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CATALOGUE
OF
KEUFFEL & ESSER CO.
New York
1890.

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CATALOGUE AND PRICE-LIST
OF
KEUFFEL & ESSER CO.

MANUFACTURERS AND IMPORTERS
OF
DRAWING-MATERIALS
AND
SURVEYING INSTRUMENTS.



NEW YORK

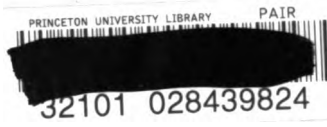
127 FULTON STREET.

42 ANN STREET.

1890.

TWENTY-FIRST EDITION.

PRICE 50 CENTS.



ENTERED ACCORDING TO ACT OF CONGRESS IN THE YEAR EIGHTEEN
HUNDRED AND NINETY BY **KEUFFEL & ESSER CO.** IN THE OFFICE OF THE
LIBRARIAN OF CONGRESS.

NOTICE.

We beg to call attention to the fact that we have copyrighted this entire book, and have also separately copyrighted more than three hundred illustrations contained in it. We have done this at considerable expense, for the purpose of protecting our patrons and the public generally from imposition at the hands of unscrupulous dealers, who in the past have made use of reproductions of our superior cuts, for the purpose of advertising inferior articles.

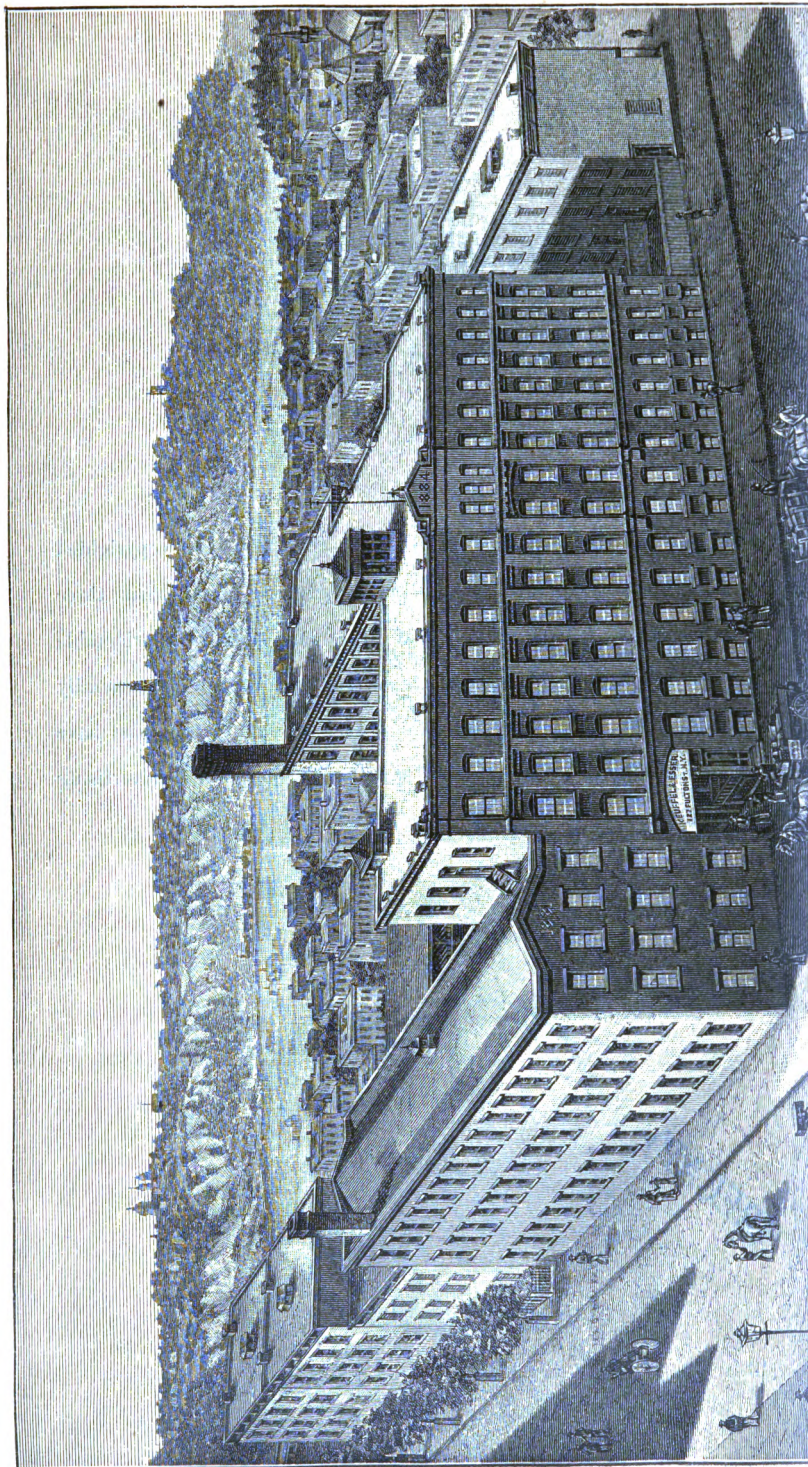


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SALESROOMS
No. 127 FULTON STREET, N. Y.

New York, August 1890.

A preface or introduction to this twenty-first edition of our Catalogue seems hardly called for. Our standing in our line of business requires no comment: while our aims are well known, it is for our friends and customers to judge how far we succeed in attaining them.

Since publishing the previous catalogue we have changed the name of our firm; we wish to emphasize that it is a **change in name only**.

We would not omit to direct special attention to our Engineering and Surveying Instruments. Since we have made this a separate and important branch of our manufacturing business, we have succeeded in bringing it to the same level of superior excellence which we feel we have a right to claim for the other goods manufactured by us for many years.

It shall be our endeavour, as in the past, to merit the liberal and constantly increasing patronage which we are enjoying.

Very Respectfully

KEUFFEL & ESSER CO.

We re-print the following from the introduction to the twentieth edition of our Catalogue:

In this twentieth edition we present to our customers an entirely new and remodeled Catalogue. The assortment of goods which we carry has increased so much, that it was no longer possible to describe all our goods within the frame of the former Catalogue, which had served us for nearly twenty years. We had to resort to a new arrangement in order to satisfactorily catalogue our goods and therefore were compelled to adopt new numbers to designate them. In adopting these new numbers we have had to destroy many landmarks, but we trust that our friends will bear with the inconvenience resulting from the new form and will soon appreciate the improvements that have been made for their convenience.



NOTICE.

The prices in this Catalogue are Net Cash.

In ordering by this Catalogue it is necessary to give the number with the price of the article and in some cases size, color etc.

As we use every precaution in the packing of goods, no allowance can be made if goods are damaged either in direct shipments or in enclosures through other houses.

Boxes, if required for packing, will be charged at cost.

Remittances can be made either by a bank-draft, payable to our order, or by Cash sent by any of the Express-Companies, or by Post-Office Money-Order. — If Cash is sent by mail the letter should be registered.

Remittances are in all cases at the risk of the sender.

For goods ordered to be sent by express, the **bill to be collected on delivery**, a remittance of **five Dollars** is required with the order, and **Express-Charges for Collection** will be added to the amount of the bill.

By sending full remittance with the order, buyers will save the collection charges and have their goods delivered sooner.

Small articles can be sent by mail in open packages at one cent per ounce and the postage must invariably be added to the price of the goods so ordered, but we can in no way be responsible for goods lost or injured in transmission by mail.

Registering mail matter lessens the risk of loss.

Should any of our goods not prove satisfactory, we solicit prompt information; all complaints shall have our careful attention as we aim to satisfy our patrons in every respect, in order to sustain the reputation we now enjoy.



DRAWING PAPERS

in Sheets.

WHATMAN'S HAND-MADE.

These Papers are made with three different styles of surface.

HP. signifies "Hot Pressed", and has a smooth surface, mostly used for pencil and very fine line-drawings.

N. signifies "Not Hot Pressed", and has a finely grained surface, used for general purposes and water-color drawing.

R. signifies "Rough", and has a coarsely grained surface, used for very bold drawing and sketching (Forchon Paper).

Whatman's Drawing Paper's „Selected Best“ and „Retree“ are made as one quality and are afterwards examined and separated. The sheets without imperfections are called „Selected Best“. Both bear the watermark
 "Whatman" or "Whatman Turkey Mills".

In ordering state surface wanted (HP. N. or R.) also quality (Selected Best or Retree).

		Selected Best	Retree or Second quality
1. Whatman's, with "HP" or "N" surface.			
Cap	13 × 17 inch per quire	\$ 75	60
Demy	15 × 20 " "	1 00	90
Medium	17 × 22 " "	1 40	1 25
Royal	19 × 24 " "	1 75	1 60
Super Royal	19 × 27 " "	2 20	1 85
Imperial	22 × 30 " "	3 00	2 70
Atlas	26 × 34 " "	4 75	3 65
Double Elephant	27 × 40 " "	5 50	5 00
Antiquarian	31 × 53 " "	28 50	16 50
"	31 × 53 " per sheet	1 50	75
2. Whatman's, with "R" surface.			
		Selected Best only	
Royal	19 × 24 inch per quire	\$ 2 00	per sheet \$ 10
Imperial	22 × 30 " "	3 50	" 18
Double Elephant	27 × 40 " "	6 00	" 30
3. Whatman's, Extra heavy, with surfaces as below.			
		Selected Best only	
Royal	19 × 24 in. N. or R. per quire	\$ 4 00	per sheet \$ 20
Imperial	22 × 30 " HP. N. or R. "	8 00	" 40
Double Elephant	27 × 40 " HP. N. or R. "	12 00	" 60



**¼ REAM
DRAWING
PAPER.**

ROYAL

**Nº 4
19 × 24**

The above is a reduced facsimile of the label on Universal Paper.

4. Universal Paper.


Our Universal Drawing Paper is of pure stock, free from adulterations and very carefully sized. A perfect, porous, soft and uniform pencil-mark can be obtained on it, it takes ink and color well, and its erasing properties are perfect. It is therefore the best Paper for Colleges and Schools.

Cap	14 × 17 inch	per quire \$	30
Demy	15 × 20 "	"	45
Medium	17 × 22 "	"	65
Royal	19 × 24 "	"	80
Super Royal	19 × 27 "	"	90
Imperial	22 × 30 "	"	1 20
Double Elephant	27 × 40 "	"	2 25


5. Normal Paper (each sheet stamped "Normal").

This is a drawing paper of very superior quality with smooth surface for line drawings in ink or pencil. It stands erasing perfectly, and is very tough.

Double Elephant 27 × 40 inch, per sheet \$ 15,	per quire \$ 3 25
Box of 250 sheets (strong box with hinged front for storing and protecting the paper and keeping it flat.)	30 00

10. Duplex Paper, cream color,  for description see page 4

Double Elephant 26 × 40 inch	per quire \$ 2 10
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11. Duplex Paper, drab color,  for description see page 4

Double Elephant 26 × 40 inch	per quire \$ 2 65
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17. Reynold's white Bristol Board, smooth surface.

	2 sheets	3 sheets	4 sheets
Cap 12½ × 15½ inch per doz	\$ 60	85	1 15
Demy 14½ × 18½ " "	85	1 30	1 70
Medium 16½ × 20½ " "	1 20	1 75	2 35
Royal 18½ × 22½ " "	1 50	2 25	3 00
Imperial 21½ × 28½ "	per doz 6 00		

18. English Parchment, best quality.

	14 × 18	16 × 20	18 × 24	23 × 31 inch
per doz \$	5 50	7 20	9 00	14 00
" sheet	50	70	90	1 40

19. Gelatine or Glasspapers.

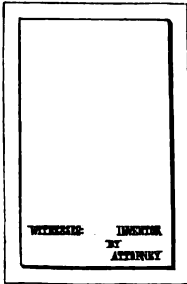
13 × 19	thin	medium	thick
per sheet \$	30	35	45

20. Polygraph Transfer Paper, black, blue, vermilion, graphite.

10 × 15 inch	per quire \$ 1 50, per sheet \$ 10
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KEUFFEL & ESSER CO. NEW YORK.

KEUFFEL & ESSER CO.'S SUPERIOR BRISTOL BOARDS



Stamped with Trade-Mark



No. 22.

This Bristol Board is whiter than any other, has a hard surface, and possesses unlimited erasing properties. It has the thickness, color, quality and size required by the U. S. Patent Office and can be rolled without injury.

21. Patent office Bristol Board, blank,
 10 × 15 inch per gross \$ 6 50, per doz \$ 60
 15 × 20 " " 18 00 " 1 20
22. Patent office Bristol Board, printed with border etc.
 10 × 15 inch per gross \$ 8 65, per doz \$ 85

DETAIL PAPERS, CONTINUOUS

47. *Economy* Transparent Sketching Paper,
 in Rolls of 50 yards, 60 inches wide per Roll \$ 3 25

This paper is specially made for Sketching, Transferring, &c. It is a white paper, sufficiently transparent to be used as a Tracing Paper for Detail Drawings.

It is strong and tough, stands erasing by rubber and knife, and takes pencil, ink and color well.

On account of its exceedingly low price it will be to a great extent a welcome substitute for the manilla papers now used for drawing.

- | | | |
|-----------------------------------|------------------------------------|----------------|
| 48. Simplex Detail Paper, medium, | in rolls of 100 lbs.
per pound. | per 100 yards. |
| 36 inch wide | \$ 12 | \$ 4 00 |
| 42 " " " | 12 | " 4 50 |
| 54 " " " | 12 | " 6 00 |
| 49. do. do. heavy, | | |
| 36 " " " | 12 | " 4 50 |
| 42 " " " | 12 | " 5 50 |
| 54 " " " | 12 | " 8 00 |

The "Simplex" Detail Papers are especially made for us by one of the most expert manufacturers and possess the qualities of a Drawing Paper as far as can be expected. Special attention has been paid to their erasing qualities, and we can recommend them as a considerable improvement over the common Manilla Papers.

The excellent reputation of the various Drawing Papers originated by us, and of which we have exclusive control, has tempted some Dealers to substitute cheaper and inferior Papers of similar appearance. The profit derived by dealers from the sale of such imitations is, of course, so much loss to the consumer. We therefore beg to again draw attention to the Watermarks (Trade Marks):

Duplex Universal Anvil Saragon

that appear along the edge of every roll of these papers and are stamped in red ink along their edge when mounted.

Buyers will please observe these Trade Marks, for their own protection, when purchasing.

DRAWING PAPERS

continuous in Rolls.

By consulting the following descriptions, in ordering paper, customers will be able to procure exactly what they want.

50—52. *Duplex* A Detail Drawing Paper, introduced by us, has met with great success. It is tough, hard, uniform in grain and finish, stands erasing, and takes ink and water color perfectly. The buff or cream color is very agreeable to the eye and permits of handling without soiling.

No. 10 and 11 are the same papers in sheets.

55. *Universal* An almost pure white paper of good quality with slightly grained surface, suitable for work in Ink, Color, Pencil or Crayon. It is used for general officework, preliminary drawings, and to a great extent for school purposes. Similar Paper, generally offered under the name of "German Drawing Paper", should not be confounded with our "Universal".

No. 4 is the same article in sheets.

60—62. *Anvil* A very tough and pliable paper of a yellowish white hue, matchless for working-drawings used out-of-doors or in the workshop, where drawings are under continuous rough handling. This paper has a slightly grained surface similar to Whatman's, it stands erasing to the greatest extent.

70—76. *Saragon* papers are so well and favorably known, that there is but little to say about them; they are universally acknowledged as the Best.

We warrant Paragon Paper and exchange all which does not give perfect satisfaction.

70-71-72-73 have a sand-grain or pebbled surface (similar to eggshells), adapted to general drawing, either in lines or in wash. For Elevations, Perspectives and every kind of finished drawings no better paper can be found.

75—76 have a grain like Whatman's "not hot pressed" on one side, while the other is smooth, adapting them for drawings to be reproduced by photographic or a similar process.

Samples of Drawing Paper sent on application or sample book for 15 c.

DRAWING PAPERS

continuous in Rolls.



The above are reduced facsimiles of the labels on our roll drawing papers.

Rolls of 30 to 40 pounds will be sent unless 10 yard lengths are specially ordered.

				in rolls of 30 to 40 lbs per lb.	piece of 10 yards,	per yard.
50.	<i>Duplex</i>	medium, cream	36 inch wide	\$ 25	1 20	15
	do.	" "	42 " "	28	1 55	20
	do.	" "	56 " "	25	2 00	25
52.	do.	thick, drab	36 " "	25	1 50	18
	do.	" "	56 " "	25	2 50	30
55.	<i>Universal</i>	medium	36 " "	35	1 60	20
	do.	" "	42 " "	35	1 85	24
	do.	" "	56 " "	35	2 85	30
	do.	" "	62 " "	35	3 20	35
60.	<i>Anvil</i>	medium	36 " "	40	2 00	25
	do.	" "	42 " "	40	2 50	30
	do.	" "	62 " "	40	3 75	40
62.	do.	thick	62 " "	40	4 50	50
70.	<i>Saragon</i>	thin, rough	58 " "	45	3 75	42
71.	do.	medium	36 " "	45	2 85	33
	do.	" "	42 " "	45	3 25	36
	do.	" "	58 " "	45	4 20	47
72.	do.	thick	58 " "	45	5 40	65
73.	do.	extra thick	58 " "	45	6 75	80
75.	do.	medium, smooth	58 " "	45	4 20	47
76.	do.	thick,	58 " "	45	5 40	65
98.	Drawing Parchment,	medium,	38 inch wide	per roll of 20 yds . \$		3 50
99.	do.	thick,	38 " " " " " "	10	" "	4 00



Samples of Mounted Paper sent on application or sample book for 15 c.

CONTINUOUS DRAWING PAPERS MOUNTED ON MUSLIN

in rolls of 10 or 20 yards.



The above are reduced facsimiles of the labels on our mounted drawing papers.

No. 100. The same paper as described under No. 55, page 5.

No. 105. The same paper as described under No. 60, page 5.

No. 110, 111, 112, 115, 116. The same papers as described under

No. 70, 71, 72. 75, 76, page 5.

				per 10 yards	per yard
100.	<i>Universal</i>	medium thick	36 inch wide	\$ 6 50	\$ 80
	do.	“ “	42 “ “	7 30	90
	do.	“ “	56 “ “	10 25	1 20
105.	<i>Anvil</i>	medium	36 “ “	7 00	90
	do.	“	42 “ “	8 20	1 00
	do.	“	62 “ “	13 25	1 60
110.	<i>Saragon</i>	thin, rough	58 “ “	11 40	1 25
111.	do.	medium “	36 “ “	7 85	1 00
	do.	“ “	42 “ “	8 85	1 10
	do.	“ “	58 “ “	11 75	1 40
112.	do.	thick “	58 “ “	13 00	1 60
115.	do.	medium, smooth	58 “ “	11 75	1 40
116.	do.	thick “	58 “ “	13 00	1 60



Samples of Mounted Paper and Tracing Cloth sent on application or Sample Book for 15 c.

DRAWING PAPERS IN SHEETS, MOUNTED ON MUSLIN.

The muslin on mounted paper in sheets is trimmed to the sizes stated below. If sheets are wanted with muslin standing over on one or more sides this must be stated in the order.

125. *Unchangeable Drawing Board*

This Board consists of two sheets of Drawing Papers mounted on strong muslin and so selected and chemically prepared that they form a flat and hard board which will neither contract nor expand under changing atmospheric conditions. For drawings that require extreme exactness or are to be preserved on record there is no material that will equal our Unchangeable Board.

The drawing surface is the heaviest Paragon drawing paper.

18 × 24 inch	per sheet \$	65
22 × 30 "	"	80
27 × 40 "	"	1 20
31 × 53 "	"	2 25

Intermediate sizes will be furnished at corresponding prices.

130. Whatman's Drawing Paper, mounted

Royal	18 × 24 inch, Selected.	per sheet \$	38
Imperial	22 × 30 "	"	45
Double Elephant	27 × 40 "	"	70
Antiquarian	31 × 53 "	"	1 80
"	31 × 53 " Retree	"	1 35

135. *Paragon* Drawing Paper, in sheets mounted.

Our mounted Paragon Papers in sheets are cut from Paper No. 71.

18 × 24 inch	per sheet \$	32
22 × 30 "	"	40
27 × 40 "	"	60
31 × 53 "	"	1 10

Other sizes of mounted sheets furnished to order. Large pieces for City, County or State-Maps mounted to order by joining and overlapping the contiguous edges.

TRACING OR VELLUM CLOTH.

156. Imperial, in rolls of 24 yards, both sides glazed, and one side glazed the other dull.

	30	36	42 inch wide
per roll \$	6 90	7 60	10 50

160. Union, in rolls of 24 yards, dull back only.

	30	37	40	43 inch
per roll \$	6 00	6 80	8 00	9 50



Samples of Tracing Paper sent on application or sample book for 15 c.

TRACING PAPERS in Sheets.



The above are reduced facsimiles of the labels on our Tracing Papers.

- | | | | | |
|------|--------------------|--------------------------------------|--------------|-------|
| 170. | <i>Vegetable</i> | very tough and transparent | | |
| | Cap | 13 × 17 inch | per quire \$ | 90 |
| | Demy | 16 × 20 " | " | 1 25 |
| | Royal | 19 × 25 " | " | 2 00 |
| | Imperial | 22 × 28 " | " | 2 50 |
| | Double Elephant | 29 × 42 " | " | 10 00 |
| 172. | <i>Acanthus</i> | very thin, transparent and tough | | |
| | | 30 × 40 inch | " | 4 00 |
| 178. | <i>Sermes</i> | common | | |
| | | 20 × 30 inch | " | 1 00 |
| | | 30 × 40 " | " | 2 00 |
| 180. | <i>Ceres</i> | very tough and transparent, thin | | |
| | | 20 × 27 inch | per quire \$ | 80 |
| | | 27 × 40 " | " | 1 50 |
| 182. | <i>Corona</i> | the same as No. 180 but medium thick | | |
| | | 27 × 40 inch | " | 2 00 |

The Vegetable, Ceres and Corona described above, and the Parchment, Alba, Lotus and Libra Papers on the next page are natural tracing papers. They will not discolor with age like the prepared papers.

Samples of Tracing Papers sent on application or sample book for 15 c.

TRACING PAPERS

continuous in rolls.



The above are reduced facsimiles of the labels on our tracing papers.

- 190. *Parchment* very tough
37 inch wide, in rolls of 20 yards per roll \$ 3 25
- 192. *Abacus* very thin, transparent and tough
42 inch wide, in rolls of 10 yards " 2 75
- 194. *Satera* stout, very tough, suitable for machinists
42 inch wide, in rolls of 20 yards " 4 00
- 198. *Gothic* very tough and transparent
42 inch wide, in rolls of 20 yards " 3 65
- 200. *Doric* superior
42 inch wide, in rolls of 20 yards " 2 75
- 202. *Alba* (not prepared) for transferring
54 inch wide, in rolls of 44 yards " 5 00
54 " " " " " 22 " " 2 50
- 204. *Lotus* very transparent and tough, thin
42 inch wide, in rolls of 20 yards " 1 50
- 206. *Libra* the same as No. 204 but medium thick
42 inch wide, in rolls of 20 yards " 2 00

MATERIAL AND APPARATUS FOR HELIOGRAPHY OR BLUE PROCESS

We have limited our assortment of Blue Print Papers to the

Soelios and E. E.

Papers. The other papers which we offered formerly have found but little sale, owing to the superior quality of the Soelios. The Blue prints made on Soelios papers are clearer and more distinct than on any other as the Soelios paper is made so as to preclude any deleterious chemical action. Soelios paper is even tougher in the bath, than when dry and it shrinks less through washing & drying than any other paper.

As the name "Soelios" has been counterfeited, please be particular to observe that every roll of Soelios paper bears along the edge the Watermark (TRADE MARK)

Soelios

and when prepared by us according to our improved formula is also stamped in ink on the reverse side at the beginning, middle and end of every roll.

PREPARED HELIOGRAPHIC PAPER

EACH ROLL OR QUIRE IN PASTEBOARD TUBE

220	<i>Soelios Paper medium continuous prepared</i>	24	27	30	36	42 inch wide
	<i>per roll of 10 yds.</i>	\$ 1.90	2.15	2.30	2.75	3.25
221	<i>Soelios Paper thick continuous prepared</i>	24	27	30	36	42 inch wide
	<i>per roll of 10 yds.</i>	\$ 2.20	2.50	2.70	3.20	3.80
222	<i>Soelios Paper medium in sheets prepared</i>	13×21	18×24	21×27	22×30	27×42 inch
	<i>per quire</i>	\$ 1.60	2.50	3.25	3.75	6.50
223	<i>Soelios Paper thick in sheets prepared</i>	13×21	18×24	21×27	22×30	27×42 inch
	<i>per quire</i>	\$ 2.00	2.90	3.70	4.30	8.00
225	<i>E. E. a very thin and tough paper (for mailing)</i>					
	<small>(TRADE MARK)</small>			24	30	36 inch wide
	<i>per roll of 10 yds.</i>	\$ 1.75	2.20	2.65		

KEUFFEL & ESSER CO. NEW YORK.

HELIOS PAPERS, UNPREPARED, FOR BLUE PRINTING.



The above are reduced facsimiles of the labels on Helios Papers.

230. *Saelios* Paper, medium thick,
- | | | | | | | | |
|-----------------------|------|------|------|------|------|------|-----------|
| | 24 | 27 | 30 | 36 | 42 | 54 | inch wide |
| per roll of 50 yds \$ | 3 20 | 3 50 | 4 00 | 4 75 | 5 25 | 7 00 | |
231. *Saelios* Paper, thick,
- | | | | | | | | |
|-----------------------|------|------|------|------|------|-------|-----------|
| | 24 | 27 | 30 | 36 | 42 | 54 | inch wide |
| per roll of 50 yds \$ | 4 70 | 5 25 | 6 00 | 7 00 | 8 00 | 10 50 | |
235. *E. E.* Paper
A very thin and tough Paper suitable for mailing,
- | | | | | |
|-----------------------|------|------|------|-----------|
| | 24 | 30 | 36 | inch wide |
| per roll of 50 yds \$ | 2 80 | 3 50 | 4 20 | |

NIGROSINE PROCESS. Black Lines on White Ground.

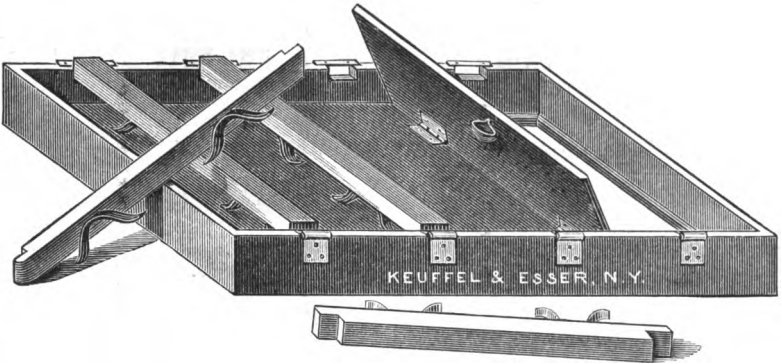
This process is nearly as simple as the Blue Process, but requires a chemical developer added to the water bath. Its great advantages are, that it gives a permanent facsimile of the original drawing, permanent black lines on a permanent white ground and the half-tones as such.

226. Prepared Nigrosine Paper
- | | | | | |
|-----------------------|------|------|------|-----------|
| | 30 | 36 | 42 | inch wide |
| per roll of 10 yds \$ | 2 50 | 3 00 | 3 50 | |
227. Developer for Nigrosine Process (Powder) . per bottle of 4 oz. \$ 75
- | | | | | |
|--|---|---|--------|------|
| | " | " | " 8 " | 1 35 |
| | | | " 16 " | 2 50 |
240. Helios Erasing Fluid, for making alterations and additions on Blue Prints, white per bottle \$ 20
241. do. do. do. red 20



PRINT FRAMES AND BATH TRAYS.

"Copyright, 1887, by Keuffel & Esser."



No. 244.

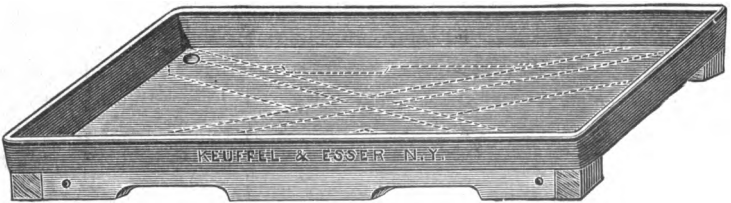
Print Frames made of hardwood, finely finished, with brass mountings, complete with felt cushion and

		Polished Plate Glass.	Double thick Glass.	Frames only.
242.	20 × 24 inch	each \$ 10 75	\$ 8 00	\$ 6 75
243.	24 × 30 "	" 13 50	10 50	9 00
244.	30 × 42 "	" 24 00	16 00	13 75
245.	36 × 60 "	" 45 00	27 50	22 00

For the larger sizes we recommend Plate Glass on account of its greater strength.

Packing of Print Frames will be charged at cost, but we are not responsible for breakage of glass.

"Copyright, 1887, by Keuffel & Esser."



No. 248.

246.	Zinc Bath Trays with drainpipe, strong wired rim and hardwood braces,	20 × 24 inch	each	\$ 3 75
247.	do.	do.	24 × 30 "	4 50
248.	do.	do.	30 × 42 "	6 00
249.	do.	do.	36 × 60 "	8 00

KEUFFEL & ESSER CO. NEW YORK.

STANDARD PROFILE PAPERS



Unmounted in rolls of 50 yards.

Mounted on muslin in rolls of 20 yards.

All our Profile Papers bear the trademark "Standard" along their edge.

Printed in orange or green.



We beg to call attention to the quality of the paper we use for our "Standard Profile and Cross Section Papers". It is light, strong and uniform, and has a fine grain. The lines are more distinct than on other Profile papers.

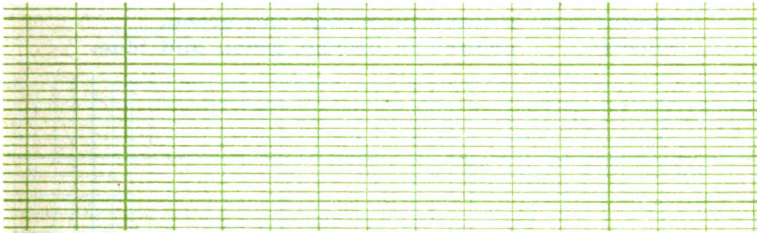


Plate A, 4 × 20 to one inch.

250.	Plate A,	15 × 42 inch	per quire \$ 8 50,	per sheet \$	40
253.	" A	continuous, 20 inch wide	"	yard	30
254.	" A	" 9 " "	"	"	20
255.	" A	" 20 " " mounted on Cloth	"	"	75
256.	" A	" 9 " " " " "	"	"	50
257.	" A	" 20 " " printed on			
		Tracing Paper (orange only)	"	"	30

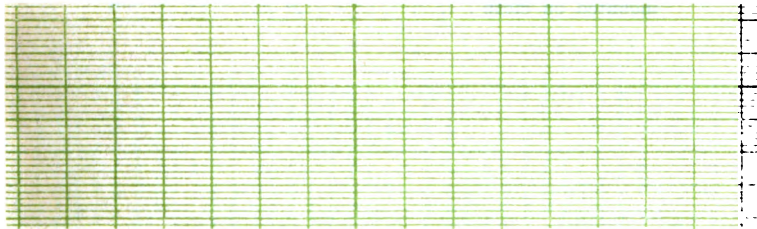


Plate B, 4 × 30 to one inch.

260.	Plate B,	13½ × 42 inch.	per quire \$ 8 50,	per sheet \$	40
263.	" B	continuous, 20 inch wide	"	yard	30
264.	" B	" 9 " "	"	"	20
265.	" B	" 20 " " mounted on Cloth	"	"	75
266.	" B	" 9 " " " " "	"	"	50
267.	" B	" 20 " " printed on			
		Tracing Paper (orange only)	"	"	30

State color when ordering above papers!

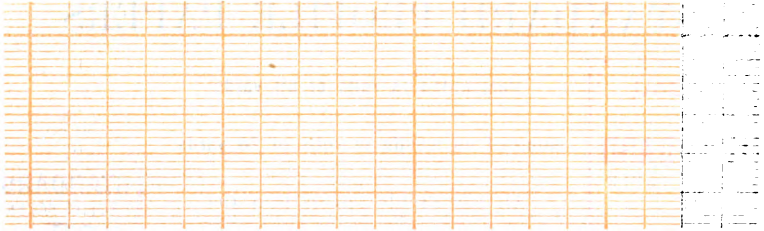


Plate C, 5 × 25 to one inch.

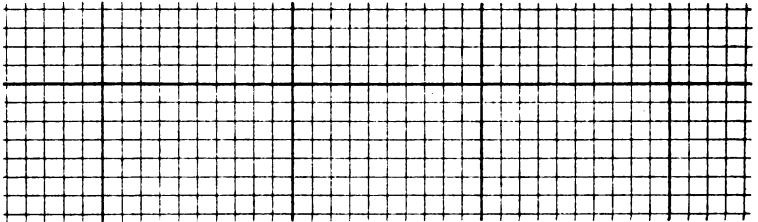
270. Plate C, 15 × 42 inch per quire \$ 8 50, per sheet \$ 40

STANDARD CROSS SECTION PAPERS

continuous and sheets.

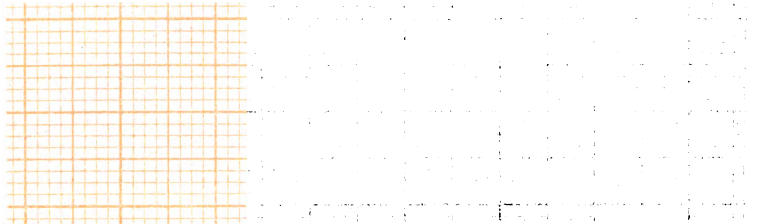
Continuous: printed in orange and green.

Sheets: printed in orange, green and blue.



10 × 10 to one inch.

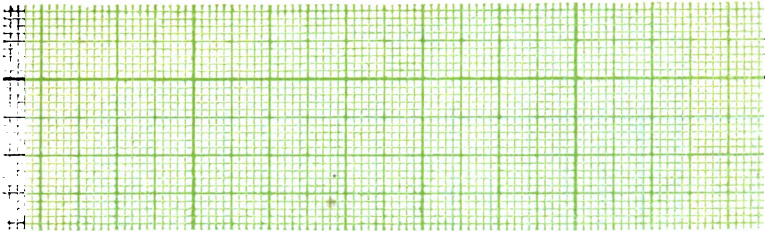
- | | | | |
|---|----------------------------|--------------|------|
| 280. Sheets, engraving 16 × 20 inch . . . | quire \$ 5 00, | per sheet \$ | 25 |
| 281. " " 16 × 20 " | | | |
| | printed on Tracing Paper | " 5 00, | " 25 |
| 283. Continuous, 20 inch wide, in rolls of 50 yards . . | per yard | | 30 |
| 285. do. 20 " " " " 20 " | | | |
| | mounted on cloth | " | 75 |



16 × 16 to one inch.

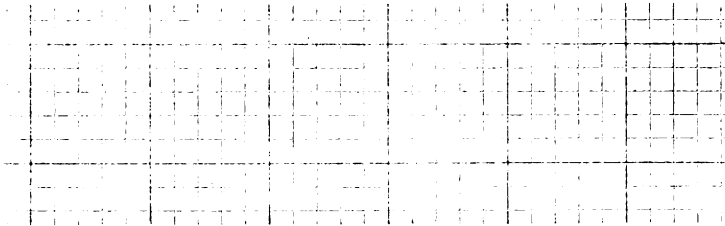
- | | | | |
|---|----------------------------|--------------|------|
| 290. Sheets, engraving 17 × 22 inch . . | per quire \$ 5 00, | per sheet \$ | 25 |
| 291. " " 17 × 22 " | | | |
| | printed on Tracing Paper | " 5 00, | " 25 |
| 293. Continuous, 20 inch wide, in rolls of 50 yards : . | per yard | | 30 |
| 295. do. 20 " " " " 20 " | | | |
| | mounted on cloth | " | 75 |

State color when ordering above papers!



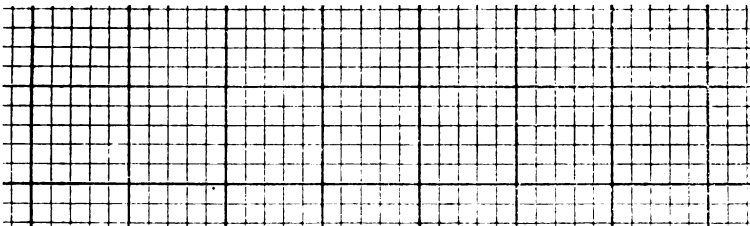
Millimeter

- 300. Sheets, engraving 40×50 c/m . . per quire \$ 5 00, per sheet \$ 25
- 303. Continuous, 50 c/m wide, in rolls of 50 yards . . per yard 30
- 305. " 50 " " " " 20 "
- mounted on cloth " 75



8 feet to one inch (sheets only).

- 310. Engraving $16\frac{1}{2} \times 21\frac{1}{4}$ inch . . per quire \$ 5 00, per sheet \$ 25
- 311. " $16\frac{1}{2} \times 21\frac{1}{4}$ "
- printed on Tracing Paper " 5 00, " 25



5×5 to $\frac{1}{4}$ inch (sheets only).

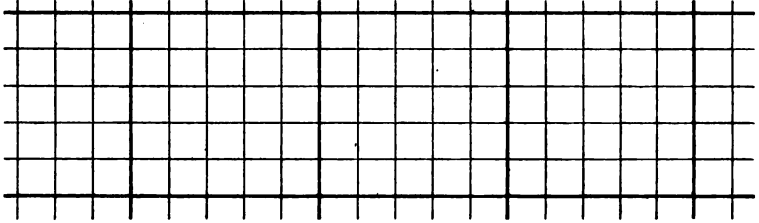
- 320. Engraving 16×20 inch . . . per quire \$ 5 00, per sheet \$ 25
- 321. " 16×20 "
- printed on Tracing Paper " 5 00, " 25

State color when ordering above papers!

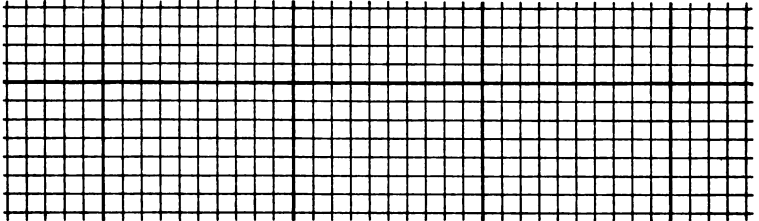


CROSS SECTION PAPERS.

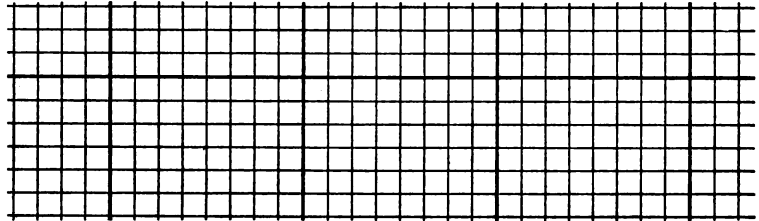
Ruled.



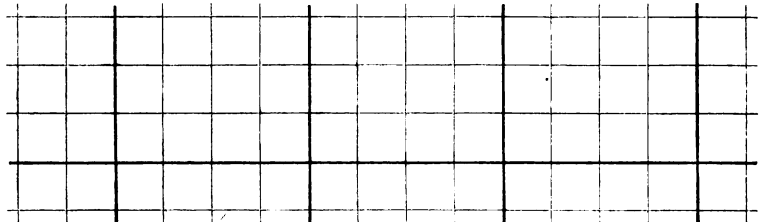
330. Cross Section, 5×5 to one inch, 16×21 inch, blue . per quire \$ 1 00



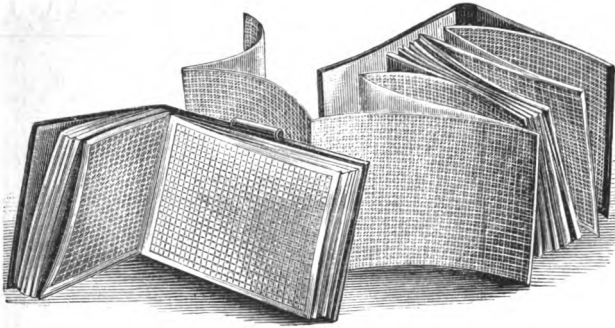
331. Cross Section, 10×10 to one inch, 16×21 inch, blue . per quire \$ 1 00



332. Cross Section, 8×8 to one inch, 16×21 inch, blue . per quire \$ 1 00



333. Topographical Paper, 16×21 inch, 400 feet to the inch, per quire \$ 1 00



No. 355.

