordinary sights; third, accuracy; fourth, compactness for transportation; fifth, cheapness and lightness of the instrument.

For prices, also Tripods, see cuts, pages 2, 3, 4 and 5.

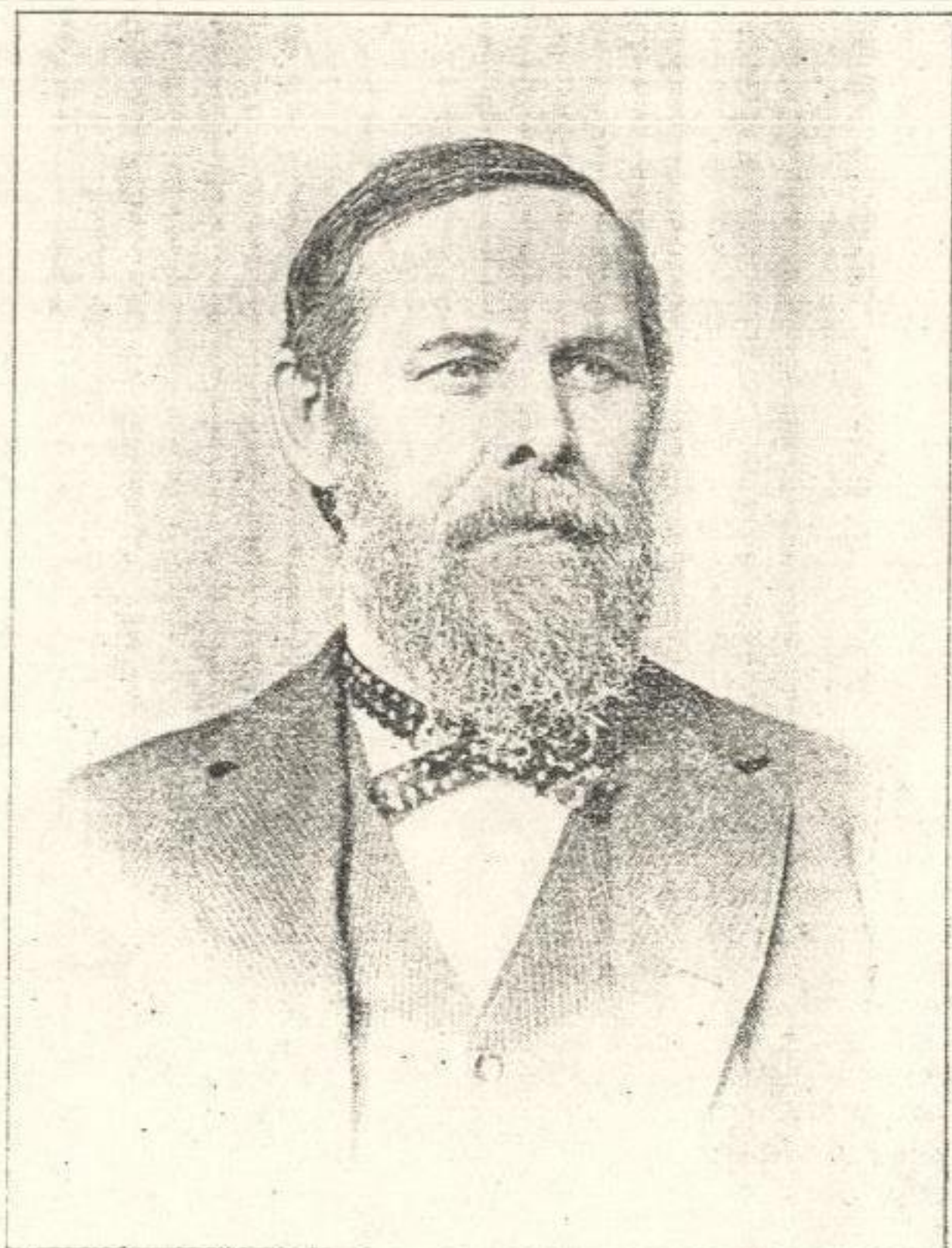
For prices of extra attachments to Telescope, see page 16.



## Key for Patent Telescope Compass

Operates every part. One goes with each Telescope Compass.

Price by mail.....75c.  
Postage.....05c.



Spencer Terry  
L. J. Randolph

# To Engineers and Surveyors.

**GENTLEMEN:** Our specialty is the manufacture of the Field Instruments only. The within cuts are quite good representations of all the instruments we make. We combine simplicity with accuracy in their construction, and use only the best grades of material in their manufacture.

We employ no agents, but sell all the instruments we make, direct to the parties using them. Therefore, we quote them in our catalogue at the very lowest price that we can furnish them at.

**Examination of Instruments.** We desire to be as liberal as possible in reference to giving satisfaction to customers, and allow five days' time for trial and examination of all our instruments. If, at the end of the five days, the instrument is not entirely satisfactory in every respect, it can be returned to us and we shall at once refund the money by New York draft.

The purchaser pays the transportation charges in all cases, and must also pay the charges for return of money, if sent C. O. D. by express. Instruments properly packed for shipment, without extra charge. In ordering great care should be taken to give plain directions, NAME, TOWN or CITY, COUNTY and STATE.

**Repair of Instruments.** We repair any and all kinds and makes of instruments, and our charges for repairs are reasonable at all times for the amount of work done. Without seeing instruments we cannot estimate the cost of repairs, and even then we cannot tell exactly, as we only charge for the time it takes to do the work. If requested to do so, we shall send an estimate of the cost of repairs on any instrument sent us before beginning the work. Otherwise we attend to all repairs promptly on receipt and return at once when finished.

**Box Instruments Sent for Trade or Repairs in Extra Packing Boxes to Save Express Charges.** The T. F. Randolph Co., Cincinnati, O., is all the mark necessary. Express Companies charge extra if known to be surveyors' or engineers' instruments, or high value placed upon them.

When sending instruments for repairs, be sure to send the tripod HEAD (not the legs) or else Staff Mountings along, as we must have the SPINDLE to make the repairs and adjustments.

**To Purchasers Wishing to Trade Old Instruments.** Parties wishing to trade old instruments on account of new ones must send their old ones for our examination and valuation. This will save writing several letters, and is absolutely the only way in which we can trade; or place the price on the old instruments when you ship, and if satisfactory the new instruments can be shipped at once. C. O. D. balance. We allow for old instruments the highest possible price after seeing them only.

We have a general assortment of second-hand instruments in good working order constantly on hand, which we sell at lowest prices. Persons wishing any second-hand instruments when they write will please state what kind of an instrument they wish; if a compass, what size and whether plain or vernier; specify about what you want, or price you wish to pay. Send for price list of second-hand instruments, which we publish at intervals, and be sure to say what you need. We may have it, but not in list.

**Best Modes of Remitting Money Without Risk.** Post Office Money Orders, Registered Letters, Express Packages or Bills of Exchange, payable to our order. Don't Send Personal Check on your Local Bank.

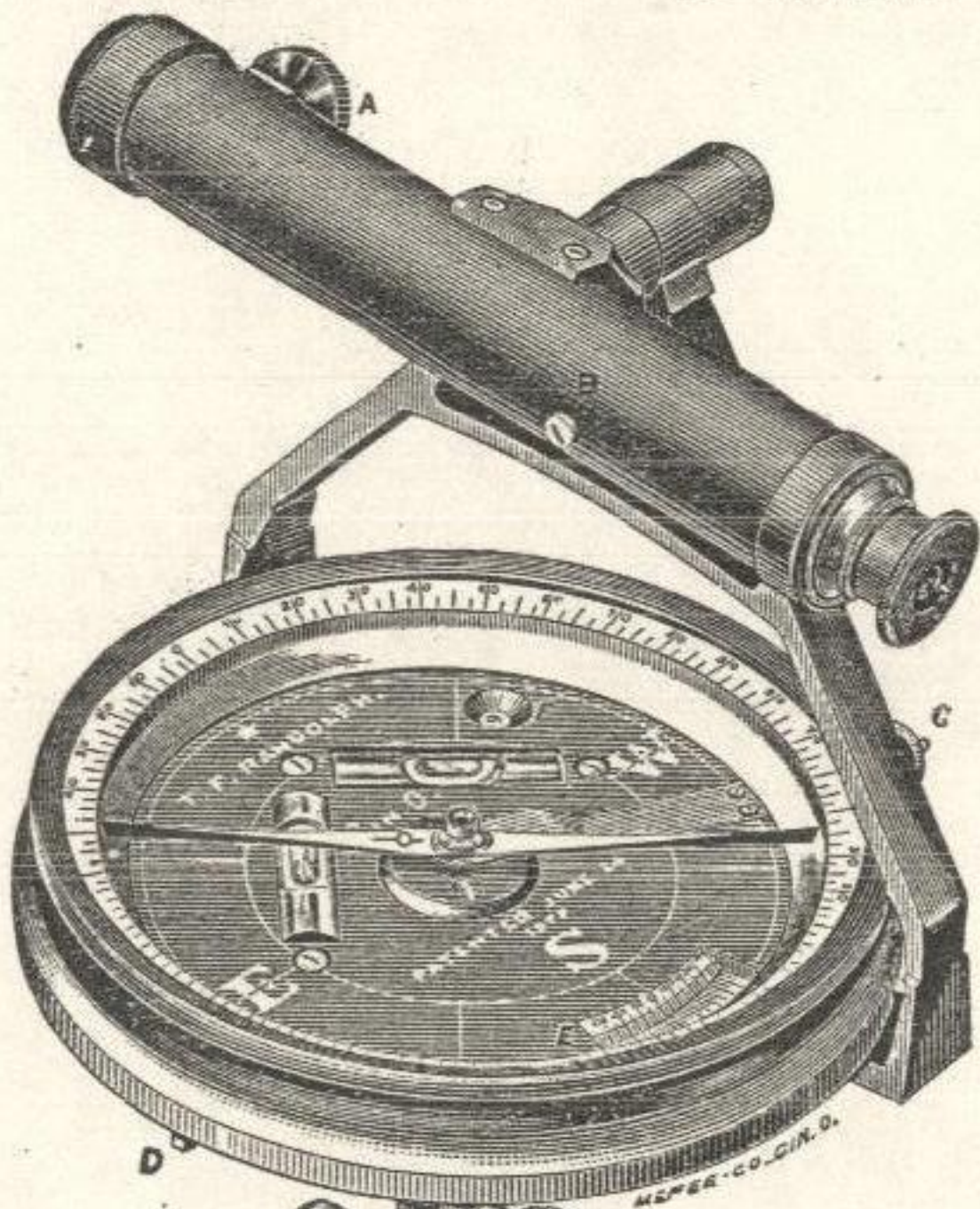
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**The T. F. RANDOLPH CO.,**  
**Surveyors' and Engineers' Instruments and Supplies,**

232 East Fifth St., half square east of Postoffice, CINCINNATI, O.

ESTABLISHED IN 1853.

(Fig. 1.) Patent Vernier Telescope Compass.



(Fig. 1)  
Patent  
Telescope  
Compass

*See explanation inside of front cover.*

This instrument has become so popular and well-known that it really needs no explanation. The telescope is removed and the whole instrument fits into a sole leather box, 8 inches square by 5 inches deep, and is carried by a strap over the shoulder.

PRICES WITH THE JACOB STAFF MOUNTINGS AND SOLE LEATHER BOX.

*For prices of extras, see page 10  
For Adjustments, see page 17  
Explanation inside front cover*

Vernier, 6-inch Needle (Fig. 1), weight, 6½ to 7 lbs.....	\$55 00
Plain, " " " " 6½ to 7 lbs. ....	50 00
Plain, 5-inch " " " " 4½ to 5 lbs. ....	45 00
Vernier, " " " " 4½ to 5 lbs.....	50 00
The Jacob Staff itself, when bought with Compass, costs extra.....	1 00
Otherwise, Regular price of Staff, with Steel-Pointed Socket, is.....	1 50

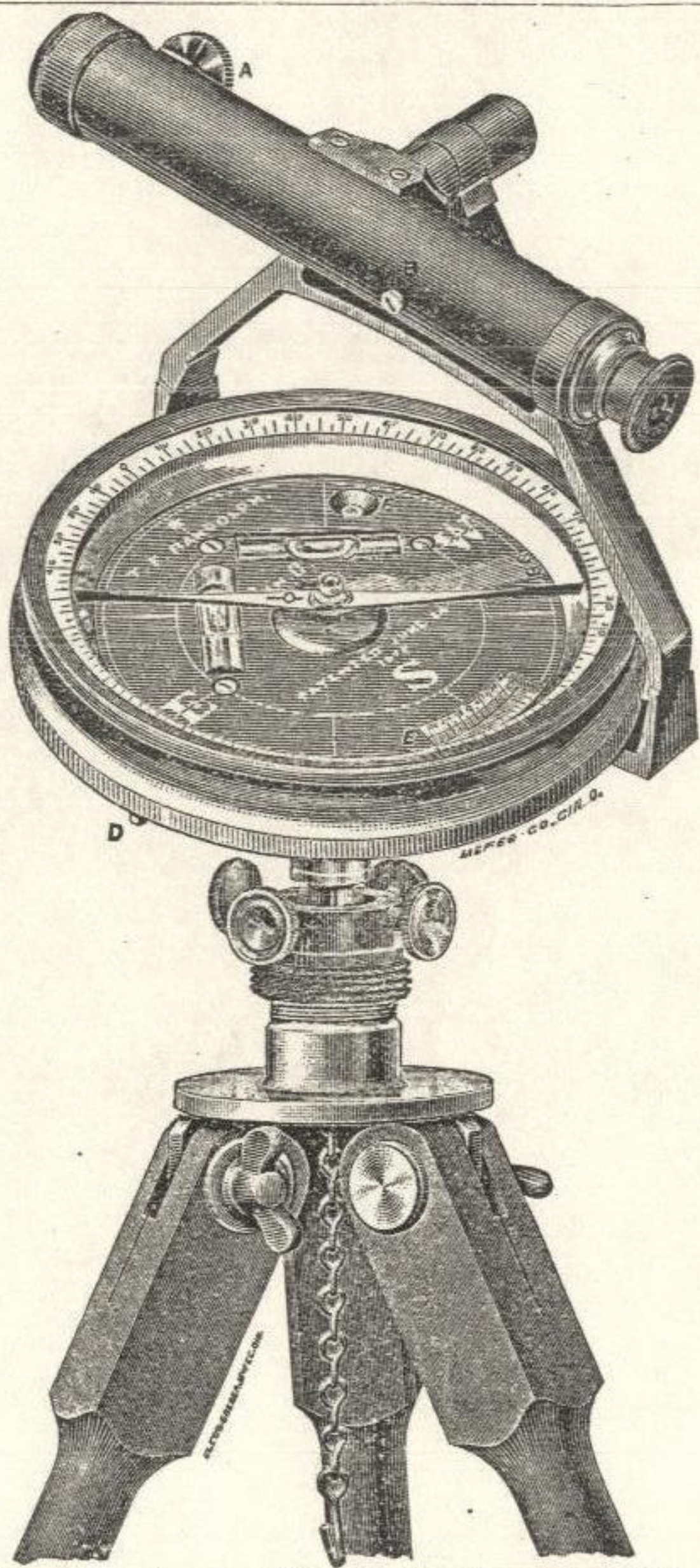


Style of My Compass Needle.

This cut represents the shape and style of my Magnetic Needles. This needle is light and gives large surface to the points; up and down being only a fine line when looking down upon it. This large surface enables a needle to retain a large amount of electricity. Finely polished and blued. Price by mail, \$3.00. Adjusted to Compass, \$4.00.

When needle instruments are not in use, we recommend Surveyors and Engineers to let the needle rest on the pivot; in this way it will retain its magnetism longer; but always in transportation screw the needle firm against the glass.

In wiping the glass that covers the needle box, always breathe on it; this removes any electricity that may be caused by rubbing for the purpose of cleaning the glass; if the point of needle still inclines to stick to glass, touch glass with tip of finger (wet) at



The above cut represents our (Fig. 1) Vernier Patent Telescope Compass, on Fig. 11 Tripod.

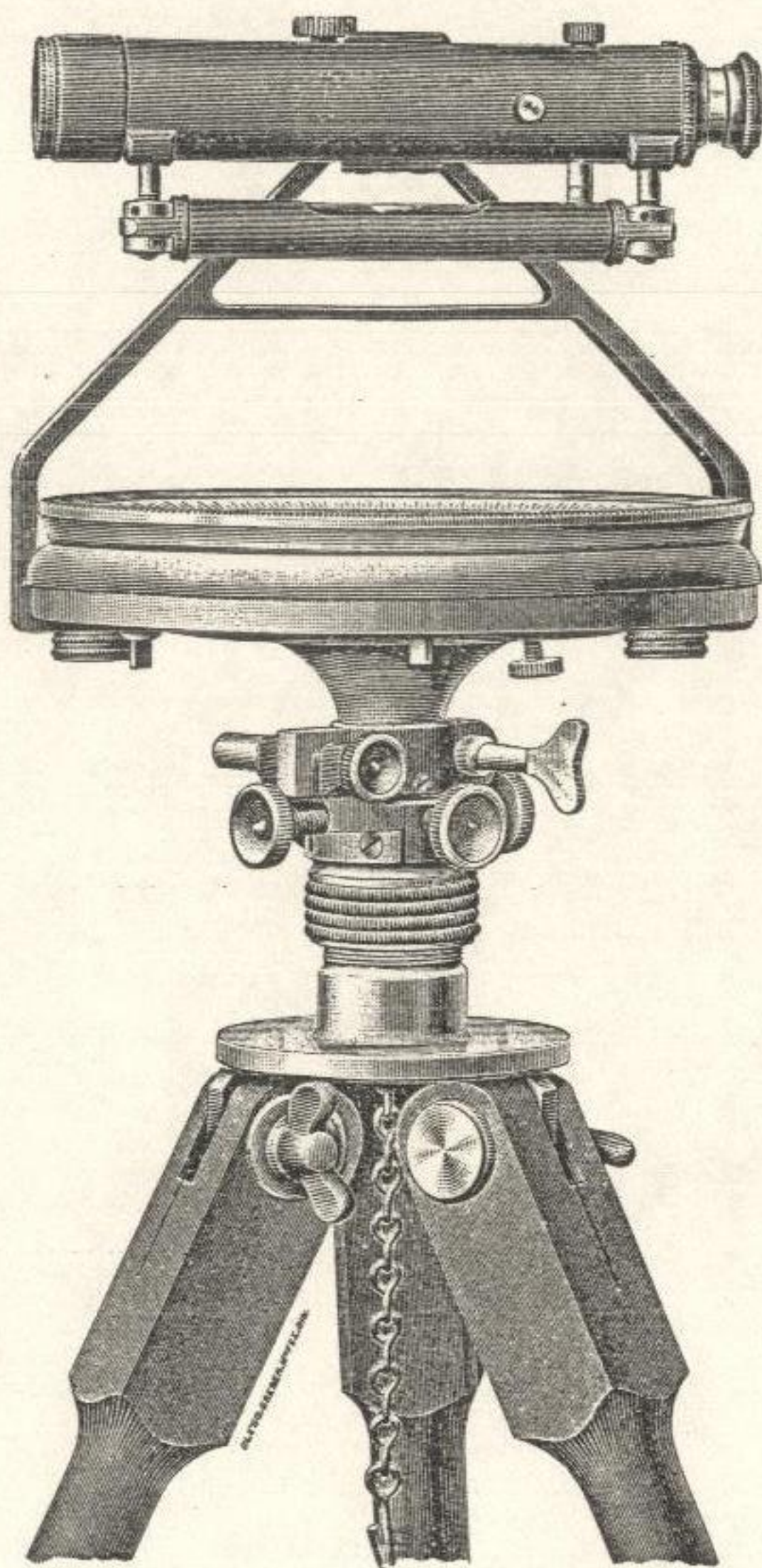
Fig. 11 Tripod is the Ball Tripod, with the addition of four Leveling Screws.

Price, as shown in the cut, including Sole Leather Box, Plumb Bob, Compass Key and Sun Shade.

VERNIER,	6	inch	needle	(Fig. 1)	.....	\$64.00
"	5	"	"	"	.....	59.00
PLAIN,	6	"	"	"	.....	59.00
"	5	"	"	"	.....	54.00

Cost for Staff if wanted as in cut 1.00

CINCINNATI, O.

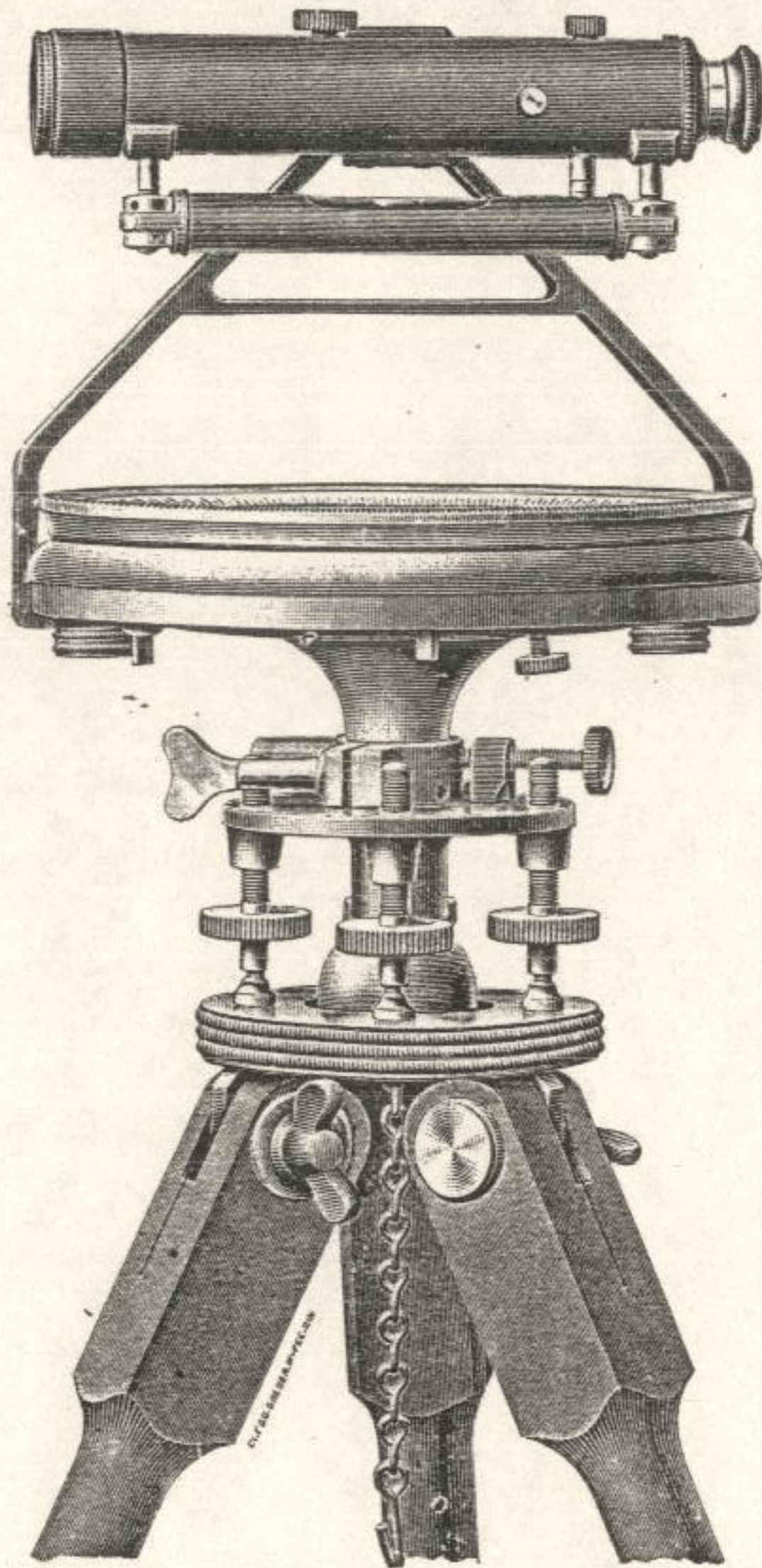


The above cut represents our (Fig. 1) Vernier Patent Telescope Compass, with the addition of Level, Clamp and Tangent on the Telescope Axis; on Fig. 12 Tripod Fig. 12 Tripod is the Fig. 11 Tripod, with the addition of Clamp and Tangent movement.

Price, as shown in the cut, including the Sole Leather Box, Plumb-bob, Compass Key and Sun Shade.

VERNIER, 6 inch needle (Fig. 1)	.....	\$82.00
"    5    "    "    "    "	.....	77.00
PLAIN, 6    "    "    "    "	.....	77.00
"    5    "    "    "    "	.....	72.00
Socket for Staff, if wanted, costs extra	.....	1.00

If the Leveling Attachment to the Telescope, as shown in the cut, is not wanted then \$15.00 from the above prices can be deducted.



The above cut represents our (Fig. 1) Vernier Patent Telescope Compass, with the addition of Level, Clamp and Tangent on the Telescope Axis; on Fig. 2 Tripod. Fig. 2 Tripod has Vertical Leveling Screws, Clamp and Tangent movement and Shifting Center to the Leveling Head.

Price, as shown in the cut, including the Sole Leather Box, Plumb-bob, Compass Key and Sun Shade.

VERNIER,	6	inch	needle	(Fig. 1)	.....	\$85.00
"	5	"	"	"	.....	80.00
PLAIN,	6	"	"	"	.....	80.00
"	5	"	"	"	.....	75.00

If the Leveling Attachment to the Telescope, as shown in the cut, is not wanted, then \$15.00 from the above prices can be deducted.

*For Prices of Extras, see Page 16; Adjustments, Page 17.*





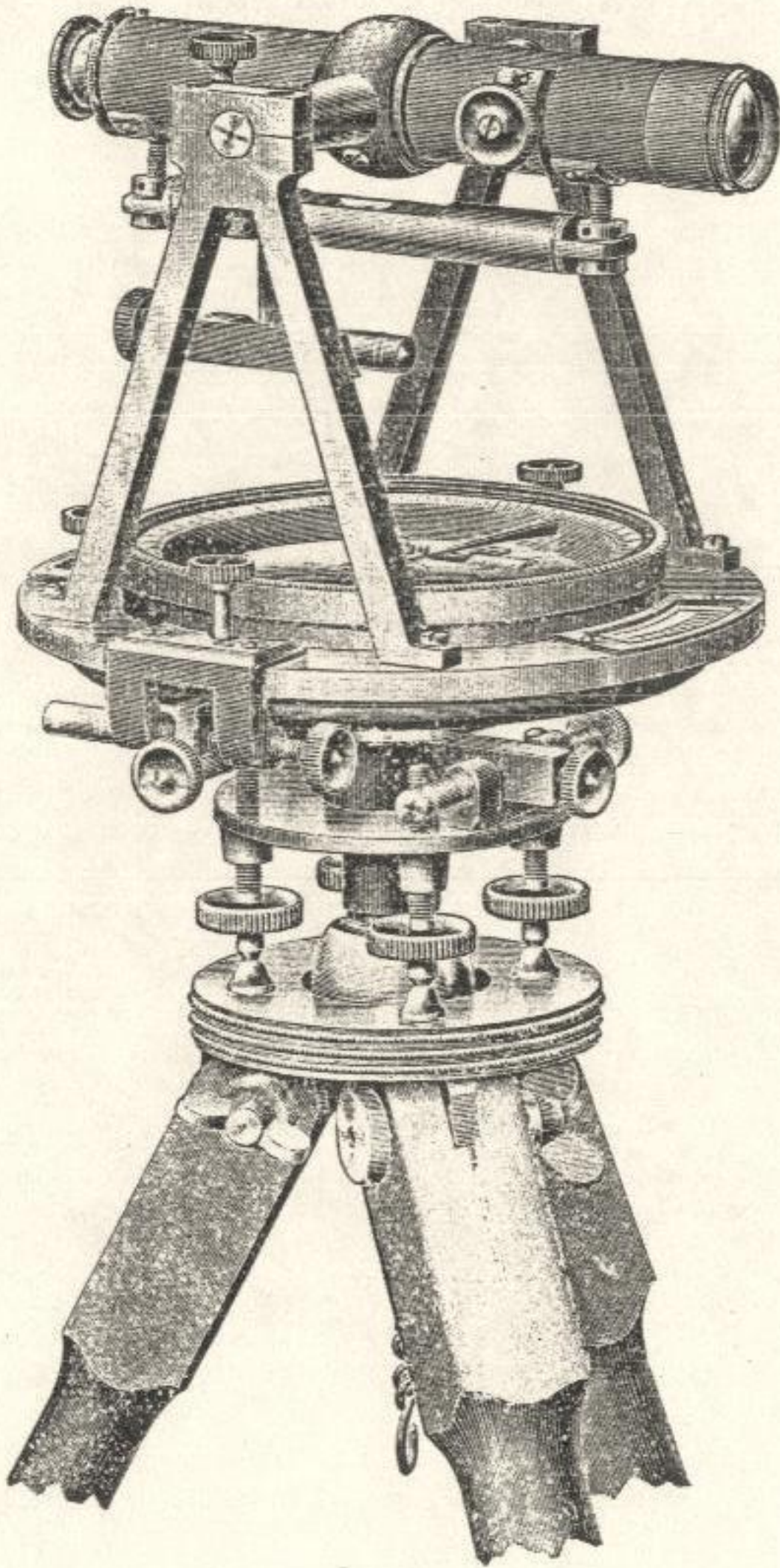


Fig. 4.