No. 350.

CONTINUOUS PROFILE BOOKS.

Flexible Morocco Covers.

These books are folded like a map and take the place of the continuous rolls of profile paper.

Each leaf, or two pages facing, contains six-thousand feet — a "Section" as generally laid out for the construction of a road.

350. Plate A. 4×20 to one inch, green, pages $5\frac{1}{2} \times 8$ inch.
 12 25 50 100 miles
 each \$ 2 00 3 00 5 00 8 00

351. Plate B. 4×30 to one inch, green, pages $4\frac{3}{4} \times 8$ inch.
 12 25 50 100 miles
 each \$ 2 00 3 00 5 00 8 00

PROFILE BOOKS.

Not continuous.

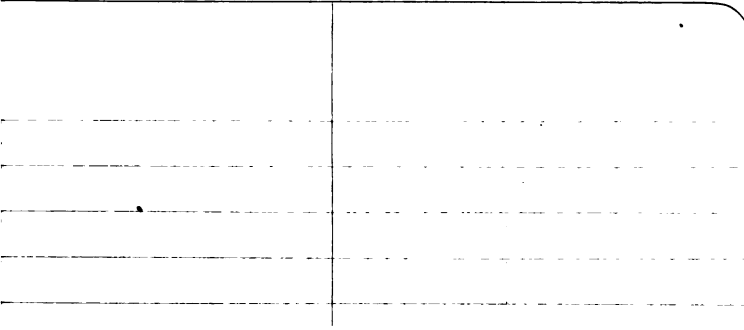
Stiff Morocco Covers.

355. Plate A. 4×20 to one inch, green, book $5\frac{3}{4} \times 8\frac{1}{2}$ inch.
 25 50 100 leaves
 each \$ 2 50 3 50 5 00

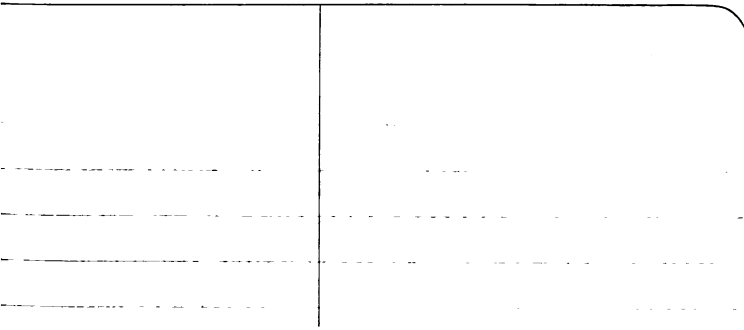
356. Plate B. 4×30 to one inch, green, book $5\frac{1}{2} \times 9$ inch.
 25 50 100 leaves
 each \$ 2 50 3 50 5 00

KEUFFEL & ESSER CO. NEW YORK.

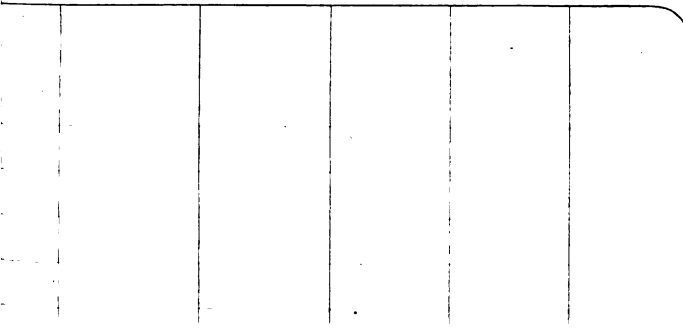
FIELD BOOKS.



leaves, with Keith's Tables	per doz	\$ 6 00
" " " "	"	4 50
" " " " Universal Drawing Paper	"	6 00



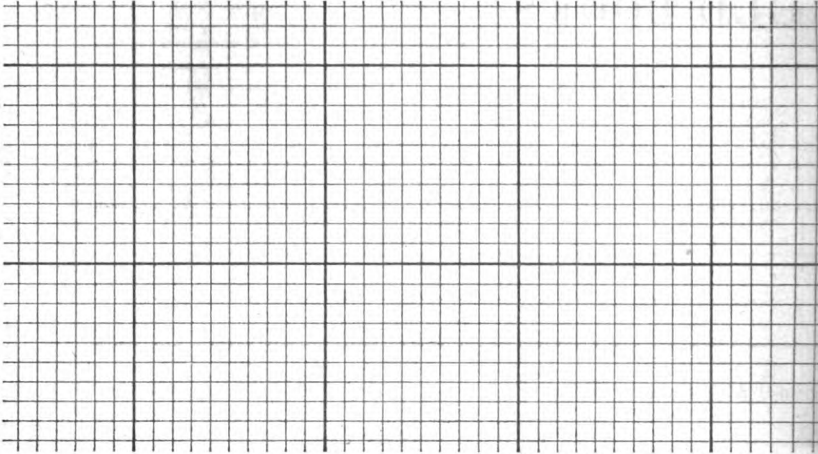
leaves, with Keith's Tables	per doz	\$ 6 00
" " " "	"	4 50
" " " " Universal Drawing Paper	"	6 00



leaves, 80 leaves	per doz	\$ 5 50
" 60 "	"	4 00
" 60 " Universal Drawing Paper	"	5 50

OTHER PATTERNS OF FIELD, RECORD AND CROSS SECTION BOOKS MADE TO ORDER
IN LOTS OF NOT LESS THAN 6 DOZ.

Send back, so as to lie flat when open.



375. Cross Section Book, $5\frac{1}{2} \times 7\frac{1}{2}$ inch, bound in leather, ro

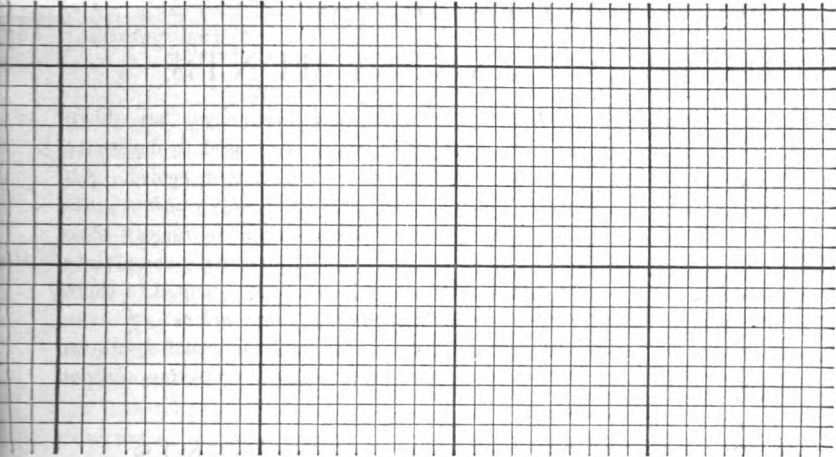
376. do. $6\frac{1}{2} \times 8\frac{1}{2}$ " " " "

SECTION.

STA.	ELEVA.	GRADE	CUT OR FILL		
			LEFT	C.	RIGHT

380. Field Book, $5 \times 7\frac{1}{2}$ inch, bound in leather, round corn

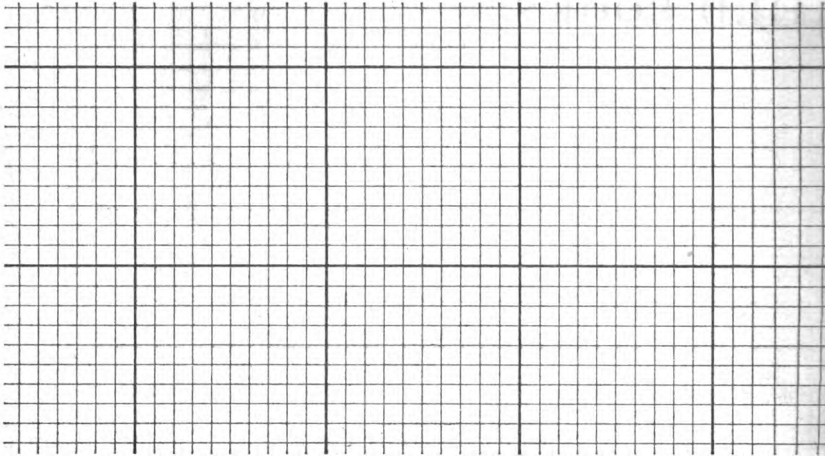
KEUFFEL & ESSER CO. NEW YORK.



ers, ruled 10 parts per inch, 80 leaves per dozen \$ 6 00
 " " 10 " " " 80 " " " 10 00

AREA'S		Cubic Yds.		Remarks
CAVATION	Embankment	Excav.	Embank.	

ted headings, 80 leaves, with Keith's Tables per dozen \$ 12 00



- 375. Cross Section Book, $5\frac{1}{2} \times 7\frac{1}{2}$ inch, bound in leather, ro
- 376. do. $6\frac{1}{2} \times 8\frac{1}{2}$ " " " "

SECTION.

STA.	ELEVA.	GRADE	CUT OR FILL		
			LEFT	C.	RIGHT

- 380. Field Book, $5 \times 7\frac{1}{2}$ inch, bound in leather, round corner

KEUFFEL & ESSER CO. NEW YORK.

HOW TO SELECT DRAWING INSTRUMENTS.

For many years our standard grades of Drawing Instruments have been imitated, the names by which we designate them have been used to designate other instruments and our illustrations and descriptions have been copied. All this we have allowed to go nearly unnoticed and we could well continue this policy as the sale of our standard instruments is increasing more rapidly than our ability to meet the demand. But as we are continually receiving complaints from persons who have bought instruments which had been represented to them as "*just as good as K. & E.*" "*good instruments at popular prices*" or even "*the same goods without trademark*" we believe that some information about the qualities of such goods will be appreciated as a means of protection against imposition.

OUR SUPERIOR SWISS INSTRUMENTS



those with **tongue-joint** as well as those with **pivot-joint** are the same make, made only for us, only with our trademark (firm name or initials) and only in this one (highest) quality. All the German Silver in these instruments is hard rolled plate metal, no part is "cast and hammered" or "coined in dies", and ours are the only instruments made of rolled German silver. This is the only metal which insures perfect uniformity of density and hardness, and on these features the working, wearing and lasting qualities of instruments depend. All our Superior Swiss Instruments, those with tongue-joint and with pivot-joint are made of this rolled plate metal, and are equally perfect and are unapproached in quality by any other make.

To work this hard rolled plate metal naturally requires more skill, time, labor and wear of tools and machinery than to smooth up castings, but the rolled metal is absolutely indispensable to an instrument of indisputably highest quality. All steel used in the manufacture of our Superior Swiss Instruments is the finest English steel and all the steel parts are hand forged. The shape, proportion and style of every part of every instrument has been the subject of careful study, aided by the suggestions of many professional gentlemen who had the kindness to assist us with their experience. From all this it will be apparent that really first class instruments cannot be furnished for little money, but for professional people and those about to enter the profession our Superior Swiss Instruments are the cheapest they can obtain and would still be such at many times their cost.

The imitations of our Superior Swiss Instruments are of some grade of German Instruments (and in our very wide field of observation always of some




other grade than the best) and this should be borne in mind in reading the following description of German Instruments.

GERMAN INSTRUMENTS

are made in an endless variety of grades, from the poorest to good serviceable instruments. These instruments (like all other except our Superior Swiss) are made from castings and the hardness of the metal is graded according to the price of the instruments as it costs very much less to work castings of soft metal than of hard. For the best grades of these instruments the best and hardest cast metal is used and the castings are coined and hammered to increase their hardness and density.

The points are made of iron or steel, and in finer grades the steel is carefully tempered. In the common compasses the joints of the head and insertion pieces are either soft cast German silver like the rest of such instruments, or an iron tongue is inserted to imitate fine steel joints. In good instruments the tongues of the joints are well hammered German silver, and in the extra fine quality they are of hard steel. Of course there is no conspicuous difference in the outward appearance of a soft and a hard German silver tongue nor of a soft iron and a hard steel joint. Only very few makers have confined themselves entirely to producing only the best grade of instruments and thus training their workmen to making them thorough and uniform.

THE POLISHING OF GERMAN INSTRUMENTS is a separate branch of manufacturing and is in no way in relation to the quality. It is evident from this that very poor instruments can be given the appearance of those which are very good, by giving them the same outward finish and polish as the best grade, and when they are liberally lubricated in the joints and put up in showy velvet or satin cases it is almost impossible for experts, and utterly so for others, to detect by their appearance the poor quality which becomes so painfully apparent in attempting to work with such instruments. Most dealers therefore have no means of knowing what grade of instruments they are selling except they can rely on the house which furnished them.

For this reason we stamp all the German Instruments which we list in our Catalogue. Those German Instruments which are stamped with our trademark  are of extra fine quality, better than any other German Instruments and they will answer for professional use. Our other grade of German Instruments stamped with our trademark  will compare very favorably with any other German Instruments except our above  quality. In these trademarks buyers have our guarantee for the quality of these instruments instead of being obliged to select them according to their very often deceptive appearance.

FRENCH INSTRUMENTS

are cast brass or cast German silver, the iron or steel points are cast into the metal and these castings are pressed in steel dies to make the metal harder and to save cost of labor. They are then highly polished (buffed) and are ready for the market. Of course they will not do for good work and cannot be used for professional purposes. They find a market on account of their price.



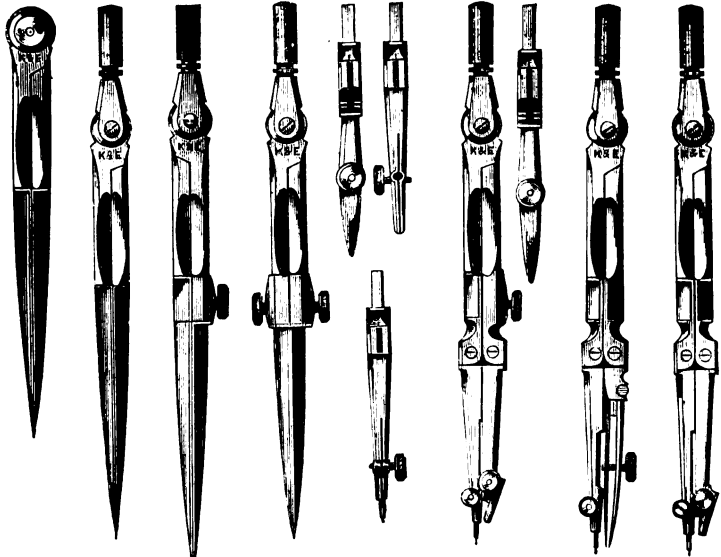
SUPERIOR SWISS INSTRUMENTS

of best German Silver and English Steel.

Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

Illustrations $\frac{2}{3}$ size.

"Copyright, 1887, by Keuffel & Esser."



No. 400. 401. 402. 403. 404. 406. 407.

400.	Plain Dividers	$3\frac{1}{2}$ inch	each	\$ 1 75
401.	do. do.	$3\frac{1}{2}$ inch, with handle	"	2 00
402.	Hairspring Dividers,	$3\frac{1}{2}$ inch, with handle	"	2 60
403.	Compasses,	$3\frac{1}{2}$ inch, with Pen, Pencil and Needle Point	"	6 00
404.	do.	$3\frac{1}{2}$ " " fixed Needle Point, Pen and Pencil Point	"	5 25
406.	do.	$3\frac{1}{2}$ " " fixed Needle and Pen Point (Bow Pen)	"	3 50
407.	do.	$3\frac{1}{2}$ " " fixed Needle and Pencil Point (Bow Pencil)	"	3 50

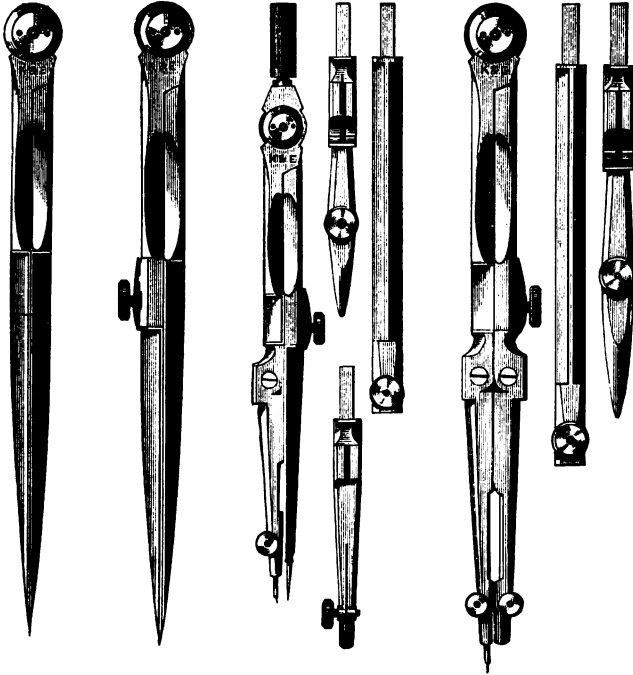
Compasses No. 403, 404 and 407 can be furnished with the same style of Pencil Point as illustrated under No. 415, if desired, but we recommend the style as above as more suitable for the small size compasses.

For Superior Swiss Instruments as above, but with Pivot-joint see pages 52 & 53.

Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

Illustrations $\frac{3}{4}$ size.

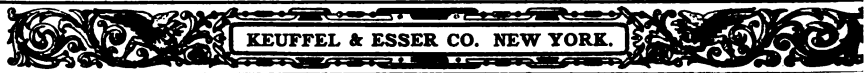
"Copyright, 1887, by Keuffel & Esser."



No. 410. 412. 414. 415.

410.	Plain Dividers, 5 inch	each	\$ 2 20
411.	do. do. 6 "	"	2 50
412.	Hairspring Dividers, 5 inch	"	3 00
413.	do. do. 6 "	"	3 30
414.	Compasses, 4½ inch, with fixed Needle Point, Steel, Pen, Pencil Point and Lengthening Bar . .	"	7 25
415.	do. 5½ inch, with fixed Needle Point, Pen, Pencil Point and Lengthening Bar	"	7 00

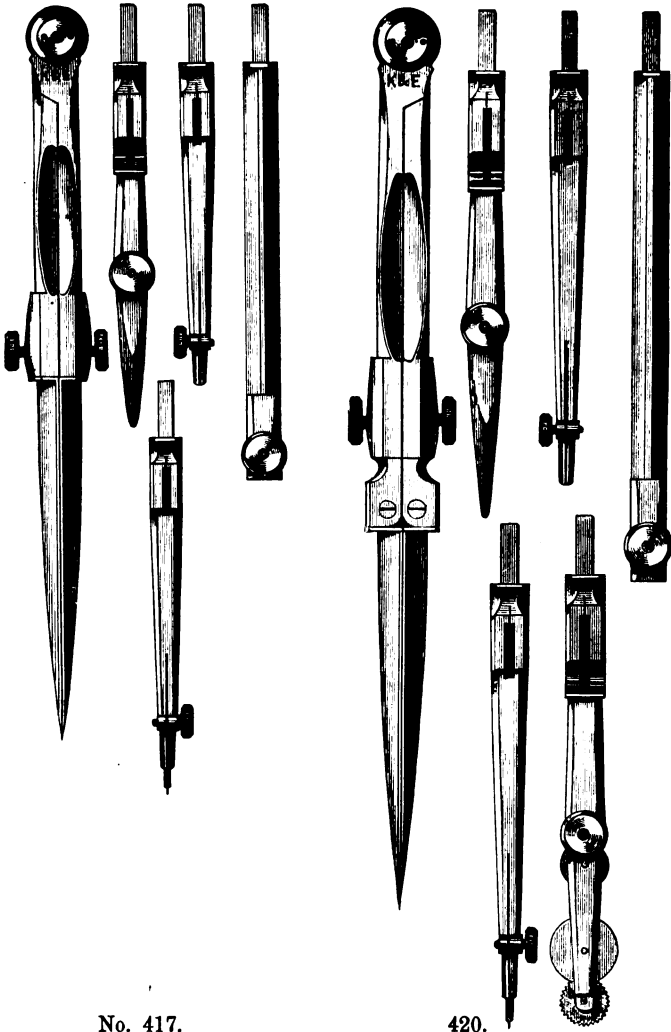
For Superior Swiss Instruments as above, but with Pivot-joint see pages 52 & 53.



Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

Illustrations $\frac{3}{8}$ size.

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No. 417.

420.

417.	Compasses,	6 inch,	with Pen, Pencil, Needle Point and Lengthening Bar	each	\$ 8 00
418.	do.	6 $\frac{1}{2}$ "	with joint in each leg, Pen, Pencil, Needle Point and Lengthening Bar	"	9 25
419.	do.	7 "	with joint in each leg, Pen, Pencil, Needle Point, Lengthening Bar and Dotting Pen	"	10 75
420.	do.	7 "	do. do. Dotting Pen with 6 wheels	"	12 00

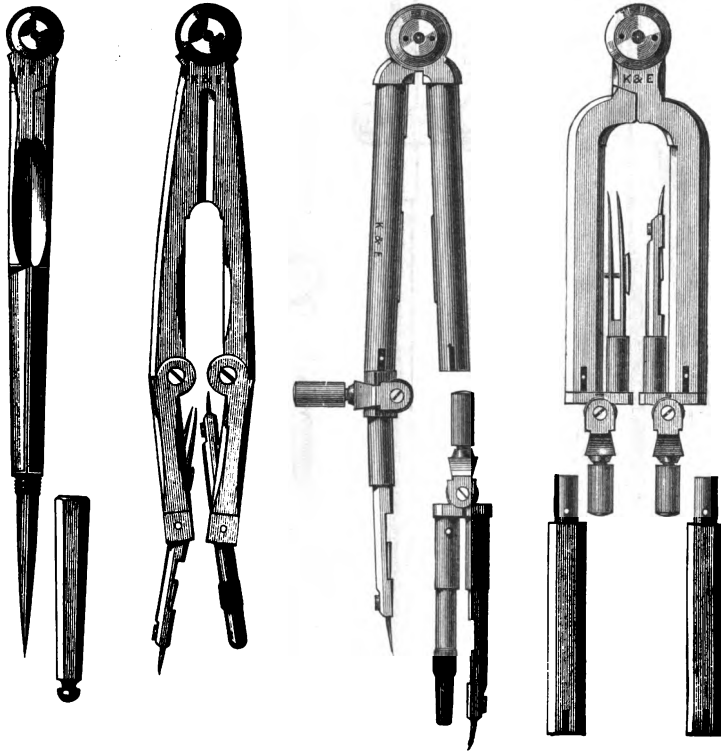
For Superior Swiss Instruments as above, but with Pivot-joint see pages 52 & 53.

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Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

Illustrations $\frac{2}{3}$ size.

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No. 425. 426. 427. 428.

- | | | |
|------|--|--------------|
| 425. | Pocket Dividers, with Sheath, 5 inch | each \$ 3 00 |
| 426. | Pocket Compasses, with folding Points | " 8 75 |
| 427. | Pillar Compasses, with Handles, 2 Needle Points, Pen and Pencil Point, which can be withdrawn from the compass and used as small Bow-Pen and Pencil respectively | " 9 50 |
| 428. | do. with 2 Lengthening Bars | " 11 50 |

Morocco Cases lined with silk velvet for:

No. 426.	427.	428.
each \$ 1 00	1 00	1 25



Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.
 Illustrations $\frac{2}{3}$ size. $\frac{1}{3}$ size.

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No. 430. 431. 432. 435. 437.

- 430. Three-legged Dividers, for taking off three points, 6 inch each \$ 5 00
- 431. do. do. one extending leg, adjustable for length, 6 inch " 5 75
- 432. Whole and Half Dividers, $7\frac{1}{2}$ inch " 4 00
- 435. Proportional Dividers, finely divided for lines and circles,
 $7\frac{1}{2}$ inch " 10 00
- 437. Proportional Dividers, finely divided for lines and circles,
 $8\frac{1}{2}$ inch, with rack-movement " 12 50

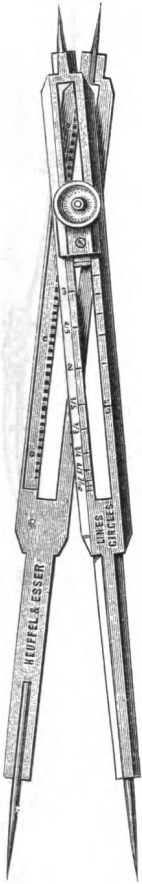
Morocco Cases lined with silk velvet for:

No. 430.	431.	432.	435.	437.
each \$ 1 00	1 20	1 00	1 00	1 20

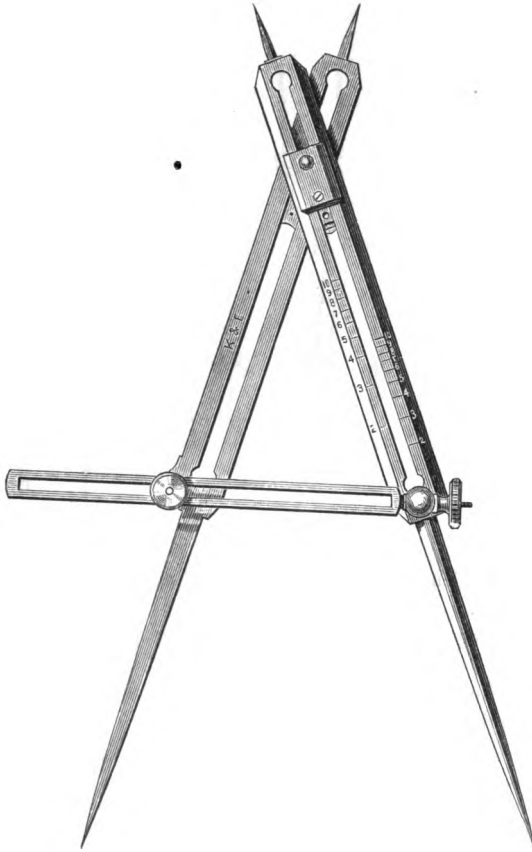
Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

Illustrations 1/2 size.

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No. 439.



441.

439. Proportional Dividers, finely divided for lines and circles,
9 inch, with rack-movement and movable points . . . \$ 16 00

The four steel points are held firmly by screws and can be readjusted to their original length in case of breakage.

441. Proportional Dividers, finely divided for lines, circles, planes
and solids, 9 inch, with micrometer adjustment . . . \$ 16 50

Morocco Cases lined with silk velvet for:

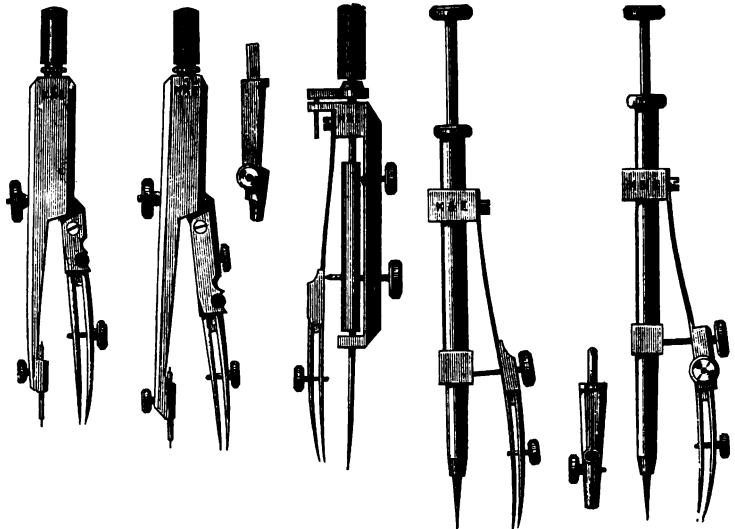
No. 439	441
each \$ 1 40	1 60



Each instrument stamped K. & E. Co. N. Y.

Illustrations $\frac{2}{3}$ size.

"Copyright, 1887, by Keuffel & Esser."



No. 450. 451. 452. 453. 454.

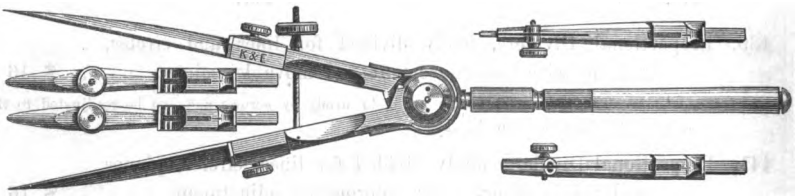
450.	Bow Pen, with spring and adjusting screw	each \$ 2 50
451.	do. " " " " and Pencil Point "	3 50
452.	Spring Bow Pen, with selfadjusting point, for very small circles	" 4 00
453.	Spring Bow Pen, for very small circles	" 4 00
454.	Spring Bow Pen and Pencil do.	" 5 00

No. 452, 453 and 454 are different from other bows and are the most excellent instruments for drawing small circles. A small rod passes through the instrument serving as handle and needlepoint. In No. 453 and 454 this centre rod remains stationary while the instrument is turned and pen or pencil draw by their own weight, avoiding the slipping of the needle or scratching of the pen.

Morocco Cases for No. 452, 453 or 454 each \$ 80

Illustration $\frac{2}{3}$ size.

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No. 458.

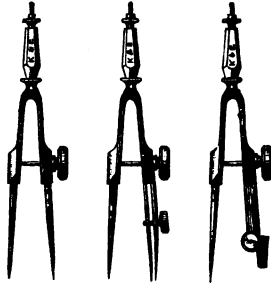
458.	Spring Bow Compasses, with long Ivory Handle, 2 Pen Points, Pencil and Needle Point	each \$ 8 25
------	---	--------------

KEUFFEL & ESSER CO. NEW YORK.

Each instrument stamped K. & E. Co. N. Y.

Illustrations $\frac{3}{4}$ size.

"Copyright, 1887, by Keuffel & Esser."

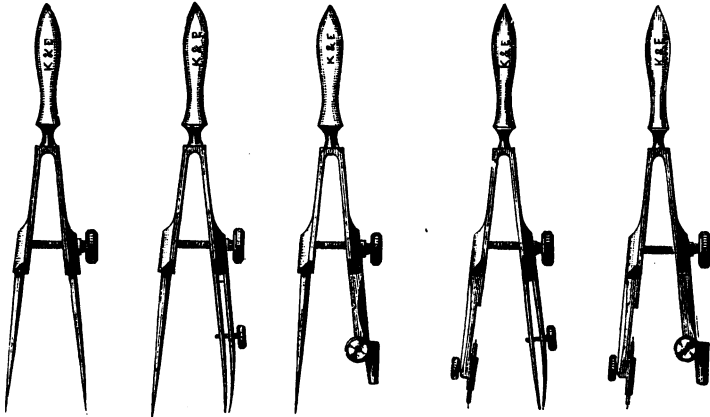


No. 460. 461. 462.

- | | | | |
|------|---|------|---------|
| 460. | Minute Steelspring Bow Dividers, with Metal Handle, $2\frac{1}{4}$ inch, | each | \$ 2 20 |
| 461. | “ “ Bow Pen, “ “ “ $2\frac{1}{4}$ “ “ | | 2 85 |
| 462. | “ “ Bow Pencil, “ “ “ $2\frac{1}{4}$ “ “ | | 2 85 |
| 463. | “ “ Bows, set of 3, No. 460, 461, 462 in Morocco silk velvet lined Case set | | 8 70 |

Illustrations $\frac{3}{4}$ size.

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No. 464. 465. 466. 469. 470.

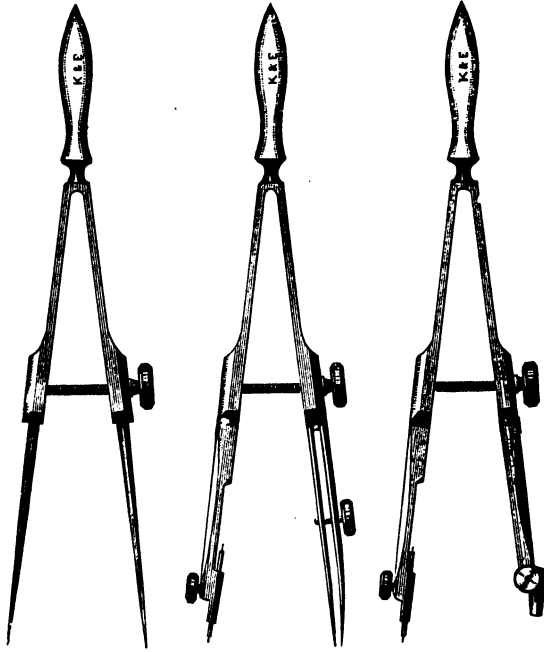
- | | | | |
|------|---|------|---------|
| 464. | Steelspring Bow Dividers, with Ivory Handle, 3 inch . . . | each | \$ 2 20 |
| 465. | “ “ Bow Pen, “ “ “ 3 “ . . . | “ | 2 50 |
| 466. | “ “ Bow Pencil, “ “ “ 3 “ . . . | “ | 2 50 |
| 467. | “ “ Bows, set of 3, No. 464, 465, 466 in Morocco silk velvet lined Case set | | 8 10 |
| 469. | Steelspring Bow Pen, with Needle Point, Ivory Handle, 3 inch, | each | \$ 2 85 |
| 470. | “ “ Bow Pencil, “ “ “ “ “ 3 “ “ | | 2 85 |
| 471. | “ “ Bows, set of 3, No. 464, 469, 470 in Morocco silk velvet lined Case set | | 8 80 |



Each instrument stamped K. & E. Co. N. Y.

Illustrations $\frac{2}{3}$ size.

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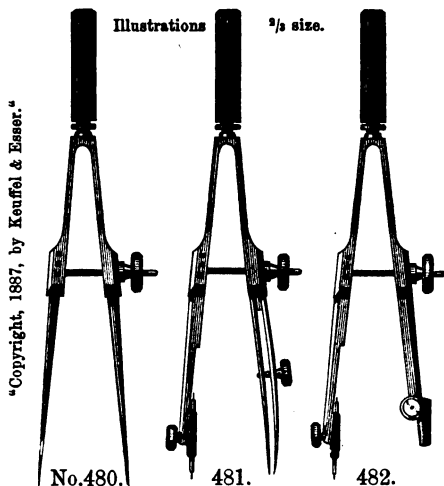
No. 476.

477.

478.

472.	Steelspring Bow Dividers, with Ivory Handle . . .	3 $\frac{1}{2}$ inch, each	\$ 2 60
473.	“ Bow Pen, with Needle Point, Ivory Handle	3 $\frac{1}{4}$ “ “	3 00
474.	“ Bow Pencil, with Needle Point, Ivory Handle	3 $\frac{1}{4}$ “ “	3 00
475.	“ Bows, set of 3, No. 472, 473, 474, in Morocco silk velvet lined Case	set	9 60
476.	Steelspring Bow Dividers, with Ivory Handle . . .	4 $\frac{3}{4}$ inch, each	2 75
477.	“ Bow Pen, with Needle Point, Ivory Handle	4 $\frac{3}{4}$ “ “	3 25
478.	“ Bow Pencil, with Needle Point, Ivory Handle	4 $\frac{3}{4}$ “ “	3 25
479.	“ Bows, set of 3, No. 476, 477, 478, in Morocco silk velvet lined Case	set	10 50

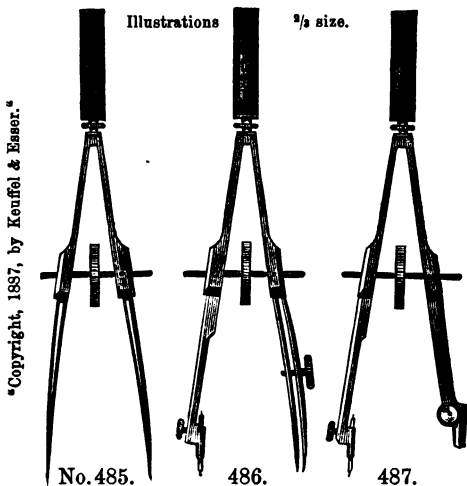
KEUFFEL & ESSER CO. NEW YORK.



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No. 480. 481. 482.

- | | | | |
|------|-------------|--|---------|
| 480. | Steelepring | Bow Dividers, with German Silver Handle, $3\frac{1}{2}$ inch | \$ 2 20 |
| 481. | " | Bow Pen " " " " | |
| | | and Needle Point, $3\frac{1}{2}$ inch | 2 85 |
| 482. | " | Bow Pencil " " " $3\frac{1}{2}$ " | 2 85 |
| 483. | " | Bows, set of 3, No. 480, 481, 482 in Morocco | |
| | | silk velvet lined Case set | 8 90 |



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No. 485. 486. 487.

- | | | | |
|------|-------------|--|--------------|
| 485. | Steelepring | Bow Dividers, with German Silver Handle, $3\frac{1}{2}$ inch | each \$ 2 60 |
| 486. | " | Bow Pen, with German Silver Handle and Needle | |
| | | Point, $3\frac{1}{2}$ inch " " | 3 25 |
| 487. | " | Bow Pencil " " " " $3\frac{1}{2}$ " " | 3 25 |
| 488. | " | Bows, Set of 3, No. 485, 486, 487 in Morocco | |
| | | silk velvet lined Case set | 10 35 |

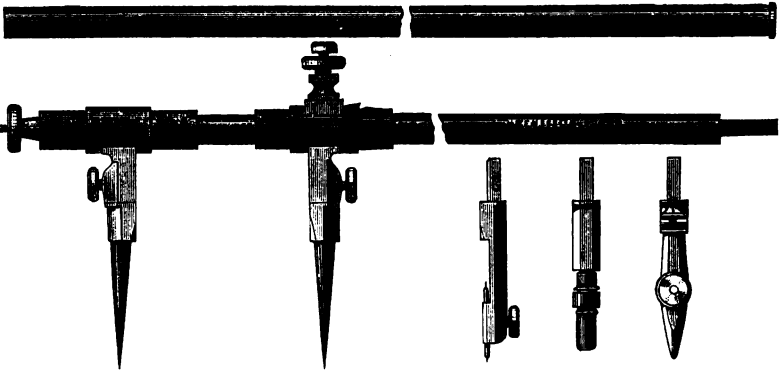
Spring Bows No. 485, 486, 487 have a right and left thread operated by one thumbnut situated between the shanks of the instrument. They are opened or closed by the screw which holds the points rigidly in any position.



Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

Illustration $\frac{2}{3}$ size.

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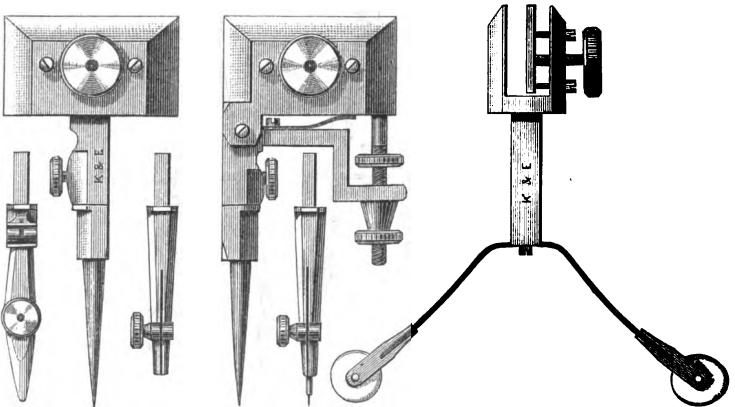


No. 500.

500.	Tubular Beam Compasses, 18 inch, 2 bars, with 2 Steel Points, Pen, Pencil and Needle Point	each	\$ 11 00
501.	Tubular Beam Compasses do. do. 24 inch, 3 bars	"	13 00
502.	" " " do. do. 36 " 3 "	"	17 50
	Morocco Cases for No. 500. 501. 502.		
	each \$ 2 00 2 25 2 75		
503.	Wheel Attachment for No. 500 or 501	"	2 25
504.	" " " No. 502	"	2 25

Illustrations $\frac{2}{3}$ size.

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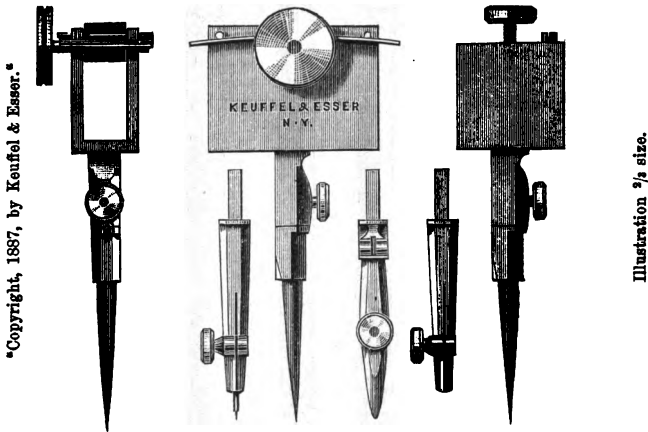
No. 510.