Fig. 4 is the same as Fig. 3½. with the addition of Level, Clamp and Tangent on the Telescope Axis.

Price, as shown in the cut, including Box, Plumb-bob and Sun Shade.

Fig. 4, with the Variation Vernier and 2 Verniers to Limb.....	\$115.00
“ “ “ “ “ 1 “ “ .....	110.00
“ without “ “ “ 2 “ “ .....	110.00
“ “ “ “ “ 1 “ “ .....	105.00

A set of Extension Tripod Legs, in place of the Plain Legs, would cost extra.. 7.00  
 Stadia Wires, if wanted, cost extra.

For Prices of Extras, see Page 16; Adjustments, Page 17.

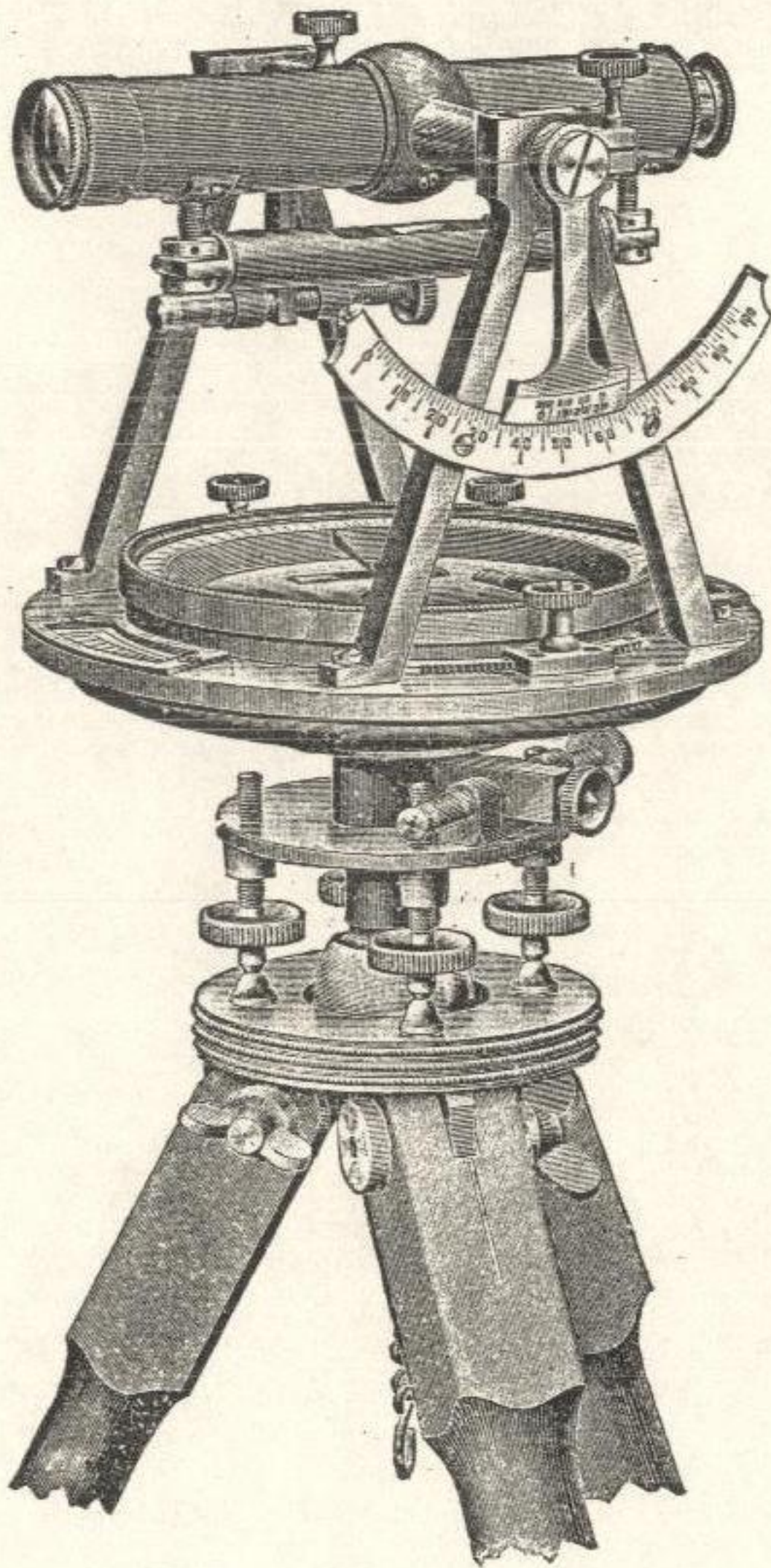


Fig. 5.

Fig. 5 is the same as Fig. 4, with the addition of 100 degree Vertical Arc, reading to minutes.

Price, as shown in the cut, including Box, Plumb-bob and Sun Shade.

Fig. 5, with the Variation Vernier and 2 Verniers to Limb.....							\$125.00
" " " " " 1 " " .....							120.00
" without " " " 2 " " .....							120.00
" " " " " 1 " " .....							115.00

A set of Extension Tripod Legs, in place of the Plain Legs, would cost extra... 7.00  
 Stadia Wires, if wanted, cost extra.

*For Prices of Extras, see Page 16; Adjustments, Page 17.*

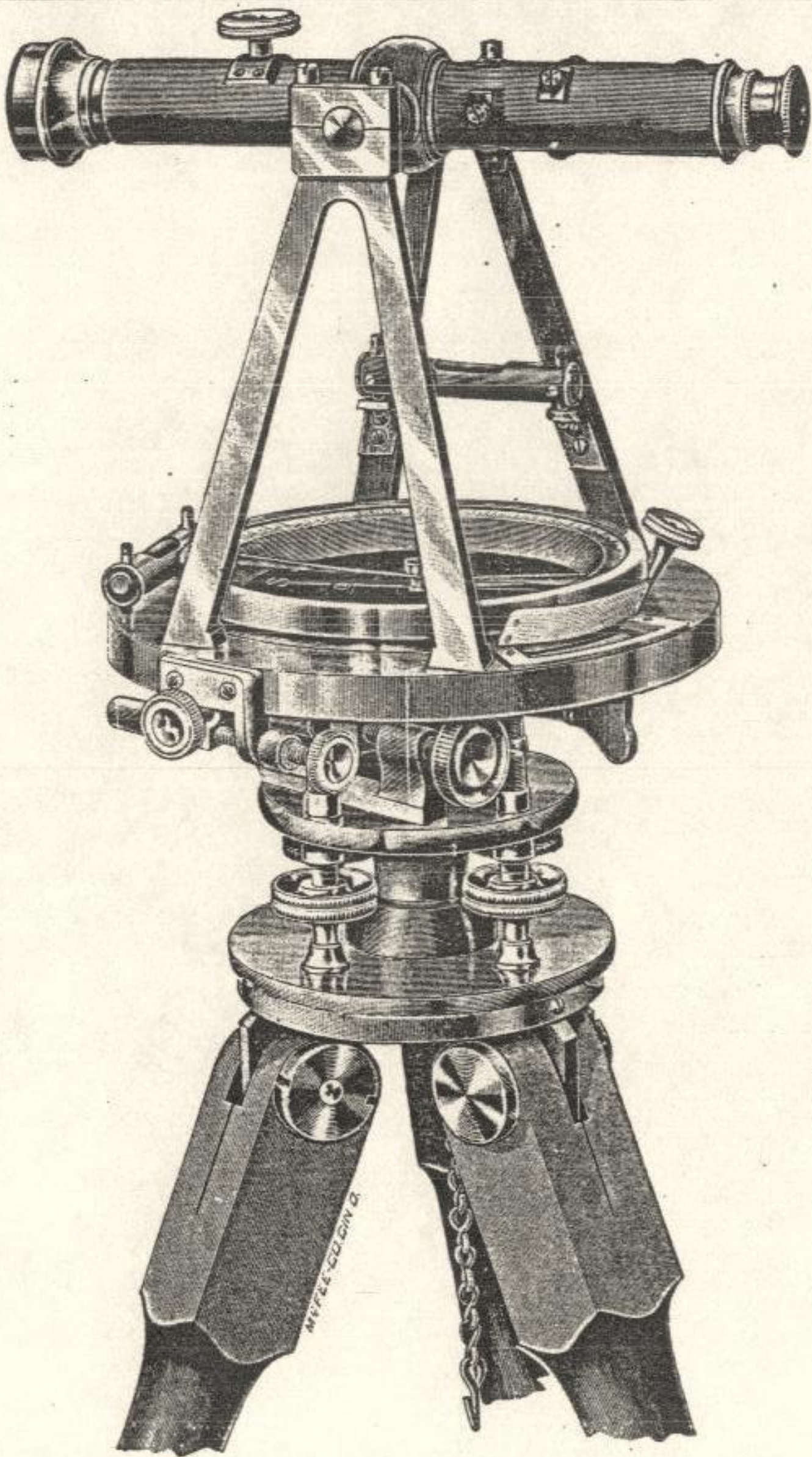


Fig. 9.

Engineers' Transit, with plain Telescope. It has  $4\frac{5}{8}$  inch Needle,  $6\frac{1}{4}$  inch Limb graduated on solid silver, 2 Verniers to Limb reading to minutes, long Spindles with Shifting Center to Leveling Head. The Telescope is 10 inches long, with a power of 24 diameters. The weight, with Tripod complete, is about 25 pounds.

Price, as shown in the cut, including Box, Plumb-bob, Cap and Sun Shade..\$150.00  
 Variation Vernier added..... 10.00  
 A set of Extension Tripod Legs, in place of the Plain Legs, would cost extra.. 8.00  
 Stadia Wires, if wanted, cost extra.

*For Prices of Extras, see Page 16; Adjustments, Page 17.*

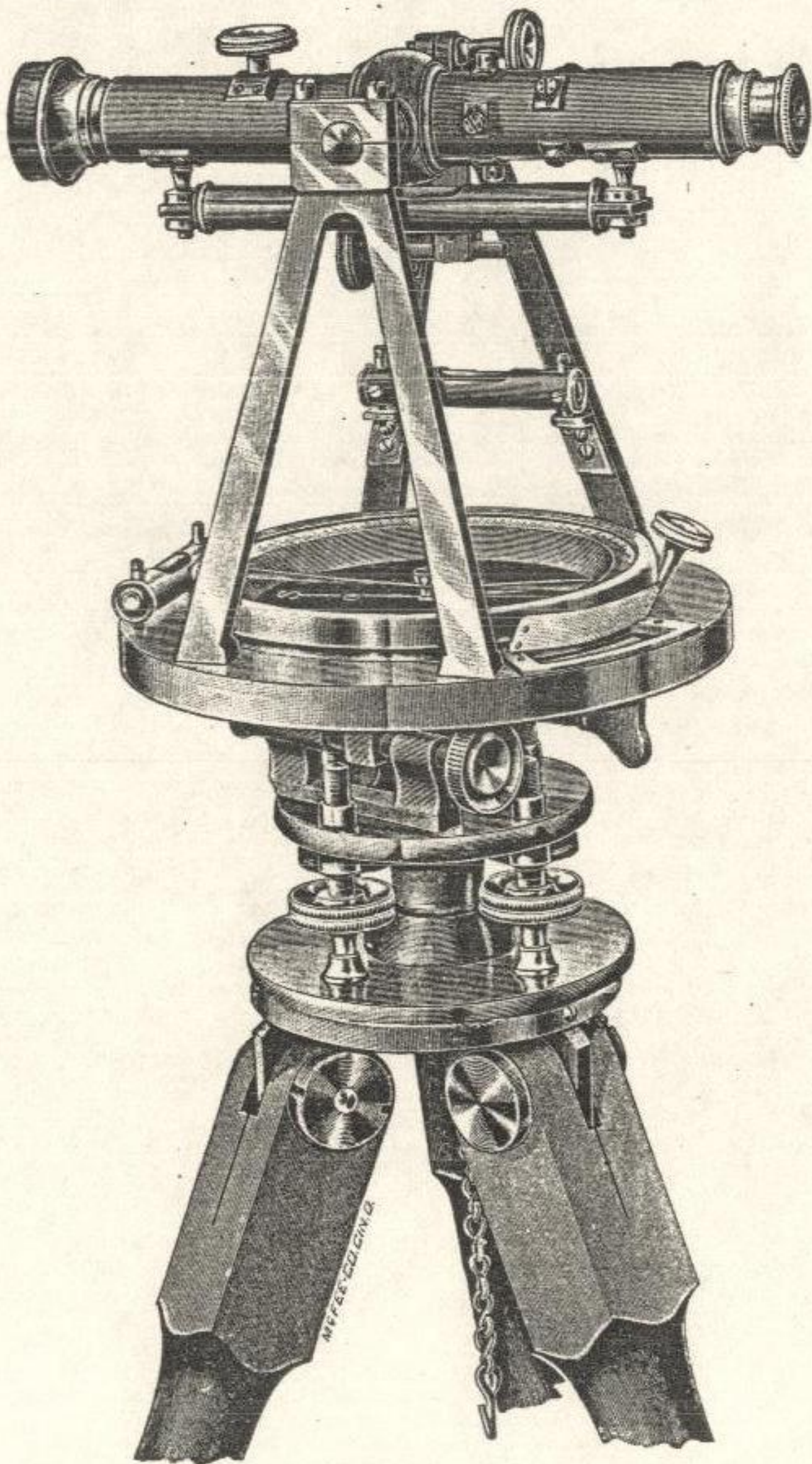


Fig. 9½.

Fig. 9½ is the same as Fig. 9, with the addition of Level, Clamp and Tangent on the Telescope Axis.

Price, as shown in the cut, including Box, Plumb-bob, Cap and Sun Shade..	\$165.00
Variation Vernier added.....	10.00
A set of Extension Tripod Legs, in place of the Plain Legs, would cost extra..	8.00
Stadia Wires, if wanted, cost extra.	

*For Prices of Extras, see Page 16; Adjustments, Page 17.*

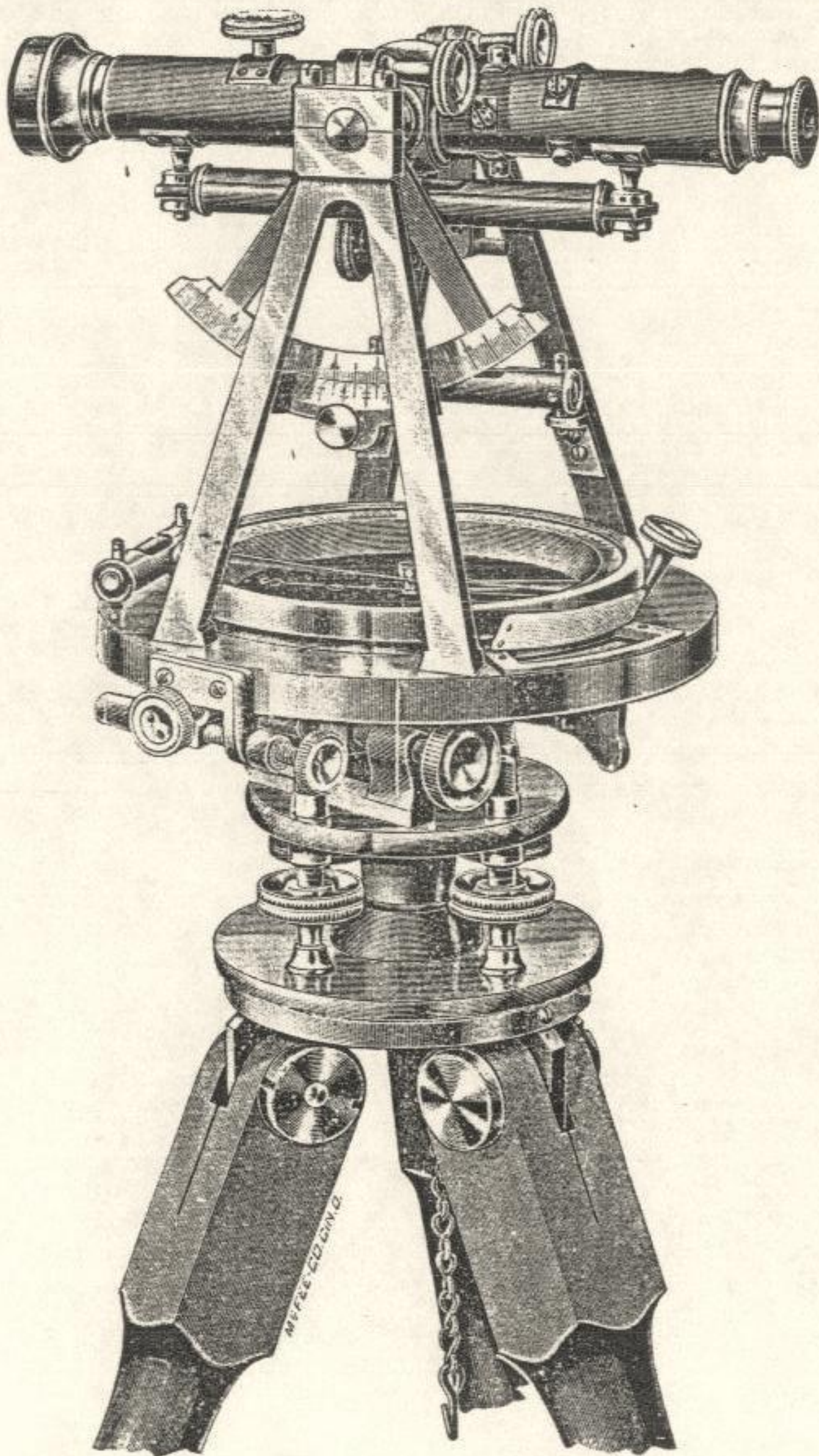


Fig. 10.

Fig. 10 is the same as Fig. 9½, with the addition of 100 degree Vertical Arc reading to minutes.

Price, as shown in the cut, including Box, Plumb-bob, Cap and Sun Shade..	\$180.00
Variation Vernier added.....	10.00
A set of Extension Tripod Legs, in place of the Plain Legs, would cost extra..	8.00
Stadia Wires, if wanted, cost extra.	

*For Prices of Extras, see Page 16; Adjustments, Page 17.*

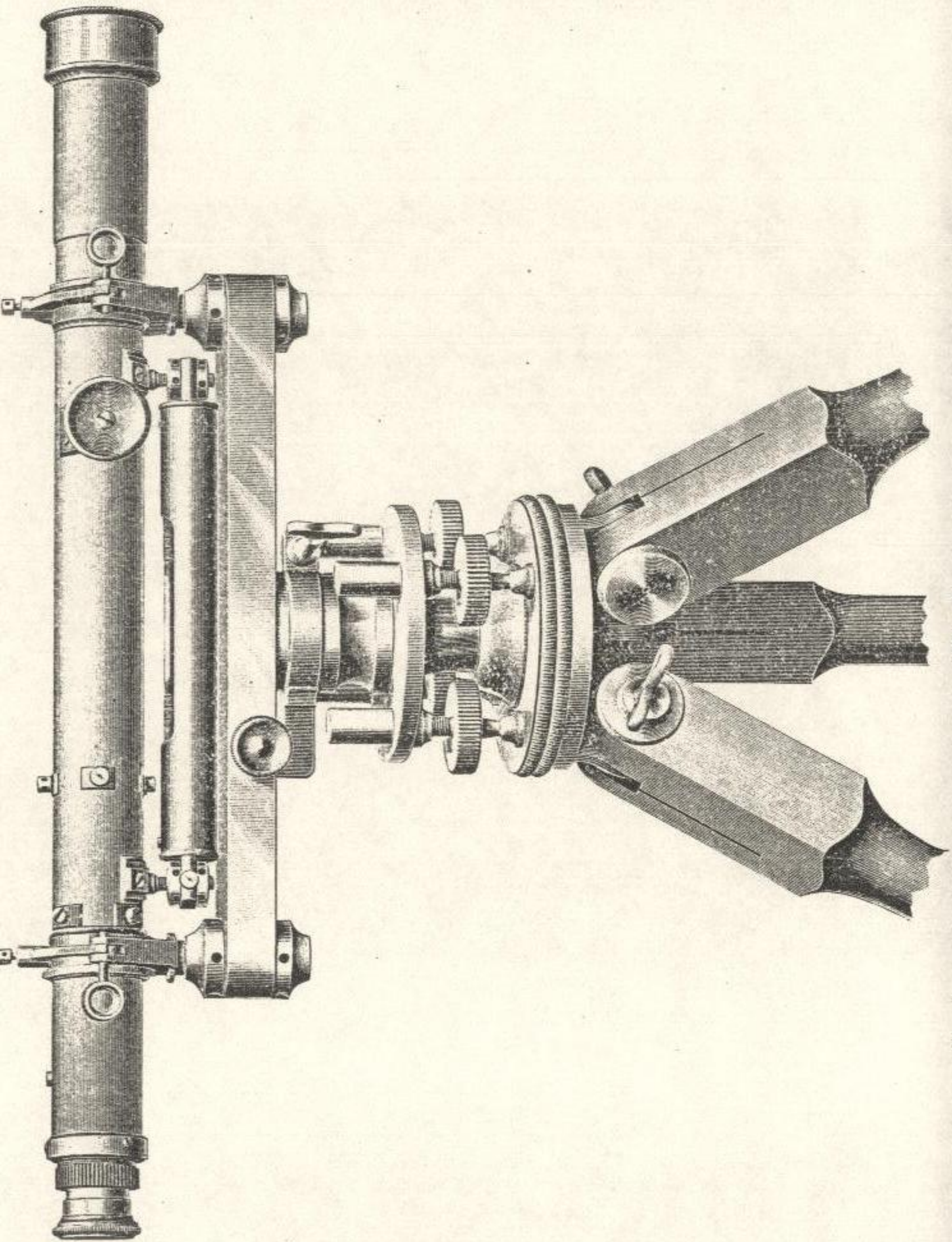


Fig. 8.

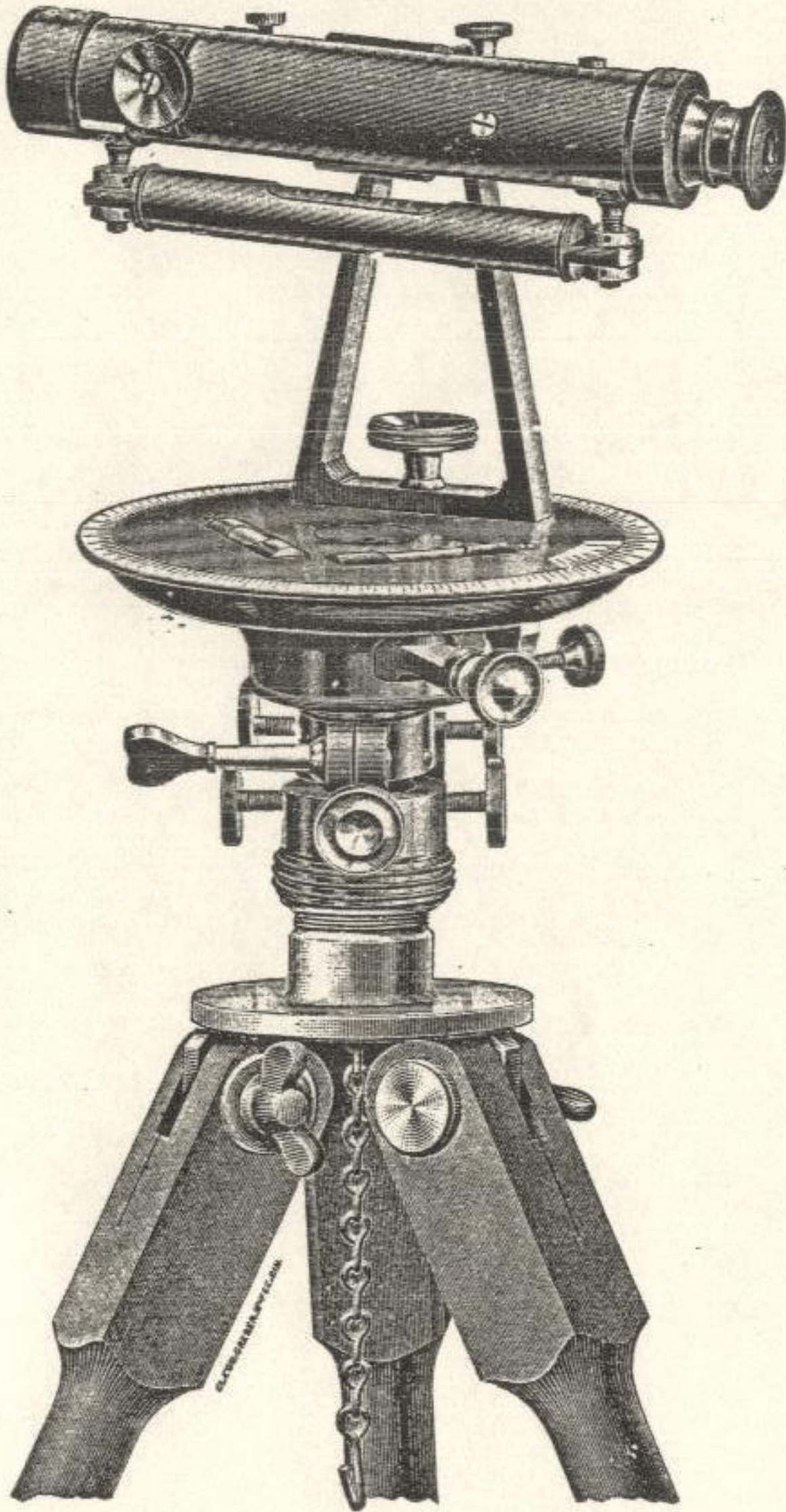


Fig. 12. Transit Level, for use of Architects and Builders.

The above cut represents a light and convenient instrument for leveling, plumbing lines and taking horizontal angles, without the magnetic needle attachment. The main plates of the instrument are supplied with two Cross Levels, for leveling the instrument. The Circle is  $4\frac{1}{2}$  inches in diameter and is graduated to  $\frac{1}{2}$  degrees, and reads by vernier to single minutes. The Telescope is  $7\frac{1}{2}$  inches long, with a power of 20 diameters. The Telescope revolves both ways for back and forward sights, thus also giving the plumb line of a structure.

Price complete, with the Fig. 12 Tripod, as shown in the cut, including the Sole Leather Box, Plumb-bob and Sun Shade.....\$55.00  
 With Fig. 2 Tripod, shown in cut, page 5..... 60.00

*For Certificates, see inside of back cover.*



### The Plain or Single Plate Compass.

All our instruments, when sold, are in adjustment and ready for use. The Compasses as we make them, scarcely ever need any re-adjustment.

To adjust the levels on a compass (these same adjustments will also answer for the small levels on all other instruments), we generally adjust one level first. Set the Compass on the Jacob Staff and bring the bubble of one level to the center of the slot in the brass tube; turn the Compass one-half around on its socket; if the bubble again settles in the center the level is adjusted; if the bubble runs to one end of the slot, bring the bubble one-half way back to the center, by the screw at one end; move the Compass on the ball-joint until the bubble remains in the center. Repeat the operation until the bubble remains in the center during a complete revolution of the Compass on its socket. One level being in adjustment and the Compass level, raise or lower one end of the other level until the bubble stands in the center, and the levels are adjusted. The sights should now reverse on a plumb line. All other adjustments are made by the maker. It will be seen that my style of compasses are changed so that the levels, outkeeper and vernier come inside the needle-box the same as my Patent Telescope Compass, which I believe makes them more desirable, and the boxes are about  $1\frac{1}{4}$  inches less in height.