511.

510.	Beam Compasses, to fit on any straight edge, with 2 Steel Points, Pen, Pencil and Needle Point	each	\$ 9 00
511.	Wheel Attachment for No. 510	"	2 25
	Morocco Case for No. 510	"	1 50
	" " " No. 510 and 511	"	2 00

Wooden Bars for Beam Compasses see page 153.

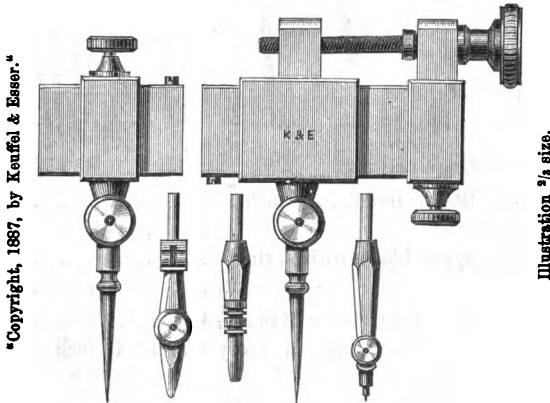
Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.



No. 512.

512. Beam Compasses, with two steel Points, Pen Pencil and Needle Point	each	\$ 9 75
513. Wheel Attachment for No. 512	"	2 75
Morocco Case for No. 512	"	1 50
do. " " 512 and 513	"	2 00

No. 512 has a pinion which is pressed against the bar by a spring and turned by a thumbscrew, as illustrated by above end-view. The pinion serves for micrometer adjustment without interfering with sliding the compass-head freely along the bar.



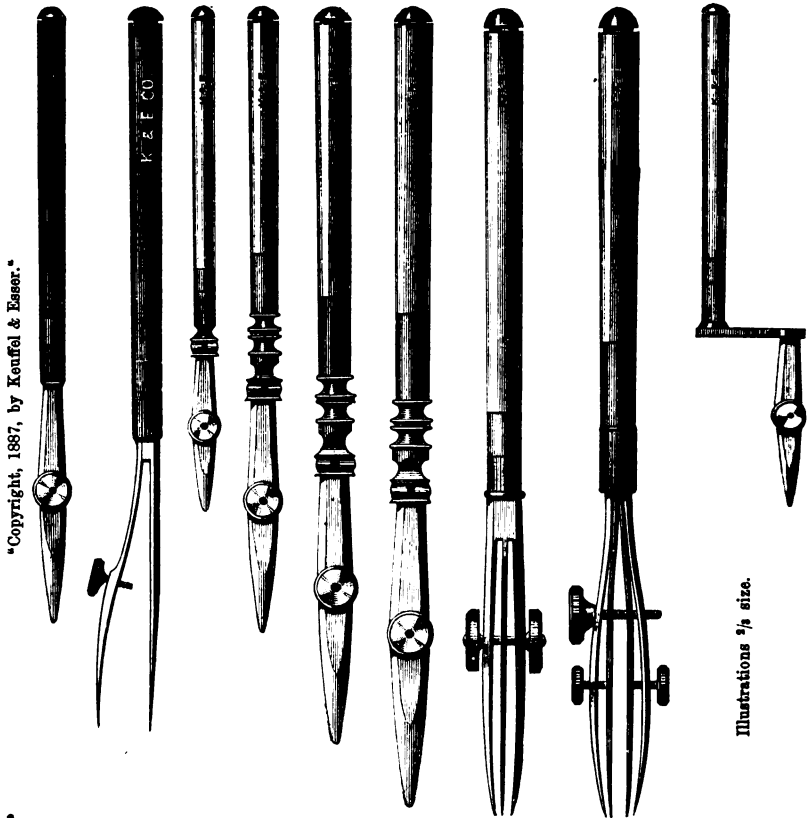
No. 515.

515. Beam Compasses, Mc. Cord's pattern, with two steel Points, Pen, Pencil and Needle Point	each	\$ 14 00
516. Wheel Attachment for No. 515	"	3 00
Morocco Case for No. 515	"	1 50
do. " " 515 and 516	"	2 00

Wooden Bars for Beam Compasses see page 153.



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Illustrations $\frac{2}{3}$ size.

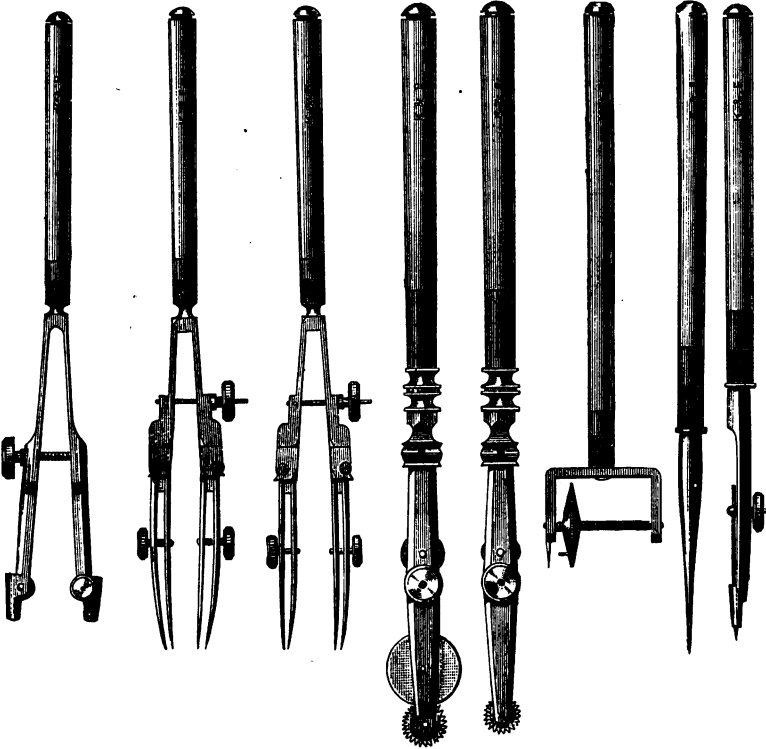
No. 520.	523.	526.	527.	528.	529.	535.	536.	540.
520.	521.	522.	523.	526.	527.	528.	529.	530.
Drawing Pen, Ebony Handle, $4\frac{1}{4}$ inch	" " " " 5 "	" " upper blade with spring	" " " " " "	" " with joint, Ivory Handle, 4 inch	" " and pin, Ivory Handle, $4\frac{1}{4}$ inch	" " " " " " $5\frac{1}{4}$ "	" " " " " " $6\frac{1}{4}$ "	German Silver blades, for red ink, $5\frac{1}{4}$ "
each \$ 1 00	" 1 10	" 1 00	" 1 10	" 1 40	" 1 60	" 1 80	" 2 00	" 1 80
535. Border Pen, for broad lines, Ivory Handle	536. " " " " " " improved $6\frac{1}{4}$ "							
3 00	3 50							
Border Pen No. 536 may also be used as Railroad Pen by filling only the two outer pair of blades with ink.								
540. Curve Pen, Ivory Handle, $4\frac{1}{4}$ inch	each \$ 1 25							

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Illustrations $\frac{2}{3}$ size.

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No. 543. 544. 545. 550. 551. 555. 556. 557.

543. Railroad Pencil, Ivory Handle, 5 inch each \$ 3 25

544. do. Pen with joints to blades and in shanks, Ivory Handle, $5\frac{1}{2}$ inch " 3 50

545. Railroad Pen with joints to blades and in shanks, K & E Co's improved, Ivory Handle, $5\frac{1}{2}$ inch " 3 75

The improvement consists in having both pens bent in the same direction, so that lines can be drawn against a straight-edge or rule as readily as with a ruling pen.

550. Dotting Pen with 6 Wheels, Ivory Handle, 6 inch each \$ 3 75

551. do. do. 6 " " improved, 6 inch " 4 25

The improved Dotting-Pen No. 551 is doubtless the best pen for the purpose, as it entirely prevents blotting, provided the ink be not too thin. The reservoir after being filled, is closed and supplies no more ink to the dotting-wheel, than is actually needed.

555. Opisometer, Ivory Handle, for measuring curved lines each \$ 1 80

556. Tracer, Ivory Handle " 1 00

557. Pricker, Ivory Handle " 1 75

Drawing Pens carefully set and sharpened each \$ 20 to 25

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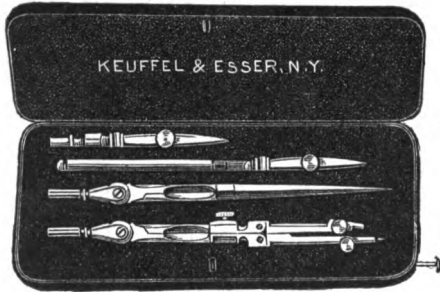
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SUPERIOR SWISS INSTRUMENTS

in Morocco Pocket Cases, lined with Silk Velvet.

The collection of Superior Swiss Instruments fitted in cases, which we offer, is very much larger than formerly, and made with regard to the various requirements. The very numerous inquiries we had as to assortments of instruments fitted in cases and their cost, induced us to increase the collection in our catalogue, to give our patrons the benefit of our long experience. Should other sets be required, we can furnish them in any combination to suit the purchaser.

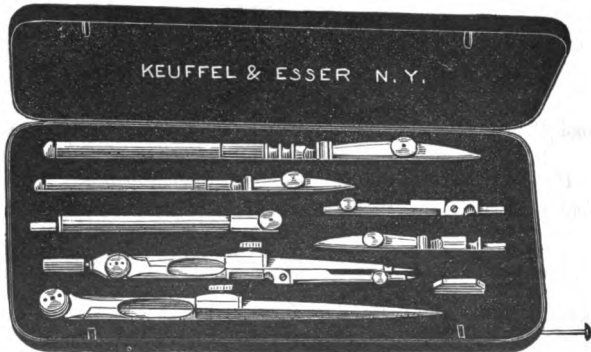
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No. 560.

560. contg.: 1 Plain Divider, $3\frac{1}{2}$ inch, with Handle No. 401,
 1 Compass, $3\frac{1}{2}$ inch, with fixed Needle Point, Pen and
 Pencil Point No. 404,
 1 Drawing Pen, 4 inch, with Joint, Ivory-Handle No. 526
 1 fine german silver Box with Leads each \$ 10 00

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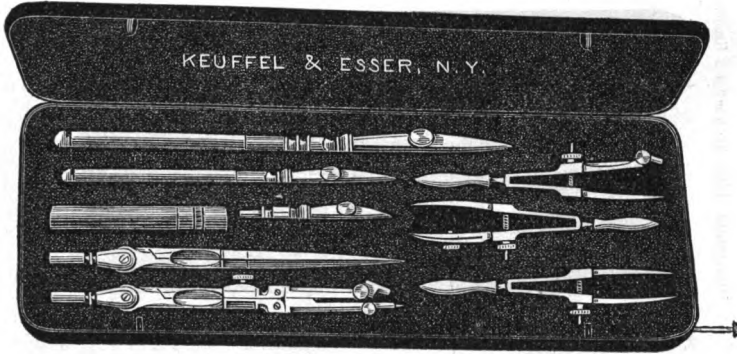
No. 561.

561. contg.: 1 Hairspring Divider, 5 inch, No. 412,
 1 Compass, $4\frac{1}{2}$ inch, with fixed Needle Point, Steel,
 Pen, Pencil Point and Lengthening Bar No. 414,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle No. 526,
 1 Drawing Pen, $5\frac{1}{2}$ inch, with Joint and Pin, Ivory
 Handle No. 528,
 1 fine german silver Box with Leads each \$ 15 00

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Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

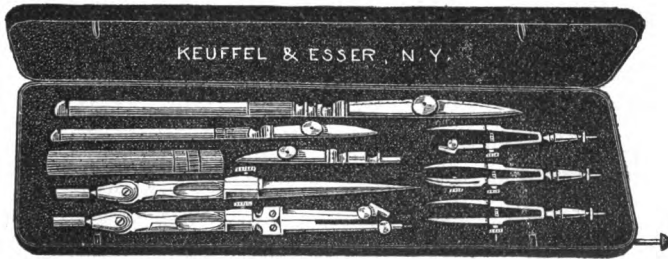
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No. 562.

562. contg.: 1 Plain Divider, 3¼ inch, with Handle No. 401,
 1 Compass, 3¼ inch, with fixed Needle Point,
 Pen and Pencil Point No. 404,
 1 Set Steelspring Divider and Bows, No. 464,
 465, 466,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle
 No. 526,
 1 Drawing Pen, 5½ inch, with Joint and Pin,
 Ivory Handle No. 528,
 1 fine german silver Box with Leads each \$ 19 50

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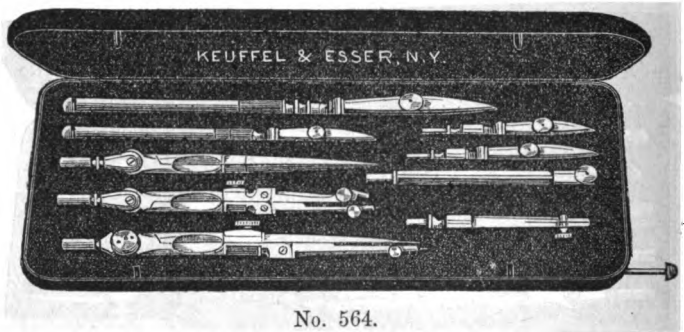
No. 563.

563. contg.: 1 Hairspring Divider, 3¼ inch, with Handle No. 402,
 1 Compass, 3¼ inch, with fixed Needle Point, Pen
 and Pencil Point No. 404,
 1 Set Minute Steelspring Divider and Bows,
 No. 460, 461, 462,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle
 No. 526,
 1 Drawing Pen, 5½ inch, with Joint and Pin, Ivory
 Handle No. 528,
 1 fine german silver Box with Leads each \$ 20 75



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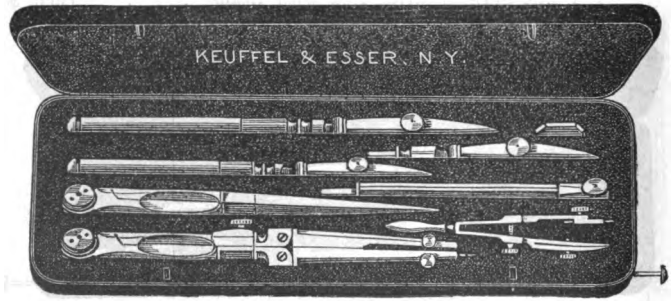
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No. 564.

564. contg.: 1 Plain Divider, 3½ inch, with Handle No. 401,
 1 Compass, 3½ inch, with fixed Needle Point, Pen and Pencil Point No. 404,
 1 Compass, 4½ inch, with fixed Needle Point, Steel, Pen, Pencil Point and Lengthening Bar No. 414,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle No. 526,
 1 Drawing Pen, 5½ inch, with Joint and Pin, Ivory Handle No. 528,
 1 fine german silver Box with Leads each \$ 20 00

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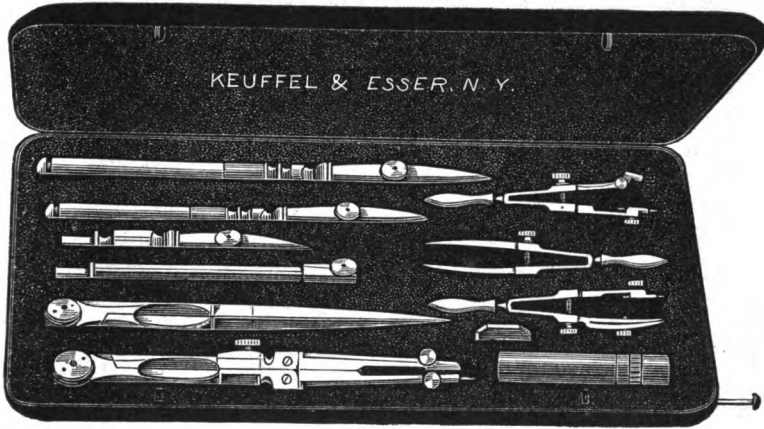
No. 565.

565. contg.: 1 Plain Divider, 5 inch, No. 410,
 1 Compass, 5½ inch, with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. 415,
 1 Steelspring Bow Pen, No. 469,
 1 Drawing Pen, 4¾ inch, with Joint and Pin, Ivory Handle No. 527,
 1 Drawing Pen, 5½ inch, with Joint and Pin, Ivory Handle No. 528,
 1 fine german silver Box with Leads each \$ 17 50

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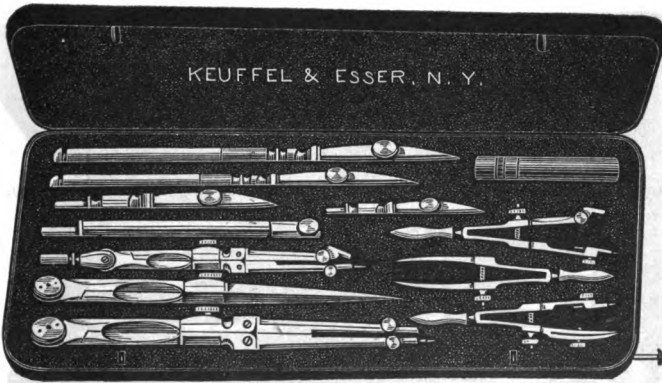
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No. 566.

566. contg.: 1 Plain Divider, 5 inch, No. 410,
 1 Compass, 5½ inch, with fixed Needle Point, Pen, Pencil Point
 and Lengthening Bar No. 415,
 1 Set Steelspring Divider and Bows No. 464, 469, 470,
 1 Drawing Pen, 4½ inch, with Joint and Pin, Ivory Handle No. 527,
 1 do. 5½ " " " " " " " " 528,
 1 fine german silver Box with Leads each \$ 22 70

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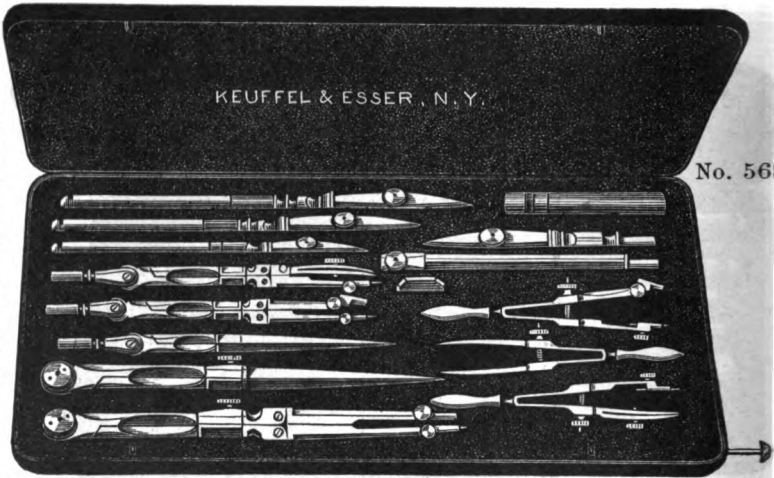


No. 567.

567. contg.: 1 Compass, 3½ inch, with fixed Needle Point, Pen and Pencil Point
 No. 404,
 1 Hairspring Divider, 5 inch, No. 412,
 1 Compass, 5½ inch, with fixed Needle Point, Pen, Pencil Point
 and Lengthening Bar No. 415,
 1 Set Steelspring Divider and Bows, No. 464, 469, 470,
 1 Drawing Pen, 4½ inch, with Joint and Pin, Ivory Handle No. 527,
 1 do. 5½ " " " " " " " " 528,
 1 fine german silver Box with Leads each \$ 28 80

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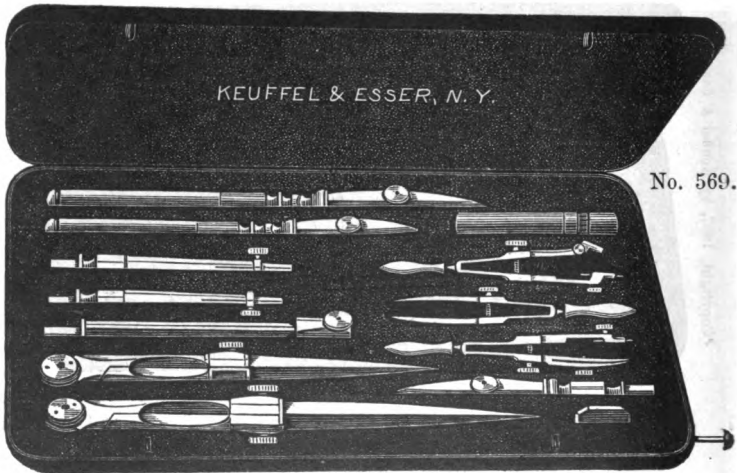
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No. 568.

568. contg.: 1 Plain Divider, 3 1/4 inch, with Handle No. 401,
 1 Compass, 3 1/4 inch, with fixed Needle and Pen Point No. 406,
 1 do. 3 1/4 " " " " " Pencil " No. 407,
 1 Hairspring Divider, 5 inch, No. 412,
 1 Compass, 5 1/4 inch, with fixed Needle Point, Pen, Pencil Point
 and Lengthening Bar No. 415,
 1 Set Steelspring Divider and Bows, No. 464, 469, 470,
 1 each Drawing Pen, Ivory Handle No. 526, 527, 528
 1 fine german silver Box with Leads each \$ 35 00

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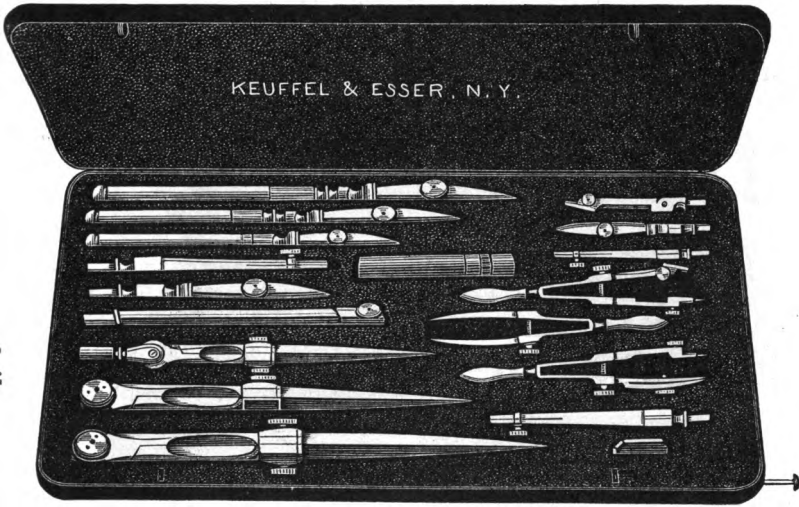
No. 569.

569. contg.: 1 Hairspring Divider, 5 inch, No. 412,
 1 Compass, 6 inch, with Pen, Pencil, Needle Point and
 Lengthening Bar, No. 417,
 1 Set Steelspring Divider and Bows, No. 464, 469, 470,
 1 each Drawing Pen, with Joint and Pin, Ivory Handle, No. 527, 528,
 1 fine german silver Box with Leads each \$ 24 80

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No. 570.

570. contg.: 1 Compass, 3 $\frac{1}{4}$ inch, with Pen, Pencil and Needle Point, No. 403,
 1 Hairspring Divider, 5 inch, No. 412,
 1 Compass, 6 inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 417,
 1 Set Steelspring Divider and Bows, No. 464, 469, 470,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle, No. 526,
 1 Drawing Pen, 4 $\frac{1}{4}$ inch, with Joint and Pin, Ivory Handle, No. 527,
 1 Drawing Pen, 5 $\frac{1}{4}$ inch, with Joint and Pin, Ivory Handle, No. 528,
 1 fine german silver Box with Leads each \$ 33 00



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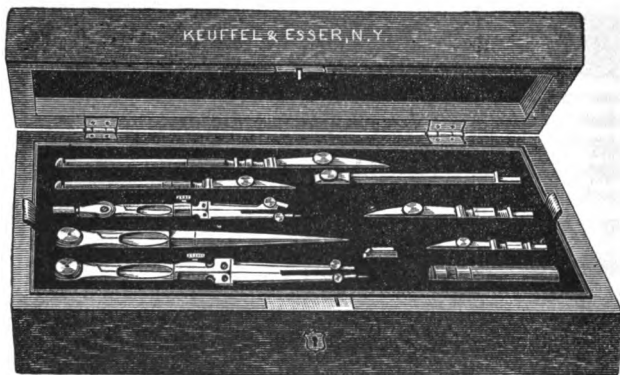


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SUPERIOR SWISS INSTRUMENTS

in polished Rosewood Cases with Lock and Tray, lined with Silk Velvet.

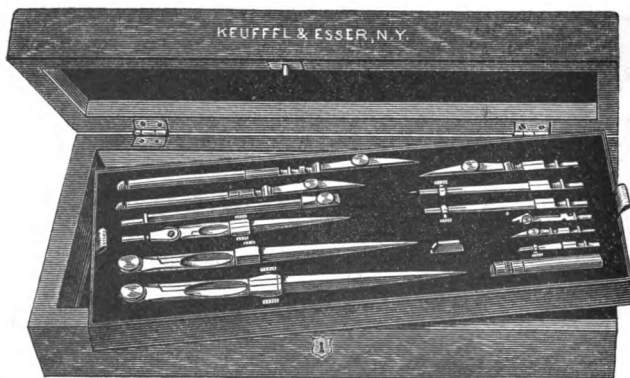
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No. 575.

575. contg.: 1 Compass, 3½ inch, with fixed Needle Point, Pen, and Pencil Point, No. 404,
 1 Plain Divider, 5 inch, No. 410,
 1 Compass, 5½ inch, with fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. 415,
 1 each Drawing Pen, Ivory Handle, No. 526, 528,
 1 fine german silver Box with Leads each \$ 22 65

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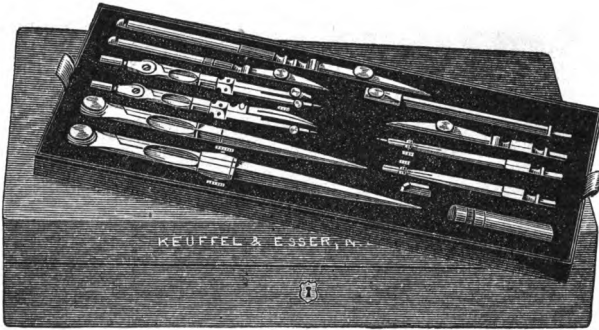
No. 576.

576. contg.: 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 403,
 1 Hairspring Divider, 5 inch, No. 412,
 1 Compass, 6 inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 417,
 1 each Drawing Pen, Ivory Handle, No. 526, 528,
 1 fine german silver Box with Leads each \$ 25 20

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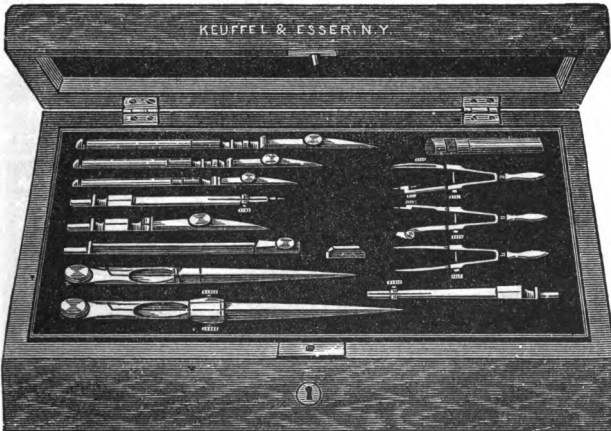
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No. 577.

577. contg.: 1 Compass, 3½ inch, with fixed Needle and Pen Point, No. 406,
 1 do. 3½ “ “ “ “ “ Pencil “ No. 407,
 1 Plain Divider, 5 inch, No. 410,
 1 Compass, 6 inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 417,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle, No. 526,
 1 do. do. 5½ “ “ “ and Pin, Ivory Handle, No. 528,
 1 fine german silver Box with Leads each \$ 26 40

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No. 578.

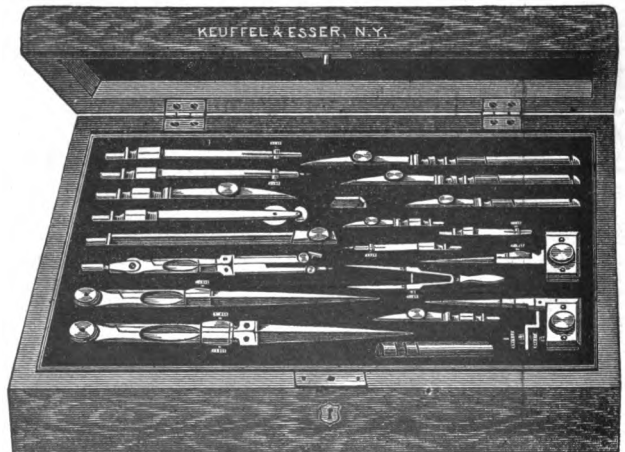
578. contg.: 1 Plain Divider, 5 inch, No. 410,
 1 Compass, 6 inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 417,
 1 Set Steelspring Divider and Bows, No. 464, 469, 470,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle, No. 526,
 1 do. do. 4½ “ “ “ and Pin, Ivory Handle, No. 527,
 1 do. do. 5½ “ “ “ “ “ “ No. 528,
 1 fine german silver Box with Leads each \$ 29 00



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No. 579.

579. contg.: 1 Compass, 3 $\frac{1}{4}$ inch, with fixed Needle and Pen Point, No. 406
 1 Compass, 3 $\frac{1}{2}$ inch, with fixed Needle and Pencil Point, No. 407
 1 Hairspring Divider, 5 inch, No. 412,
 1 Compass, 6 $\frac{1}{2}$ inch, with Joint in each leg, Pen, Pencil, Needle
 Point and Lengthening Bar, No. 418,
 1 Set Steelspring Divider and Bows, No. 464, 469, 470,
 1 each Drawing Pen, Ivory Handle, No. 526, 527, 528
 1 fine german silver Box with Leads each \$ 39 20



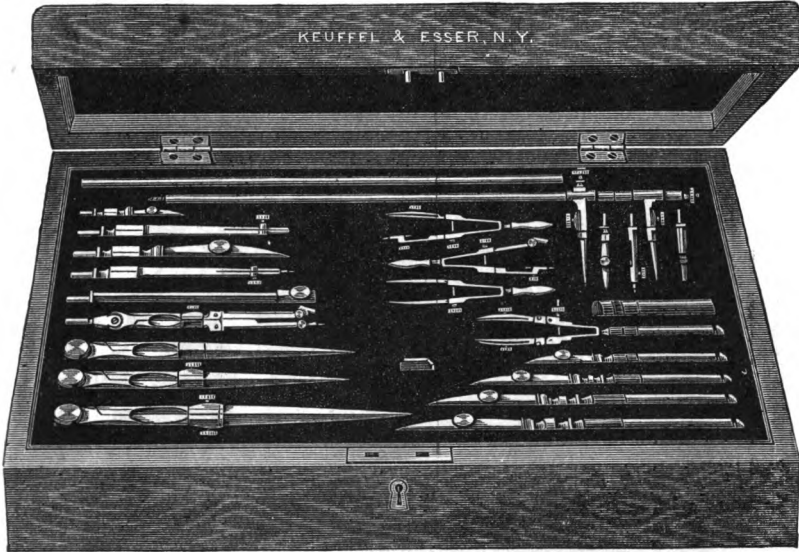
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No. 580.

580. contg.: 1 Compass, 3 $\frac{1}{4}$ inch, with fixed Needle Point, Pen and Pencil
 Point, No. 404,
 1 Hairspring Divider, 5 inch, No. 412,
 1 Compass, 7 inch, with Joint in each leg, Pen, Pencil, Needle
 Point, Lengthening Bar and Dotting Pen, No. 419,
 1 Steelspring Divider, No. 464,
 1 Beam Compass, No. 510,
 1 each Drawing Pen, Ivory Handle, No. 526, 527, 528
 1 fine german silver Box with Leads each \$ 43 50

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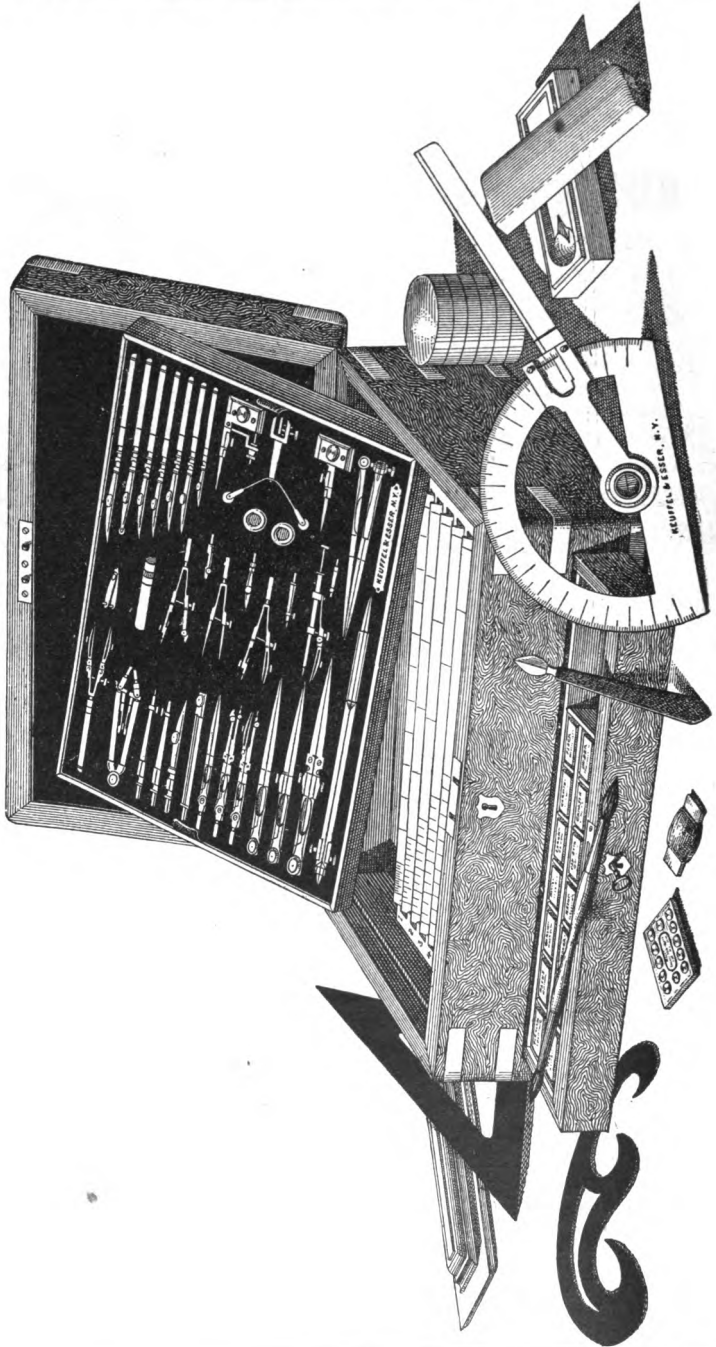
No. 581.

581. contg.: 1 Compass, $3\frac{1}{4}$ inch, with fixed Needle Point,
 Pen and Pencil Point, No. 404,
 1 Plain Divider, 5 inch, No. 410,
 1 Hairspring Divider, 5 inch, No. 412,
 1 Compass, 6 inch, with Pen, Pencil, Needle Point
 and Lengthening Bar, No. 417,
 1 Set Steelspring Divider and Bows, No. 464,
 469, 470,
 1 Tubular Beam Compass, 18 inch, No. 500,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle,
 No. 526,
 1 Drawing Pen, $4\frac{1}{4}$ inch, with Joint and Pin,
 Ivory Handle, No. 527,
 1 Drawing Pen, $5\frac{1}{2}$ inch, with Joint and Pin,
 Ivory Handle, No. 528,
 1 Drawing Pen, $6\frac{1}{2}$ inch, with Joint and Pin,
 Ivory Handle, No. 529,
 1 Railroad Pen, 5 inch, Ivory Handle, No. 544,
 1 fine german silver Box with Leads each \$ 58 40

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No. 588.

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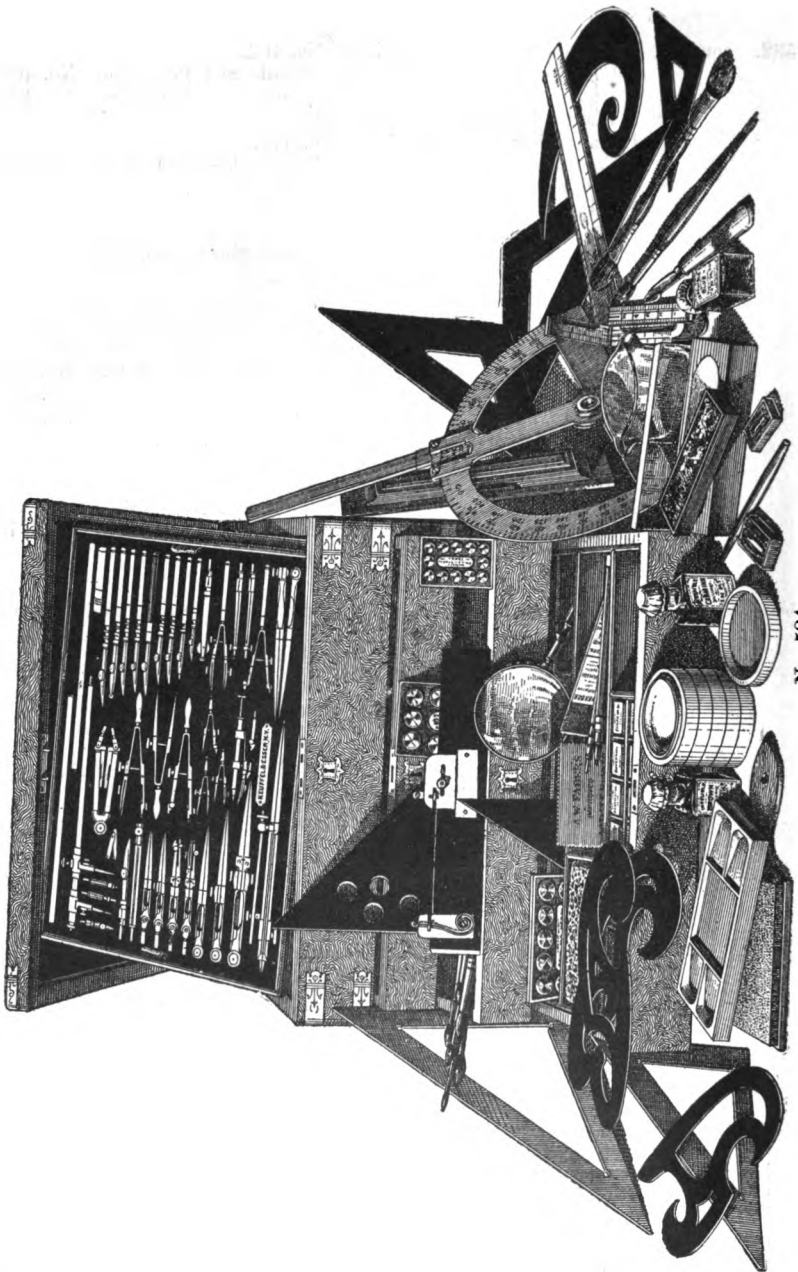
Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

582. contg.: 1 Hairspring Divider, 3¼ inch, No. 402,
 1 Compass, 3¼ inch, with fixed Needle and Pen Point, No. 406,
 1 do. 3¼ " " " " " Pencil " No. 407,
 1 Plain Divider, 6 inch, No. 411,
 1 Hairspring Divider, 6 inch, No. 413,
 1 Compass, 6¼ inch, with Joint in each leg, Pen, Pencil, Needle
 Point and Lengthening Bar, No. 418,
 1 Pocket or Pillar Compass, No. 427,
 1 Three legged Divider, No. 430,
 1 Proportional Divider, with movable Points, No. 439,
 1 Spring Bow Pen and Pencil, No. 454,
 1 Set Steelspring Divider and Bows, No. 480, 481, 482,
 1 Beam Compass, No. 510, with Wheel Attachment, No. 511,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle, No. 526,
 2 do. do. 4¼ " " " and Pin, Ivory Handle, No. 527,
 2 do. do. 5¼ " " " " " " " No. 528,
 1 do. do. 6¼ " " " " " " " No. 529,
 1 Railroad Pen, 5½ inch, Ivory Handle, No. 544,
 1 Dotted Pen, 6 inch " " No. 551,
 1 Adjusting Key and Screwdriver, No. 825,
 2 Horn Centres, with German Silver rim, No. 2691,
 1 fine german silver Box with Leads each \$ 116 75

583. Fine polished Rosewood Case, with German Silver Straps and Corners,
 Lock, Tray and Drawer,
 contg.: The same Instruments as No. 582; and
 1 Set Boxwood Scales like, No. 1576,
 1 Paper Cutter, No. 2701,
 1 Protractor, No. 1226,
 1 German Silver Parallel Rule, No. 1750,
 2 doz each German Silver Thumb Tacks, No. 2622, 2625,
 1 Tacklifter, No. 2680,
 1 each Rubber Triangle, No. 1802, 5, 8, 12 inch,
 1 " " " No. 1804, 4, 7, 10 "
 1 " " Curve No. 1820, 4, 13, 19
 1 Set of 18 Technical Water Colors, No. 2900 and 2901. Full
 Pans,
 1 Cake Chinese Ink, No. 3030 T,
 1 doz assorted Camel Hair Brushes, No. 3102,
 1 each black sable Brush, No. 3120, 1, 2, 6, 10, 14, 18,
 1 " double Camel Hair Brush, No. 3135, 1, 3,
 1 Camel Hair Brush, No. 3136, 3,
 1 Patent Ink Slab, No. 3151,
 1 Nest of Saucers, No. 3161,
 1 doz Lettering Pens, No. 3202,
 3 Siberian Artists Pencils, No. 3361,
 3 Boxes Siberian Leads, No. 3370,
 1 Cake Sponge Rubber, No. 3412,
 2 Cakes Artists Rubber, No. 3425,
 2 " Ink Erasers, No. 3445,
 1 Steel Eraser, No. 3481,
 1 Pencil Pointer, No. 3502,
 1 fine german silver Box with Leads each \$ 195 00

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No. 584.

Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

584. Magazine Case. Polished Mahogany, ornamental Brass Corners, Bands, Hinges, Shield and Name-Plate, with Tray and three Drawers.

- contg. : 1 Hairspring Divider, 3¼ inch, No. 402,
 1 Plain Divider, 3¼ inch, No. 401,
 1 Compass, 3½ inch, with fixed Needle and Pen Point, No. 406,
 1 do. 3½ " " " " Pencil " No. 407,
 1 Plain Divider, 5 inch, No. 410,
 1 Hairspring Divider, 6 inch, No. 413,
 1 Compass, 7 inch, with Joint in each leg, Pen, Pencil, Needle Point, Lengthening Bar and Dotting Pen, No. 419,
 1 Pocket Compass, No. 427,
 1 Three legged Divider, No. 430,
 1 Proportional Divider, with Micrometer adjustment, No 441,
 1 Spring Bow Pen and Pencil, No. 454,
 1 Set Steelspring Divider and Bows, No. 460, 461, 462,
 1 " " do. " do. No. 476, 477, 478,
 1 Tubular Beam Compass, 36 inch, No. 502,
 1 Drawing Pen, 5 inch, Ebony Handle, No. 521,
 1 do. do. 4¾ " with Joint, Ivory Handle, No. 526,
 2 do. do. 5 " " " and Pin, Ivory Handle, No. 527,
 2 do. do. 5½ " " " " " " " No. 528,
 1 do. do. 6½ " " " " " " " No. 529,
 1 Railroad Pencil, 5 inch, Ivory Handle, No. 543,
 1 " Pen, 5½ " " " " " No. 544,
 1 Improved Dotting Pen, 6 inch, Ivory Handle, No. 551,
 1 Pricker, Ivory Handle, No. 557,
 1 Adjusting Key and Screwdriver No. 825,
 1 Casey's Section Liner, No. 1157,
 1 Protractor with Arm and Vernier, No. 1226,
 1 Set Ivory Scales, like No. 1571, 1 Scale Rule, No. 1720,
 1 Parallel Rule, No. 1751, 1 Set Lettering Triangles, No. 1810,
 1 each Rubber Triangle, No. 1802, 5, 8, 12 inch,
 1 " do. do. " 1804, 4, 7, 10 "
 1 each Rubber Curve, No. 1820, 4, 13, 19 and No. 1822,
 1 " Steel Triangle, No. 2002, 10½ inch, No. 2003, 8 inch,
 2 doz each G. S. Tacks, No. 2622, 2626,
 1 doz Steel Tacks, No. 2600,
 1 Tacklifter, No. 2680, 2 Horn Centres, No. 2691,
 1 Set Technical Colors, No. 2900 and No. 2901, Full Pans,
 1 Set Drawing Ink No. 3011, 1 Cake India Ink, No. 3030, A. F.,
 1 doz Brushes, No. 3102, 1 each Brush, No. 3123, 1, 2,
 1 each Brush, No. 3120, 1, 2, 4, 6, 8, 10, 14, 18, 22,
 1 " do. No. 3133, 0, 3, No. 3135, 1, 3,
 1 Slate Ink Slab, No. 3153, 1 Nest of Saucers, No. 3161,
 1 Centre Slab, No. 3183, 1 Water Glass, No. 3187,
 1 doz each Pens, No. 3200, 3202,
 1 each Penholder, No. 3220, 3221,
 6 Siberian Artist's Pencils, No. 3361, 6 Boxes Leads, No. 3370,
 1 Cake Sponge Rubber, No. 3412,
 1 Cake Artist's Rubber, No. 3425,
 1 Cake Mammoth Ink and Pencil Eraser, No. 3446,
 1 Pencil Pointer, No. 3507, 1 Steel Eraser, No. 3480,
 1 Reading Glass, No. 6970, 3 inch,
 1 fine german silver Box with Leads. . . . each \$ 300 00



Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

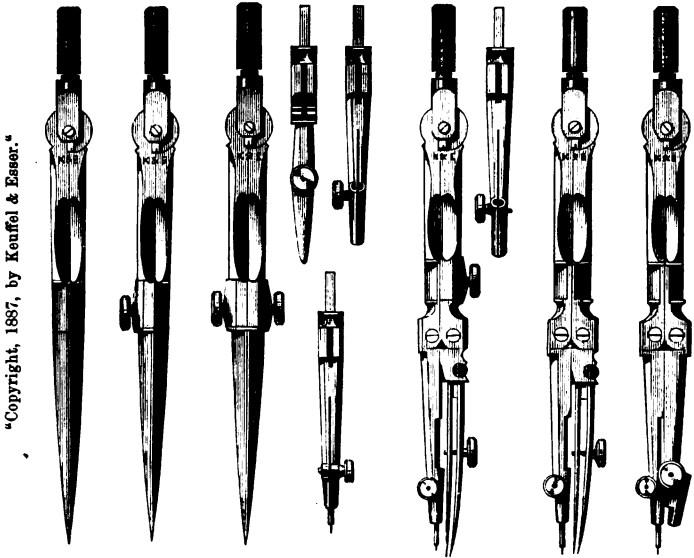
SUPERIOR SWISS INSTRUMENTS

WITH PIVOT-JOINT

of best German Silver and English Steel.

Corresponding in style, quality and finish to our Superior Swiss Instruments No. 400 to 557.

It should be borne in mind that pivot-joint instruments are not an improved style over tongue-joint instruments, but only a **different form**. While tongue-joint instruments are also made with handle to suit individual preferences (see Nos. 401, 402, 403, 404, 406, 407, 414) the pivot-joint instruments **must** be with handle because the handle forms part of the joint. The selection between tongue-joint and pivot-joint instruments of the same grade and style is therefore altogether a **matter of fancy**. This is easily lost sight of in selecting from a Catalogue which describes instruments of only one style of joint of the **same grade**. Our Catalogue being the only one which describes full assortments of instruments with both kinds of joint of the same make, grade and shape, affords the careful buyer an opportunity of indulging his preference in regard to style of joint.



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Illustrations $\frac{2}{3}$ size.

No. 600. 601. 602. 603. 604. 605.

600.	Plain Dividers, $3\frac{1}{2}$ inch	each	\$ 2 25
601.	Hairspring Dividers, $3\frac{1}{2}$ inch	"	3 00
602.	Compasses, $3\frac{1}{2}$ inch, with Pen, Pencil and Needle Point	"	7 00
603.	do. $3\frac{1}{2}$ " with fixed Needle Point, Pen and Pencil Point	"	6 00
604.	do. $3\frac{1}{2}$ " with fixed Needle and Pen Point (Bow Pen)	"	4 25
605.	do. $3\frac{1}{2}$ " with fixed Needle and Pencil Point (Bow Pencil)	"	4 25

Compasses No. 602, 603 and 605 can be furnished with the same style of Pencil Point as illustrated under No. 610 if desired, but we recommend the style as above, as more suitable for the small size compasses.

For Superior Swiss Instruments as above, but with Tongue-joint see pages 24 etc.



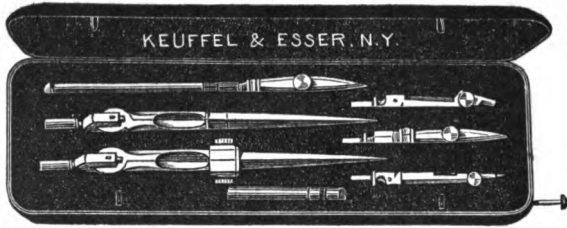
Each Instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

SUPERIOR SWISS INSTRUMENTS

WITH PIVOT-JOINT

in Morocco Pocket Cases, lined with Silk Velvet.

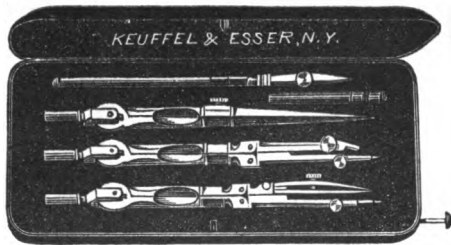
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No. 620.

620. contg.: 1 Plain Divider, 3½ inch, No. 600,
 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 602,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle, No. 526,
 1 fine german silver Box with Leads each \$ 12 00

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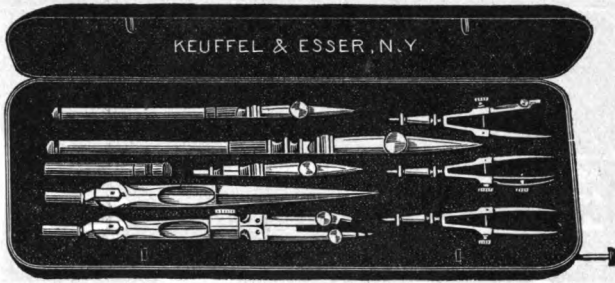
No. 621.

621. contg.: 1 Hairspring Divider, 3½ inch, No. 601,
 1 Compass, 3½ inch, with fixed Needle and Pen Point, No. 604,
 1 Compass, 3½ inch, with fixed Needle and Pencil Point, No. 605,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle, No. 526,
 1 fine german silver Box with Leads each \$ 14 40

KEUFFEL & ESSER CO. NEW YORK.

Each instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

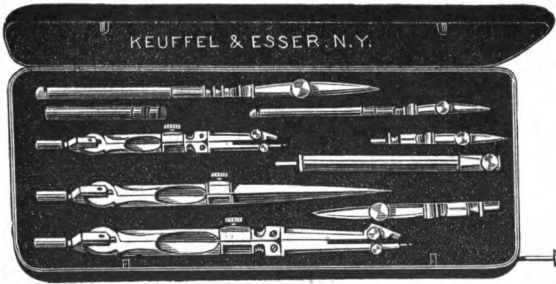
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No. 622.

622. contg.: 1 Plain Divider, 3½ inch, No. 600,
 1 Compass, 3½ inch, with fixed Needle Point,
 Pen and Pencil Point, No. 603,
 1 Set Minute Steelspring Divider and Bows,
 No. 460, 461, 462,
 1 Drawing Pen, 4 inch, with Joint, Ivory Handle,
 No. 526,
 1 Drawing Pen, 5½ inch, with Joint and Pin,
 Ivory Handle, No. 528,
 1 fine german silver Box with Leads each \$ 21 20

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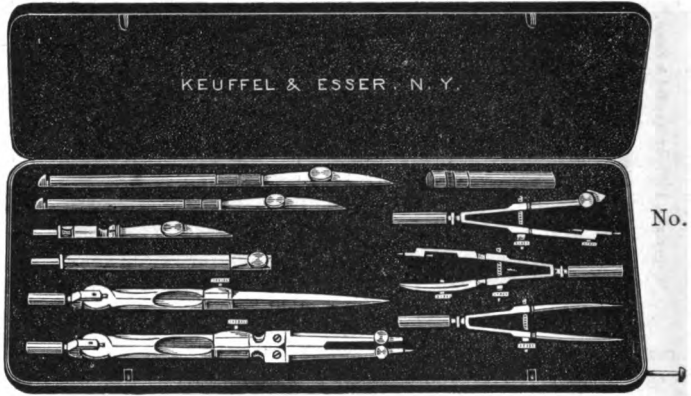
No. 623.

623. contg.: 1 Compass, 3½ inch, with fixed Needle Point, Pen
 and Pencil Point, No. 603,
 1 Hairspring Divider, 5 inch, No. 608,
 1 Compass, 6 inch, with fixed Needle Point, Pen,
 Pencil Point and Lengthening Bar, No. 610,
 1 Drawing Pen, 4 inch, with Joint, Ivory
 Handle, No. 526,
 1 Drawing Pen, 5½ inch, with Joint and Pin,
 Ivory Handle, No. 528,
 1 fine german silver Box with Leads each \$ 22 25



Each Instrument stamped KEUFFEL & ESSER CO. or K. & E. Co. N. Y.

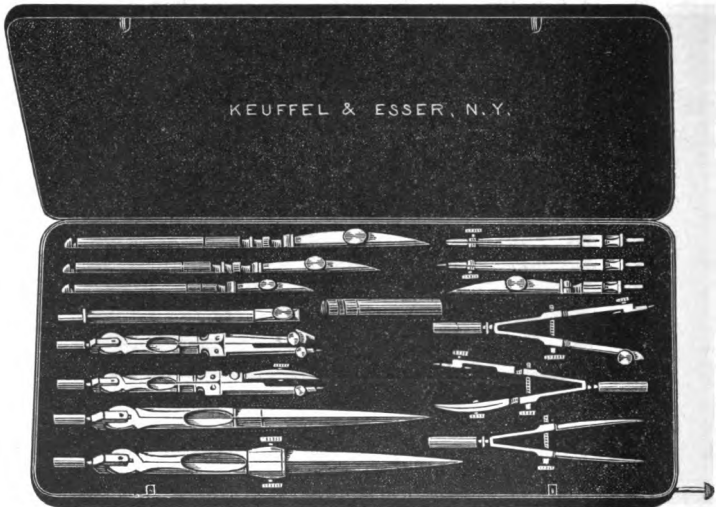
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No. 624.

624. contg.: 1 Hairspring Divider, 5 inch, No. 608,
 1 Compass, 6 inch, with fixed Needle Point, Pen, Pencil Point
 and Lengthening Bar, No. 610,
 1 Set Steelspring Divider and Bows, No. 480, 481, 482,
 1 each Drawing Pen, Ebony Handle, No. 520, 521,
 1 fine german silver Box with Leads each \$ 23 50

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No. 625.

625. contg.: 1 Compass, 3 1/4 inch, with fixed Needle and Pen Point, No. 604,
 1 Compass, 3 1/4 inch, with fixed Needle and Pencil Point, No. 605,
 1 Plain Divider, 5 inch, No. 606,
 1 Compass, 6 inch, with Pen, Pencil, Needle Point and Leng-
 thening Bar, No. 612,
 1 Set Steelspring Divider and Bows, No. 480, 481, 482,
 1 each Drawing Pen, Ivory Handle, No. 526, 527, 528,
 1 fine german silver Box with Leads each \$ 36 00

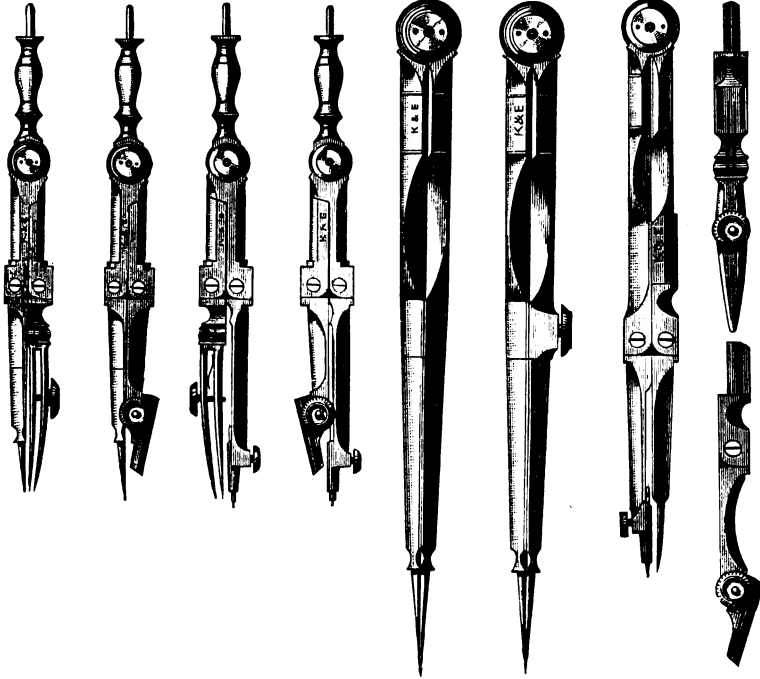
ENGLISH INSTRUMENTS.

German Silver, fine finish, double Sector-Joint.

Illustrations $\frac{2}{3}$ size.

$\frac{1}{3}$ size.

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No. 640. 641. 642. 643. 644. 646. 650.

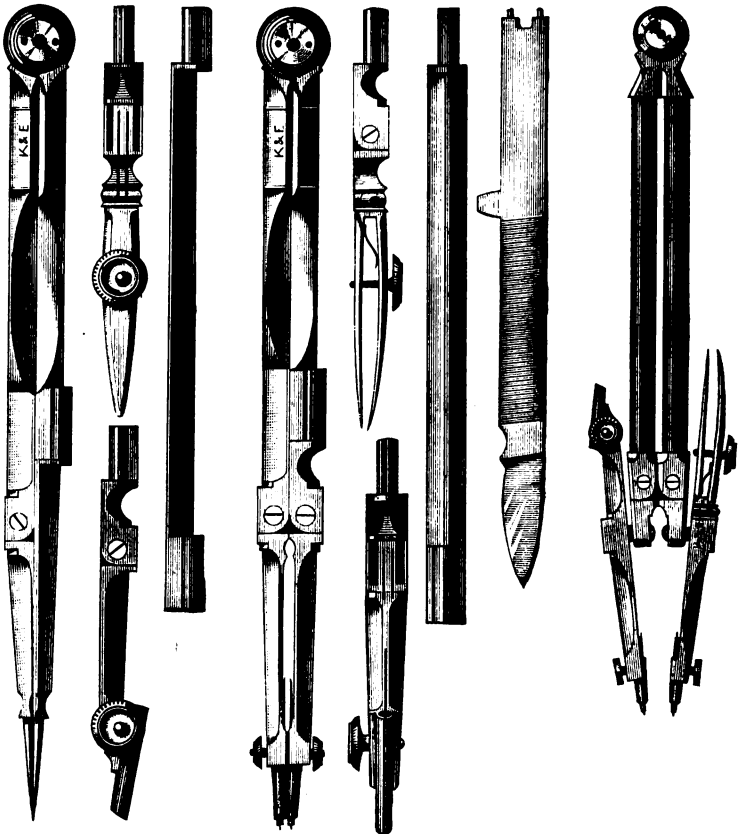
640. Bow Pen, $3\frac{1}{2}$ inch	each	\$ 3 25
641. Bow Pencil, $3\frac{1}{2}$ inch	"	3 25
642. Bow Pen with Needle Point, $3\frac{1}{2}$ inch	"	4 00
643. Bow Pencil with " " $3\frac{1}{2}$ "	"	4 00
644. Dividers, 5 inch	"	2 00
646. Hairspring Dividers, 5 inch	"	3 00
650. Compasses, $5\frac{1}{2}$ inch, with Joint in each leg, fixed Needle Point, Pen and Pencil Point	"	10 00



Illustrations 2/3 size.

1/3 size.

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No. 651.

652.

653.

- | | | |
|------|---|---------------|
| 651. | Compasses 6 inch, with Pen, Pencil Point, Lengthening Bar and Knife Key | each \$ 10 00 |
| 652. | do. 6 inch, with Joint in each leg, Pen, Pencil, Needle Points, Lengthening Bar and Knife Key | “ 13 50 |
| 653. | Tubular Compasses, with improved Slide Bar and Needle Points | “ 15 00 |

Illustrations $\frac{2}{3}$ size.

"Copyright, 1887, by Keuffel & Esser."



No. 660.	661.	662.	665.	666.	667.	670.	671.	672.
660.	661.	662.	665.	666.	667.	670.	671.	672.
Drawing Pen, Ivory Handle, $4\frac{1}{2}$ inch	do. " " $5\frac{1}{2}$ "	do. " " $6\frac{1}{2}$ "	Drawing Pen, with Joint, Ivory Handle, $4\frac{1}{2}$ inch	do. " " " $5\frac{1}{2}$ "	do. " " " $6\frac{1}{2}$ "	Drawing Pen, with Joint, square Ivory Handle, $4\frac{1}{2}$ inch	do. " " " " $5\frac{1}{2}$ "	do. " " " " $6\frac{1}{2}$ "
each \$ 1 25	" 1 35	" 1 50	" 1 50	" 1 75	" 2 00	" 1 75	" 2 00	" 2 25

Steelspring Dividers and Bows No. 460 to 482 match the above.

CASES OF ENGLISH INSTRUMENTS

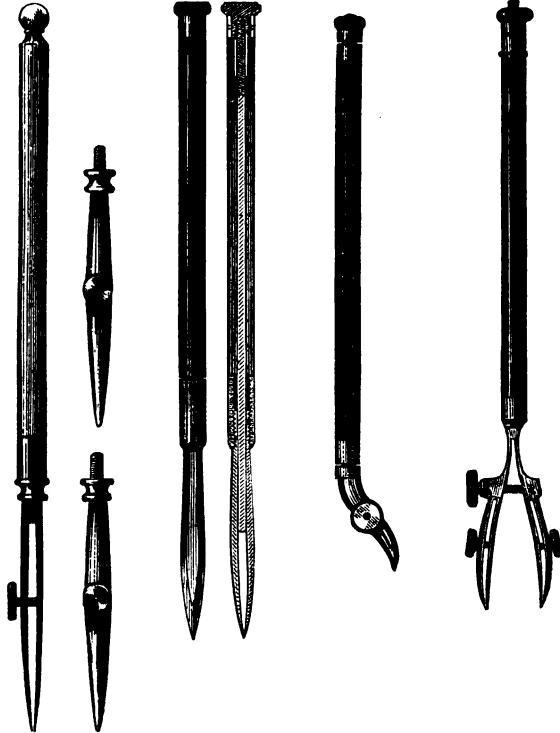
containing any of the above Instruments, also Scales, Colors, Brushes etc., made to order.

Empty Cases see page 90.



IMPROVED DRAWING PENS.

Illustrations $\frac{2}{3}$ size.



No. 691.

695.

696.

697.

690. Hatching Pen, extra fine, with Pushing Screw, 5 inch . . . each \$ 1 25

691. do. do. do. 3 Pens to one Handle " 3 00

695. Improved Drawing Pen without Set-screw " 1 50

This pen opens and closes by turning the thumb-screw at the upper end of handle, making the screw through the blades unnecessary, and a displacement of the nibs sideways impossible. As there is no obstruction to the sight in working, this pen is preferable for fine work.

696. Improved Curve Pen each \$ 1 75

This pen has a hollow handle in which a small rod turns. The blades being fastened to the end of the rod and being eccentric to it, turn easily and follow the smallest curve with precision. By means of a nut at the upper end of the rod the pen can be fastened and may then be used as a common drawing pen.

697. Improved Railroad Pen each \$ 4 50

The construction of this pen is exactly like that of No. 696 with the exception of its having two pair of blades. The heads of the screws in the blades are graduated to secure uniform adjustment.

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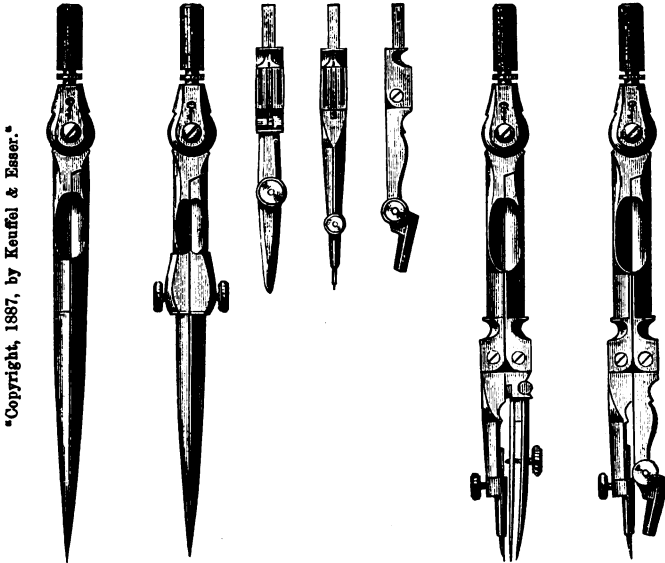
GERMAN INSTRUMENTS

of German Silver, best Steel Points, highly finished.

Extra Quality "TRADE  MARK"

We ask our customers to pay particular attention to this trade-mark, whenever they want the best of these instruments.

Illustrations $\frac{2}{3}$ size.



No. 700.

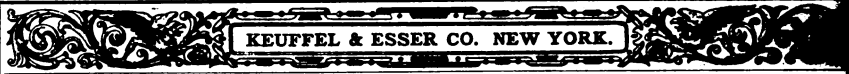
702.

704.

705.

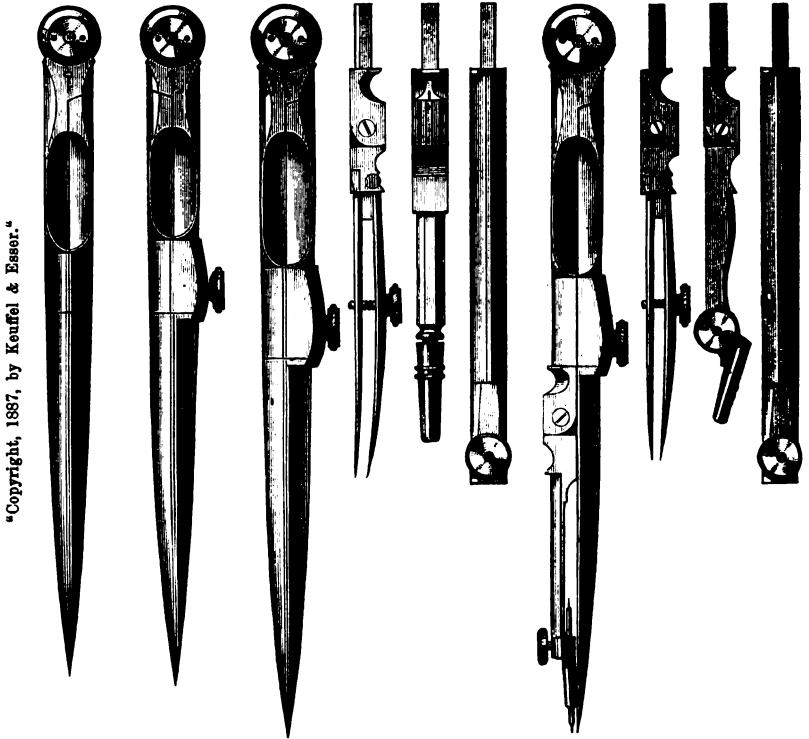
700.	Plain Dividers, $3\frac{1}{2}$ inch, with Handle	each \$ 1 00
702.	Compasses, $3\frac{1}{2}$ inch, with Pen, Pencil and Needle Point	" 2 75
704.	do. $3\frac{1}{2}$ " " fixed Needle and Pen Point	" 2 15
705.	do. $3\frac{1}{2}$ " " " " Pencil Point	" 2 15





Each instrument stamped with trade-mark 

Illustrations $\frac{2}{3}$ size.



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No. 707.	710.	714.	715.	
706. Plain Dividers, 4 inch				each \$ 80
707. " " 5 "				" 85
708. " " 6 "				" 1 00
710. Hairspring Dividers, 5 inch				" 1 50
711. " " 6 "				" 2 00
714. Compasses, 5 $\frac{1}{2}$ inch, with Pen, Pencil Point and Lengthening Bar				" 2 50
715. Compasses, 5 $\frac{1}{2}$ inch, with fixed Needle Point, Steel, Pen, Pencil Point and Lengthening Bar				" 3 00

Each instrument stamped with trade-mark 

Illustrations $\frac{2}{3}$ size.

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No. 716.

717.

718.

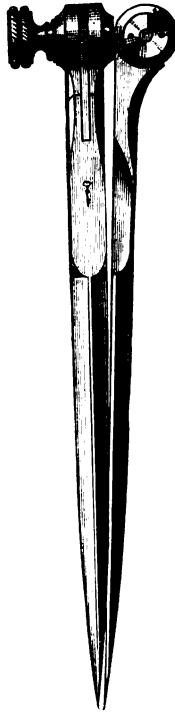
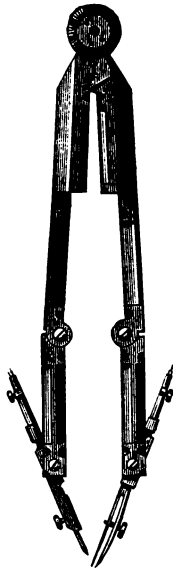
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|------|---------------------------------|---|--------------|
| 716. | Compasses, $5\frac{1}{4}$ inch, | with Hairspring to fixed Needle Point,
Pen, Pencil Point and Lengthening Bar | each \$ 4 50 |
| 717. | " $5\frac{1}{4}$ " | with Pen, Pencil, Needle Point and
Lengthening Bar | " 3 50 |
| 718. | " $5\frac{1}{2}$ " | with Joint in each leg, Pen, Pencil,
Needle Point and Lengthening Bar . | " 4 30 |



Each instrument stamped with trade-mark 

Illustrations $\frac{2}{3}$ size.

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No. 720.

721.

725.

727.

720.	Pocket Dividers, 5 inch, with Sheath	each	\$ 1 75
721.	Pocket Compasses with folding Points	"	5 50
725.	Three-legged Divider, 5 inch	"	3 00
727.	Whole and Half Dividers, 6 $\frac{1}{2}$ inch	"	2 50

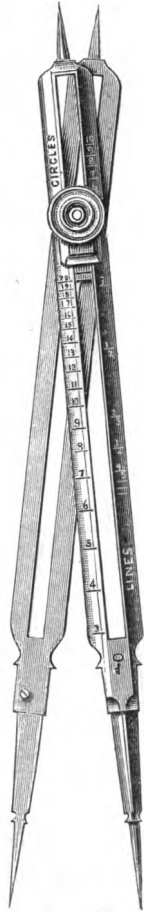
Each instrument stamped with trade-mark 

Illustrations $\frac{1}{2}$ size.

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No. 731.

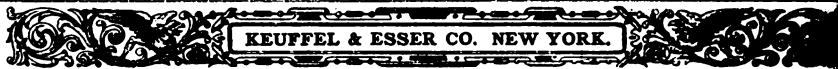


732.



733.

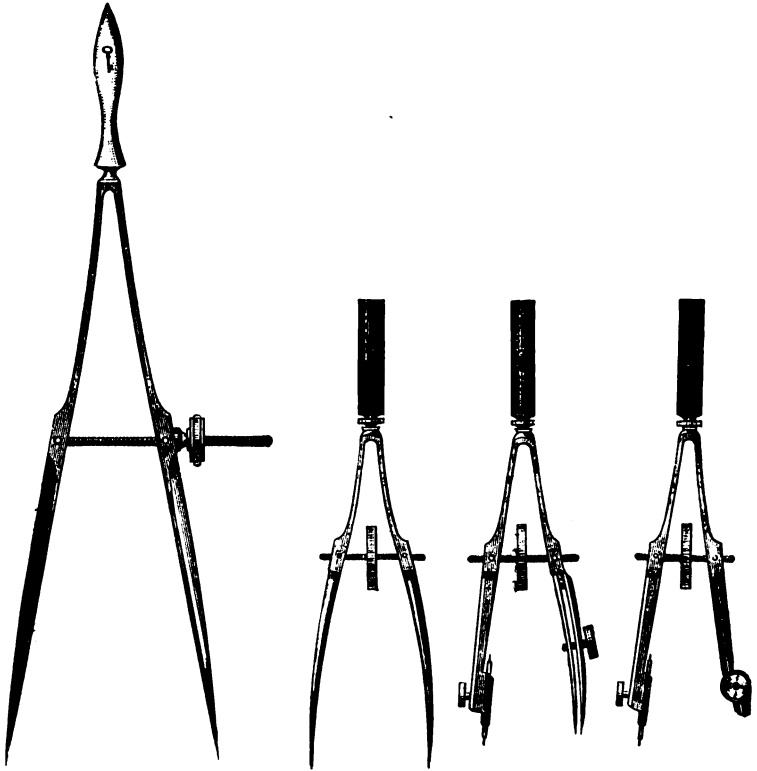
730.	Proportional Dividers, $7\frac{1}{4}$ inch, for lines and circles, in Case each	\$ 8 00
731.	do. $9\frac{1}{4}$ " " " " " " " "	10 35
732.	do. $7\frac{1}{4}$ " with Rack-Movement, for lines, circles solids and planes, in Case . . .	11 50
733.	Proportional Dividers, $9\frac{1}{4}$ inch, with Micrometer adjustment, for lines and circles, in Case	12 65



Each instrument stamped with trade-mark (ケッセル)

Illustrations $\frac{2}{3}$ size.

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No. 739.

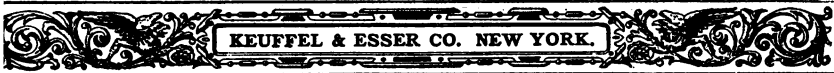
740.


741.

742.

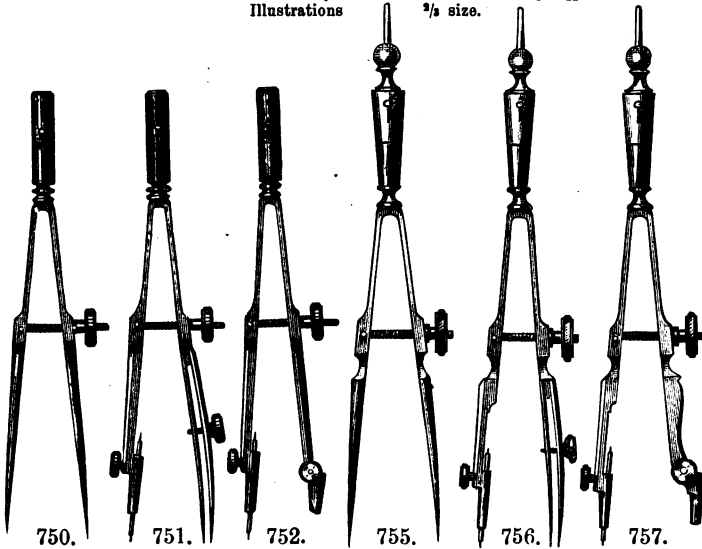
- | | | |
|--|------|---------|
| 739. Large Steelspring Dividers, 5 $\frac{1}{2}$ inch, white Handle . . . | each | \$ 2 35 |
| 740. Steelspring Dividers, 3 $\frac{1}{2}$ inch, German Silver Handle . . . | " | 1 85 |
| 741. " Bow Pen, 3 $\frac{1}{2}$ inch, with Needle Point, German Silver Handle | " | 2 05 |
| 742. Steelspring Bow Pencil, 3 $\frac{1}{2}$ inch, with Needle Point, German Silver Handle | " | 2 05 |
| 743. Steelspring Bows, set of 3, No. 740, 741, 742 in Morocco Case | set | 6 70 |

Steelspring Bows No. 740, 741, 742 have a right and left thread, operated by one thumbnut situated between the shanks of the instrument. They are opened and closed by the screw which holds the points rigidly in any position.



Each instrument stamped with trade-mark 
Illustrations $\frac{2}{3}$ size.

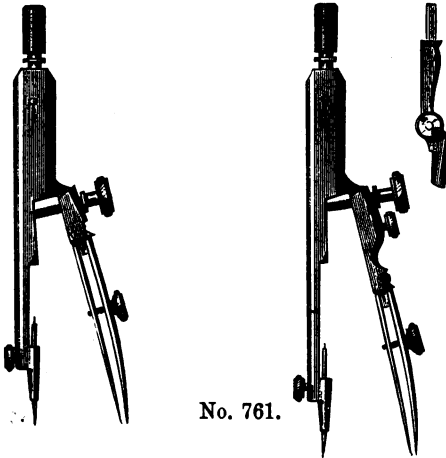
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- | | | | |
|------|--|------|---------|
| 750. | Steelspring Dividers, $3\frac{1}{4}$ inch, with German Silver Handle | each | \$ 1 10 |
| 751. | " Bow Pen, $3\frac{1}{4}$ " " Needle Point | do. | " 1 40 |
| 752. | " Bow Pencil, $3\frac{1}{4}$ " " " do. | " | " 1 40 |
| 753. | " Bows, set of 3, No. 750, 751, 752 in Morocco Case | set | 4 65 |

- | | | | |
|------|---|------|------|
| 755. | Steelspring Dividers, 4 inch, with white Handle | each | 1 00 |
| 756. | " Bow Pen, 4 " with Needle Point do. | " | 1 30 |
| 757. | " Bow Pencil, 4 " " " do. | " | 1 30 |
| 758. | " Bows, set of 3, No. 755, 756, 757 in Morocco Case | set | 4 35 |

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No. 760.

No. 761.

- | | | | |
|------|---|------|---------|
| 760. | Spring Bow Pen, with Needle Point | each | \$ 1 50 |
| 761. | do. do. " " " and Pencil Point | " | 2 10 |




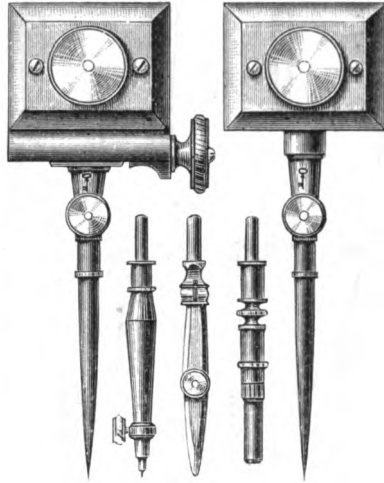
Each instrument stamped with trade-mark 

Illustration $\frac{2}{3}$ size.

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No. 770.

770. Beam Compasses to fit on any straight edge, with two Steel Points, Pen, Pencil and Needle Point . . . each \$ 6 90
 Morocco Case for No. 770 “ 1 00
 Bars for Beam compasses see page 153.

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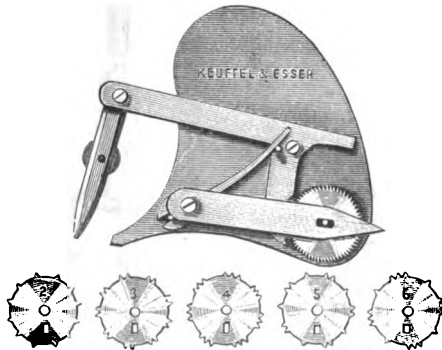


Illustration $\frac{2}{3}$ size.

No. 775.

775. Dotting Instrument of German Silver with 6 Wheels, in Case each \$ 3 75

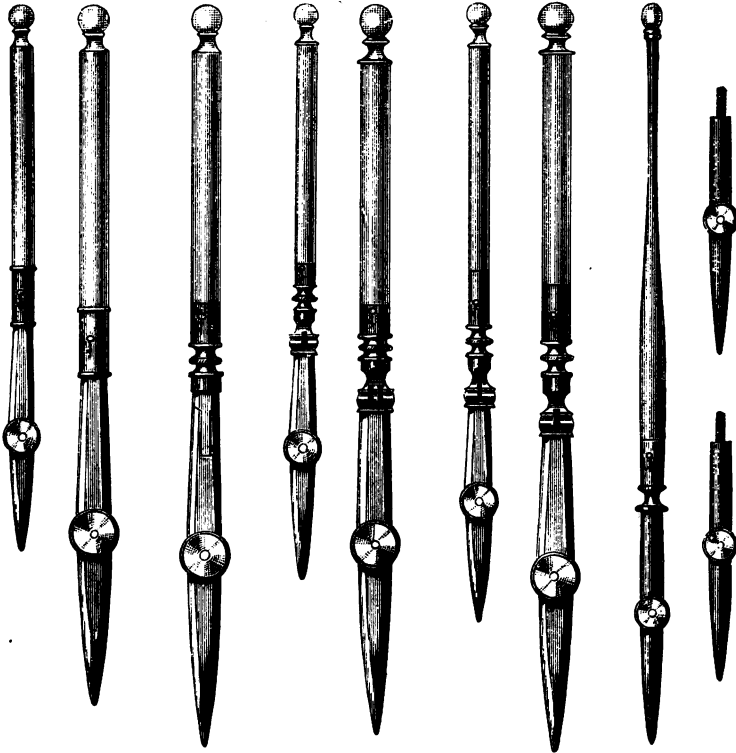
The outer wheel is rolled on the edge of a T Square or straight edge and turns the ratchet wheel, which causes the pen to move up and down. The flat point close to the pen must slide on the paper. To change the pattern of the dotted lines, throw back the spring which holds the wheels on the axle and insert the proper ratchet wheel.