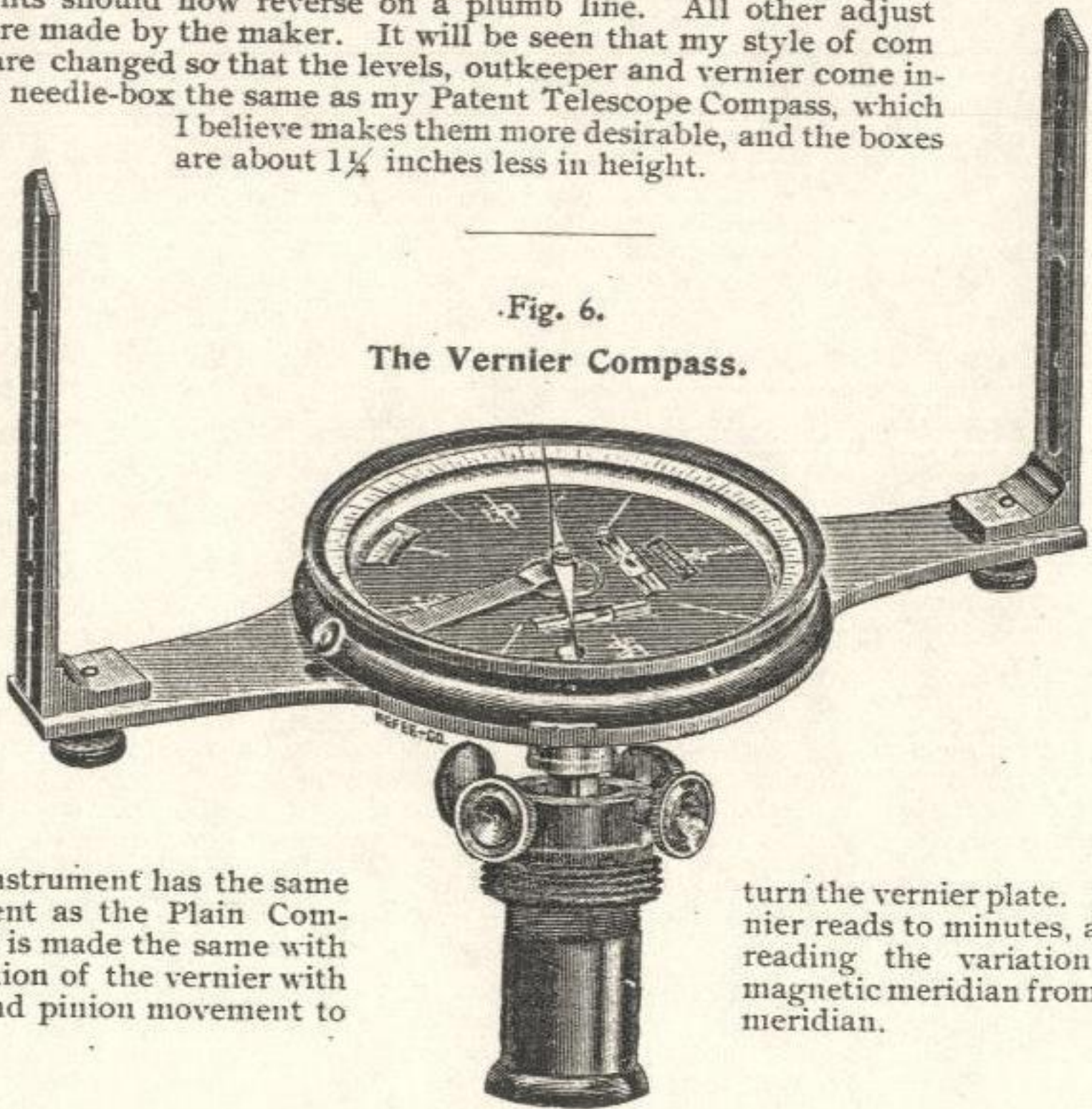


Fig. 6.

The Vernier Compass.

This instrument has the same adjustment as the Plain Compass and is made the same with the addition of the vernier with clamp and pinion movement to

turn the vernier plate. This vernier reads to minutes, and is for reading the variation of the magnetic meridian from the true meridian.

**RULES FOR READING THE VERNIER.**—This rule will apply to all our Verniers. Read the degrees from the zero on the circle in the direction of the graduations up to the line next preceding the zero line on the vernier, this is the reading of degrees look along the Vernier, in the same direction from the zero of the circle, until a dividing line is found to coincide with a line of the circle, the numbers on the Vernier will give the minutes, the minutes added to the degrees will be the reading of the instrument. The needle should cut opposite graduations in every position very accurately. Sights graduated for leveling and grading.

**PRICES OF TRIPODS AS EXTRAS SAME AS FOR TELESCOPE COMPASS. See Page 16.**

Plain Sight Compass, 6-inch Needle ( <i>Fig. 6</i> ), $15\frac{1}{2}$ -inch Plate, Brass Cover, two Ground Spirit Levels, Adjustable Outkeeper, strong, well made Box of Walnut, Staff Mountings.....	\$35 00
Plain Sight Compass, 5-in. Needle, $14\frac{1}{2}$ -in. Plate, same otherwise as above.....	30 00
Vernier Sight Compass, 5-in. Needle, $14\frac{1}{2}$ -in. Plate, balance same as 5-in. plain....	35 00
Vernier Sight Compass 6 in. Needle $15\frac{1}{2}$ in. Plate.....	35 00

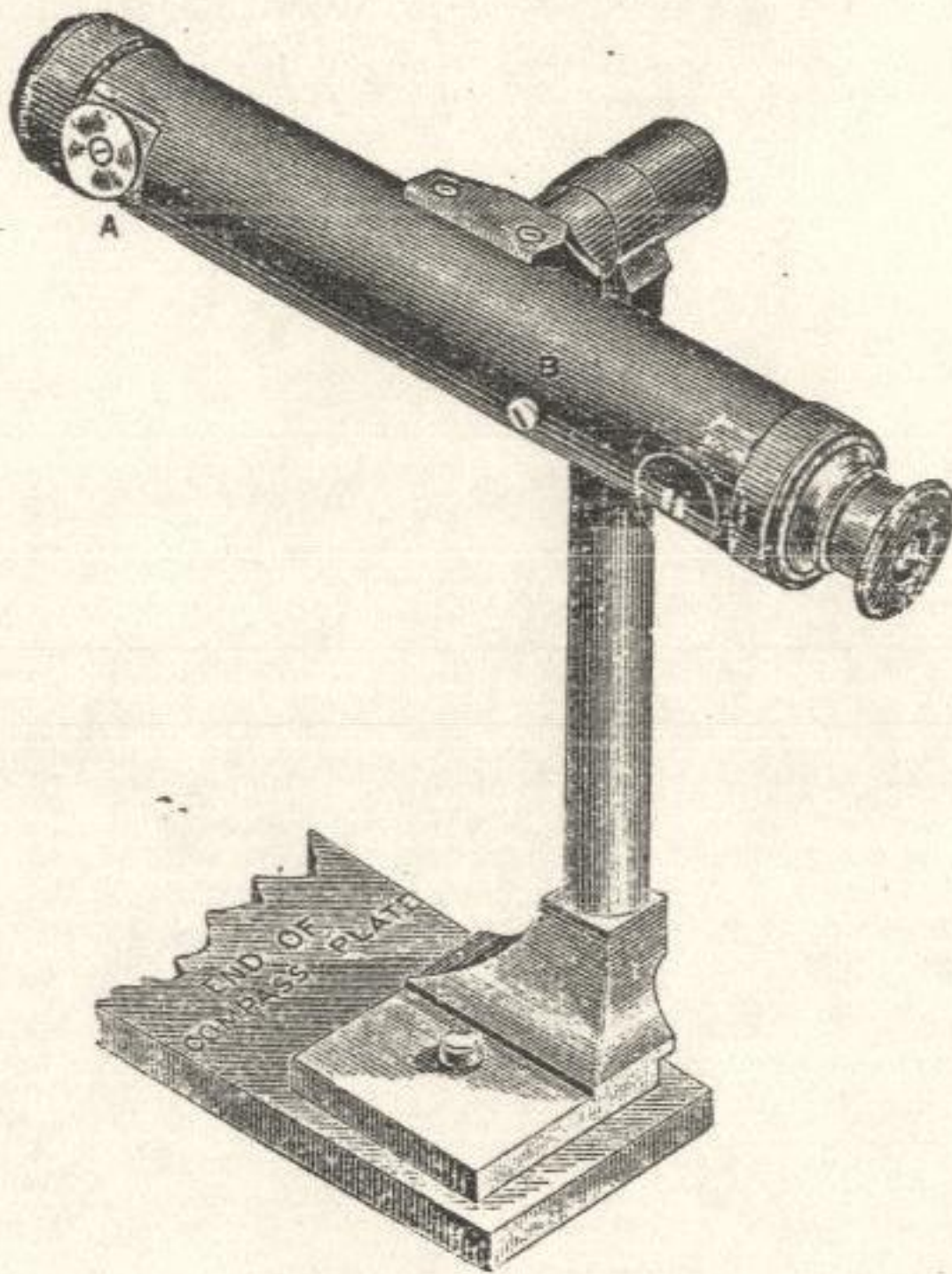


Fig. 3.

### Patent Telescope Attachment for Sight Compass.

To take the place of the Sights. This Attachment screws onto the Compass Plate, the same as a Sight. The Telescope is  $7\frac{1}{2}$  inches long, with a power of 20 diameters, and is fitted with a set of Cross Wires. The Telescope revolves both ways for back and forward sights and reads in line with the zeros, without any offset. We ought to have the Compass, so that we can properly fit and adjust the Attachment to it, as we prefer to place a third Steady-pin to the foot of the Upright, so that the adjustment will be perfect.

If the Telescope Attachment is wanted, without sending the Compass, on receipt of a stiff piece of cardboard, giving the fac-simile of the South end of the Compass Plate, showing the exact size and position of the holes for the Sight Screw and Steady-pins, we can then furnish this Attachment by mail.

It is quite necessary to have the Balance Weight, if the Compass is a light one.

The above will be easily understood from the cut as representing the end of the Compass Plate. This attachment will generally go into the Compass Box with the Compass.

Price of the above Telescope Attachment.....	\$15.00.	Postage,	25c.
Price of Level added to the Telescope, with Clamp Screw.....	8.00.	"	35c.
Balance Weight .....	2.00.	"	25c.



### Adjustment of Instruments.

#### ADJUSTMENT OF SMALL LEVELS OR LEVELING THE INSTRUMENT, GIVEN ON PAGE 14.

The adjustment of cross wires in Fig. 1 is about all the surveyor can make (made with two screws on side of Telescope), as follows: The instrument being level, bisect some point with the vertical wire; revolve Telescope one-half around on its axis and the opposite direction from the first object to another distant point; turn the instrument one-half around on its axis until the vertical wire bisects the first object observed; turn the Telescope as before, and see if it again bisects the second point observed; if it does, the adjustment is right; if not, one-quarter the error is corrected by moving the cross wire, one-quarter by moving the instrument on its socket, and one-half by moving one of the points observed.

The adjustment of the cross wires in a Transit are made by reversing the Telescope and using the zeroes in a similar manner by the four capstan head screws. (IN ALL TELESCOPES THE EYE-PIECE REVERSES THE CROSS-WIRES AND THEY ARE MOVED IN APPARENTLY OPPOSITE DIRECTIONS FROM WHAT THEY APPEAR TO THE EYE, TO MAKE THE ADJUSTMENT.)

**TO ADJUST THE REVOLVING LEVEL.**—Used on all my Telescopes. Level the instrument by the two small levels; bring the Telescope to as near a level as possible by turning it on its axis; now clamp the axis and move the Telescope and Level together on their axis by the slow-motion tangent screw until the bubble stands in the center, designated by the lines made on the level glass; turn the instrument one-half around; if the bubble again comes to the center the level is adjusted; if not, one-half the adjustment is made by raising or lowering one end of the level, as the case may be, by the adjusting nuts at each end, the other half by the tangent screw.

**ADJUSTMENT OF THE HORIZONTAL CROSS WIRE TO THE LEVEL.**—Observe a point, say one hundred yards distance; bring the horizontal wire to bear on it, the level still remaining in the center; unclamp the Telescope axis and turn it half over on its axis; this will bring the level to the top of the Telescope; turn the level on its own socket; clamp the Telescope axis and bring the bubble to the center by the tangent screw; now see if the wire cuts the same point; if it does, the cross wire is in adjustment with the level; if not, one-half the error is corrected by moving the cross wire, the other half by raising or lowering the point observed. The vertical arc being loose on the Telescope axis, which can be clamped at any point, needs no adjustment. To start from zero on the vertical arc, the Telescope must be level; the zero on the arc is then made to coincide with that on the vernier; and clamped to the vernier; the arc is then clamped to the telescope axis, the clamp of the vernier is then unloosed, with that of the tangent screw, and the arc will move with the Telescope.

**ADJUSTMENT OF THE Y LEVEL.**—First, is that of the line of collimation, or the intersection of the cross wire to revolve on a given point by the entire revolution of the Telescope in its Y's. The instrument is set on its tripod, and the eye piece is moved in focus with the cross wire by turning the pinion at the eye end; the object glass is then moved out, by turning the pinion, until the object appears distinct; the horizontal line is brought to bear on some line or point, the Telescope is turned one-half around in its Y's, and if the wire cuts the same point, that wire is adjusted; but if it comes on either side of the first point observed, one-half of the variation is corrected by one of the four small capstan head screws on the Telescope, the other half by raising or lowering the end of the instrument with the horizontal adjusting screws. The Telescope is then turned one-quarter of the way around, and the other wire is adjusted to the same point. The four screwdriver head screws between the eye piece and the capstan head screws are for bringing the cross wires to the center of the field. It will be noticed that in the adjustment of the cross wires it apparently moves out of the center of the Telescope. These screws bring them to the center of the field. This is same in a Transit.

**ADJUSTMENT OF THE Y's.**—Raise the clips; bring the horizontal wire on a point; turn the telescope end for end in the Y's; turn the instrument one-half around on the socket. If the cross wire cuts the first point observed, the Y's are adjusted; if not, one-half the error is corrected by the nuts securing the Y's to the level bar, and the other half by the horizontal adjusting screws.

**ADJUSTMENT OF THE SPIRIT LEVEL.**—Bring the level over a set of horizontal adjusting screws, and bring the bubble to the center. (The glass tube has lines marked on it to correspond with the length of the bubble in the place of a brass scale over the level tube.) Turn the instrument one-half around. If the bubble again runs to the center the level is in adjustment; if not, one-half of the adjustment is made by the capstan nuts, which secure the level to the telescope tube, the other half by the horizontal adjusting screws. All of these adjustments should be repeated.

## REPAIRS OF NEEDLES.

The **needle** is the most sensitive part of an instrument, and extreme care must constantly be exercised so as not to get the point of the center-pin dulled any. **Always** in transportation, and when moving the instrument about, from place to place, be sure to raise the needle off of the center-pin, each and every time, so as to protect the point of the center-pin.

In most cases, when needles act badly, the fault generally lies in a dull center-pin. But without seeing the needle and center-pin we can not tell what is wrong with them.

The repairs of the needle and center-pin is a very difficult piece of work and can only be done right by an experienced instrument maker.

The center-pin can be unscrewed and sent to us by mail with the needle for repairs, carefully packed, so as not to get injured in any way; but without the instrument into which the needle and center-pin belong we can make none of the adjustments of the needle or center-pin.

**To adjust the Needle.**—If the needle does not "cut" the opposite degrees exactly, then bend the center-pin near its base, also the needle slightly and very carefully until it does.

The general charges for the repairs of a needle and center-pin are as follows:

Recharging a Needle .....	\$0 50
Sharpening the Center-pin.....	50
New Steel Center fitted into the Needle Cap .....	50
Entire New Cap fitted into the Needle.....	1 00
Adjusting Needle and Center-pin into a Compass .....	1 00



Style of Our Compass Needle.

This cut represents the shape and style of our Magnetic Needles. This needle is light and gives large surface to the points; up and down being only a fine line when looking down upon it. This large surface enables a needle to retain a large amount of electricity. Finely polished and blued. Price by mail, \$3.00. Adjusted to compass, \$4.00.

**Price of Center-pin for our make of instrument, by mail, \$0 75**

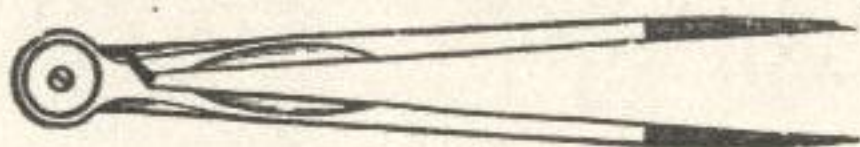
**Price of Center-pin, fitted into an instrument..... 1 00**

All needles vary slightly in length, and center-pins in height. This is caused by the turning of the plates of instruments, as some castings are more rough than others.

Therefore, if a needle or center-pin is wanted by mail, then send us a measure, by stiff piece of paper, the **exact** length the needle must be, also state the height of center-pin, and we can send the correct size to fit the compass, on receipt of price, as stated above. But without the instrument for which they are intended, we can make none of their adjustments. If a center-pin is wanted for any other make of instrument, then we **can not** furnish it by **mail**. We would have to have the compass to fit in the new center-pin on account of the different sizes of threads.

When needle instruments are not in use, we recommend surveyors and engineers to let the needle rest on the pivot; in this way it will retain its magnetism longer; but **always** in transportation screw the needle firm against the glass.

In wiping the glass that covers the needle box, always breathe on it; this removes any electricity that may be caused by rubbing for the purpose of cleaning the glass;



**Mathematical Instruments of Brass.**

	POSTAGE.
Brass Dividers, 4½ in. long, screw joint.....	\$0.30 \$0.02
“ “ 5½ “ “ .....	.40 .03
“ “ 6½ “ “ .....	.50 .04
Brass Dividers, Needle Point, 4½ in. long, with Pen and Pencil Points and Lengthening Bar.....	.85 .04
Brass Dividers, Needle Point, 6 in. long, with Pen and Pencil Points and Lengthening Bar.....	1.00 .06
Brass Proportional Dividers, divided for lines.....	2.50 .06
Drawing Pen, Ebony Handle.....	.15 .02
“ “ Bone “ .....	.20 .02
“ “ “ “ spring blade .....	.45 .02

**Brass Instruments in Boxes.**

Rosewood Box, with Lock and Key (the instruments are set in a tray so that colors, etc., may be put below), containing:

Pair of 6-inch Needle Point Dividers, with Pen and Pencil Points and Lengthening Bar.

Pair of 4½-inch Plain Dividers.

“ 3½ “ Needle Point Dividers, with Pen and Pencil Points.

Spring Bow Pen with Needle Point.

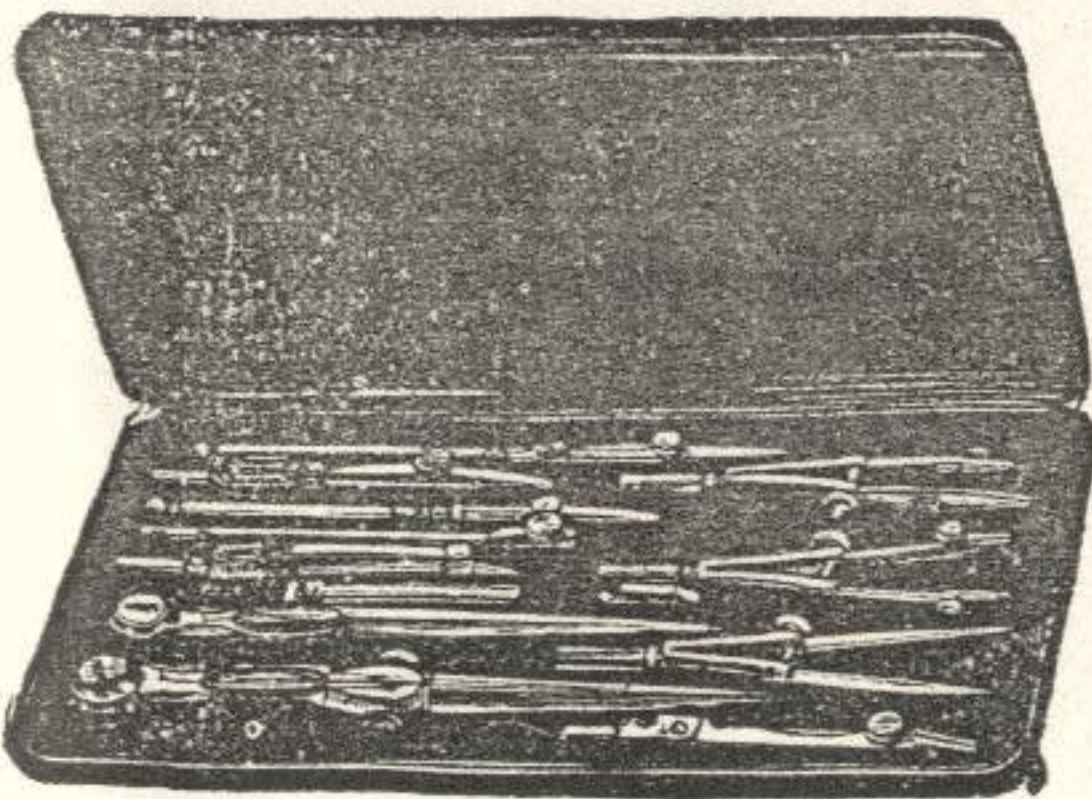
Brass Protractor; Drawing Pen; Divided Wood Rule; Horn Protractor.

Price complete .....: \$4.25 \$0.25

**Special Cases of Superior Instruments.**

Highly Finished in Steel and German Silver. Velvet Lined Morocco Pocket Cases.

No. 117. Morocco Case (Alteneder Joints) containing fine German Silver Instruments; Compasses, 6-in. needle points, pen pencil and lengthening bar; hair spring dividers, 6-in; 1 each steel spring dividers; bow-pen and bow-pencil, with needle point; 2 drawing pens, 5 and 4-in.; box of leads. This is a very fine set of instruments. Price..\$14.00. Postage 15c.



Dividers, German Silver, 5 inches long.....	\$0.85	\$0.05
“ “ “ 6 “ “ .....	1.00	.05
“ “ “ 5 “ “ with Shield for Pocket.....	1.25	.06
Beam Compasses, German Silver, with Adjusting Screw, in Morocco Case..	7.00	.15
Steel Spacing Divider, 3½-inch.....	1.00	.04
Steel Bow Pen, 3½-inch Needle Point.....	1.35	.04
Steel Bow Pencil, 3½-inch Needle Point.....	1.35	.04

**Ideal Thumb Tacks.**

Diameter.	⅜-inch.		½-inch.		⅝-inch.	
	Price.	Postage.	Price.	Postage.	Price.	Postage.
Steel, per dozen.....	\$0.08	\$0.02	\$0.10	\$0.02	\$0.12	\$0.03
Brass, per dozen.....	.10	.02	.15	.02	.20	.03
German Silver, per dozen....	.15	.02	.20	.02	.25	.03







## PAPERS.

## Continuous or Roll, Manilla Drawing Paper.

Best Am. manuf., quality XXX, 36 in. wide, sold in 10 yd. lots only, roll.....\$0.80

## Cross Section Paper.

Printed in Green.

	Price,	POSTAGE.	
Plate Cross Section Paper, ruling 16 x 20 inches, 10 x 10 to 1 inch. Price, per quire, \$3.50. Per sheet.....	\$0.20	\$0.05	
Ruled Cross Section Paper (best quality), ruling 16 x 20 inches, 10 x 10 to 1 inch. Price, per quire, \$2.00. Per sheet.....	.10	.05	
Perfect Cross Section Paper, Continuous, ruling 20 inches wide, 10 x 10 to 1 inch. Price, per yard.....	.24	.02	

## Profile Paper, Red or Green.

Plate A, continuous, ruling 20 inches wide, horizontal ruling 4, vertical ruling 20 to 1 inch, postage 4 cents per yard.....	\$0.20
Plate B, continuous, ruling 20 inches wide, horizontal ruling 4, vertical ruling 30 to 1 inch, postage 4 cents per yard.....	.20

## Tracing Paper, Continuous.

	PER ROLL.
Parchment Tracing Paper, medium, very tough, 39 inches wide, in rolls of 20 yards, per yard 20 cents, postage 3 cents per yard.....	\$3.25
Parchment Tracing Paper, thick, very tough, 39 inches wide, in rolls of 20 yards, per yard 25 cents, postage 3 cents per yard.....	3.75

## Imperial Tracing or Vellum Cloth.

24-Yard Roll.

One side glazed, the other dull; suitable for pencil marks.

18 inches wide, per yard 25 cents, postage 2 cents per yard.....per roll	\$4.50
30 " " " " 40 " " 3 " " " " " " " " " "	8.10
36 " " " " 45 " " 4 " " " " " " " " " "	9.00
42 " " " " 60 " " 5 " " " " " " " " " "	12.10

## Prepared Blue Process Paper.

30 inches wide, in 10 yard rolls, per roll.....postage 55c.....	\$1.00
36 " " " " 10 " " " " " " " " " " " " " " " "	1.15
42 " " " " 10 " " " " " " " " " " " " " " " "	1.40

## Whatman's Best Drawing Paper.

Hot and Cold Pressed, in Sheets.

Cap.....13 by 17.....postage 15c., per quire \$	0.75
Demy.....15 by 20....." 20c., " "	.90
Medium.....17 by 22....." 28c., " "	1.40
Royal.....19 by 24....." 35c., " "	1.75
Super Royal.....19 by 27....." 45c., " "	2.10
Imperial.....22 by 30....." " " " " " " " " "	3.00
Atlas.....26 by 34....." " " " " " " " " "	4.60
Double Elephant.....27 by 40....." " " " " " " " " "	5.75
Antiquarian.....30 by 53....." " " " " " " " " "	27.00

### Egg Shell Drawing Paper.

36 inches wide, postage 15c. per yard.	Per yard 35c.,	per roll of 10 yards.....	\$3.00
42 " " "	" 40c.,	" 10 " .....	3.50
58 " " "	" 50c.,	" 10 " .....	4.50

### Egg Shell Drawing Paper.

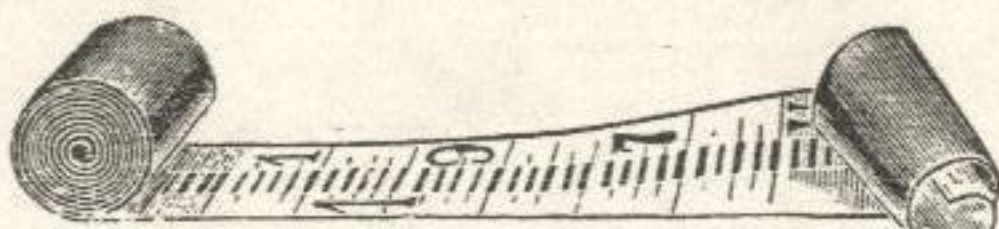
Mounted on Muslin.

36 inches wide, postage 20c. per yard.	Per yard \$1.00,	per roll of 10 yards....	\$ 7.50
42 " " "	" 1.10,	" 10 " .....	8.85
58 " " "	" 1.40,	" 10 " .....	11.75

### Pocket Magnifying Glasses.

					POSTAGE.
Hard Rubber case and frame, oval form,	1 dbl. convex lens,	1 in. diam..	\$0.40		.02
" " " " "	1 " " "	1 1/4 " "	..	.60	.02
" " " " "	1 " " "	1 1/2 " "	..	.70	.02
Ivory " " " " "	1 " " "	1 1/4 " "	..	1.00	.02

### Flexible or Pocket Leveling Rod.



Made of strips of prepared canvas about three inches wide, and divided the same as self-reading rods. Can be rolled up and carried in the pocket. For use they are tacked to any convenient strip of wood.

Pocket Leveling Rod, 10 feet, divided feet, 10ths and 100ths, each....\$3.25. Post. 12c.

### Leveling Rods.

	PRICE.
Philadelphia Rod, 2 ply, 7 3-10 feet closed, sliding to 13 feet, graduated to feet, 10ths and 100ths, with vernier reading to 1000ths.....	\$14.00
Light Philadelphia Rod, 2 ply, 6 1/2 feet closed, sliding to 12 feet, graduated to feet, 10ths and 100ths, with vernier reading to 1000ths.....	12.00
New York Rod, 2 ply, 6 8-10 feet closed, sliding to 12 feet, graduated to feet, 10ths and 100ths, with vernier reading to 1000ths.....	14.00
Architects' Rod, 2 ply, 5 1/2 feet closed, sliding to 10 feet, graduated to feet, inches and 16ths.....	6.00
Architects' Rod, 2 ply, 5 1/2 feet closed, sliding to 10 feet, graduated to feet, 10ths and 100ths, with vernier reading to 1000ths.....	6.00

### Ranging Poles.

Transit or Flag Poles, of pine, well painted, red and white, steel-pointed.	
" " 6 feet long, each.....	\$2.00
" " 8 " " .....	2.25
" " 10 " " .....	2.50

Price List of Chains.