KEUFFEL & ESSER CO. NEW YORK.

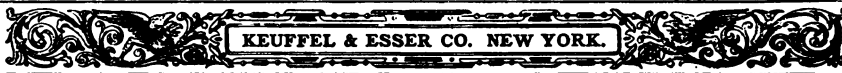
Each instrument stamped with trade-mark 


Illustrations $\frac{2}{3}$ size.

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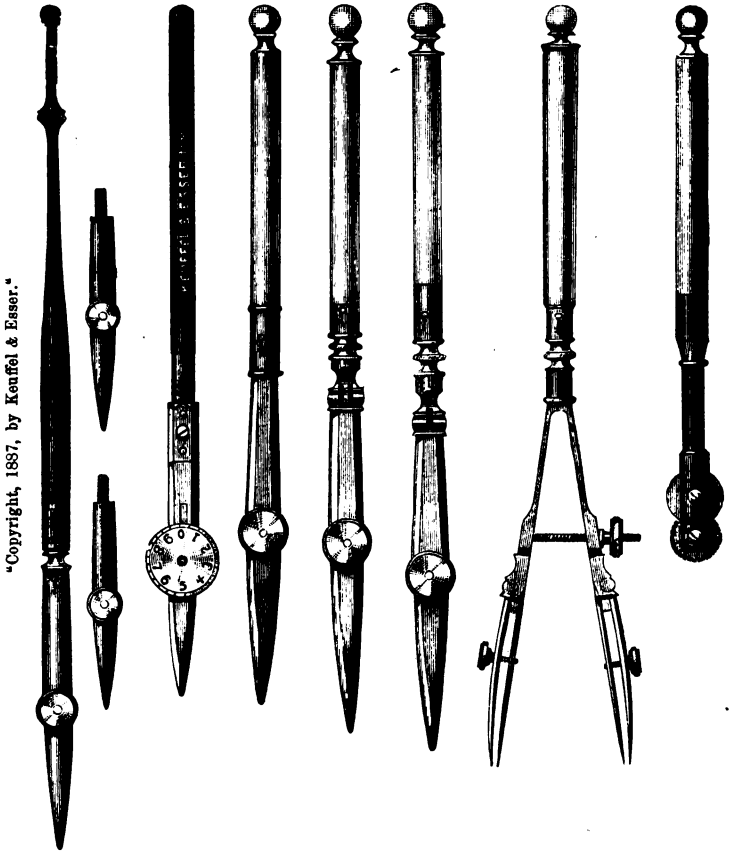


No. 779.	780.	781.	782.	783.	784.	785.	786.	
779.	780.	781.	782.	783.	784.	785.	786.	
Drawing Pen, 4 inch	do.	do.	do.	do.	do.	do.	Hatching Pen, 5, inch, with 3 Pens to one Handle	
.	5 "	5 " common Joint	4 " fine Joint	5½ " " "	4 " " " and Pin	5½ " " "		
each	"	"	"	"	"	"	"	
\$	45	55	70	75	80	90	1 50	



Each instrument stamped with trade-mark 


Illustrations $\frac{3}{4}$ size.



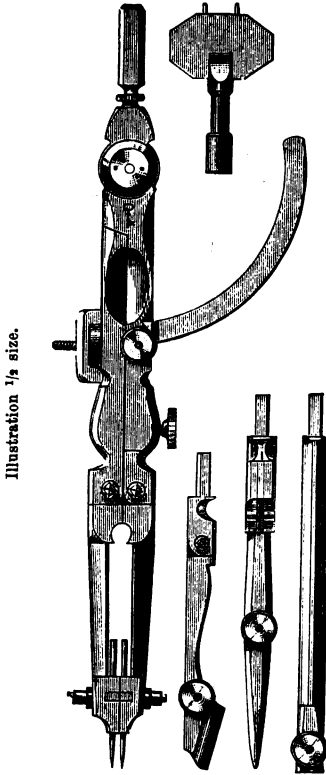
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No. 792. 795. 797. 798. 799. 805. 810.

790.	Hatching Pen, 6 inch, with Pushing Screw	each \$	85
791.	do. 6 " do. 2 Pens to one Handle "	"	1 25
792.	do. 6 " do. 3 Pens to one Handle "	"	1 65
795.	Drawing Pen, 5 $\frac{1}{4}$ inch, with graduated Thumb-Screw	"	1 75
797.	do. 5 " with German Silver Blades, for red ink "	"	70
798.	do. 5 $\frac{1}{2}$ " do. do. with Joint	"	85
799.	do. 5 $\frac{1}{2}$ " do. do. with Joint and Pin "	"	1 00
805.	Railroad Pen, 5 $\frac{1}{2}$ inch, both Pens with Joint	"	2 50
810.	Dotting Pen, with 1 Wheel, 5 inch	"	1 00
	Drawing Pens carefully set and sharpened	each \$	20 to 25

Each instrument stamped with trade-mark 

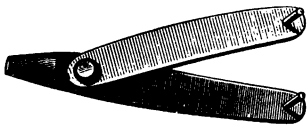
LITHOGRAPHIC COMPASSES.



No. 820.

820. German Silver, very strong, with Arc, Set Screw and Micrometer Adjustment, 8 inch; with Pen, Pencil-Point, Lengthening Bar and Wrench-key, in Case . each \$ 13 65

Illustrations full size.



No. 825.



830.

825. Adjusting key and screwdriver each \$ 50
 830. Patent Leads for Instruments, Box contg. 4 Leads " 15



SEPARATE PARTS

for

SUPERIOR SWISS AND GERMAN INSTRUMENTS.

To accommodate our customers we keep in stock separate parts for our Mathematical Instruments, such as Pen Points, Pencil Points, Needle Points, Lengthening Bars, Screws, Shouldered Needles, Pen Handles etc., but while we can replace parts for compasses, we can not replace the compasses without the parts, nor the three-cornered steel legs of compasses. To repair points which are not detachable from the compasses (so called fixed points) is generally not advisable.

As our instruments are hand-made and the parts belonging to them consequently not interchangeable, they must be fitted to the instrument. The charge for such fitting is included in the following prices.

PARTS FOR SUPERIOR SWISS INSTRUMENTS.

Pen Points, Pencil Points, Needle Points, for $3\frac{1}{2}$ inch Compasses	each	\$	1	25
do. do. do. " $4\frac{1}{2}, 5\frac{1}{2}, 6$ inch "	"	"	1	60
do. do. do. " $6\frac{1}{2}, 7$ inch "	"	"	1	75
do. do. do. " Beam Compasses .	"	"	1	00
Lengthening Bars for $4\frac{1}{2}, 5\frac{1}{2}, 6$ inch Compasses	"	"	1	35
do. " $6\frac{1}{2}, 7$ " "	"	"	1	50
Screws and Nuts	each from	\$	20	to \$ 25
Shouldered Needles	"	"	15	" 20
Ivory Handles for Drawing Pens, $4\frac{1}{2}$ inch	each	\$	25	
do. " do. $4\frac{3}{4}$ "	"	"	30	
do. " do. $5\frac{1}{4}$ "	"	"	35	
do. " do. $6\frac{1}{4}$ "	"	"	40	

PARTS FOR GERMAN INSTRUMENTS.

Pen Points, Pencil Points, Needle Points, for $3\frac{1}{2}$ inch Compasses	each	\$	1	00
do. do. do. " $5\frac{1}{2}$ " " " "	"	"	1	25
do. do. do. " Beam Compasses .	"	"	80	
Screws and Nuts	each from	\$	15	to 20
Shouldered Needles	"	"	10	" 15
Handles for Drawing Pens, 4 inch	each	\$	20	
do. " do. 5 or $5\frac{1}{2}$ inch	"	"	25	

KEUFFEL & ESSER CO. NEW YORK.

GERMAN INSTRUMENTS IN CASES.

German Silver, best Steel Points, highly finished.

Extra Quality "TRADE MARK"

EXTRA FINE MOROCCO POCKET CASES, LINED WITH PURPLE VELVET.

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No. 850.

850. contg.: 1 Compass, 3 1/4 inch, with Pen, Pencil and Needle Point, No. 702,
 1 Drawing Pen with Joint, 4 inch, No. 782,
 1 Box with Leads No. 830 each \$ 4 50


"Copyright, 1887, by Keuffel & Esser."



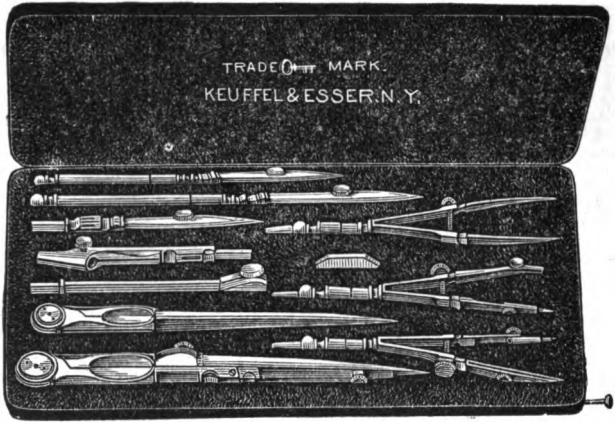
No. 852.

852. contg.: 1 Compass, 5 inch, with fixed Needle Point, Pen and Pencil Point and Lengthening Bar, No. 715,
 1 Divider, 5 inch, No. 707,
 1 Steelspring Bow Pen with Needle Point, No. 756,
 1 Drawing Pen with Joint, No. 782,
 1 do. " " and Pin, No. 785,
 1 Box with Leads, No. 830 each \$ 8 50



Each instrument stamped with trade-mark 

"Copyright, 1887, by Keuffel & Esser."



No. 854.

854. contg.: 1 Compass, 5 inch, with fixed Needle Point, Pen and Pencil Point and Lengthening Bar, No. 715,
 1 Dividers, 5 inch, No. 707,
 1 Steelspring Divider, No. 755,
 1 " Bow Pen, No. 756,
 1 " Bow Pencil, No. 757,
 1 Drawing Pen with Joint, No. 782,
 1 do. " " and Pin, No. 785,
 1 Box with Leads, No. 830 each \$ 11 25


"Copyright, 1887, by Keuffel & Esser."



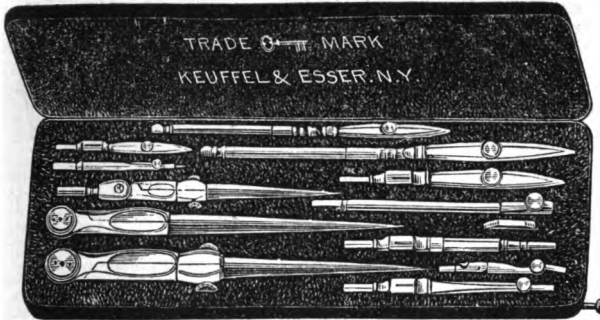
No. 856.

856. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
 1 Divider, 5 inch, No. 707,
 1 Drawing Pen with Joint and Pin, No. 785,
 1 Box with Leads, No. 830 each \$ 6 85

KEUFFEL & ESSER CO. NEW YORK.

Each instrument stamped with trade-mark 

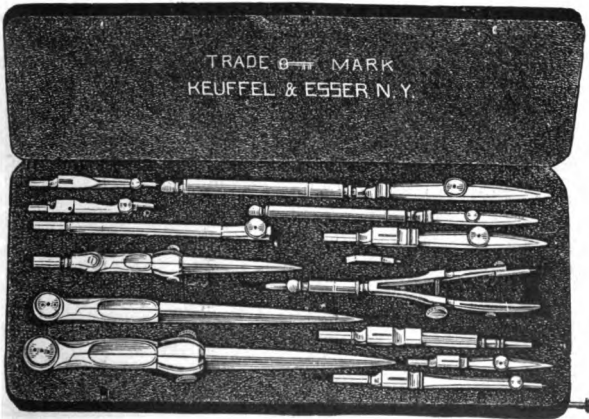
“Copyright, 1887, by Keuffel & Esser.”



No. 858.

858. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
 1 Divider, 5 inch, No. 707,
 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 702,
 1 Drawing Pen with Joint, No. 782,
 1 do. “ “ and Pin, No. 785,
 1 Box with Leads, No. 830 each \$ 10 80

“Copyright, 1887, by Keuffel & Esser.”



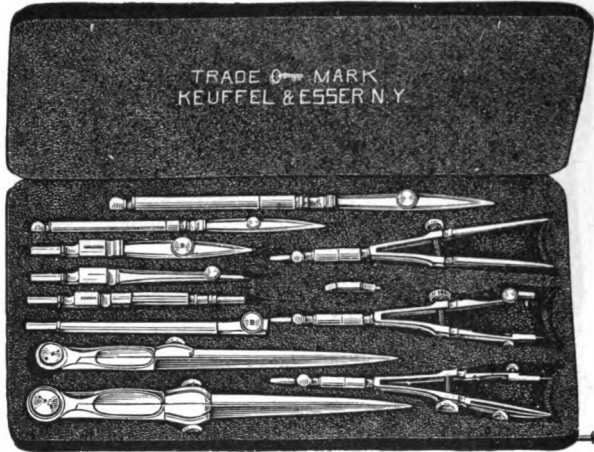
No. 860.

860. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
 1 Divider, 5 inch, No. 707,
 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 702,
 1 Steelspring Bow Pen, No. 756,
 1 Drawing Pen with Joint, No. 782,
 1 do. “ “ and Pin, No. 785,
 1 Box with Leads, No. 830 each \$ 12 25



Each instrument stamped with trade-mark 

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No. 862.

862. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
 1 Hairspring Divider, 5 inch, No. 710,
 1 Set Steelspring Divider and Bows, No. 755, 756, 757,
 1 Drawing Pen, with Joint, No. 782,
 1 do. " " and Pin, No. 785,
 1 Box with Leads, No. 830 each \$ 12 75

"Copyright, 1887, by Keuffel & Esser."



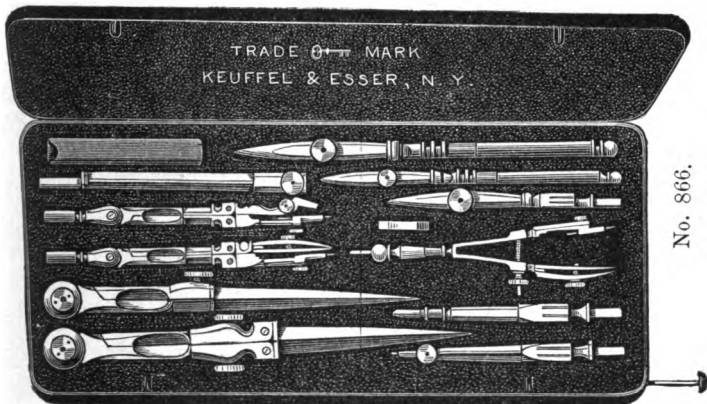
No. 864.

864. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
 1 Hairspring Divider, No. 710,
 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 702,
 1 Set Steelspring Divider and Bows, No. 755, 756, 757,
 1 Drawing Pen, with Joint, No. 782,
 1 do. " " and Pin, No. 785,
 1 Box with Leads, No. 830 each \$ 15 75

KEUFFEL & ESSER CO. NEW YORK.

Each instrument stamped with trade-mark 

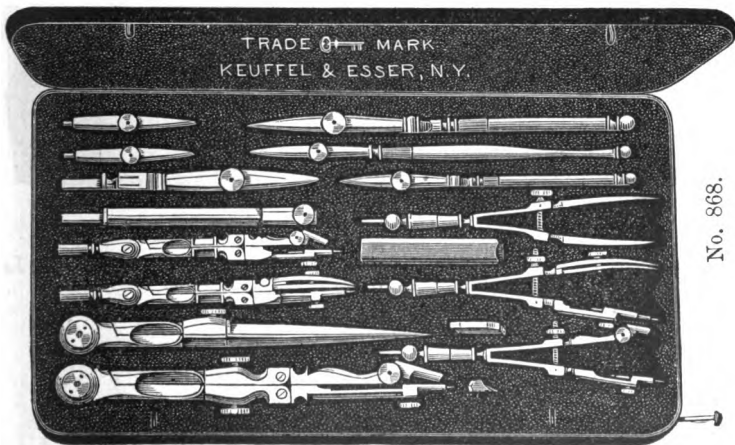
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No. 866.

866. contg.: 1 Compass, 5½ inch, with Joint in each leg, Pen, Pencil, Needle Point and Lengthening Bar, No. 718,
 1 Hairspring Divider, 5 inch, No. 710,
 1 Compass, 3¼ inch, with fixed Needle and Pen Point, No. 704,
 1 do. 3¼ " " " " " Pencil " No. 705,
 1 Steelspring Bow Pen, No. 756,
 1 each Drawing Pen No. 782, 785,
 1 Box with Leads, No. 830 each \$ 15 50

"Copyright, 1887, by Keuffel & Esser."



No. 868.

868. contg.: 1 Compass, 5½ inch, with Hairspring to fixed Needle Point, Pen, Pencil Point and Lengthening Bar, No. 716,
 1 Hairspring Divider, 5 inch, No. 710,
 1 Compass, 3¼ inch, with fixed Needle and Pen Point, No. 704,
 1 do. 3¼ " " " " " Pencil " No. 705,
 1 Set Steelspring Divider and Bows, No. 755, 756, 757,
 1 each Drawing Pen, No. 782, 785,
 1 Hatching Pen, with 3 Pens to one Handle, No. 786,
 1 Box with Leads, No. 830 each \$ 20 25



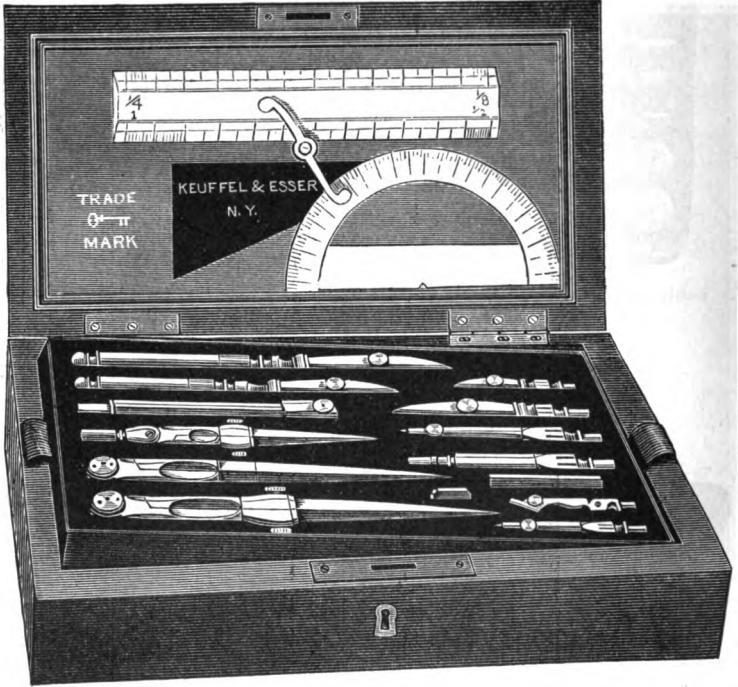
GERMAN INSTRUMENTS.

German Silver, best Steel Points, highly finished.

Quality "TRADE  MARK"

In fine polished Black Walnut Cases with Lock and Tray. Lined with Purple Velvet and with Cushion between instruments and lid.


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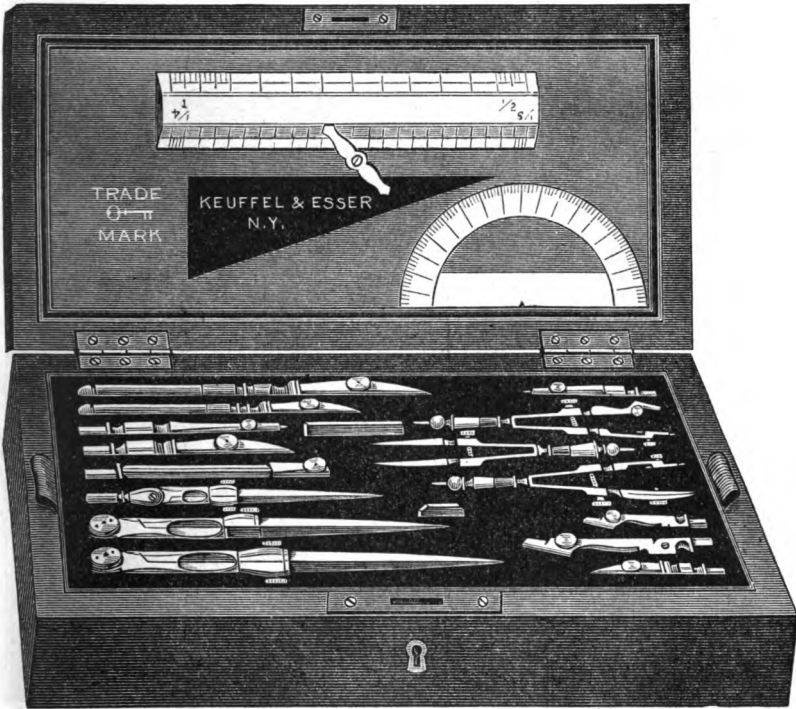


No. 882.

- 880. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
- 1 Divider, 5 inch, No. 707,
- 1 Steelspring Bow Pen, No. 756,
- 1 each Drawing Pen, No. 782, 785,
- 1 German Silver Protractor,
- 1 Rubber Triangle,
- 1 Boxwood Scale, No. 1390,
- 1 Box with Leads, No. 830 each \$ 12 65
- 882. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
- 1 Divider, 5 inch, No. 707,
- 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 702,
- 1 each Drawing Pen, No. 782, 785,
- 1 German Silver Protractor,
- 1 Rubber Triangle,
- 1 Boxwood Scale, No. 1390,
- 1 Box with Leads, No. 830 each \$ 14 15

KEUFFEL & ESSER CO. NEW YORK.

Each instrument stamped with trade-mark 



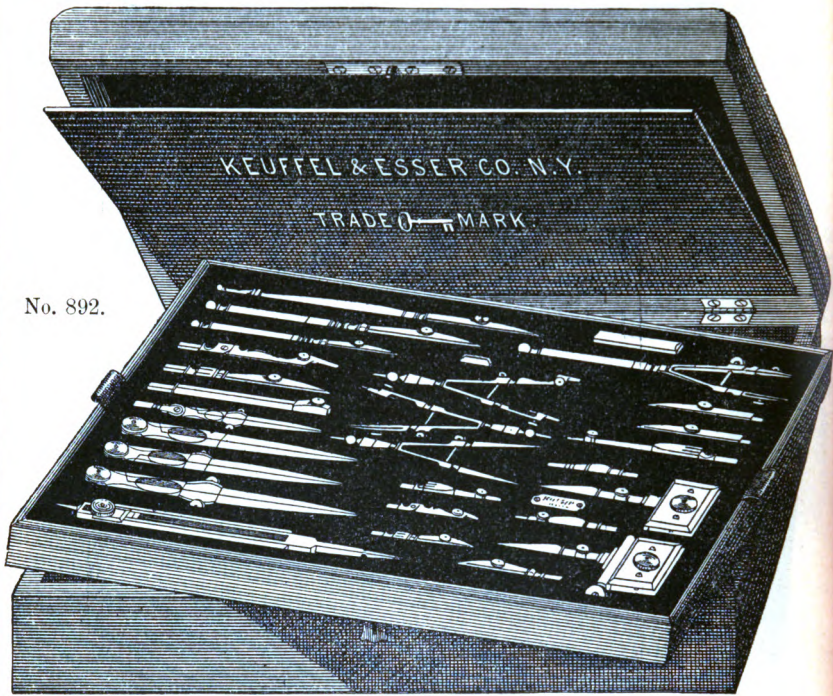
No. 888.

886. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
 1 Divider, 5 inch, No. 707,
 1 Compass, 3¼ inch, with Pen, Pencil and Needle Point, No. 702,
 1 Steelspring Bow Pen, No. 756,
 1 Drawing Pen with Joint, No. 782,
 1 do. " " and Pin, No. 785,
 1 German Silver Protractor, 1 Rubber Triangle,
 1 Boxwood Scale, No. 1390, 1 Box with Leads,
 No. 830 each \$ 15 35
888. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
 1 Hairspring Divider, 5 inch, No. 710,
 1 Compass, 3¼ inch, with Pen, Pencil and Needle Point, No. 702,
 1 Set Steelspring Divider and Bows, No. 755, 756, 757,
 1 Drawing Pen with Joint, No. 782,
 1 do. " " and Pin, No. 785,
 1 German Silver Protractor, 1 Rubber Triangle,
 1 Boxwood Scale, No. 1390, 1 Box with Leads,
 No. 830 each \$ 19 45

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Each instrument stamped with trade-mark



No. 892.

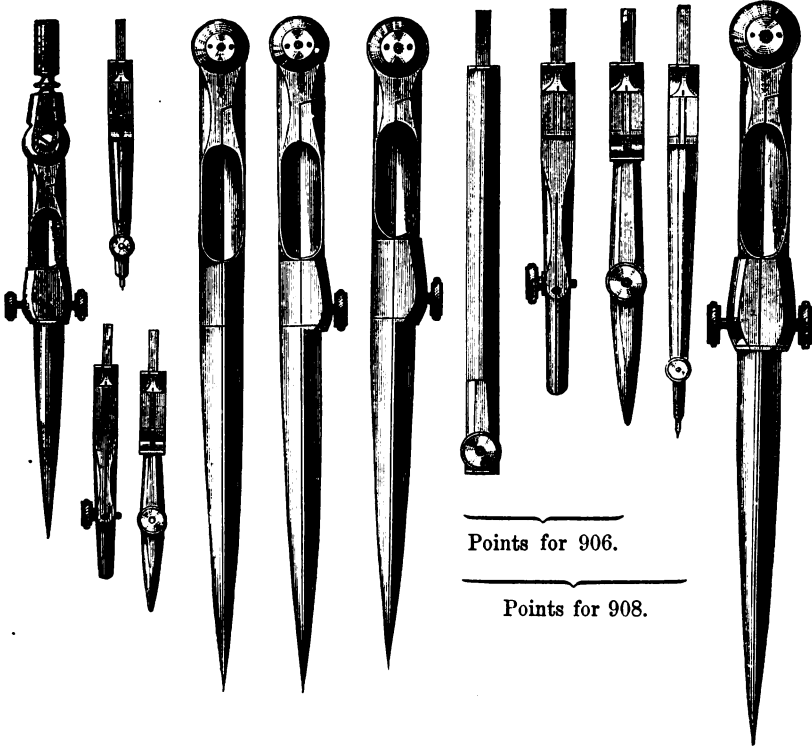
890. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 717,
 1 Hairspring Divider, 5 inch, No. 710,
 1 Plain Divider, 5 inch, No. 707,
 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 702,
 1 Set Steelspring Divider and Bows, No. 755, 756, 757,
 1 Proportional Divider, 7¼ inch, No. 730,
 1 Railroad Pen, 5½ inch, No. 805,
 1 Drawing Pen, with Joint, No. 782,
 1 do. " " and Pin, No. 785,
 1 Hatching Pen, 6 inch, with 3 Pens, No. 792,
 1 German Silver Protractor,
 1 Rubber Triangle,
 1 Boxwood Scale No. 1390,
 1 Box with Leads No. 830 each \$ 33 80
892. contg.: the same instruments as No. 890, with addition
 of Beam Compass, No. 770 " 41 65

GERMAN INSTRUMENTS

of German Silver, Steel Points.

Quality "TRADE  MARK"

Illustrations $\frac{2}{3}$ size.



No. 900.

902.


904.

906.

908.

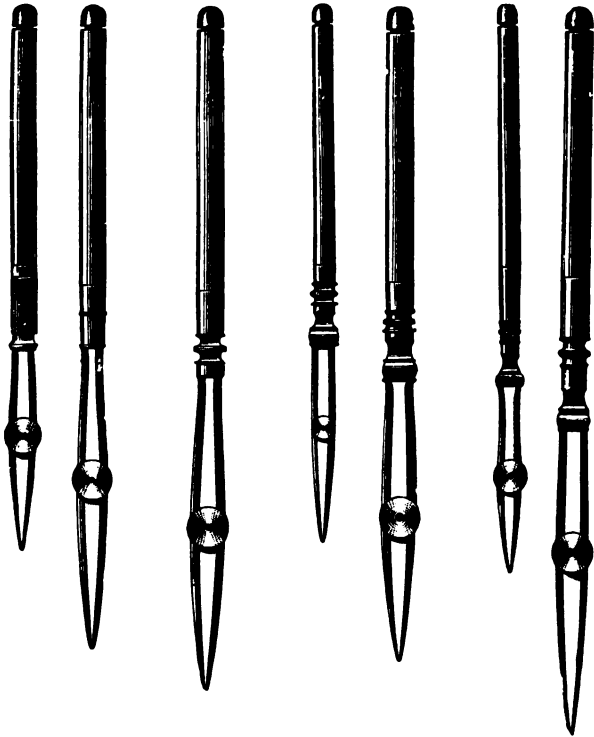
900.	Compasses, $3\frac{1}{2}$ inch,	with Pen, Pencil and Needle Point	each	\$ 2 20
902.	Plain Dividers, 5 inch		"	70
904.	Hairspring Dividers, 5 inch		"	1 30
906.	Compasses, $5\frac{1}{4}$ inch,	with Pen, Pencil Point and Leng-		
		thening Bar	"	2 00
908.	do. $5\frac{1}{2}$ "	with Pen, Pencil, Needle Point and		
		Lengthening Bar	"	2 75



Each instrument stamped with trade-mark 

Illustrations $\frac{2}{3}$ size.

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No. 919. 920. 921. 922. 923. 924. 925.

919.	Drawing Pen, 4 inch.	each	\$	30
920.	do.	5 "	"	35
921.	do.	5 " common Joint.	"	40
922.	do	4 " fine Joint . . . . .	. . . . .	"	50
923.	do.	5 $\frac{1}{2}$ " " " . . . . .	. . . . .	"	55
924.	do.	4 " " " and Pin . . . . .	. . . . .	"	70
925.	do.	5 $\frac{1}{2}$ " " " " " . . . . .	. . . . .	"	75

KEUFFEL & ESSER CO. NEW YORK.

GERMAN INSTRUMENTS IN CASES.

German Silver, Steel Points.

Quality "TRADE  MARK"

Cases of black Morocco, lined with Velvet. No. 935 to 950 have a Satin Cushion hinged to the box, to keep the compasses from coming in contact with the tools in the cover. The Cases are locked by a rod. These Cases are the neatest and best ever offered, except our Morocco Pocket Cases No. 850 to 868.

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No. 931.

931. contg.: 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 900,
 1 Drawing Pen with Joint, No. 922,
 1 Box with Leads, No. 830 each \$ 3 40


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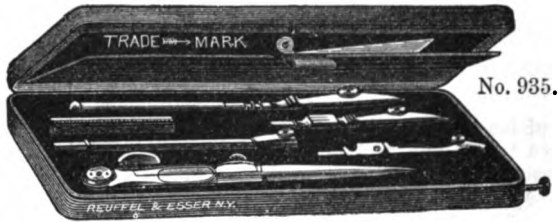
No. 933.

933. contg.: 1 Compass, 3½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, .
 1 Divider, 3½ inch, with Handle,
 1 Drawing Pen with Joint, No. 922,
 1 Box with Leads, No. 830 each \$ 4 30

KEUFFEL & ESSER CO. NEW YORK.

Each instrument stamped with trade-mark 

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No. 935.

935. contg.: 1 Compass, $5\frac{1}{2}$ inch, with Pen, Pencil Point and Lengthening Bar, No. 906,
1 Drawing Pen with Joint, No. 923,
1 Box with Leads, No. 830,
1 Boxwood Scale, No. 1605, 1 Triangle . . each \$ 3 50

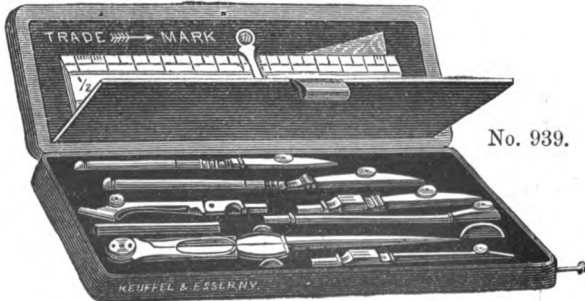
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No. 937.


937. contg.: 1 Compass, $5\frac{1}{2}$ inch, with Pen and Pencil Point,
1 Divider, 5 inch, No. 902,
1 Drawing Pen with Joint, No. 923,
1 Box with Leads, No. 830,
1 Boxwood Scale, No. 1605, 1 Triangle . . each \$ 3 80

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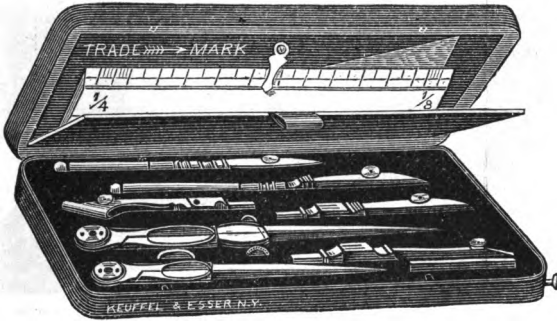


No. 939.

939. contg.: 1 Compass, $5\frac{1}{2}$ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 908,
1 Drawing Pen, No. 919,
1 Drawing Pen with Joint, No. 923,
1 Box with Leads, No. 830,
1 Boxwood Scale, No. 1605, 1 Triangle . . . each \$ 4 90

Each instrument stamped with trade-mark 

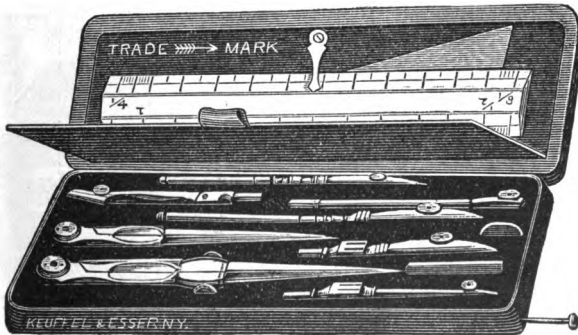
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No. 941.

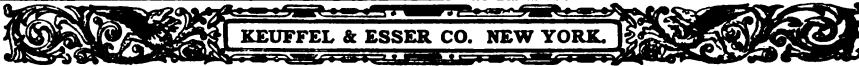
941. contg.: 1 Compass, 5½ inch, with Pen, Pencil and Needle Point,
 1 Divider, 5 inch, No. 902,
 1 Drawing Pen, No. 919,
 1 Drawing Pen with Joint, No. 923,
 1 Box with Leads, No. 830,
 1 Boxwood Scale, No. 1605,
 1 Triangle each \$ 5 40


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No. 943.

943. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point
 and Lengthening Bar, No. 908,
 1 Divider, 5 inch, No. 902,
 1 Drawing Pen, No. 919,
 1 Drawing Pen with Joint, No. 923,
 1 Box with Leads, No. 830,
 1 Boxwood Scale, No. 1605,
 1 Triangle each \$ 5 80



Each instrument stamped with trade-mark 

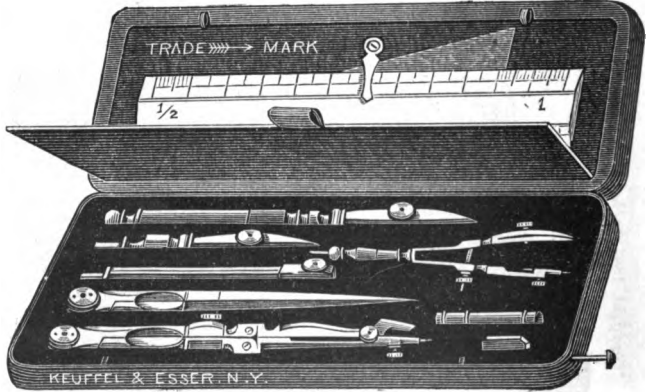
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No. 945.

945. contg.: 1 Compass, 5½ inch, with fixed Needle Point, Pen and Pencil Point,
 1 Divider, 5 inch, No. 902,
 1 Drawing Pen with Joint, No. 923,
 1 Box with Leads, No. 830,
 1 Boxwood Scale, No. 1605,
 1 Triangle each \$ 4 20


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No. 947.

947. contg.: 1 Compass, 5½ inch, with fixed Needle Point, Pen, Pencil Point and Lengthening Bar,
 1 Divider, 5 inch, No. 902,
 1 Steelspring Bow Pen, No. 756,
 1 Drawing Pen with Joint, No. 923,
 1 Box with Leads, No. 830,
 1 Boxwood Scale, No. 1605,
 1 Triangle each \$ 5 90

KEUFFEL & ESSER CO. NEW YORK.

Each instrument stamped with trade-mark 

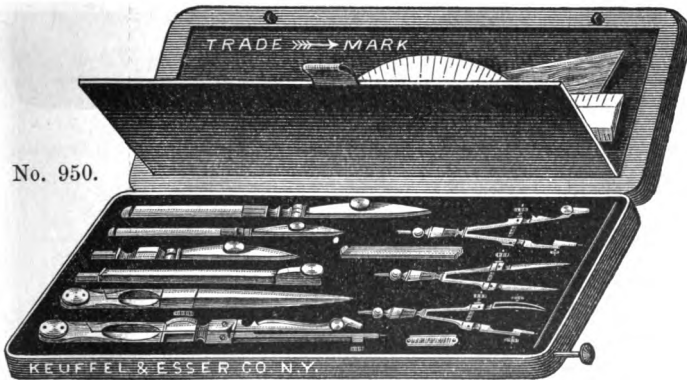
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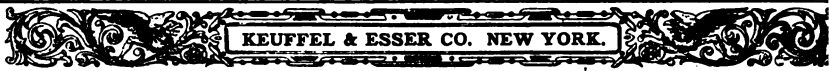
No. 949.

949. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 908,
 1 Divider, 5 inch, No. 902,
 1 Steelspring Bow Pen with Needle Point, No. 756,
 1 Drawing Pen, No. 919,
 1 Drawing Pen, with Joint, No. 923,
 1 Box with Leads, No. 830,
 1 Boxwood Scale, No. 1605,
 1 Semicircular Protractor,
 1 Triangle each \$ 7 55

No. 950.



950. contg.: 1 Compass, 5½ inch, with fixed Needle Point, Pen, Pencil Point and Lengthening Bar,
 1 Divider, 5 inch, No. 902,
 1 Steelspring Dividers, No. 755,
 1 do. Bow Pen, No. 756,
 1 do. Bow Pencil, No. 757,
 1 Drawing Pen, No. 919,
 1 do. with Joint, No. 923,
 1 Box with Leads, No. 830,
 1 Boxwood Scale, No. 1605,
 1 Semicircular Protractor,
 1 Triangle each \$ 8 45



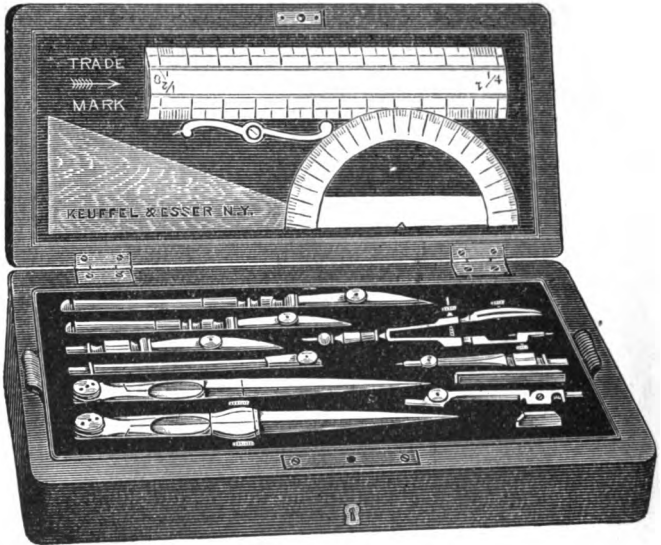
GERMAN INSTRUMENTS.

German Silver, Steel Points.

Quality "TRADE  MARK"

In black Walnut Cases with Look and Tray, lined with black Velvet and with Cushion between instruments and lid.


"Copyright, 1887, by Keuffel & Esser."

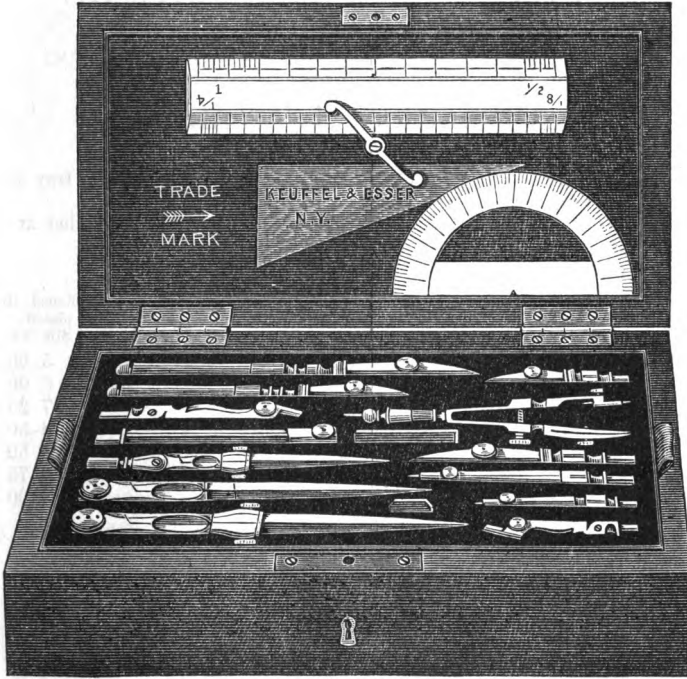


No. 955.

955. contg.: 1 Compass, $5\frac{1}{2}$ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 908,
 1 Divider, 5 inch, No. 902,
 1 Drawing Pen, No. 919,
 1 Drawing Pen, $5\frac{1}{8}$ inch, with Joint and Pin, No. 925,
 1 Steelspring Bow Pen with Needle Point, No. 756,
 1 Box with Leads, No. 830,
 1 Boxwood Scale, No. 1605,
 1 Semicircular Protractor, 1 Triangle . . . each \$ 10 25
957. contg.: 1 Compass, $5\frac{1}{2}$ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 908,
 1 Divider, 5 inch, No. 902,
 1 Compass, $3\frac{1}{8}$ inch, with Pen, Pencil and Needle Point, No. 900,
 1 Drawing Pen, No. 919,
 1 Drawing Pen with Joint and Pin, No. 925,
 1 Box with Leads, No. 830.
 1 Boxwood Scale, No. 1605,
 1 Semicircular Protractor, 1 Triangle . . . each \$ 11 95

KEUFFEL & ESSER CO. NEW YORK.

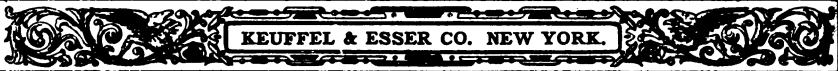
Each instrument stamped with trade-mark 



No. 959.

959. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 908,
 1 Divider, 5 inch, No. 902,
 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 900,
 1 Steelspring Bow Pen with Needle Point, No. 756,
 1 Drawing Pen, No. 919,
 1 Drawing Pen with Joint and Pin, No. 925,
 1 Box with Leads, No. 830,
 1 Boxwood Scale, No. 1605,
 1 Semicircular Protractor,
 1 Triangle each \$ 13 15
961. contg.: 1 Compass, 5½ inch, with Pen, Pencil, Needle Point and Lengthening Bar, No. 908,
 1 Hairspring Divider, 5 inch, No. 904,
 1 Compass, 3½ inch, with Pen, Pencil and Needle Point, No. 900,
 1 Set Steelspring Divider and Bows, No. 755, 756, 757,
 1 Drawing Pen, No. 919,
 1 Drawing Pen with Joint and Pin, No. 925,
 1 Box with Leads, No. 830,
 1 Boxwood Scale, No. 1605,
 1 Semicircular Protractor,
 1 Triangle each \$ 17 15

Copyright, 1887, by Keuffel & Esser.



EMPTY WOODEN CASES

with Lock and Tray

fitted for

Mathematical Instruments.

These Cases are made of thoroughly seasoned wood, have a tray to hold the instruments and under the tray room for colors, brushes etc.

Partitions under the tray for tools, colors etc., will be added at slight additional cost.

The dimensions refer to the size of the tray in the box.

Size of Tray.	Black Walnut, Brass Hinges and Shield, Tray lined with Cotton Velvet.	Rosewood polished, Hinges and Shield plated, Tray lined with Silk Velvet.
$3\frac{1}{2} \times 9$ inch	each \$ 3 25	each \$ 5 00
5×9 "	" 4 00	" 6 00
6×10 "	" 5 00	" 7 25
7×11 "	" 5 75	" 8 50
$5 \times 12\frac{1}{2}$ "	" 5 75	" 8 50
7×13 "	" 7 25	" 10 75
10×14 "	" 12 50	" 18 00

Cases of Rosewood, Mahogany, Oak or other wood with German Silver or plated corners and bands, made to order.

EMPTY POCKET CASES

fitted for

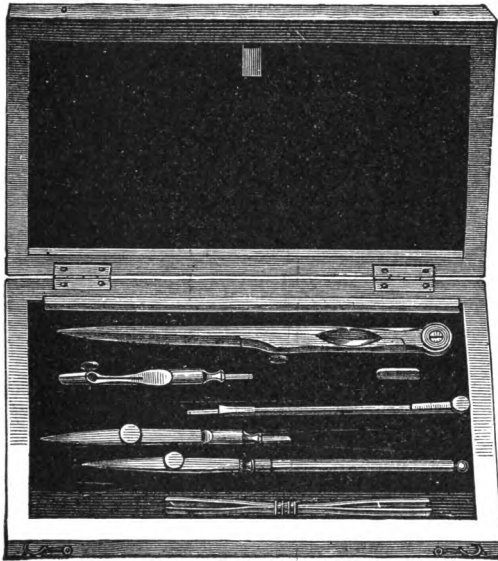
Mathematical Instruments.

These Cases are covered with Morocco, lined with Velvet and have a Bar Lock as illustrated under No. 560 etc.

Size of Case.	Lined with Cotton Velvet.	Lined with Silk Velvet.
2×6 inch	each \$ 1 30	each \$ 1 50
$3 \times 7\frac{1}{2}$ "	" 1 75	" 2 00
$3\frac{1}{2} \times 9$ "	" 2 00	" 2 50
5×9 "	" 2 40	" 3 00
6×10 "	" 3 20	" 4 00
7×11 "	" 3 70	" 4 50
7×13 "	" 4 20	" 5 00
$5 \times 12\frac{1}{2}$ "	" 3 70	" 4 50

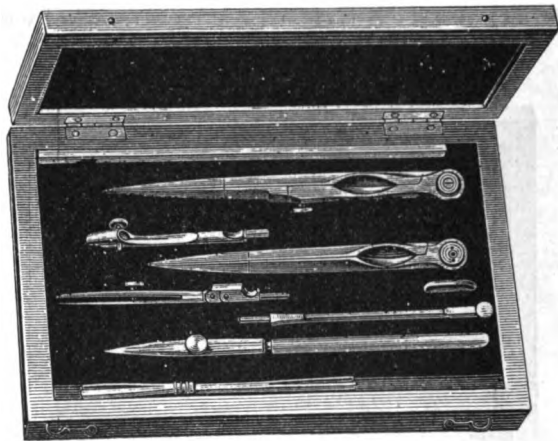


FRENCH INSTRUMENTS of Brass and German Silver in Cases.



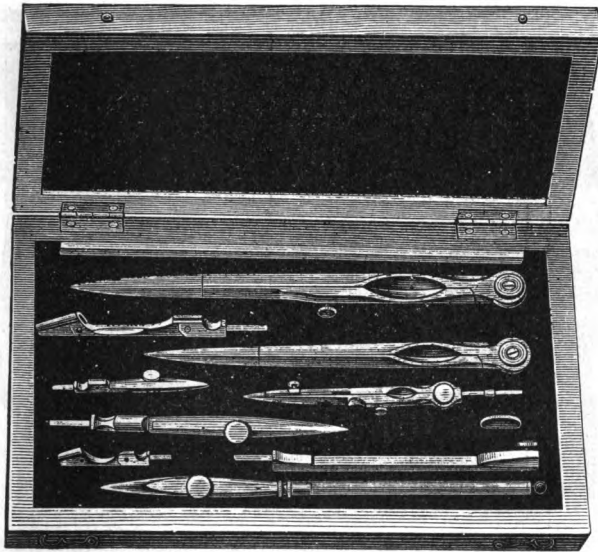
No. 1003.

- 1000. Mahogany Case, contg.: 5 pieces, Brass,
1 Pair Compasses, $4\frac{1}{4}$ inch, with Pen and Pencil
Point, 1 Key each \$ 45
- 1001. Mahogany Case, contg.: 6 pieces, Brass,
1 Pair Compasses, $4\frac{1}{4}$ inch, with Pen and Pencil
Point, 1 Crayonholder, 1 Key, 1 Rule " 50
- 1002. Mahogany Case, contg.: 8 pieces, Brass,
1 Pair Compasses, $4\frac{1}{4}$ inch, with Pen, Pencil Point
and Lengthening Bar,
1 Crayonholder, 1 Protractor, 1 Key, 1 Rule " 60
- 1003. Mahogany Case, contg.: 9 pieces, Brass,
1 Pair Compasses, $4\frac{1}{4}$ inch, with Pen, Pencil Point
and Lengthening Bar,
1 Drawing Pen, 1 Crayonholder, 1 Protractor, 1 Key,
1 Rule " 75



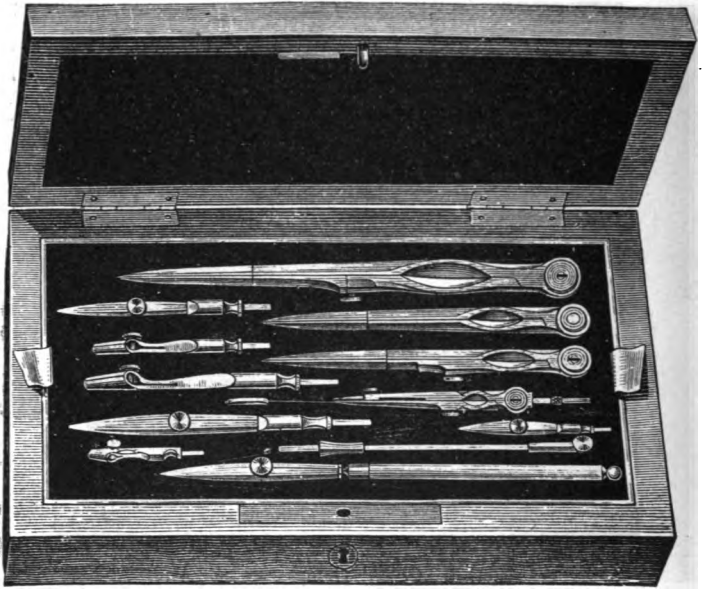
No. 1005.

- | | | |
|-------|--|--------------|
| 1004. | Rosewood Case, contg.: 10 pieces, German Silver,
1 Pair Compasses, 4½ inch, with Pen, Pencil Point
and Lengthening Bar,
1 Pair Dividers, 1 Drawing Pen,
1 Protractor, 1 Key, 1 Rule | each \$ 2 20 |
| 1005. | Mahogany Case, contg.: 10 pieces, Brass,
1 Pair Compasses, 4½ inch, with Pen, Pencil Point
and Lengthening Bar,
1 Pair Dividers, 3½ inch, 1 Drawing Pen,
1 Protractor, 1 Crayonholder, 1 Key, 1 Rule | " 80 |
| 1006. | Mahogany Case, the same as No. 1005, but
Compasses, 5½ inch, Dividers, 4½ inch | " 1 10 |
| 1007. | Mahogany Case, the same as No. 1005, but
Compasses, 6½ inch, Dividers, 5½ inch | " 1 30 |
| 1008. | Rosewood Case, the same as No. 1006, but
German Silver | " 2 40 |



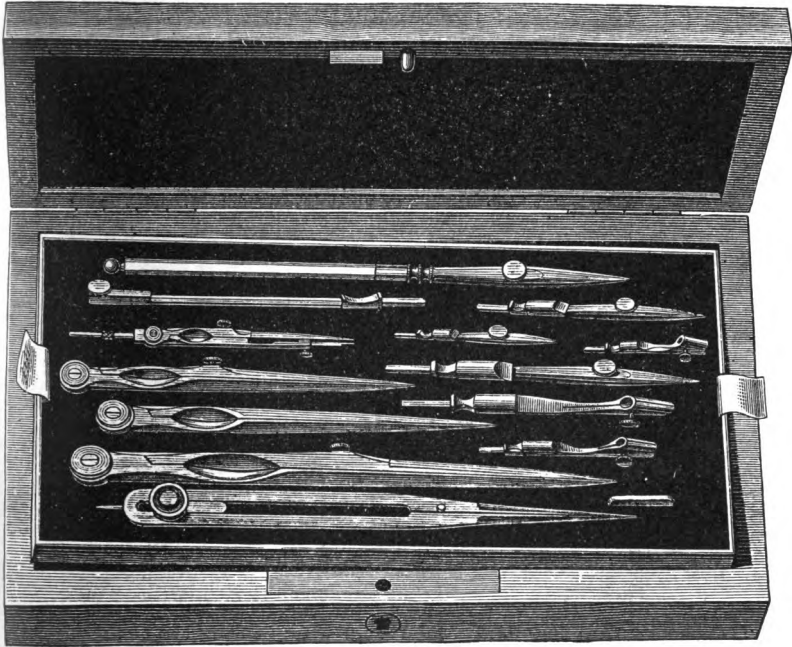
No. 1009.

- | | |
|---|--------------|
| 1009. Mahogany Case, contg.: 12 pieces, Brass,
1 Pair Compasses, 4½ inch, with Pen, Pencil Point
and Lengthening Bar,
1 Pair Dividers, 3½ inch, 1 Bow Pen with Pencil Point,
1 Drawing Pen, 1 Protractor, 1 Key, 1 Rule . . . | each \$ 1 20 |
| 1010. Mahogany Case, contg.: 12 pieces, Brass, the same as
No. 1009, but Compasses 5½ and 4½ inch | " 1 50 |
| 1011. Rosewood Case, contg.: 12 pieces, Brass, the same as
No. 1010 | " 1 60 |
| 1012. Rosewood Case, with Lock and Tray, contg.: 12 pieces,
Brass, the same as No. 1010 | " 2 00 |
| 1013. Rosewood Case, with Lock and Tray, contg.: 12 pieces,
German Silver, the same as No. 1012 | " 4 00 |
| 1014. Rosewood Case, with Lock and Tray, contg.: 12 pieces,
Brass, the same as No. 1012, but Compasses 6½ and
5½ inch | " 2 35 |



No. 1015.

1015. Rosewood Case, with Lock and Tray, contg.: 16 pieces,
 Brass,
 1 Pair Compasses, 6 $\frac{1}{4}$ inch, with Pen, Pencil Point
 and Lengthening Bar,
 1 Pair Compasses, 4 $\frac{1}{4}$ inch, with Pen and Pencil Point,
 1 Pair Dividers, 4 $\frac{1}{4}$ inch, 1 Bow Pen with Pencil Point,
 1 Drawing Pen, 1 Protractor, 1 Key, 1 Rule . . . each \$ 2 60
1016. Rosewood Case, with Lock and Tray, contg.: 16 pieces,
 Brass, the same as No. 1015, the Compasses with
 Needle Points " 3 25
1017. Rosewood Case, with Lock and Tray, contg.: 16 pieces,
 German Silver, the same as No. 1015 " 5 50
1018. Rosewood Case, with Lock and Tray, contg.: 16 pieces,
 German Silver, the same as No. 1017, the Compasses
 with Needle Points " 6 25

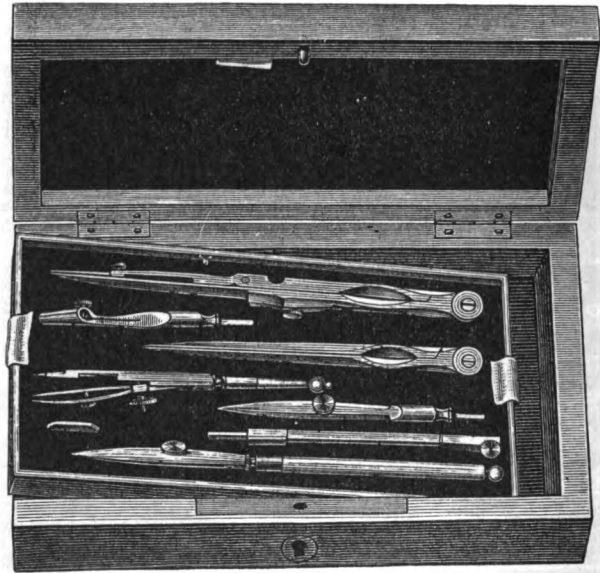


No. 1019.

1019. Rosewood Case, with Lock and Tray, contg.: 17 pieces,
 Brass,
 1 Pair Compasses, 6½ inch, with Pen, Pencil Point
 and Lengthening Bar,
 1 Pair Compasses, 4½ inch, with Pen and Pencil Point,
 1 Pair Dividers, 4¼ inch, 1 Bow Pen with Pencil Point,
 1 Proportional Dividers,
 1 Drawing Pen, 1 Protractor, 1 Key, 1 Rule . . . each \$ 5 00

1020. Rosewood Case, with Lock and Tray, contg.: 17 pieces,
 German Silver, the same as No. 1019 . . . “ 7 75





No. 1021.

1021. Rosewood Case, with Lock and Tray, contg.: 9 pieces, Brass,
 1 Pair Compasses, with Needle Point, $5\frac{1}{2}$ inch, with
 Pen, Pencil Point and Lengthening Bar,
 1 Pair Dividers, $4\frac{1}{2}$ inch, 1 Spring Bow Pen,
 1 Drawing Pen, 1 Protractor, 1 Key each \$ 2 85
1022. Rosewood Case, with Lock and Tray, contg.: 9 pieces,
 German Silver, the same as No. 1021 " 4 25



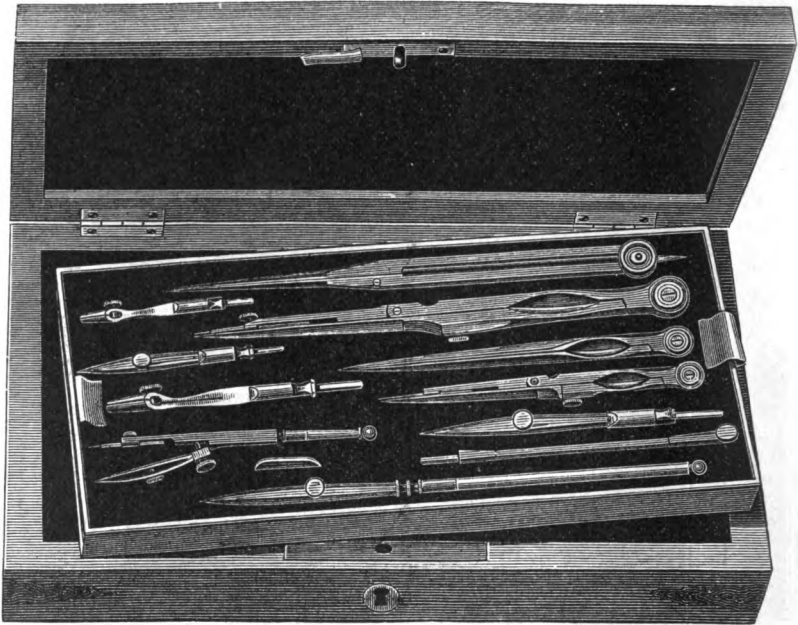
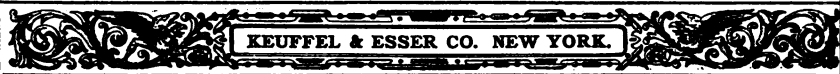
No. 1023.

1023. Pocket Case, covered with fine cloth, contg.: 9 pieces, Brass,
 the same as No. 1021, but compasses, $4\frac{1}{2}$ inch . . . each \$ 2 85
1024. Pocket Case, covered with fine cloth, contg.: 9 pieces, German
 Silver, the same as No. 1022, but compasses, $4\frac{1}{2}$ inch " 4 25



No. 1025.

1025. Rosewood Case, with Lock and Tray, contg.: 14 pieces,
 Brass,
 1 Pair Compasses with Needle Point, 6½ inch, with
 Pen, Pencil Point and Lengthening Bar,
 1 Pair Compasses with Needle Point, 4½ inch, Pen
 and Pencil Point,
 1 Pair Dividers, 4½ inch, 1 Spring Bow Pen,
 1 Drawing Pen, 2 Protractors, 1 Rule, 1 Key . each \$ 3 50
1026. Rosewood Case, with Lock and Tray, contg.: 14 pieces,
 German Silver, the same as No. 1025 . . . " 5 75
1027. Rosewood Case, with Lock and Tray, contg.: 14 pieces,
 Brass, the same as No. 1025, but with Patent
 Pencil Points " 4 00



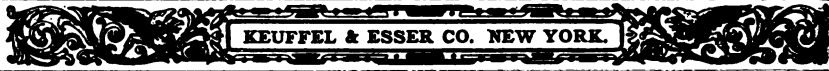
No. 1028.

- 1028. Rosewood Case, with Lock and Tray, contg.: 15 pieces, Brass,
 1 Pair Compasses with Needle Point, 6½ inch, with
 Pen, Pencil Point and Lengthening Bar,
 1 Pair Compasses with Needle Point, 4½ inch, with
 Pen and Pencil Point,
 1 Pair Dividers, 4½ inch, 1 Spring Bow Pen,
 1 Proportional Dividers,
 1 Drawing Pen, 1 Protractor, 1 Key each \$ 5 50
- 1029. Rosewood Case, with Lock and Tray, contg.: 15 pieces, Brass,
 the same as No. 1028, but with Patent Pencil Points " 6 00
- 1030. Rosewood Case, with Lock and Tray, contg.: 15 pieces,
 German Silver, the same as No. 1028 " 8 25
- 1031. Rosewood Case, with Lock and Tray, contg.: 15 pieces,
 German Silver, the same as No. 1030, but with Patent
 Pencil Points " 9 00
- 1032. Rosewood Case, with Lock and Tray, contg.: 19 pieces,
 the same as No. 1031 and with Beam Compasses,
 No. 1082 " 14 00



1033. Rosewood Case, inlaid, with Lock and Tray,
 contg.: 18 pieces, German Silver,
 1 Pair Compasses with Needle Point, 6½ inch, with
 Pen, Patent Pencil Point and Lengthening Bar,
 1 Pair Compasses, 4½ inch, with Handle, with Needle
 Point, Pen and Patent Pencil Point,
 1 Pair Dividers, 4½ inch,
 1 Spring Bow Pen,
 1 Proportional Dividers,
 3 Drawing Pens,
 2 Protractors,
 1 8 inch Ivory Rule,
 1 Key each \$ 18 00
1034. Rosewood Case, inlaid, with Lock and Tray,
 contg.: 22 pieces, German Silver,
 1 Pair Compasses with Needle Point, 6½ inch, with
 Pen, Patent Pencil Point and Lengthening Bar,
 1 Pair Compasses, 4½ inch, with Handle, with Needle
 Point, Pen and Patent Pencil Point,
 1 Pair Dividers, 4½ inch,
 1 Proportional Dividers,
 1 Steelspring Dividers,
 1 Steelspring Bow Pen,
 1 Steelspring Bow Pencil,
 3 Drawing Pens,
 1 8 inch Ivory Rule,
 2 Protractors,
 1 Key,
 2 Triangles,
 1 Curve “ 22 50
1035. Rosewood Case, inlaid, with Lock and Tray,
 contg.: 26 pieces, German Silver,
 the same as No. 1034, but with Beam Compasses “ 29 00

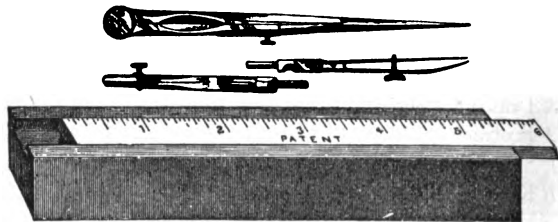




FRENCH INSTRUMENTS.

Brass and German Silver

IN PATENT WOODEN SLIDE BOXES.



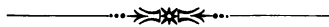
These boxes are more durable than the cheap French cases and are therefore often preferred for use in schools etc. The boxes are of one piece.

BRASS.

1040.	1	Pair	Compasses,	$4\frac{1}{2}$	inch,	with	Pencil	Point	each	\$	45
1041.	1	do.		$5\frac{1}{2}$	"	"	"	"	"		55
1042.	1	do.		$6\frac{1}{2}$	"	"	"	"	"		65
1043.	1	do.		$4\frac{1}{2}$	"	"	Pen	and	Pencil	Point .	55
1045.	1	do.		$4\frac{1}{2}$	"	"	"	"	"	"	60
1046.	1	do.		$5\frac{1}{2}$	"	"	do.	do.		"	65
1047.	1	do.		$6\frac{1}{2}$	"	"	do.	do.		"	75
1048.	1	do.		$4\frac{1}{2}$	"	"	fixed	Needle	Point,	Pen	75
							Pencil	Point	and	Lengthening	Bar
1049.	1	do.		$5\frac{1}{2}$	"	"	do.	do.		"	80

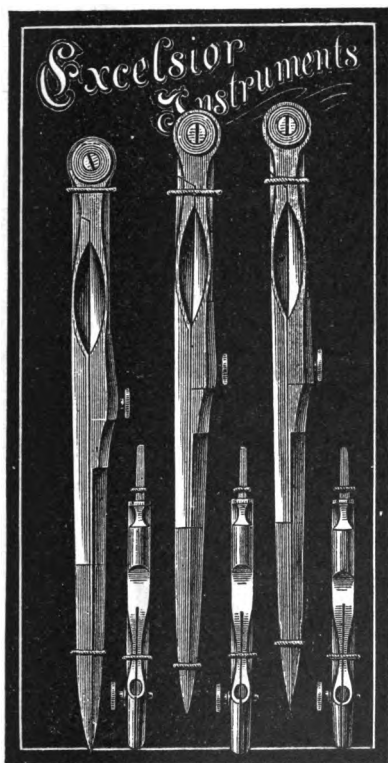
GERMAN SILVER.

1051.	1	Pair	Compasses,	$5\frac{1}{2}$	inch,	with	Pen,	Pencil	Point	and	Lengthening	Bar	"	1	25			
1054.	1	do.		$5\frac{1}{2}$	inch,	with	fixed	Needle	Point,	Pen,	Pencil	Point	and	Lengthening	Bar	"	1	50

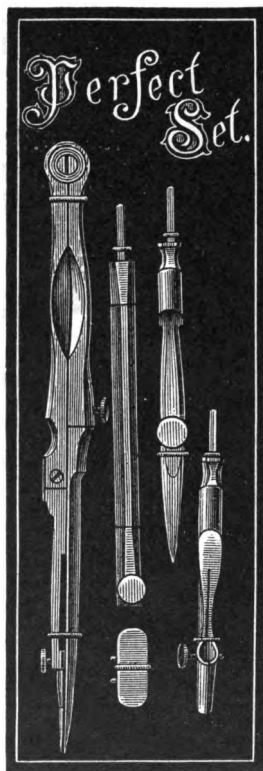


FRENCH INSTRUMENTS ON CARDS.

Brass and German Silver.



No. 1066.



1071.

1065.	Brass,	1 Pair	Compasses,	4½ inch,	with	Pencil	Point	each	\$	40
1066.	"	do.		5½	"	"	"	"		50
1067.	"	do.		6½	"	"	"	"		60
1068.	Brass,	1 Pair	Compasses,	4½ inch,	with	Pen,	Pencil	Point		
						and	Length'g.	Bar,	Key	"
										55
1069.	"	do.		5½	"	do.	do.	"		60
1070.	"	do.		6½	"	do.	do.	"		70
1071.	Brass,	1 Pair	Compasses,	5½ inch,	with	fixed	Needle	Point,		
						Pen,	Pencil	Point	and	Lengthening
						Bar,	Key	. . .	"	75
1072.	German	Silver,	1 Pair	Compasses,	5½	inch,	like	No.	1069	" 1 20
1073.	German	Silver,	1 Pair	Compasses,	5½	inch,	like	No.	1071	" 1 45



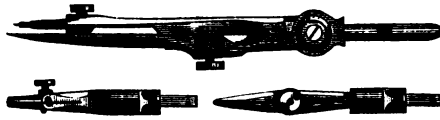
FRENCH INSTRUMENTS.

Brass and German Silver.



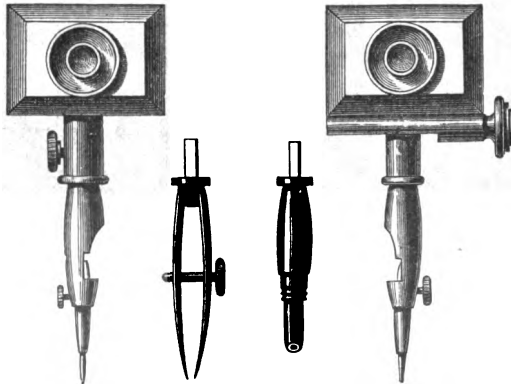
No. 1076.

1075.	Brass, Plain Dividers, 4½ inch	each \$	20
1076.	“ do. do. 5½ “	“	25
1077.	“ do. do. 6¼ “	“	30
1079.	German Silver, Plain Dividers, 5½ inch	“	55



No. 1080.

1080.	1 Pair Compasses with Handle, 3½ inch, with fixed Needle Point, Pen and Pencil Points, Brass . . .	each \$	55
1081.	do. do. do. German Silver	“	75



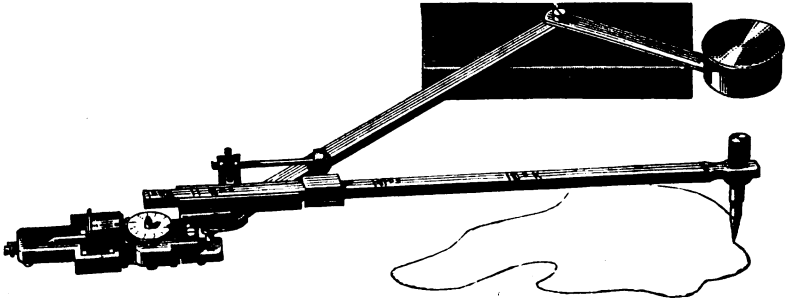
No. 1082.

1082.	German Silver Beam Compasses with Pen and Pencil Point in Case	each \$	5 75
1083.	Brass Beam Compasses with Pen and Pencil Point in Case	“	5 20

Wooden Bars for Beam Compasses see page 153.



PLANIMETERS.

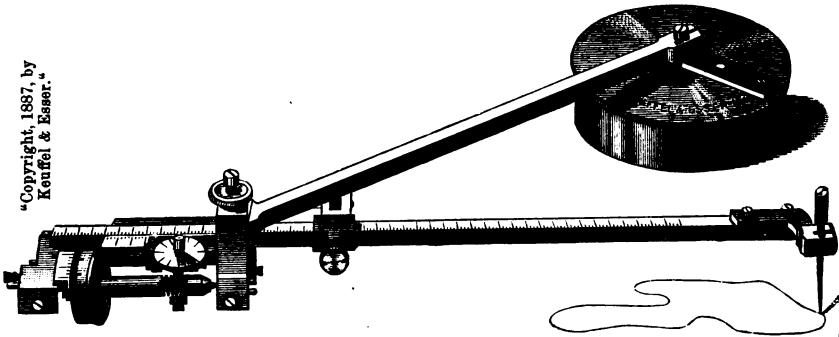


No. 1102.

The Polar-Planimeter is used for determining with absolute accuracy the area of any figure, no matter how irregular it may be, such as Railroad-Profiles, Indicator Diagrams, Plots of Ground etc. etc. and is indispensable to Engineers and others on account of the time and labor saved by it. The above illustration shows the Planimeter in its improved form. The needle point is replaced by a brass weight, which by shifting to the proper position, allows the index to be set to 0, so that the resulting figure can be read off directly, instead of being calculated by subtracting the first reading from the second. The edge of the roller wheel is exactly in the centre between the bearings of its axis, which insures a proportionate wear on both bearings alike. The horizontal wheel has been so arranged, that it is open to view and not concealed below the tracer-arm as in old style instruments.

1102. Polar Planimeter of German Silver, in polished mahogany case each \$ 30 00

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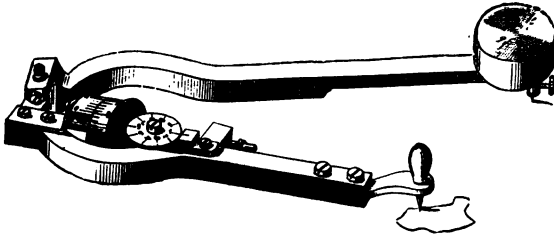


No. 1104.

1104. Polar Planimeter of German Silver, with divided Tracer Arm, in polished mahogany case each \$ 33 00

Planimeter No. 1104 has the tracer arm divided for nearly its entire length to $\frac{1}{2}$ mm, reading by a vernier to $\frac{1}{20}$ mm. Proportions are either indicated by the scale or read off from proportion-marks engraved on tracer-arm. The scale with vernier is a valuable aid in adjusting the Planimeter to proportions other than those marked on the instrument. A testing Plate for proving its accuracy is furnished with each instrument.

KEUFFEL & ESSER CO. NEW YORK.



No. 1111.

1110. Polar Planimeter, to measure only square inches, in Case each \$ 15 00

No. 1110. Represents the Planimeter in its simplest form. It has one index wheel only and is intended to measure square inches, $\frac{1}{10}$ and $\frac{1}{100}$ th of a square inch. This instrument is of value only for Steam Indicator Diagrams.

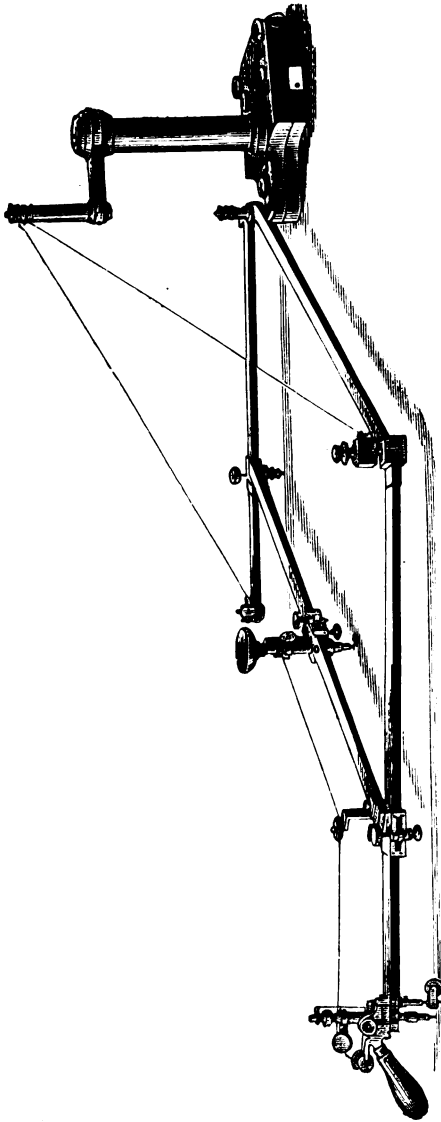
1111. The same as No. 1110, but with horizontal wheel, in Case each \$ 17 50

The figures on the horizontal wheel indicate the tenths. It is superior to those with only one wheel as it reads to 10, 1, $\frac{1}{10}$ th and $\frac{1}{100}$ ^{ths} square inches.





PANTOGRAPHS.

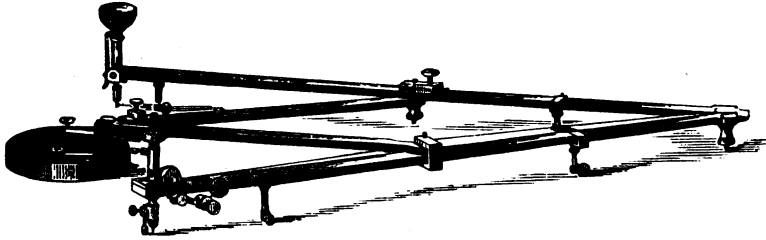


No. 1125.

1125. Suspended Pantograph of Square Brass Tubes, 24 inch, in wooden Case each \$ 160 00

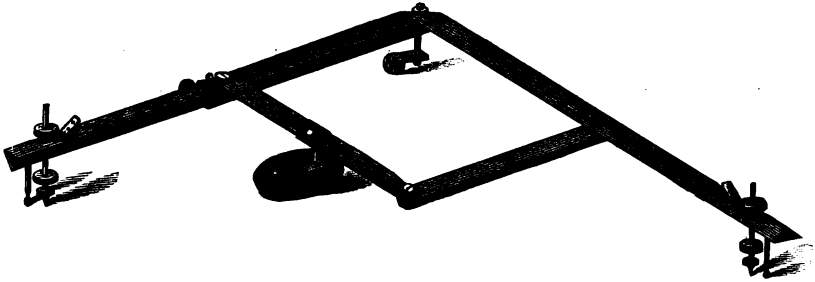
The Bars of the instrument are suspended on the solid Standard in order to avoid the friction which necessarily takes place in other Pantographs through running on the paper. The Standard is provided with a spirit level to adjust the instrument to a horizontal position.

The proportions are set with great accuracy by the rack-movement in the slides. The Bars are divided in half-centimeters and read to millimeters by the slides.



No. 1126.

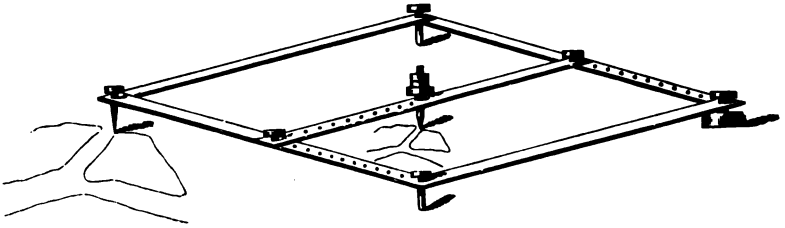
1126. Pantograph of square Brass Tubes, for reducing and enlarging engravings, plans, drawings etc., of the best construction and with all the latest improvements, in hard wood Case,
- | | | | | |
|-------|-----|-----|------------------------|---------------|
| | | | arms 24 inch | each \$ 60 00 |
| 1127. | do. | do. | " 28 " | " 75 00 |
| 1128. | do. | do. | " 33 " | " 90 00 |



No. 1135.

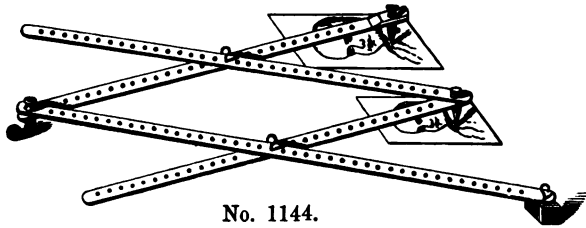
1135. Pantograph of Triangular Brass Tubes, for reducing and enlarging, one arm telescoping, good construction, in wooden Case, arms 20 inch each \$ 15 00
- | | | | | |
|-------|-----|-----|------------------|---------|
| 1136. | do. | do. | " 25 " | " 18 00 |
| 1137. | do. | do. | " 30 " | " 21 00 |
| 1138. | do. | do. | " 36 " | " 24 00 |





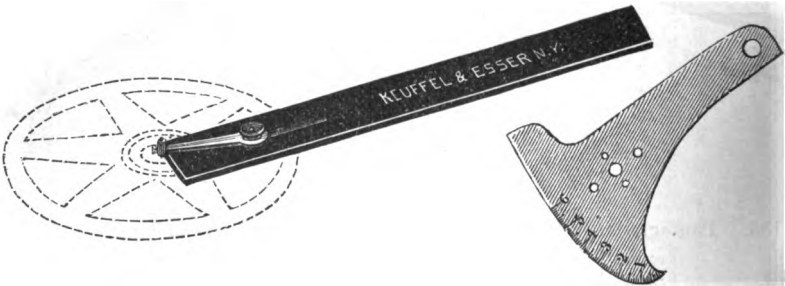
No. 1143.