					Postage.
33 feet	No. 8	Iron Wire,	50 link	\$ 2.00	
66 "	" 8	" "	100 "	3.20	
33 "	" 12	Steel Wire,	50 "	3.50	.35
66 "	" 12	" "	100 "	6.50	.55
10 Vara	12	" "	50 "	3.50	.25
20 "	" 12	" "	100 "	6.50	.55
33 feet	Brazed Links and Rings,		50 "	No. 12 best Steel Wire.	5.50 .35
66 "	" "	" "	100 "	" 12 "	10.00
50 "	" "	" "	50 "	" 12 "	6.00 .50
100 "	" "	" "	100 "	" 12 "	11.00

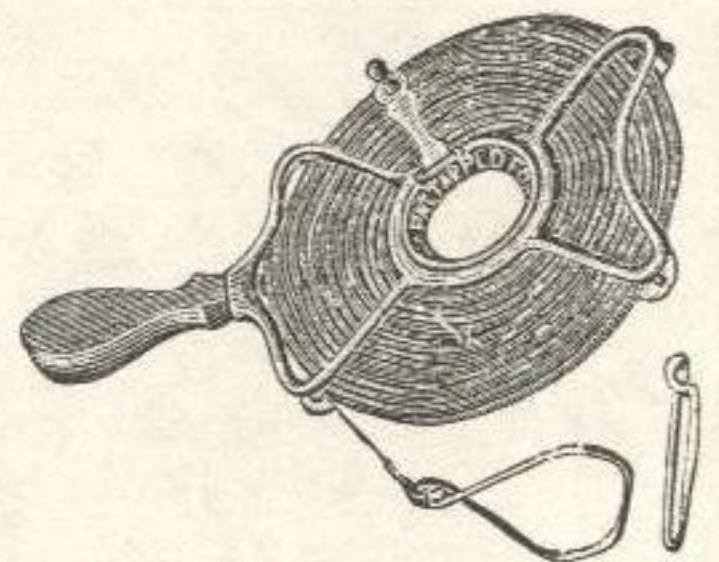
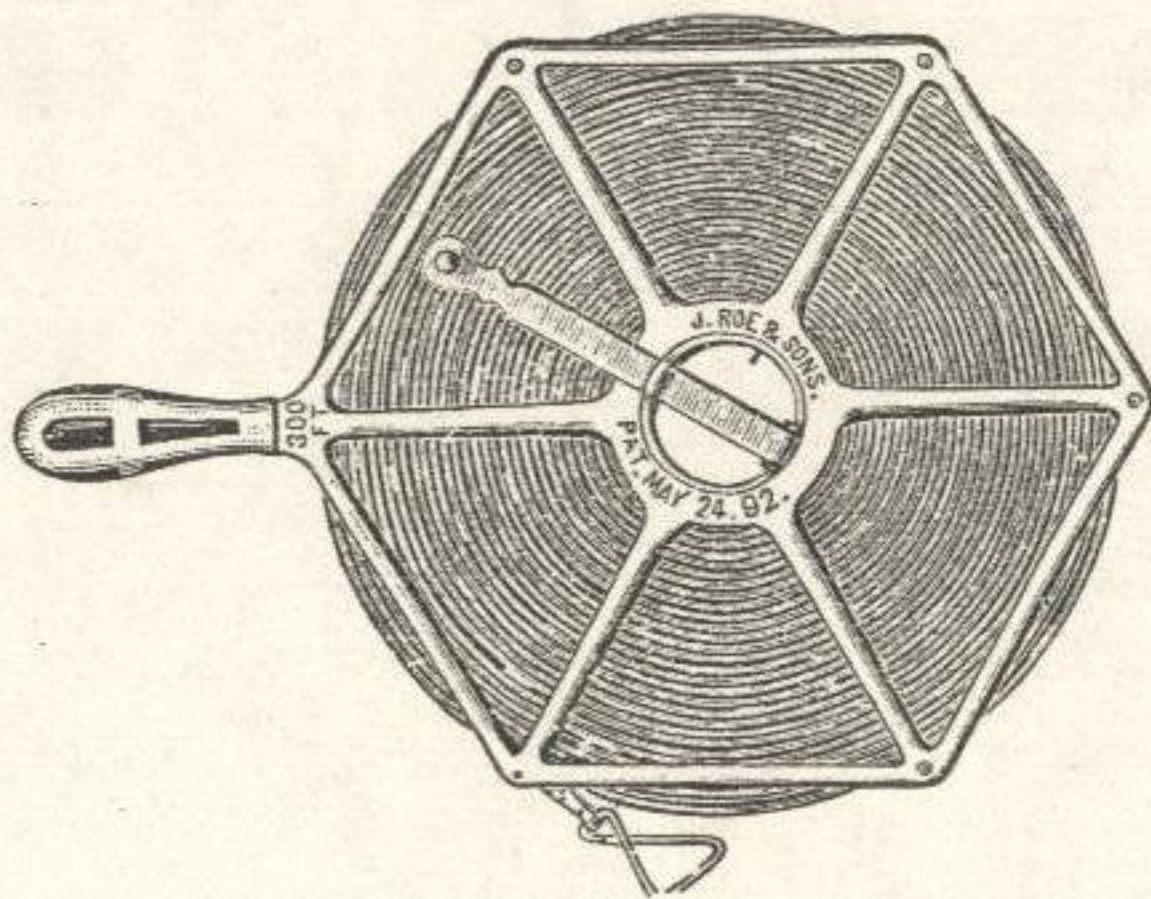
Chesterman's Metallic Tapes.

33 feet long,	in 10ths or 12ths,	links on reverse side,	each	\$2.10	.10
50 "	" "	" "	" "	2.60	.16
66 "	" "	" "	" "	3.00	.18
75 "	" "	" "	" "	3.30	.20
100 "	" "	" "	" "	4.20	.25
50 "	" "	" without box		1.50	.10

Chesterman's Steel Tapes.

All Steel, to wind up in a box same as linen measures, the most accurate, durable and portable measure. Links on reverse side.

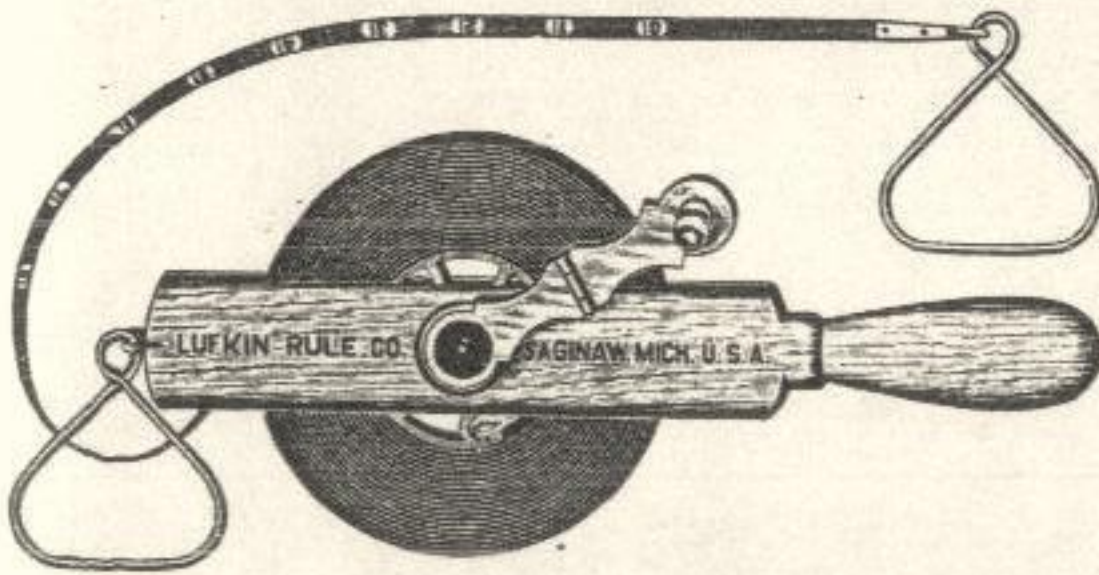
10 feet long,	in 10ths or 12ths,	in German Silver case,	each	\$ 3.25	.05
25 "	" "	" " " " " " " "	Leather case, each	4.50	.10
33 "	" "	" " " " " " " "	" " " " " " " "	5.20	.10
50 "	" "	" " " " " " " "	" " " " " " " "	7.20	.12
66 "	" "	" " " " " " " "	" " " " " " " "	9.20	.14
100 "	" "	" " " " " " " "	" " " " " " " "	12.80	.20



Roe's Steel Tape Chains on Patent "Electric" Reel.

No.	Plain.	Nickel Plate.	Alumi-num. Plate.
1.—100 feet long, graduated every foot, end feet in tenths or inches,	\$5 00	\$6 00	\$7 00
7.— 50 "	4 00	5 00	5 50
16.—200 "	7 50	10 00	10 50
16.—200 " 5 "	6 00	7 50	9 00
4.— 66 " link	5 00	6 00	6 50
10.— 33 " link	3 00	4 00	4 50
30.—300 " foot. End feet in tenths or inches,	10 00	12 00	14 00
21.— 40 Vara,	4 00	5 50	6 00
22.— 20 " "	3 00	4 00	4 50
23.— 10 " "	2 50	3 00	3 50
Price of 100 feet Electric Reel, without Tape			1 50
" 200 " " " " "			2 00
" 300 " " " " "			2 50
Brass Detachable handle per pair			.30

Surveyor's Chain Tapes.



With heavy 1/4-inch Steel Tapes. Nicely finished hardwood reel, with large, metal folding handle and two large detachable rings. Trimmings nicely nickel plated. The frame and winding apparatus is strong, durable and compact, and can be conveniently carried in the pocket when the tape is in use. The tape can easily be detached from the frame, and is provided with two large and strong detachable handles or rings. When the tape is not in use these handles are fastened to the frame, where they will not get lost, and at the same time they serve as a convenient handle for carrying the complete tape.

Graduations.



All chain tapes are graduated one side only in feet every foot, or links and poles every link, as ordered. Tapes graduated in feet have end feet graduated to tenths or twelfths, and, unless otherwise specified, will be sent end feet in tenths. Tapes graduated in links have end links graduated in tenths of links. As shown in cut, wherever graduated the steel has a bright, raised surface with the figures etched in. The steel being tempered and of the finest quality, the graduations and figures will never be effaced, but will always show up clear and distinct.

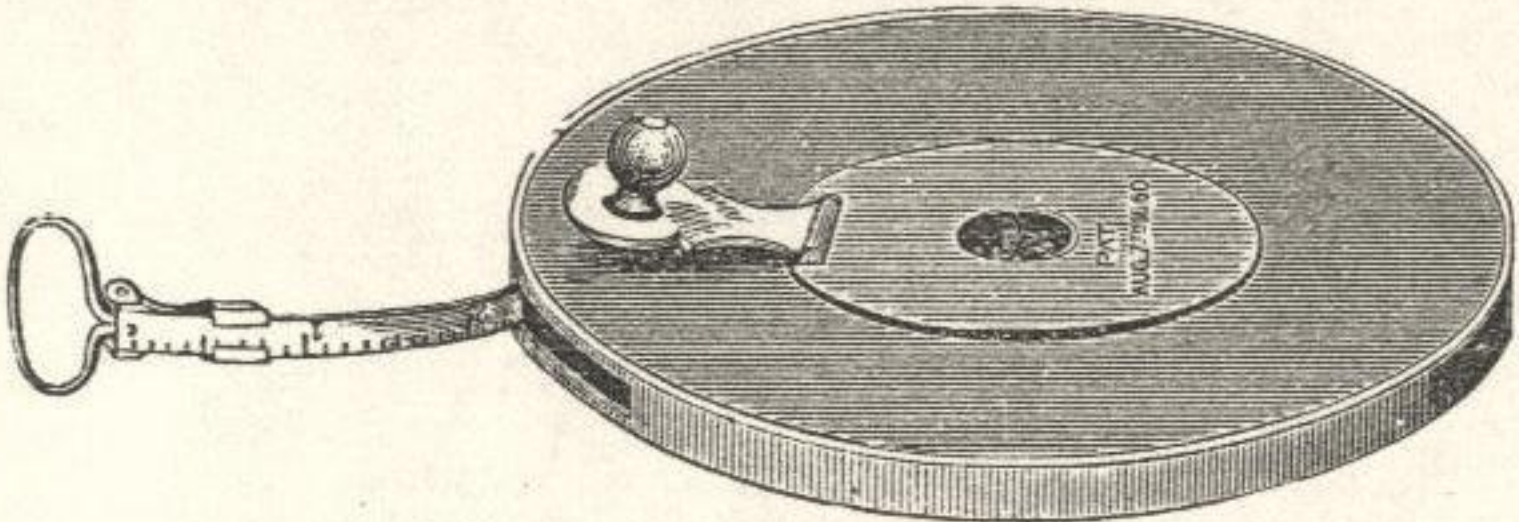
Tapes complete, with Reel.

	Each,	Postage.
100 ft. ....	\$6.00	.35
150 ft. ....	7.50	.50
200 ft. ....	9.00	
100 links ....	5.00	.35
200 links ....	7.00	.50
300 links ....	9.00	
Reel only .....	2.00	.10

Tapes only, with Rings.

	Each,	Postage.
100 ft. ....	\$4.00	.25
150 ft. ....	5.50	.40
200 ft. ....	7.00	.50
100 links ....	3.00	.25
200 links ....	5.00	.40
300 links ....	7.00	.50
Rings only .....	Per pair,	.50 .02

Engineer's Pattern Steel Tapes.



With 1/4 inch Heavy Tapes.

STEEL CASES. Nicely enameled in black and bound with nickel plated brass. Two detachable rings. Flush handle and trimmings also nickel plated. A strong, durable and handsome case. The tape can be readily detached from case and we furnish an extra ring for other end. Marked on one side in tenths or twelfths.

33 ft. ....	\$ 4.25	.15	66 ft. ....	\$7.00	.25
50 ft. ....	5.25	.20	100 ft. ....	10.50	.40

HARD LEATHER CASES. Steel lined, nickel plated trimmings, two detachable rings.