1143. Pantograph of hardwood for reducing plans and drawings each \$ 3 50



No. 1144.

1144. Pantograph of hardwood, 21 inch, with brass mountings,
for reducing and enlarging each \$ 2 00
1145. do. do. 41 inch long. " 5 00

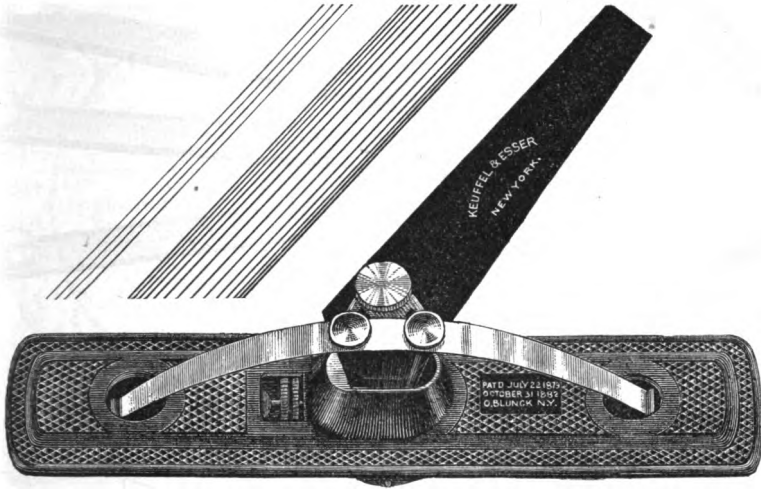


No. 1152.

1155.

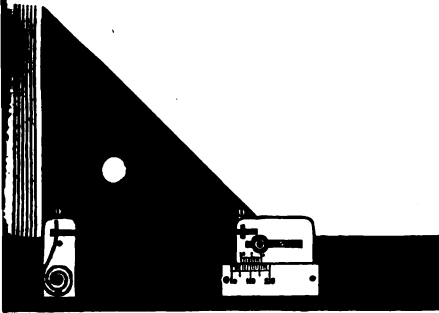
1150. Eccentrolinead, all German Silver, 9 inch each \$ 3 25
1151. do. " " " sliding top, 9 inch . . " 4 00
1152. do. Ebony, German Silver mounted, 9 inch . . " 2 75
1153. do. " " " " sliding
top, 9 inch " 3 25
1155. Templet Odontograph, for describing Teeth of Gear Wheels,
a valuable instrument for Mill wrights, Machinists,
Pattern makers etc. with full description, in Case . . " 3 50

SECTION LINERS.

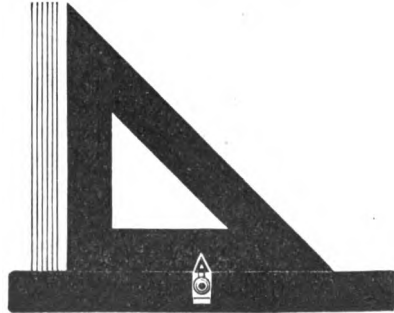


No. 1156.

1156. Blunck's Patent Section Liner is very easy to operate, extremely accurate and not liable to get out of order. Awarded a medal at the Centennial Exhibition . . . each \$ 5 00



No. 1157.



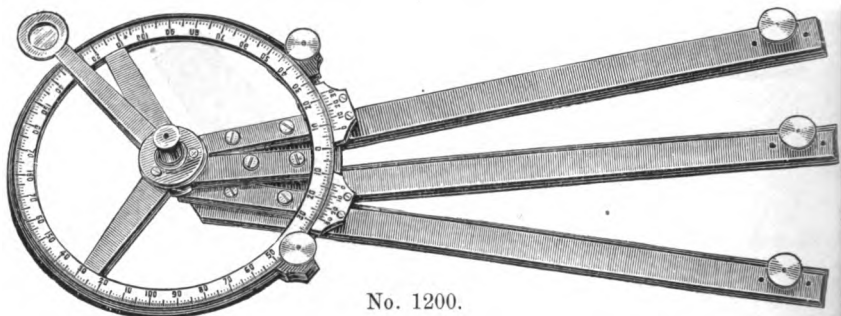
No. 1158.

1157. Casey's Section Liner, a very reliable and simple instrument. There is hardly any practice required to operate it to perfection. By the scale and vernier on the metal plates the distances are regulated to $\frac{1}{100}$ th of an inch or $\frac{1}{10}$ th of a millimeter each \$ 4 50

1158. William's Section Liner, a simple and ingenious instrument of hard-rubber, which after a little practice will be found to work admirably well each \$ 3 50



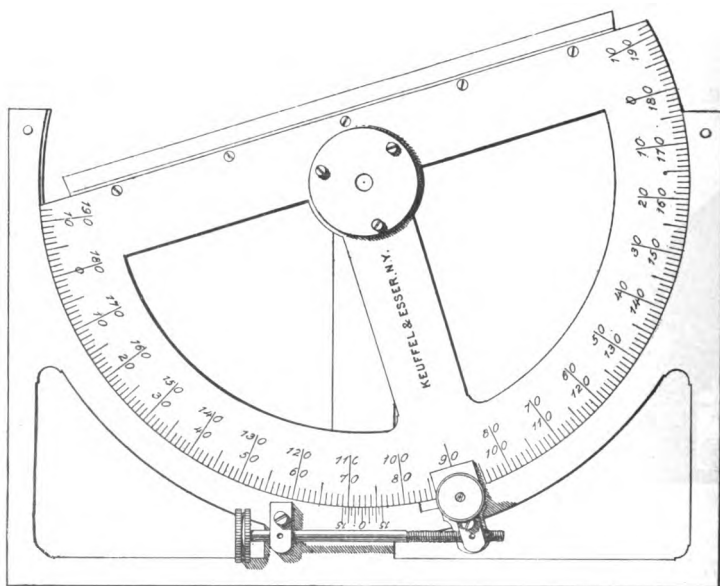
METAL PROTRACTORS.



No. 1200.

1200. Three Arm Protractor or Station Pointer $6\frac{1}{2}$ inch diameter, arms 9 inch long, with extension pieces to lengthen to $17\frac{1}{2}$ inch. Divided $\frac{1}{2}$ degrees, the two outer arms with Verniers reading to 1 minute, with magnifying lense. In polished mahogany Case. . . each \$ 80 00

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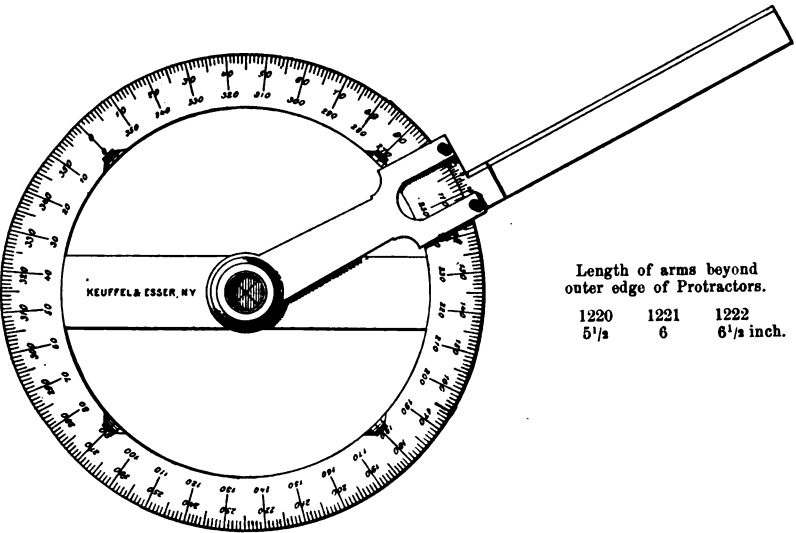


No. 1210.

1210. Crozet Protractor, 8 inch, German Silver, divided to $\frac{1}{4}$ degrees, Vernier reading to 1 minute, with tangent screw, in polished mahogany Case each \$ 45 00

This is the best and most practical protractor. It is used along a straight edge or T square, and angles are set off with it without bringing the centre over the starting point.

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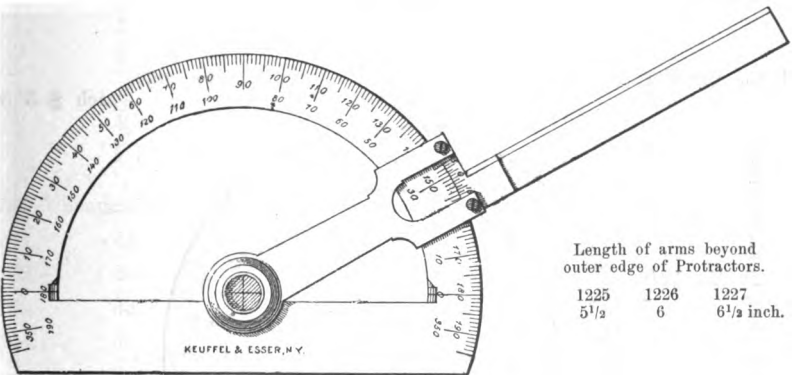
Length of arms beyond
outer edge of Protractors.

1220	1221	1222
5 1/2	6	6 1/2 inch.

No. 1220.

1220. Circular German Silver Protractor, 5 1/2 inch, with Horncentre, divided to 1/2 degrees, Vernier reading to 3 minutes . . each \$ 14 00
 1221. do. 8 inch, div. 1/4 degrees, Vernier reading to 1 minute " 16 25
 1222. do. 10 " " 1/4 " " " " " 1 " " 20 00
 Polished mahogany Cases, for No. 1220 1221 1222
 each \$ 2 75 3 00 3 25

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Length of arms beyond
outer edge of Protractors.

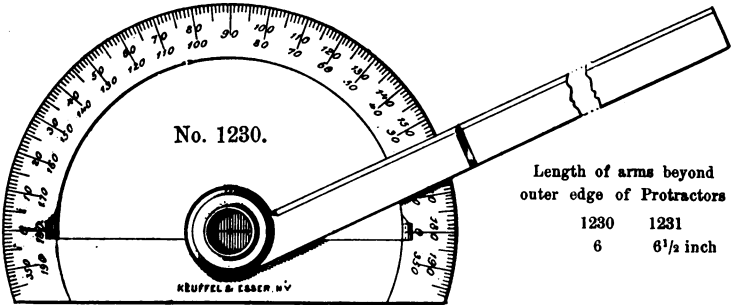
1225	1226	1227
5 1/2	6	6 1/2 inch.

No. 1225.

1225. Semicircular German Silver Protractor, 5 1/2 inch, with Horncentre, divided to 1/2 degrees, Vernier reading to 3 minutes each \$ 11 00
 1226. do. 8 inch, div. 1/4 degrees, Vernier reading to 1 minute " 14 50
 1227. do. 10 " " 1/4 " " " " " 1 " " 18 00
 Polished mahogany Cases, for No. 1225 1226 1227
 each \$ 2 25 2 50 2 75



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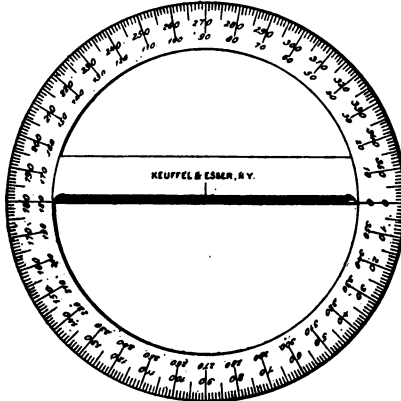


Length of arms beyond outer edge of Protractors	
1230	1231
6	6 1/2 inch

1230. Semicircular German Silver Protractor, 6 inch, with Horn-centre and movable arm, divided to $\frac{1}{2}$ degrees each \$ 7 50
 1231. do. 7 inch, divided to $\frac{1}{2}$ degrees " 9 00

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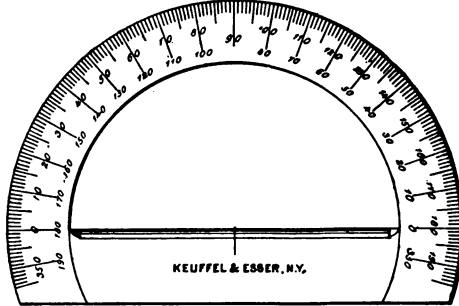
No. 1235.



1235. Circular German Silver Protractor, 5 inch, beveled edge, divided to $\frac{1}{2}$ degrees each \$ 5 50

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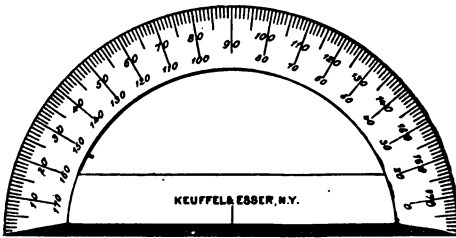
No. 1240.



1240. Semicircular German Silver Protractor, 4 inch, beveled edge, centre on inner edge divided to 1 degree. each \$ 2 35
 1241. do. 5 inch, divided to $\frac{1}{2}$ degrees " 3 00
 1242. do. 6 " " " $\frac{1}{2}$ " " 3 50
 1243. do. 6 " " " $\frac{1}{4}$ " " 4 25

For Rubber Protractors see page 142.

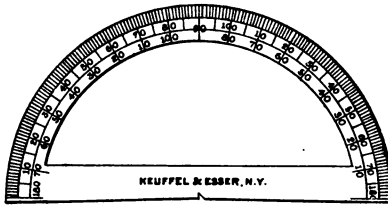
"Copyright, 1887, by Keuffel & Esser."



No. 1245.

1245.	Semicircular German Silver Protractor, 4 inch, beveled edge, centre on outer edge, divided to 1 degree	each \$ 1 60
1246.	do. 5 inch, divided to $\frac{1}{2}$ degree	" 2 25
1247.	do. 6 " " " $\frac{1}{4}$ "	" 2 75
1248.	do. 6 " " " $\frac{1}{4}$ "	" 3 50
1249.	do. 7 " " " $\frac{1}{2}$ "	" 4 50
1250.	do. 8 " " " $\frac{1}{2}$ "	" 5 25

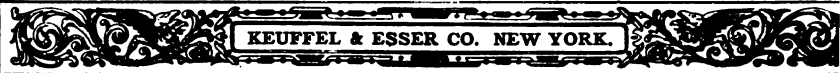
"Copyright, 1887, by Keuffel & Esser."



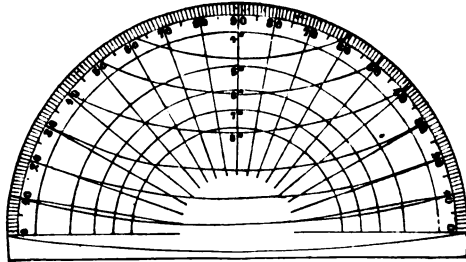
No. 1262.

1260.	Semicircular German Silver Protractor, 4 $\frac{1}{4}$ inch, 1 degree	each \$ 60
1261.	do. do. do. 5 $\frac{1}{8}$ " $\frac{1}{4}$ " " " "	90
1262.	do. do. do. 6 $\frac{3}{8}$ " $\frac{1}{4}$ " " " "	1 10
1263.	do. do. do. 7 $\frac{1}{8}$ " $\frac{1}{4}$ " " " "	1 35
1264.	do. do. do. 8 $\frac{1}{2}$ " $\frac{1}{4}$ " " " "	1 75
1265.	do. Brass do. 3 $\frac{3}{4}$ " 1 " " "	10
1266.	do. do. do. 4 $\frac{1}{4}$ " 1 " " "	25
1267.	do. do. do. 5 $\frac{1}{8}$ " $\frac{1}{2}$ " " " "	50
1268.	do. do. do. 6 $\frac{3}{8}$ " $\frac{1}{4}$ " " " "	60

For Rubber Protractors see page 142.

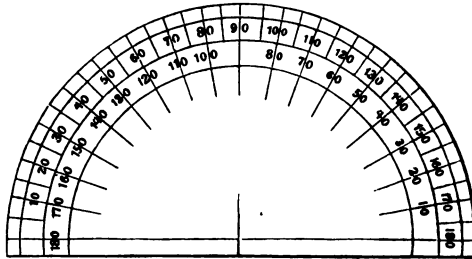


HORN PROTRACTORS.



No. 1275.

1275. Railroad Curve Protractor, Horn, 8 inch, $\frac{1}{4}^\circ$ with circular curves from $\frac{1}{4}^\circ$ to 8° , Scale 400 feet to the inch . each \$ 1 50



No. 1277.

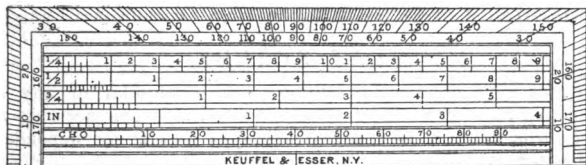
1276.	Semicircular Horn Protractor,	$4\frac{1}{4}$ inch	1°	each \$	15
1277.	“	“	do. $5\frac{1}{4}$ “	$\frac{1}{2}^\circ$	“	25
1279.	“	“	do. $6\frac{1}{4}$ “	$\frac{1}{2}^\circ$	“	30
1281.	“	“	do. 7 “	$\frac{1}{2}^\circ$	“	45
1283.	“	“	do. 8 “	$\frac{1}{2}^\circ$	“	55
1285.	“	“	do. $8\frac{3}{4}$ “	$\frac{1}{2}^\circ$	“	75
1286.	Circular	“	do. 4 “	1°	“	1 00
1287.	“	“	do. $5\frac{1}{8}$ “	$\frac{1}{2}^\circ$	“	1 25
1288.	“	“	do. $6\frac{1}{4}$ “	$\frac{1}{2}^\circ$	“	1 50
1290.	Square	“	do. $4\frac{3}{4}$ “	$\frac{1}{2}^\circ$	“	35
1291.	“	“	do. 6 “	$\frac{1}{2}^\circ$	“	50

PAPER PROTRACTORS.

1293.	Circular Protractor on Vegetable Tracing Paper,	14 inch, diam.	$\frac{1}{4}^\circ$	each \$	30
1294.	do. do. “	Drawing Paper, 14 inch, diam.	$\frac{1}{4}^\circ$	“	30
1295.	do. do. “	Bristol Board, 14 “	$\frac{1}{4}^\circ$	“	40
1296.	do. do. “	“	8 “	$\frac{1}{2}^\circ$	25
1297.	Semicircular do. “	“	5 “	$\frac{1}{2}^\circ$	20
1298.	do. do. “	“	5 “	$\frac{1}{2}^\circ$ with Diagonal Scales of inches to $\frac{1}{160}$ th, and millimeter . .	25

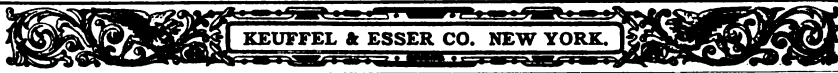
BOXWOOD AND IVORY PROTRACTORS.

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No. 1320.

- | | | |
|-------|---|------------|
| 1310. | Square Boxwood Protractor, 6 inches long, $1\frac{3}{4}$ inches wide, divided: whole degrees, 4 Scales, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 inch, Diagonal Scales, Scale of Chords | each \$ 40 |
| 1320. | Square Ivory Protractor, 6 inches long, $1\frac{3}{4}$ inches wide, divided: whole degrees, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 inch Scales, Scale of Chords, Diagonal Scale, Scales of 25, 30, 35, 40, 45 parts per inch | " 1 50 |
| 1321. | Square Ivory Protractor, 6 inches long, $1\frac{3}{4}$ inches wide, divided: whole degrees, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 inch Scales, Scale of Chords, Diagonal Scale, Scales of 30, 35, 40, 45, 50, 60 parts per inch, Scale of 40 on lower edge | " 1 75 |
| 1322. | Square Ivory Protractor, 6 inches long, 2 inches wide, divided: whole degrees, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{1}{2}$ inch Scales, Scale of Chords, Diagonal Scale, Scales of 30, 35, 40, 45, 50, 60 parts per inch, Scale of 40 on lower edge | " 3 75 |
| 1323. | Square Ivory Protractor, 6 inches long, $2\frac{1}{4}$ inches wide, divided: half degrees, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$ inch Scales, Scale of Chords, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60 parts per inch and Diagonal Scale, Scale of 40 on lower edge | " 4 50 |
| 1324. | Square Ivory Protractor, 8 inches long, 2 inches wide, divided: whole degrees, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 inch Scales, Scale of Chords, Diagonal Scales, Scales of 20, 25, 30, 35, 40, 45, 50, 60 parts per inch, Scale of 40 on lower edge | " 5 00 |
| 1325. | Square Ivory Protractor, 8 inches long, $2\frac{1}{4}$ inches wide, divided: half degrees, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$ inch Scales, Scale of Chords, Diagonal Scale, Scales of 10, 15, 20, 25, 30, 35, 40, 45, 50, 60 parts per inch, Scale of 40 on lower edge | " 7 00 |
| 1326. | Square Ivory Protractor, 12 inches long, $2\frac{1}{4}$ inches wide, divided: half degrees, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1, $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$ inch Scales, Scale of Chords, Diagonal Scale, Scales of 10, 15, 20, 25, 30, 35, 40, 45, 50, 60 parts per inch, Scale of 40 on lower edge | " 11 50 |



IVORY AND BOXWOOD SCALES.

Machine divided.

U. S. Std.

Our U. S. Std. machine divided Scales are made of the best selected material wider and thicker than the hand divided and of a better finish. They are superior in quality and accuracy to any others in the market.

FLAT SCALES.

Flat Scales have manifest advantages over triangular or any other form of Scales and are fast superseding them since reliable and accurate Scales have been made in this country and consumers were no longer dependent for flat Scales on the imported hand divided article.

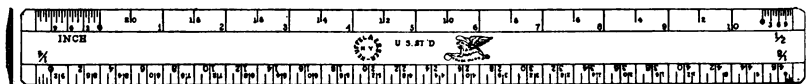
Flat Scales do not offer any liability to error, nor do they necessitate that careful examination each time they are used, which is so great an annoyance in triangular Scales, that a special "scale guard" has been invented to lessen this disadvantage. A flat Scale will last much longer than a triangular, as the latter can not be used without wearing one of the divided surfaces by friction on the drawing, and a single flat scale can be replaced at less cost than a triangular. The triangular scales generally have a number of divisions which the purchaser will hardly ever use, but for which he is nevertheless obliged to pay. The flat shape is also more convenient for Scales, because it presents more surface for holding it in position. As the divisions are nearly on a plane with the drawing they are presented at a better angle of vision and allow the draughtsman to assume a more comfortable position, especially when working on large drawings.

We also call attention to the lengths of scales. For divisions $\frac{1}{8}$ inch to the foot or smaller a 12 inch scale will well answer the purpose, but in drawings made to a larger scale an 18 inch or even 24 inch will be necessary in order to avoid error from repeating the Scale in setting off one measurement. We would therefor recommend 12 inch as the best length for $\frac{1}{8}$ inch to the foot or smaller, 18 inch as the best length for $\frac{3}{8}$ to 2 inch to the foot, and 24 inch for still larger scales.

OPEN DIVIDED IVORY SCALES

Divided inch to feet.

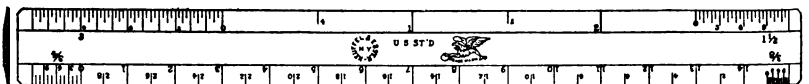
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No. 1351.

- | | | | |
|-------|-----------------------------------|--|--------------|
| 1350. | Flat Ivory Scale, 6 inch, divided | $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot | each \$ 2 00 |
| 1351. | do. 12 " | " $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 " " " " | " 3 00 |

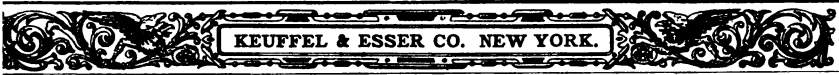
"Copyright, 1887, by Keuffel & Esser."



No. 1352.

- | | | | |
|-------|------------------------------------|---|--------------|
| 1352. | Flat Ivory Scale, 12 inch, divided | $\frac{3}{8}$, $\frac{1}{2}$, $1\frac{1}{2}$, 3 inch to the foot | each \$ 3 00 |
|-------|------------------------------------|---|--------------|

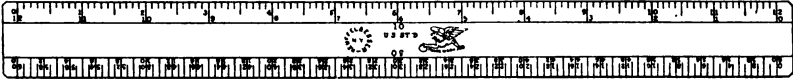
For Paragon Scales see page 118.



IVORY CHAIN SCALES

Divided in inches and tenths.

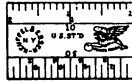
"Copyright, 1887, by Keuffel & Esser."



No. 1360.

1355.	Flat Ivory Chain Scale, 6 inch, div. 10	×	50 parts to the inch	each	\$	2 00
1356.	do. do. 6 "	"	20	×	40 "	2 00
1357.	do. do. 6 "	"	30	×	60 "	2 00
1358.	do. do. 6 "	"	80	×	100 "	2 50
1360.	do. do. 12 "	"	10	×	50 "	3 00
1361.	do. do. 12 "	"	20	×	40 "	3 00
1362.	do. do. 12 "	"	30	×	60 "	3 00
1363.	do. do. 12 "	"	80	×	100 "	3 75

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No. 1365.

1365.	Flat Ivory Offset Scale, 2 inch, div. 10	×	50 parts to the inch	"	80	
1366.	do. do. 2 "	"	20	×	40 "	80
1367.	do. do. 2 "	"	30	×	60 "	80
1368.	do. do. 2 "	"	80	×	100 "	1 00

Foot divided decimally.

1370.	Flat Ivory Chain Scale, 12 inch, div. 100	×	500 parts to the foot	"	3 00	
1371.	do. do. 12 "	"	200	×	400 "	3 00
1372.	do. do. 12 "	"	300	×	600 "	3 00
1373.	do. do. 12 "	"	800	×	1000 "	3 75
1375.	do. do. Offset Scale, 2 "	"	100	×	500 "	80
1376.	do. do. 2 "	"	200	×	400 "	80
1377.	do. do. 2 "	"	300	×	600 "	80
1378.	do. do. 2 "	"	800	×	1000 "	1 00

Purchaser's Name put on any Scale without charge.

For Paragon Scales see page 118.

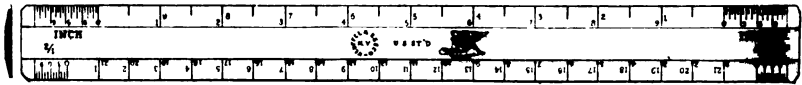


FLAT PARAGON SCALES.

These Scales are made of the best seasoned Borwood. The bevels are lined with a material resembling Ivory, which will permanently remain white and will not shrink. The Paragon Drafting Scales are a great and decided improvement over all other Scales now in use. They combine durability and distinctness, and will not tire nor injure the eyes, because they are even more distinct and legible than Ivory Scales.

Divided: inch to the foot.

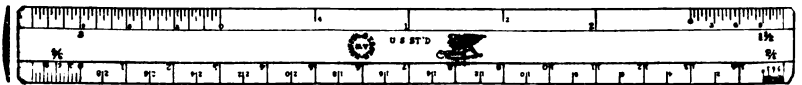
"Copyright, 1887, by Keuffel & Esser."



No. 1391 P.

- | | | | |
|--|--|---------|------|
| 1390 P. | Flat Paragon Scale, 6 inch, div. $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1$ inch to the foot | each \$ | 85 |
| 1391 P. | " " " 12 " " " $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1$ " " " " " | " | 1 25 |
| 1392 P. | " " " 12 $\frac{1}{2}$ " " " $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1$ " " " " " | " | 1 50 |
| Scale No. 1392 has the advantage of covering 100 feet on $\frac{1}{4}$ inch, 50 feet on $\frac{1}{2}$ inch, and 25 feet on $\frac{3}{4}$ inch scale. | | | |
| 1393 P. | Flat Paragon Scale, 18 inch, div. $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1$ inch to the foot, | each \$ | 2 25 |
| 1394 P. | " " " 24 " " " $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1$ " " " " " | " | 3 00 |
| 1395 P. | " " " 24 " " " $\frac{1}{8}, \frac{1}{4}$ inch to the foot, $\frac{1}{16}$ inch full size, | " | 3 00 |

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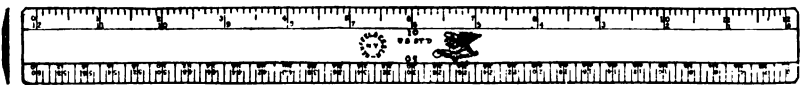


No. 1396 P.

- | | | | |
|---------|---|---------|------|
| 1396 P. | Flat Paragon Scale, 12 inch, div. $\frac{3}{8}, \frac{1}{2}, 1, 1\frac{1}{2}$, 3 inch to the foot, | each \$ | 1 25 |
| 1397 P. | " " " 18 " " " $\frac{3}{8}, \frac{1}{2}, 1, 1\frac{1}{2}$, 3 " " " " " | " | 2 25 |
| 1398 P. | " " " 24 " " " $\frac{3}{8}, \frac{1}{2}, 1, 1\frac{1}{2}$, 3 " " " " " | " | 3 00 |

Divided: inches and tenths.

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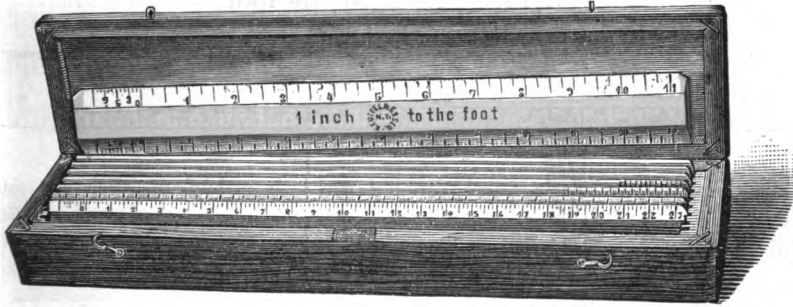
No. 1415 P.

- | | | | |
|---------|---|---------|------|
| 1410 P. | Flat Paragon Chain Scale, 6 inch, div. 10×50 parts to the inch, | each \$ | 85 |
| 1411 P. | " " " " 6 " " 20×40 " " " " " | " | 85 |
| 1412 P. | " " " " 6 " " 30×60 " " " " " | " | 85 |
| 1413 P. | " " " " 6 " " 80×100 " " " " " | " | 1 35 |
| 1415 P. | " " " " 12 " " 10×50 " " " " " | " | 1 25 |
| 1416 P. | " " " " 12 " " 20×40 " " " " " | " | 1 25 |
| 1417 P. | " " " " 12 " " 30×60 " " " " " | " | 1 25 |
| 1418 P. | " " " " 12 " " 80×100 " " " " " | " | 2 00 |

Foot divided decimally.

- | | | | |
|---------|--|---|------|
| 1425 P. | Flat Paragon Chain Scale, 12 inch, div. 100×500 parts to the foot, | " | 1 50 |
| 1426 P. | " " " " 12 " " 200×400 " " " " " | " | 1 50 |
| 1427 P. | " " " " 12 " " 300×600 " " " " " | " | 1 50 |
| 1428 P. | " " " " 12 " " 800×1000 " " " " " | " | 2 50 |

PARAGON SCALES IN SETS.



Flat Scales in Sets present the most perfected form of Draughtsman's Scales, as they overcome entirely the defects previously mentioned. They are put up and arranged in a manner to make their use the most practical, time saving and economical. The Scales are arranged, as the above illustration shows, in neat but strong mahogany boxes which have a separate place for each scale, which place is plainly marked, so that the desired division can be selected at a glance. In this manner the scales, which are as valuable and more delicate than compasses and dividers are protected as well as the latter; for it is unreasonable that scales should be allowed to take care of themselves while compasses are preserved in velvet lined cases.

Each Scale has the same division on both edges, one edge reading from left to right, other edge from right to left. See figure C, page 124.

- 1575 P. Set of 4 Paragon Scales, 12 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot set \$ 6 25
- 1576 P. Set of 8 Paragon Scales, 12 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{8}$, 3 inch to the foot " 11 50
- 1577 P. Set of 12 Paragon Scales, 12 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{8}$, 2, 3, 4, 6 inch to the foot
 $\frac{1}{8}$ inch full size " 17 00
- 1578 P. Set of 4 Paragon Scales, 18 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot " 10 75
- 1579 P. Set of 8 Paragon Scales, 18 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{8}$, 3 inch to the foot " 20 25
- 1580 P. Set of 12 Paragon Scales, 18 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{8}$, 2, 3, 4, 6 inch to the foot
 $\frac{1}{8}$ inch full size " 30 00

Each Scale has two different divisions, one on each edge, both of which are numbered to read both ways. See figure D, page 125.

- 1584 P. Set of 4 Paragon Scales, 12 inch
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch set \$ 7 00

Each Scale has only one division, the same on both edges, and is numbered to read both ways on each edge.

- 1592 P. Set of 6 Paragon Scales, 12 inch
divided: 10, 20, 30, 40, 50, 60 parts to the inch set \$ 9 00
- 1593 P. Set of 8 Paragon Scales, 12 inch
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch " 13 50

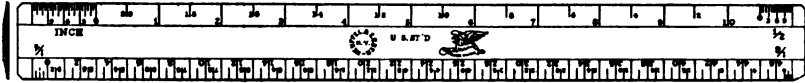
For Boxwood and Ivory Scales in Sets see page 122.



OPEN DIVIDED BOXWOOD SCALES

Divided: inch to the foot.

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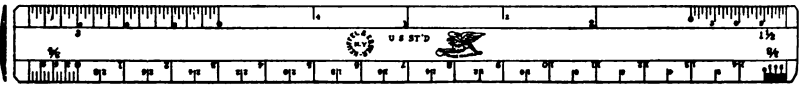
No. 1391.

- 1390. Flat Boxwood Scale, 6 inch, div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot each \$ 50
- 1391. " " do. 12 " " $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 " " " " " 75
- 1392. " " do. 12 $\frac{1}{2}$ " " $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 " " " " " 1 00

Scale No. 1392 has the advantage of covering 100 feet on $\frac{1}{8}$ inch, 50 feet on $\frac{1}{4}$ inch and 25 feet on $\frac{1}{2}$ inch scale.

- 1393. Flat Boxwood Scale, 18 inch, div., $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot each \$ 1 50
- 1394. " " do. 24 " " $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 " " " " " 2 00
- 1395. " " do. 24 " " $\frac{1}{8}$, $\frac{1}{2}$ inch to the foot
 $\frac{1}{8}$ inch full size " 2 00

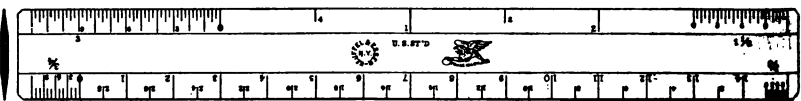
"Copyright, 1887, by Keuffel & Esser."



No. 1396.

- 1396. Flat Boxwood Scale, 12 inch, div. $\frac{2}{8}$, $\frac{3}{8}$, $1\frac{1}{8}$, 3 inch to the foot each \$ 75
- 1397. " " do. 18 " " $\frac{2}{8}$, $\frac{3}{8}$, $1\frac{1}{8}$, 3 " " " " " 1 50
- 1398. " " do. 24 " " $\frac{2}{8}$, $\frac{3}{8}$, $1\frac{1}{8}$, 3 " " " " " 2 00

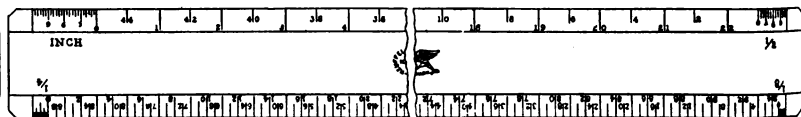
"Copyright, 1887, by Keuffel & Esser."



No. 1400.

- 1400. Flat Boxwood Scale, 12 inch, beveled and div. on both sides, div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $1 \times \frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{8}$, 3 inch to the foot each \$ 1 20
- 1401. Flat Boxwood Scale, 18 inch, beveled and div. on both sides, div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $1 \times \frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{8}$, 3 inch to the foot " 2 25

"Copyright, 1887, by Keuffel & Esser."



No. 1402.

- 1402. Flat Boxwood Scale, 24 inch, beveled and div. on both sides, div. $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $1 \times \frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{8}$, 3 inch to the foot each \$ 3 00

Purchaser's name put on any Scale without charge.

For Paragon Scales see page 118.

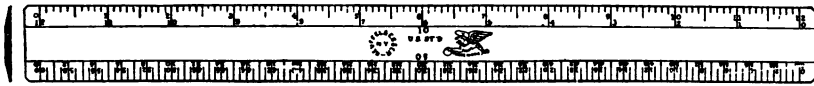
For Boxwood Scales in Sets see page 122.

KEUFFEL & ESSER CO. NEW YORK.

BOXWOOD CHAIN SCALES

Divided in inches and tenths.

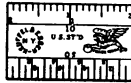
"Copyright, 1887, by Keuffel & Esser."



No. 1415.

1410.	Flat Boxwood Chain Scale, 6 inch, div. 10	×	50 parts to the inch	each	\$	50
1411.	do.	do.	6 " " 20	×	40 " " " "	50
1412.	do.	do.	6 " " 30	×	60 " " " "	50
1413.	do.	do.	6 " " 80	×	100 " " " "	1 00
1415.	do.	do.	12 " " 10	×	50 " " " "	75
1416.	do.	do.	12 " " 20	×	40 " " " "	75
1417.	do.	do.	12 " " 30	×	60 " " " "	75
1418.	do.	do.	12 " " 80	×	100 " " " "	1 50

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No. 1420.

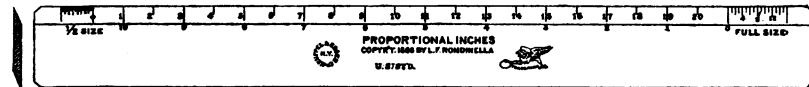
1420.	Flat Boxwood Offset Scale, 2 inch, div. 10	×	50 parts to the inch	"	50	
1421.	do.	do.	2 " " 20	×	40 " " " "	50
1422.	do.	do.	2 " " 30	×	60 " " " "	50
1423.	do.	do.	2 " " 80	×	100 " " " "	1 00

Foot divided decimally.

1425.	Flat Boxwood Chain Scale, 12 in., div. 100	×	500 parts to the foot	"	1 00	
1426.	do.	do.	12 " " 200	×	400 " " " "	1 00
1427.	do.	do.	12 " " 300	×	600 " " " "	1 00
1428.	do.	do.	12 " " 800	×	1000 " " " "	2 00

SCALE OF PROPORTIONAL INCHES.

"Copyright, 1888, by L. F. Rondinella."



This scale is designed especially for the use of Mechanical and Machine Draftsmen. It contains the Scales most used in practice: full, $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$ size in inches, two scales on each edge, the unit beyond the zero point subdivided.

1490.	Flat Boxwood Scale, 12 inch, bevels on opposite sides . . .	each	\$	80
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FLAT METRIC SCALES.

1530.	Flat Boxwood Scale, 10 c/m div. m/m and half m/m	"	50
1540.	do.	20 " "	60
1550.	do.	30 " "	75
1560.	do.	50 " "	1 50

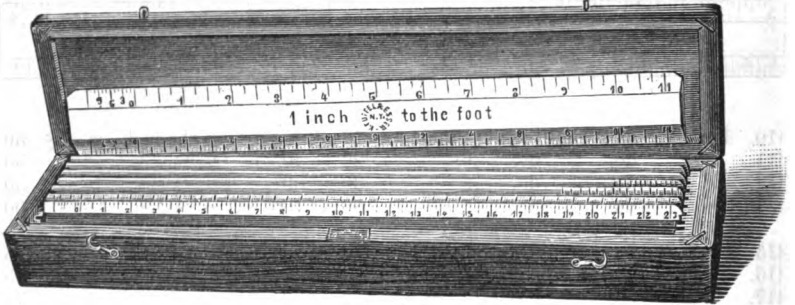
Purchaser's name put on any Scale without charge.

For Paragon Scales see page 118.

For Scales in Sets see pages 119 and 122.



IVORY AND BOXWOOD SCALES in Sets.



OPEN DIVIDED SCALES IN SETS.

Each Scale has the same division on both edges, one edge reading from left to right, other edge from right to left. See figure C, page 124.