33 ft. ....	\$ 5.00	.15
50 ft. ....	6.00	.20
66 ft. ....	8.00	.25
100 ft. ....	12.00	.40

Tapes marked links on back, add 1 cent per foot to list price.

"Rival" Steel Tapes.

3/8-inch wide. Steel Cases, nickel plated, flush handle, graduated one side only in tenths or twelfths.

		Postage.
33 ft. ....	\$3.00	.10
50 ft. ....	3.40	.15
66 ft. ....	4.25	.20
75 ft. ....	4.50	.25
100 ft. ....	5.75	.30



WHEN you have a good outfit of Randolph Instruments for Land Surveying, and know how to use and keep them in order, then you want a copy of the

## Manual of Land Surveying

By F. HODGMAN

Which gives you not only the Mathematics of Land Surveying in the most practical way, but gives you the rules of law, which govern surveys and boundary lines. That is just what every surveyor wants to know, but few surveyors, or lawyers either, do know, because, until this book was published, it has never been collected in accessible form. The decisions of the highest courts in the land are given in over 200 cases, covering every point in surveying practice, which has been settled by these courts. It has the latest U. S. Instructions and handy methods of finding a true meridian by observation of Polaris at any time when visible, or from the sun. 525 pages. Price, \$2.50.

### ... What they say of it ..

CHIEF JUSTICE SHERWOOD, of the Supreme Court of Michigan, says:

"You have done the profession and Bench and the public generally, great service in presenting the whole subject in a compact form, together with the authority on which your conclusions are founded."

R. M. ALEXANDER, County Surveyor, Montgomery, Alabama, says:

"Your manual for practical surveyors is superior to all others. I would give up all my other works (and I have quite a number) on surveying and engineering, rather than be without it."

PROF. C. A. HARGRAVE, of Danville, Ind., says:

"I prize it more highly than any other two books I have on surveying."

D. R. CROSBY, County Surveyor of Ottawa County, Kansas, says:

"I have been surveying for many years and never came across a book before that tells what a fellow wants to know."

PROF. C. S. MAGOWAN, of the University of Iowa, says:

"I have a number of works on surveying on my table, but they stay there. When I go out yours goes with me."

## Surveyors' Tables

These are the tables from the "Manual of Land Surveying," bound separately. It is the handiest pocket table book out. 134 pages. Price, \$1.00. Star Edition, \$1.50.

The Star Edition is printed on the very best Crane's linen paper, manufactured expressly for it. The binding is of the best morocco and the workmanship the best that could be had, with the design of making a book that would stand the greatest possible amount of hard use. This edition has also thirty-two pages of blank paper, ruled in cross sections, ten to the inch, for receiving any other matter that the Surveyor may desire to write down.

## Surveyors' Field Book

A handy book for taking down notes in the field. It has all the tables commonly used by a Surveyor in field work, saving the necessity of carrying extra books with tables. 20 pages of tables, 176 pages blank, 16 pages index. Sent postpaid on receipt of price. Single copy, 75c. Per dozen, \$7.00. F. Hodgman, Publisher, Climax, Michigan.

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By THOMAS BAGOT

A book dealing directly with the problems continually coming up before Surveyors, and containing all the rules and instructions necessary in ordinary surveying. Indorsed by hundreds of surveyors and teachers.

Revised Edition, Cloth, \$1.00, postpaid.

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Manufacturers, Dealers,

and Importers of

Surveyors'

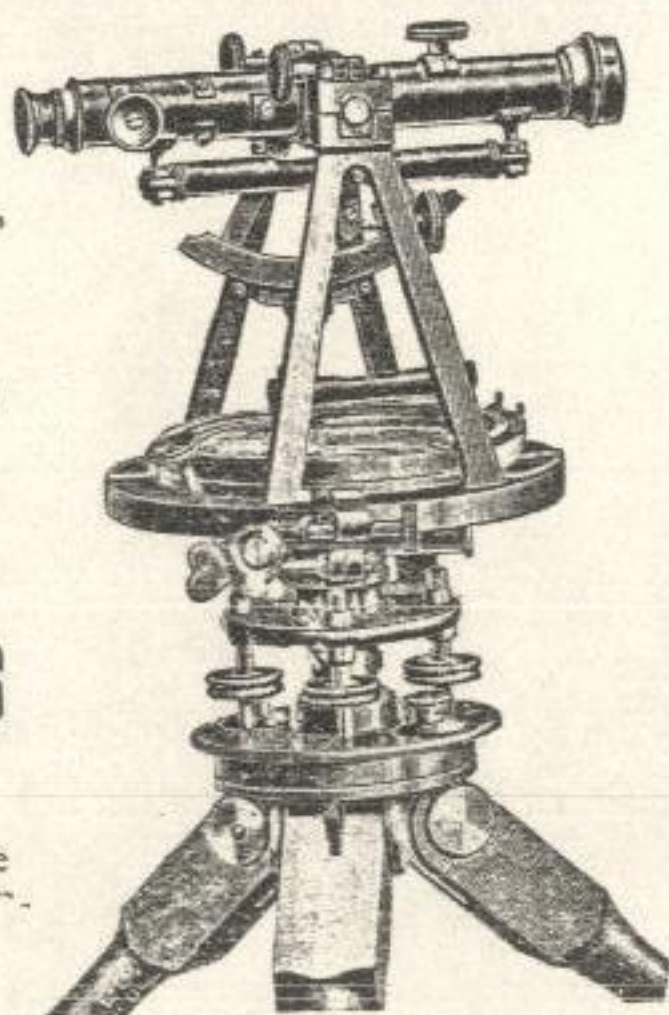
**INSTRUMENTS**

Engineers'

and **SUPPLIES,**

And Sole

Manufacturers of



**RANDOLPH'S NINE PATENTS.**



My Surveyors' Compass took the First Premium at the Ohio State Fair, held at Cincinnati, September, 1857. We also took the medal on Theodolite, Transit, Y Level, Dumpy Level, and Surveyors' Compasses, at the Fair of the Ohio Mechanics' Institute, held in this city, which ended October 8, 1858, after the most scrutinizing examination by competent judges. We were awarded separate medals for a Theodolite and Surveyors' Compass, at the United States Agricultural Fair, held at Cincinnati, September, 1860. Also, **First Premium Silver Medals at Cincinnati Industrial Exposition, 1871 - 1874.** Since the above, my instruments have not been in any Fair or Exposition, in competition.

No. 232 EAST FIFTH STREET, One-half Square East of Postoffice,

# Certificates for Transit Level,

PATENTED MARCH 1, 1892.

MOREHEAD, ROWAN CO., KY., Oct. 5, 1892.

*T. F. Randolph, Esq., Cincinnati, O.*—Dear Sir: I am very well pleased with the Transit Level I bought of you two years ago. I find it very accurate in plumbing and leveling and as a Transit I can do good work. I have laid out two short line R. R. and used no other instrument except a compass to take latitude in starting; in fact, I do much work with it for which you do not recommend it. It is the best instrument that I know of for the price and can cheerfully recommend it for contractors' use.

A. J. THURBER, C. E. & Sur.  
Ex. County Surveyor.

WESTMINSTER, November 1, 1892.

*T. F. Randolph, Cincinnati, O.*: Yours of October 31st, received. In reply would say the instrument I received from you on Oct. 21st, 1890, gave perfect satisfaction. I used it for grading streets and also for squaring and leveling foundations for buildings.

Yours,  
JACOB S. ELGEN, Contractor and Builder,  
Westminster, Md.

BAY CITY, MICH., Nov. 2, 1892.

*T. F. Randolph, Esq., Cincinnati, Ohio.*—Dear Sir: I find the Transit Level which I purchased from you some time ago, the most useful instrument which I have ever used about a building. I am certain I have saved myself the cost of it in the past month alone, by its use. In every instance about a large building, the Transit Level will do the work of the more costly instruments, exactly as well. For a contractor's use, I consider that there is nothing better.

Yours truly,  
JOHN H. HOLMES, Building Contractor.

CRYSTAL FALLS, MICH., Nov. 3rd, 1892.

*T. F. Randolph, Cincinnati, Ohio.*—Dear Sir: On June 25th, 1891, I purchased from you a Fig. 12, Transit Level. I have used the instrument for over one year almost continuously and have given it every thorough test that has been possible in my business, in order to prove its accuracy and stability, and take pleasure in saying that it is all that you recommend it to be. Its graduations are so correct that I have turned fourteen angles in a surface survey at one of the mines in this district and checked up within less than one-half inch. I think that this error might have been considerably reduced had I used range poles or sight rods of less thickness. The telescope and leveling apparatus are all that can be desired for any but the most particular work, and can be used to advantage in all ordinary municipal surveying. Its lightness and compactness when in transit, make it one of the most desirable instruments that I have ever used.

Very respectfully yours,  
F. G. CLARK.

BAY CITY, MICH., Nov. 3rd, 1892.

*T. F. Randolph, Esq.*—Dear Sir: In answer to yours of Oct. 31st, asking how I liked the fig. 12 transit level bought of you, I can say it is everything you claim for it. I have it in constant use and do not know what I would do without it; am using it in road making, leveling, tile draining, sewerpipe laying, laying out sections, in fact it will do any work required in my line. Since I bought it it has sold one to J. H. Holmes, Contractor of this city.

Yours truly,  
GEO. RENSCHAW, Supt.

CINCINNATI, OHIO, Nov. 4th, 1892.

*T. F. Randolph Esq., 51 W. 4th Street.*—Dear Sir: I have had one of your figure 12 Transits in use for about eighteen months and consider it an invaluable addition to the paraphernalia of either an architect or contractor, in fact, for any ordinary leveling or small surveys, I have found it perfectly reliable, and for the price, away ahead of any instrument ever used.

Very respectfully yours,  
E. W. MURPHY, C. E.,  
Superintendent Cincinnati Gymnasium and Athletic Club.

COVINGTON, KY., November 4th, 1892.

*Mr. T. F. Randolph, Cincinnati, Ohio.*—Dear Sir: On the 19th of December, 1889, you sold me one of your Fig. 12 Transit Levels, which I have used ever since, and must say, that it is one of the best instruments I have ever used, for Architects and Builders. It is very accurate and easily managed. I would not do without it, and would recommend every Architect and Builder to get one. It will pay for itself in six months.

Respectfully yours,  
DANIEL SEGER, Architect.

CINCINNATI, O., November 1, 1892.

*Mr. T. F. Randolph, 51 W. Fourth St., City.*—Dear Sir: The Fig. 12 Transit Level for builders' and contractors' use I bought of you last year proved very satisfactory, and I consider it a very good one.

Yours respectfully,  
M. RUMBAUGH.

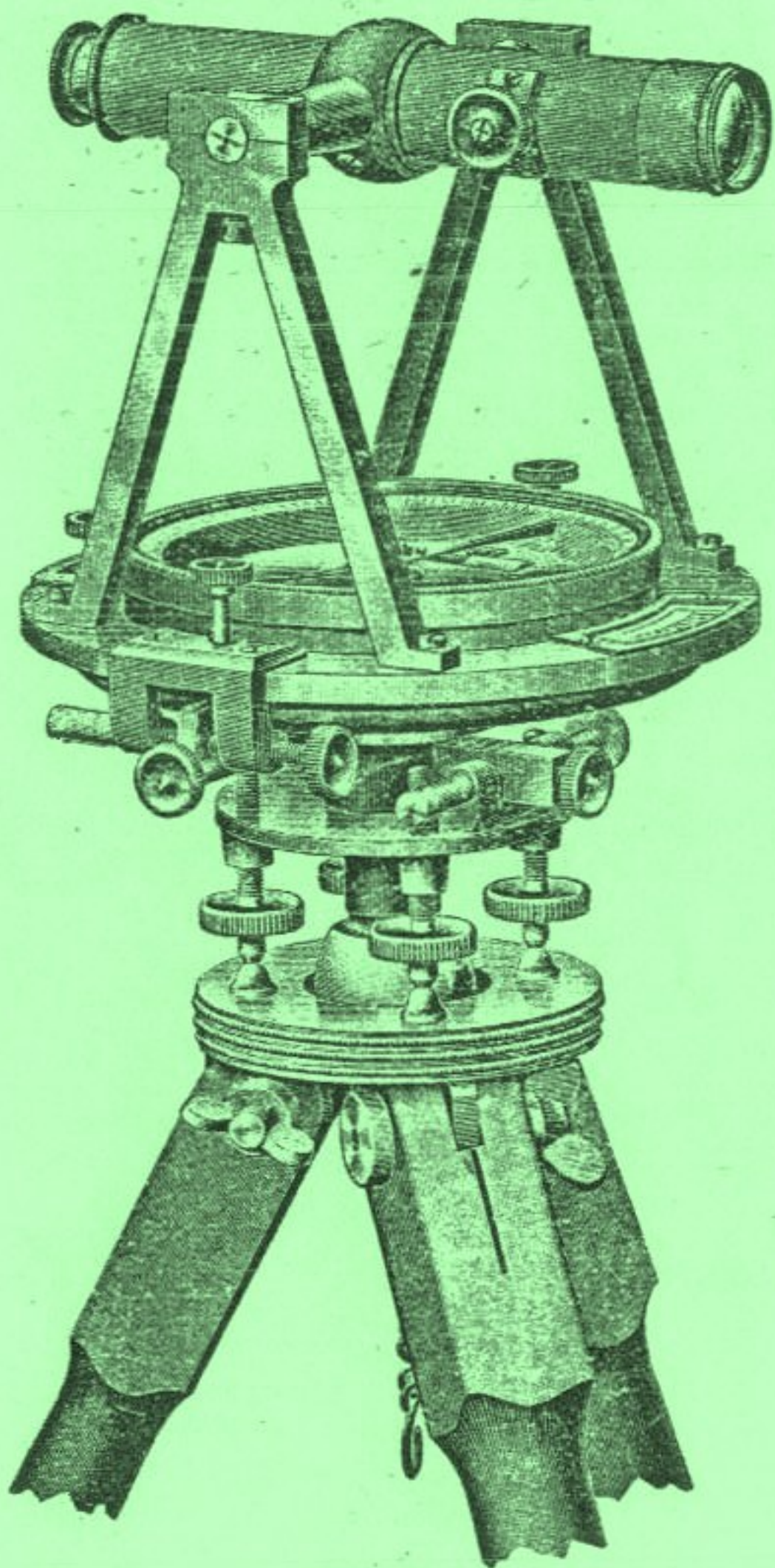


Fig. 3½.

See page 6.