- 1570. Set of 4 Ivory Scales, 12 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot set \$ 13 50
- 1571. Set of 8 Ivory Scales, 12 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{2}$, 3 inch to the foot . . . " 25 50
- 1572. Set of 12 Ivory Scales, 12 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{2}$, 2, 3, 4, 6 inch to the foot
 $\frac{1}{16}$ inch full size " 37 50
- 1575. Set of 4 Boxwood Scales, 12 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot " 4 25
- 1576. Set of 8 Boxwood Scales, 12 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{2}$, 3 inch to the foot. . . " 7 50
- 1577. Set of 12 Boxwood Scales, 12 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{2}$, 2, 3, 4, 6 inch to the foot
 $\frac{1}{16}$ inch full size " 11 00
- 1578. Set of 4 Boxwood Scales, 18 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 inch to the foot " 7 75
- 1579. Set of 8 Boxwood Scales, 18 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{2}$, 3 inch to the foot . . . " 14 25
- 1580. Set of 12 Boxwood Scales, 18 inch
divided: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, 1, $1\frac{1}{2}$, 2, 3, 4, 6 inch to the foot
 $\frac{1}{16}$ inch full size " 21 00

For Paragon Scales in Sets see page 119.

CHAIN SCALES IN SETS.

Each Scale has two different divisions, one on each edge, both of which are numbered to read both ways. See figure D, page 125.

1582. Set of 4 Ivory Scales, 12 inch
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch set \$ 14 25
1583. Set of 8 Ivory Scales, four 12 inch and four 2 inch Offset to match
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch " 17 75
1584. Set of 4 Boxwood Scales, 12 inch
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch " 5 00
1585. Set of 8 Boxwood Scales, four 12 in. and four 2 in. Offset to match
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch " 7 75

Each Scale has only one division, the same on both edges, and is numbered to read both ways on each edge.

1588. Set of 6 Ivory Scales, 12 inch
divided: 10, 20, 30, 40, 50, 60 parts to the inch . . set \$ 19 50
1589. Set of 8 Ivory Scales, 12 inch
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch " 28 25
1590. Set of 12 Ivory Scales, six 12 inch and six 2 inch Offset to match
divided: 10, 20, 30, 40, 50, 60 parts to the inch . . " 24 50
1591. Set of 16 Ivory Scales, eight 12 in. and eight 2 in. Offset to match
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch " 35 75
1592. Set of 6 Boxwood Scales, 12 inch
divided: 10, 20, 30, 40, 50, 60 parts to the inch . . " 6 00
1593. Set of 8 Boxwood Scales, 12 inch
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch " 9 50
1594. Set of 12 Boxwood Scales, six 12 in. and six 2 in. Offset to match
divided: 10, 20, 30, 40, 50, 60 parts to the inch . . " 9 30
1595. Set of 16 Boxw. Scales, eight 12 in. and eight 2 in. Offset to match
divided: 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch " 15 50

For Paragon Scales in sets see page 119.

See following page: "Special Scales to order."



SPECIAL SCALES TO ORDER.

We are called upon frequently to make special scales to order. To avoid error and tedious and delaying correspondence we give directions how to order such scales and to judge of their probable cost.

There are two distinct different ways of dividing a scale, the "open divided" and the "full divided or chain scale."

Open divided Scales are illustrated under A, B, C. They are generally used in Architectural or Mechanical Drawing, and are divided in inches or parts of inches which represent feet or full inches. The units are marked along the whole length of the edge and only the first foot is subdivided to inches and fractions.

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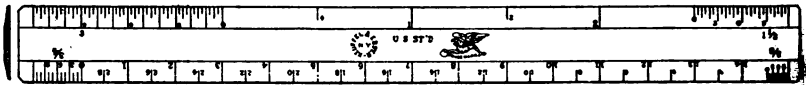


Fig. A.

Fig. A represents an open divided Scale, with **four different divisions**, two on each edge. Two of these divisions are numbered to read from the right, the other two from the left.

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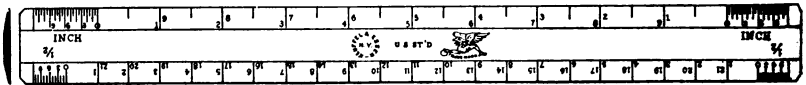


Fig. B.

Fig. B represents an open divided Scale with **two different divisions**, one on each edge, which both read from right to left and from left to right.

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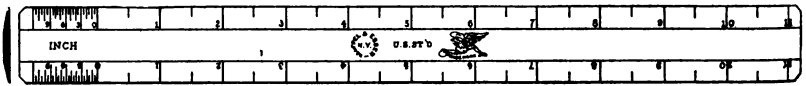


Fig. C.

Fig. C represents an open divided Scale with only **one division**, the same on both edges; one edge reads from right to left, the other from left to right.

In ordering open divided scales it is therefor necessary to state that they are to be open divided, also length, shape and material, how many different divisions are wanted and which on each edge and whether the figures should read from right to left, or from left to right or both ways. Of course they can read both ways only when there is but one division on each edge.

“Full divided or Chain Scales“ are those on which equal divisions are carried along the whole length of the edge. Therefor only one or two scales can be made on one blank. They are generally divided to decimals of inches, numbered continuous per 10 divisions and are used by Surveyors and Civil Engineers, but can be divided inches to the foot as shown in figure E.

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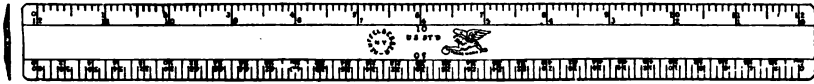


Fig. D.

Fig. D represents a Chain Scale with two different divisions, one on each edge, both of which read from right to left and from left to right.

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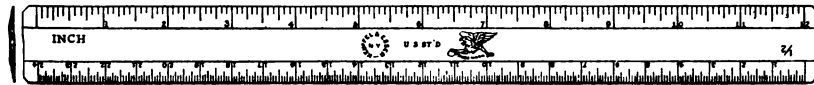


Fig. E.

Fig. E represents a Chain Scale with two different divisions, one on each edge, both of which read from left to right.

In ordering Chain Scales it is therefor necessary to state that they are to be chain scales, also length, shape and material which divisions are wanted and whether they should read from right to left, or from left to right or both ways.

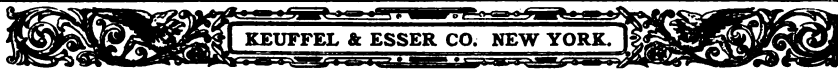
The safest way to order a special scale is to send us a sketch showing divisions and numbering, and to specify material.

To estimate the price of a flat scale to order, add about 25 % of the price of a similar catalogued boxwood scale to the price of the kind of scale wanted, if it be other than boxwood.

We invariably require remittance covering the entire cost of such scale, with the order.

Scales with any divisions, also in foreign measure, cut to order.





KEUFFEL & ESSER CO. NEW YORK.

IVORY AND BOXWOOD SCALES.

Hand divided.

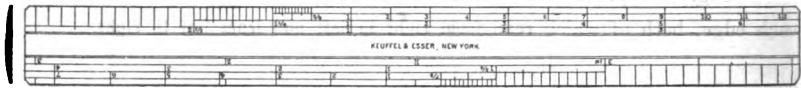
"Copyright, 1887, by Keuffel & Esser."



No. 1600.

1600. Flat Ivory Universal Scale, 12 inch:
 one side divided: $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1, \frac{5}{8}, \frac{3}{4}, 1\frac{1}{2}, 2\frac{1}{4}$ } inch to the foot, each \$ 3 25
 other " " $\frac{3}{8}, \frac{1}{2}, 1\frac{1}{4}, 3, \frac{7}{8}, 1\frac{1}{2}, 2, 4$ }
1601. Flat Boxwood Universal Scale, 12 inch, divided like No. 1600 " 1 00

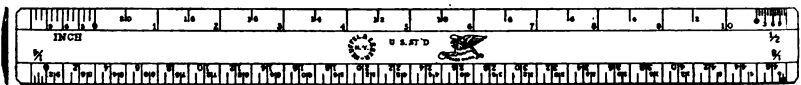
"Copyright, 1887, by Keuffel & Esser."



No. 1602.

1602. Flat Ivory Universal Scale, 12 inch, all Scales brought to the edge:
 one side divided: $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1\frac{1}{2}$ } inch to the foot, each \$ 3 25
 other " " $\frac{1}{8}, \frac{5}{8}, 1\frac{1}{2}, 2\frac{1}{4}, \frac{7}{8}, \frac{1}{2}, 1\frac{1}{2}, 3$ }
1603. Flat Boxwood Universal Scale, 12 inch, divided like No. 1602 " 1 00

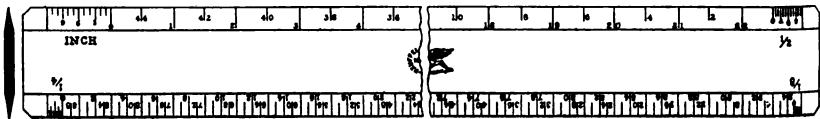
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No. 1606.

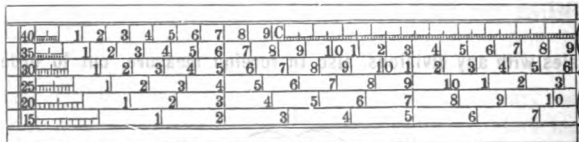
1605. Flat Boxwood Scale, 6 inch, div. $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1$ inch to the foot, each \$ 35
 1606. " " " 12 " " $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1$ " " " " " " 50
 1607. " " " 24 " " $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1$ " " " " " " 1 50

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No. 1610.

1610. Flat Boxwood Scale, beveled and divided both sides, 24 inch,
 div. $\frac{1}{8}, \frac{1}{4}, \frac{1}{2}, 1 \times \frac{3}{8}, \frac{1}{2}, 1\frac{1}{2}, 3$ inch to the foot . . each \$ 2 00



No. 1615.

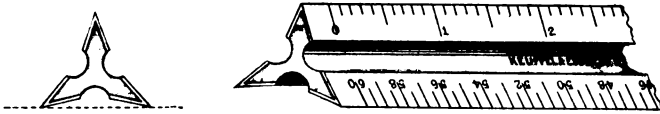
1615. Ivory Plotting Scale, 6 inch each \$ 75

KEUFFEL & ESSER CO. NEW YORK.

TRIANGULAR SCALES.

Machine divided.
U. S. St^d

TRIANGULAR PARAGON SCALES.



These Scales have the improved shape, shown in above cut, which prevents wearing off of the divisions and insures better contact with the drawing and a better angle of vision. The bevels bearing the divisions are lined with a material resembling ivory, like the above Flat Paragon Scales. The advantages of these combined improvements are obvious.

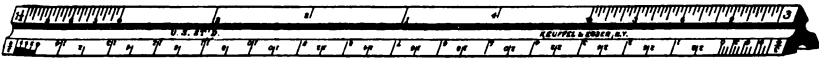
Improved Triangular Paragon Scales, Architects'.

1621 P. 12 inch, div. $\frac{3}{16}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{5}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 , $1\frac{1}{2}$, 3 inch to the foot, $\frac{1}{16}$ inch, each \$ 3 00
 1622 P. 12 " " $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 , $1\frac{1}{2}$, 2, 3, 4 " " " " " " " 3 00

Improved Triangular Paragon Scales, Engineers'.

1631 P. 12 inch, div. 10, 20, 30, 40, 50, 60 parts to the inch . . . " 3 00
 1634 P. 12 " " 20, 30, 40, 50, 60, 80 " " " " . . . " 3 00

TRIANGULAR BOXWOOD SCALES.



No. 1621.

Triangular Boxwood Scale, Architects,

1620. 6 inch, div. $\frac{3}{16}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, $\frac{5}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 , $1\frac{1}{2}$, 3 inch to the foot, $\frac{1}{16}$ inch, each \$ 80
 1621. 12 " " " " " " " " " " " " " " " " " 1 50
 1622. 12 " " $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 , $1\frac{1}{2}$, 2, 3, 4 " " " " " " " " 1 50
 1623. 18 " " " " " " " " " " " " " " " " " 2 50
 1624. 24 " " " " " " " " " " " " " " " " " 4 25



No. 1631.

Triangular Boxwood Chain Scale, Engineers,

1630. 6 inch, div. 10, 20, 30, 40, 50, 60 parts to the inch . . . each \$ 80
 1631. 12 " " " " " " " " " " " " " " " " " 1 50
 1632. 18 " " " " " " " " " " " " " " " " " 2 50
 1633. 24 " " " " " " " " " " " " " " " " " 4 25
 1634. 12 " " 20, 30, 40, 50, 60, 80 " " " " " " " 1 50
 1635. Triangular Boxwood Chain Scale, 12 inch
 div. 100, 200, 300, 400, 500, 600 parts per foot . . . " 1 75
 1636. Triangular Boxwood Offset Scale
 2 inch to match No. 1630 to 1633 " 60

KEUFFEL & ESSER CO. NEW YORK.

PAPER SCALES.

ENGINE DIVIDED. PRINTED ON BRISTOL BOARD.

Superior to all others.

19 inch long, 1 1/4 inch wide.

1675.	Series A, 6 in Set, div. $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{8}$, 1, $1\frac{1}{2}$, 3 inch to the foot	set \$	1 00
1676.	" B, 6 " " " $\frac{2}{32}$, $\frac{1}{16}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{7}{8}$ " " " " " "	"	1 00
1677.	" C, 6 " " " 10, 20, 30, 40, 50, 60 parts per inch	"	1 00
	Single Scales of the above	each	20
	" " div. 2, 4 inch to the foot, 66 parts per inch		
	and $\frac{1}{16}$ ths inch	"	20



No. 1678.

1678.	Meter and Inch Comparing Scales, $\frac{1}{2}$ meter long	each \$	35
1679.	Meter Scale, $\frac{1}{2}$ meter long	"	20
1689.	Scale of Proportional Inches, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{1}$, 12 inch long	"	10

PATENT TRIANGULAR SCALE GUARD.



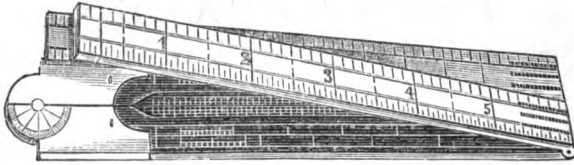
No. 1690.

1690.	Patent Triangular Scale Guard	each \$	25
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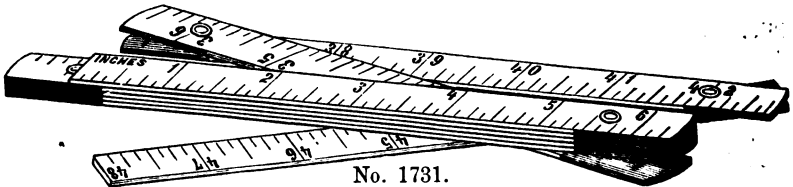
SCALE RULES.



No. 1720.

1720. Ivory Joint Rule, 2 feet 4 fold, German Silver mounted, divided: $\frac{1}{8}$, $\frac{1}{10}$, $\frac{1}{12}$, $\frac{1}{16}$ of an inch, outside edge foot in 100ths. The inside edges are beveled and have Scales of $\frac{1}{16}$, $\frac{2}{16}$, $\frac{3}{16}$, $\frac{4}{16}$, $\frac{5}{16}$, $\frac{6}{16}$, $\frac{7}{16}$, $\frac{8}{16}$, $\frac{9}{16}$, 1, $1\frac{1}{2}$, $1\frac{1}{4}$ inches to the foot. The main joint is divided to 5 degrees for setting off angles each \$ 7 50
1721. Boxwood Joint Rule, 2 feet 4 fold, German Silver mounted, divided like No. 1720 " 2 25
1722. Boxwood Joint Rule, 2 feet 4 fold, Brass mounted with Scales on beveled edge of $\frac{1}{16}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{5}{16}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, 1 inch to the foot. The main joint is divided to 45, 60 and 90 degrees " 1 25

ENGINEER'S POCKET RULES.



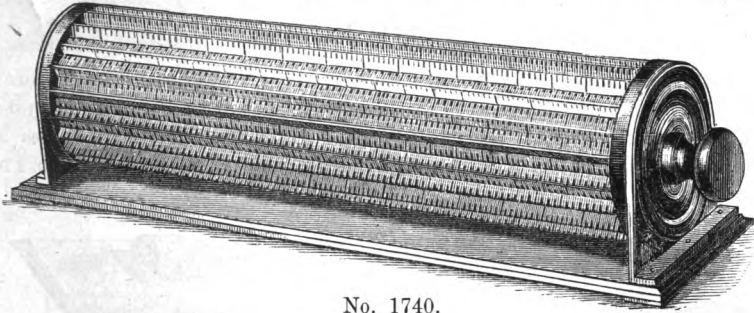
No. 1731.

These Pocket Rules are thinner and lighter, and therefore more convenient than the common Joint rule. They are extremely accurate, as by a peculiar preparation of the wood shrinkage is prevented entirely. No. 1730 to 1732 have the additional advantage of being provided with ingenious springs (Pat. March 29. 81) which hold the rule in a straight line when open and require no attention whatever when folding it.

No. 1733 is so flexible that it can be used also for measuring curved or bent objects.

1730. Engineer's Pocket Rule, 2 feet 4 fold div. $\frac{1}{16} \times \frac{1}{16}$ in., with Springs each \$ 50
1731. " do. do. 4 " 8 " " $\frac{1}{16} \times \frac{1}{16}$ " " " " 90
- 1731-5. " do. do. 5 " 10 " " $\frac{1}{16} \times \frac{1}{16}$ " " " " 1 20
1732. " do. do. 4 " 8 " " $\frac{1}{16} \times$ meter " " " 90
1733. " do. do. 4 " 8 " " $\frac{1}{16} \times$ " extra flexible " 60
1734. " do. do. 4 " 8 " " $\frac{1}{16} \times \frac{1}{16}$ inch " 40
1735. " do. do. 2 " 4 " " $\frac{1}{16} \times \frac{1}{16}$ " " 25
1736. " do. do. 4 " 8 " " $\frac{1}{16} \times$ meter " 40

THACHER'S CALCULATING INSTRUMENT.



No. 1740.

1740. Thacher's Calculating Instrument, for performing the greatest variety of useful calculations with unexampled rapidity and accuracy, cylinder 18 inch, $\frac{1}{2}$ in polished mahogany Box each \$ 30 00

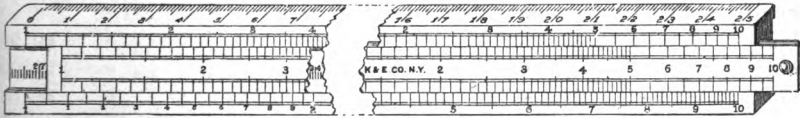
It will be found useful to the Engineer, Architect, Actuary, Scientist, Manufacturer, Mechanic, Navigator and Accountant.

A book containing a full description of the instrument, all the necessary rules for operating it, and numerous examples both general and special, will accompany each instrument, or will be mailed on receipt of 50 c.

Testimonials will be furnished on application.

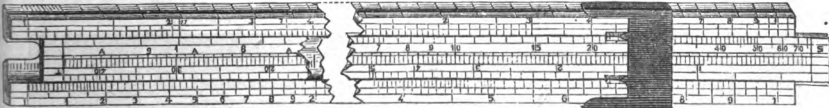
ENGINEERS SLIDE RULES.

"Copyright, 1890, by Keuffel & Esser Co."



No. 1745.

1745. Engineers Slide Rule, 10 inch, boxwood, with directions . each \$ 3 50



No. 1746.

1746. Engineers Slide Rule, 10 inch, divided on celluloid facings, with brass indicator, directions with rule each \$ 4 50

1748. do. do. do. 20 inch divided on celluloid facings, with brass indicator, directions with rule " 16 50

The 20 inch Slide Rules have the great advantage that they admit of finer divisions and consequent closer reading than the 10 inch. Of course the longer rules are more liable to warp, and thereby give rise to complaint, but they are nevertheless preferred on account of the advantages of the finer divisions.

Printed Directions (except when furnished with the rule) each \$ 20



ROLLING PARALLEL RULES.

Our Own Make.

The Metal Rolling Parallel Rules made by us are heavier than those generally offered. They are made by special machinery and mounted according to a system which insures the greatest possible accuracy. All our Rolling Parallel Rules are furnished in style of No. 1751 or with wooden handle as shown in cut No. 1766 if so ordered.



No. 1751.

German Silver.

1750.	Parallel Rule,	9 inch,	weight about	19 oz.	. . . . .	each	\$ 8 50
1751.	do.	12 "	"	" 24 "	. . . . .	"	10 00
1752.	do.	15 "	"	" 32 "	. . . . .	"	12 00
1753.	do.	18 "	"	" 42 "	. . . . .	"	15 00
1754.	do.	24 "	"	" 60 "	. . . . .	"	20 00

Brass.

1755.	Parallel Rule,	9 inch,	weight about	18 oz.	. . . . .	"	7 25
1756.	do.	12 "	"	" 23 "	. . . . .	"	8 50
1757.	do.	15 "	"	" 31 "	. . . . .	"	10 00
1758.	do.	18 "	"	" 40 "	. . . . .	"	12 00
1759.	do.	24 "	"	" 58 "	. . . . .	"	18 00

Polished Boxes for above	9	12	15	18	24 inch
each \$	75	85	1 00	1 10	1 25



No. 1760.

1760.	Ebony Rolling Parallel Rule	Brass mountings, divided white edges,				
			$\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, 1 inch	to the foot	12 inch	each \$ 5 00
1761.	do.	do.			15 "	" 6 50
1762.	do.	do.			18 "	" 7 50

For Rubber Rolling Parallel Rules see page 142.

KEUFFEL & ESSER CO. NEW YORK.



No. 1766 with wooden handle.

1765.	Ebony Rolling Parallel Rule, Brass mountings, 9 inch	each	\$ 2 75
1766.	“ do. “ “ “ “ 12 “	“	3 25
1767.	“ do. “ “ “ “ 15 “	“	4 00
1768.	“ do. “ “ “ “ 18 “	“	5 00

FOLDING PARALLEL RULES.

1771.	Parallel Rule, all German Silver, 6 inch	each	\$ 1 50
-------	--	------	---------



No. 1781.

As the imported wooden Rules warp and shrink in this climate, we make Parallel Rules here which we can recommend and warrant.

Keuffel and Esser Co.'s Ebony Parallel Rules, Brass Bars,

	<u>1780</u>	<u>1781</u>	<u>1782</u>	<u>1783</u>	<u>1784</u>	<u>1785</u>
	6	9	12	15	18	24 inch
each \$	35	60	75	90	1 25	2 25

Imported Ebony Parallel Rules, Brass Bars,

	<u>1790</u>	<u>1791</u>	<u>1792</u>	<u>1793</u>	<u>1794</u>	<u>1795</u>
	6	9	12	15	18	24 inch
each \$	20	40	50	65	75	1 75

For Rubber Parallel Rules see page 142.



KEUFFEL & ESSER CO. NEW YORK.

HARD RUBBER DRAWING TOOLS

MANUFACTURED BY

KEUFFEL & ESSER CO.



All our Tools of Hard Rubber are highly recommended. Their superiority over others is recognized and indorsed by the best authorities. They are annealed and consequently not affected by changes of temperature.

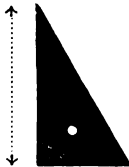
The Triangles and Curves are of the utmost durability in comparison to those made of wood, which are liable to break or part at the joints.

The density of the Rubber permits of a very high finish on the edges similar to metal, which is a great advantage.

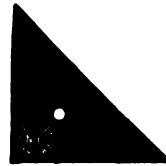
We warrant all our Rubber Tools to be correct and of the best possible quality, and stamp each of them with our firm name and trade mark:



HARD RUBBER TRIANGLES.



No. 1800.



No. 1801.

1800. Hard Rubber Triangles, solid, $30 \times 60^\circ$

	4	6	8 inch
each \$	18	25	35

1801. Hard Rubber Triangles, solid, 45°

	$3\frac{1}{2}$	5	6 inch
each \$	18	25	35



No. 1802.

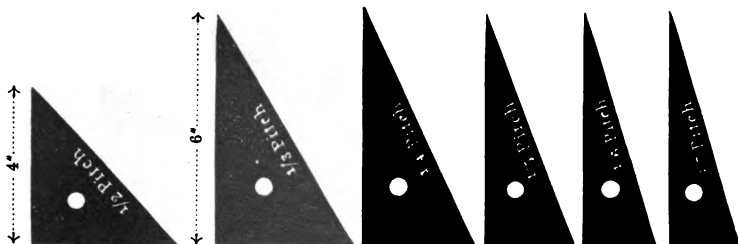
1803.

1804.

1802. Hard Rubber Triangles, $30 \times 60^\circ$
 each \$ 4 5 6 7 8 9 10 11 12 13 14 15 16 inch
 \$ 25 30 35 40 50 60 65 75 90 1 00 1 25 1 50 1 75

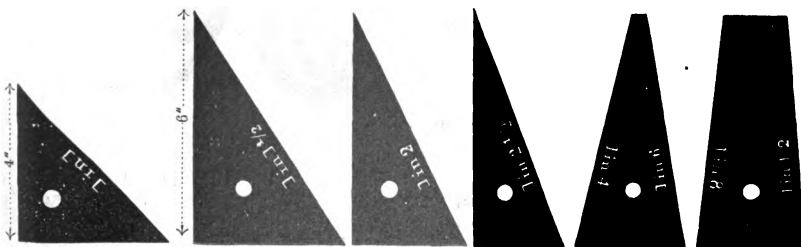
1803. Hard Rubber Triangles, $22\frac{1}{2} \times 67\frac{1}{2}^\circ$
 each \$ 4 5 6 7 8 9 10 11 12 13 14 15 16 inch
 \$ 25 30 35 40 50 60 65 75 90 1 00 1 25 1 50 1 75

1804. Hard Rubber Triangles, 45°
 each \$ 4 5 6 7 8 9 10 11 12 13 14 15 16 inch
 \$ 35 40 45 55 70 80 100 1 25 1 50 1 75 2 00 2 25 2 50



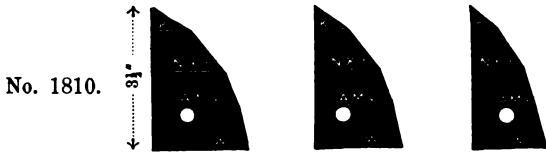
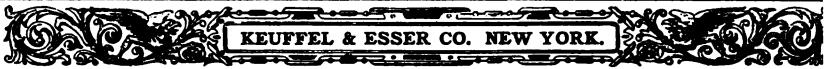
No. 1805.

1805. Hard Rubber Triangles for roof pitches, 6 in set . . . set \$ 3 00



No. 1806.

1806. Hard Rubber Triangles for embankments, 8 slopes in set . set \$ 4 25



1810. Hard Rubber Lettering Triangles, 3 in set. per set \$ 1 25

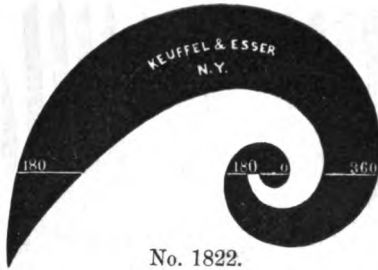
HARD RUBBER CURVES.



No. 1820.

1820. Hard Rubber Curves:

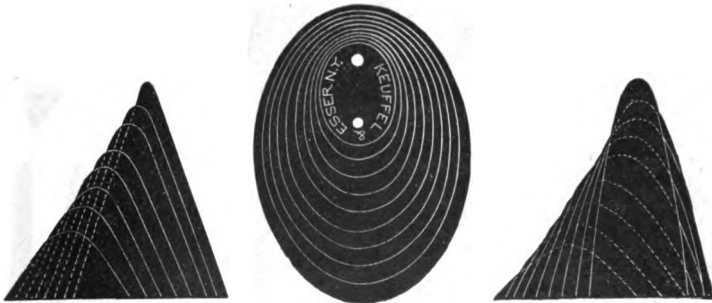
No. 1	2	3	4	5	6	7	8	9	10	11	12	13
\$ 35	35	50	50	40	35	30	25	25	20	20	30	50
No. 14	15	16	17	18	19	20	21	22	23	24		
\$ 35	45	35	35	40	50	50	45	35	40	60		
		No. 25	26	27	28							
		\$ 40	35	75	2 25							



No. 1822.

1822. Logarithmic Spiral Curve each \$ 1 50

This curve is mathematically constructed, it contains every curve within the limit of its size. If properly used according to the directions accompanying each the most difficult calculations can be made with it.

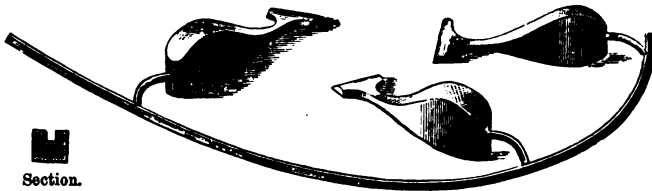


No. 1827.

1825.

1828.

1825.	Hard Rubber Ellipses,	10 in set from $1\frac{1}{4}$ to 6 inch . . . set	\$ 2 00
1826.	do. do.	6 " " " 2 " $4\frac{1}{4}$ " . . . " "	1 50
1827.	Hard Rubber Hyperbolas,	8 " " " 2 " $5\frac{1}{4}$ " . . . " "	2 25
1828.	Hard Rubber Parabolas,	8 " " " $1\frac{1}{4}$ " $5\frac{1}{4}$ " . . . " "	2 25
1829.	do. do.	8 " " " $3\frac{1}{4}$ " $14\frac{1}{4}$ " . . . " "	5 00



No. 1835.

1835.	Hard Rubber Splines,						
		12	18	24	30	36	42 inch
	each \$	25	30	35	40	45	50

These Splines have a small groove, as shown in the section, to admit the fingers of the weights which hold them in position.

For Spline Weights see page 151.

Illustrations $\frac{1}{10}$ size.



KEUFFEL & ESSER CO. NEW YORK.

1836. Set of 120 Hard Rubber Copenhagen Ship Curves, in
Black Walnut Case \$ 65 00

1837. Set of 10 do. for Mechanical Engineers, contg.: No. 55, 60,
94, 102, 104, 109, 114, 119, 121, 128, Set in Case " 5 25

1838. Hard Rubber Copenhagen Ship Curves.

No. 31 each \$ 1 25	No. 72 each \$ 50	No. 113 each \$ 40
32 " 1 25	73 " 50	114 " 50
33 " 1 25	74 " 50	115 " 40
34 " 1 25	75 " 50	116 " 40
35 " 1 25	76 " 50	117 " 35
36 " 1 25	77 " 50	118 " 25
37 " 1 25	78 " 50	119 " 50
38 " 1 25	79 " 50	120 " 35
39 " 1 25	80 " 50	121 " 35
40 " 1 25	81 " 50	122 " 30
41 " 1 25	82 " 50	123 " 25
42 " 1 25	83 " 50	124 " 25
43 " 1 25	84 " 40	125 " 25
44 " 1 25	85 " 50	126 " 25
45 " 1 25	86 " 50	127 " 25
46 " 1 25	87 " 60	128 " 35
47 " 1 25	88 " 75	129 " 40
48 " 1 00	89 " 75	130 " 50
49 " 80	90 " 60	131 " 40
50 " 80	91 " 60	132 " 40
51 " 80	92 " 50	133 " 40
52 " 60	93 " 40	134 " 40
53 " 60	94 " 50	135 " 40
54 " 1 00	95 " 40	136 " 35
55 " 80	96 " 40	137 " 30
56 " 1 25	97 " 50	138 " 40
57 " 80	98 " 50	139 " 40
58 " 80	99 " 40	140 " 40
59 " 80	100 " 40	141 " 40
60 " 80	101 " 40	142 " 40
61 " 75	102 " 40	143 " 35
62 " 75	103 " 40	144 " 40
63 " 75	104 " 35	145 " 40
64 " 75	105 " 35	146 " 40
65 " 75	106 " 40	147 " 40
66 " 50	107 " 50	148 " 40
67 " 50	108 " 50	149 " 40
68 " 50	109 " 75	150 " 50
69 " 50	110 " 75	151 " 50
70 " 50	111 " 40	
71 " 50	112 " 60	



HARD RUBBER RAILROAD CURVES

AWARDED

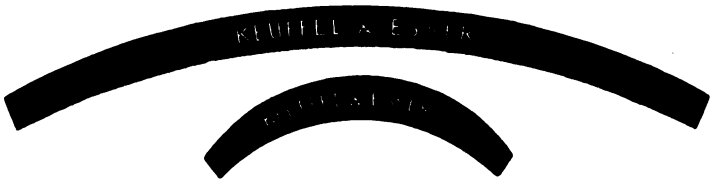
THE ONLY MEDAL



AT THE NATIONAL EXPOSITION

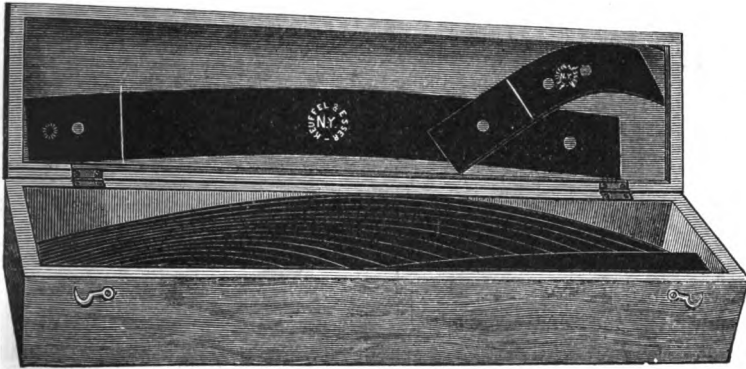
OF

RAILWAY APPLIANCES, CHICAGO 1883.



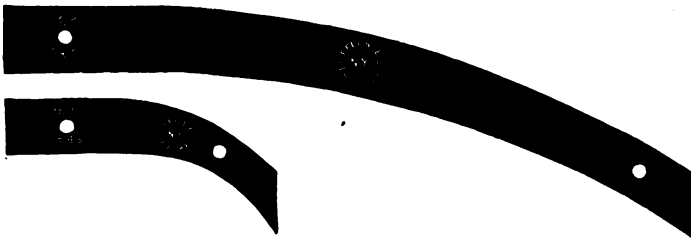
1840. Hard Rubber Railroad Curves, 10 in set, viz: 12, 24, 36,
48, 60, 72, 84, 96, 108, 120 inch radius, in wooden box \$ 7 75
1841. do. do. do. 17 in set, viz: 12, 15, 18,
21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57,
60 inch radius, in wooden box. " 13 25
1842. do. do. do. 40 in set, viz: 3, 4, 5, 6,
7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 21, 24, 27, 30, 33,
36, 39, 42, 45, 48, 51, 54, 57, 60, 66, 72, 78, 84, 90,
96, 102, 108, 114, 120 inch radius, 1 curve 1° to
100 foot scale, 57.30 inch, 1 curve 2° to 100 foot
scale, 28.65 inch, in wooden box " 28 00

KEUFFEL & ESSER CO. NEW YORK.



No. 1845.

1845. **Hard Rubber Railroad Curves with Tangent**, 55 in set,
 viz: 3, 3½, 4, 4½, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,
 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28,
 30, 32, 34, 35, 36, 38, 40, 45, 50, 55, 60, 65, 70, 75,
 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180,
 190, 200 inch radius, in wooden box \$ 40 00



1846. **Hard Rubber Railroad Curves, with Tangent, marked in degrees and inches to 100 foot scale**, 41 in set, viz.:

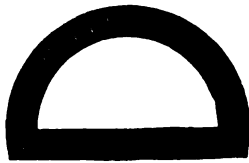
0°.30' = 114.59 inch.	3°.30' = 16.37 inch.	6° = 9.55 inch.	8°.30' = 6.75 inch.
1° = 57.30 "	3°.45' = 15.28 "	6°.15' = 9.17 "	8°.45' = 6.55 "
1°.15' = 45.84 "	4° = 14.33 "	6°.30' = 8.82 "	9° = 6.37 "
1°.30' = 38.20 "	4°.15' = 13.48 "	6°.45' = 8.49 "	9°.15' = 6.20 "
1°.45' = 32.74 "	4°.30' = 12.73 "	7° = 8.19 "	9°.30' = 6.04 "
2° = 28.65 "	4°.45' = 12.07 "	7°.15' = 7.91 "	9°.45' = 5.88 "
2°.15' = 25.47 "	5° = 11.46 "	7°.30' = 7.64 "	10° = 5.74 "
2°.30' = 22.92 "	5°.15' = 10.92 "	7°.45' = 7.40 "	10°.30' = 5.48 "
2°.45' = 20.84 "	5°.30' = 10.42 "	8° = 7.17 "	11° = 5.22 "
3° = 19.10 "	5°.45' = 9.97 "	8°.15' = 6.95 "	11°.30' = 4.99 "
3°.15' = 17.63 "			
	In wooden box \$ 30 00		

Single Railroad Curves as described above of any desired scale cut to order.

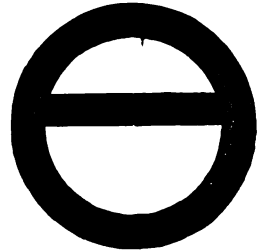
Single Railroad Curves each \$ 75
 do. with tangent " 90



HARD RUBBER PROTRACTORS.



No. 1850.



1852.

1850.	Semicircular Rubber Protractor, beveled edge, 6 inch	$\frac{1}{8}$ "	each	\$ 3 00
1851.	do. do.	8 "	"	3 75
1852.	Circular Rubber Protractor,	6 "	"	3 75
1853.	do. do.	8 "	"	5 00
1854.	do. do.	10 "	"	6 00

HARD RUBBER PARALLEL RULES.



No. 1911.

1910.	Hard Rubber Rolling Parallel Rules, nickel plated mountings, 9 in.	each	\$ 3 50
1911.	" " " do.	12 "	4 25
1912.	" " " do.	15 "	5 00
1913.	" " " do.	18 "	6 00
1914.	" " " do.	24 "	8 00

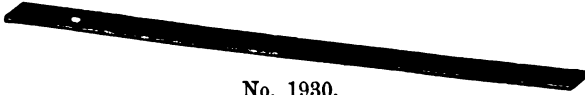


No. 1921.

1920.	Hard Rubber Folding Parallel Rules, nickel plated bars, 6 inch	each	\$ 75
1921.	" " " do.	9 "	1 00
1922.	" " " do.	12 "	1 25
1923.	" " " do.	15 "	1 50
1924.	" " " do.	18 "	1 75
1925.	" " " do.	24 "	2 50

HARD RUBBER

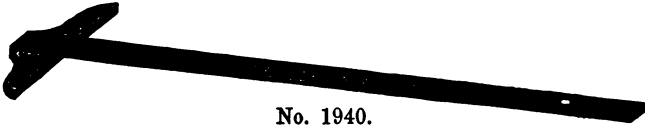
STRAIGHT EDGES AND T SQUARES.



No. 1930.

1930. Hard Rubber Straight Edges, with square edges

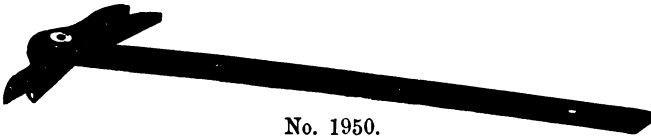
	12	15	18	24	30	36	42 inch
each \$	35	40	50	75	1 00	1 50	2 00



No. 1940.

1940. T Squares, Rubber blade, ebonized fixed head,

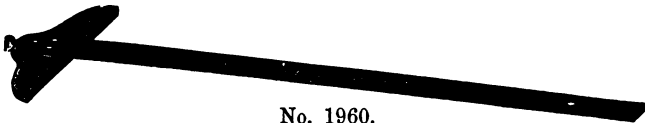
	6	9	12	15	18	24	30	36 inch
each \$	40	50	60	75	90	1 25	1 60	2 00



No. 1950.

1950. T Squares, Rubber blade, ebonized shifting head, with brass thumb-screw and washer,

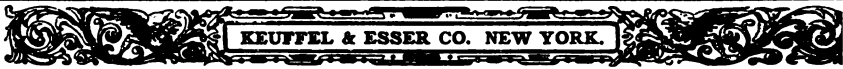
	6	9	12	15	18	24	30	36 inch
each \$	1 00	1 20	1 40	1 60	1 80	2 25	2 60	3 00



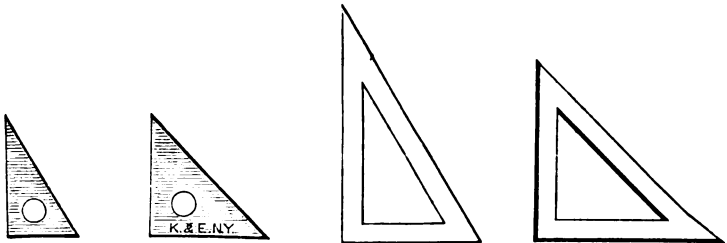
No. 1960.

1960. Unique T Squares, Rubber blade, ebonized head, with nickel plated Patent Clamping Lever as described page 154,

	24	30	36 inch
each \$	2 25	2 60	3 00

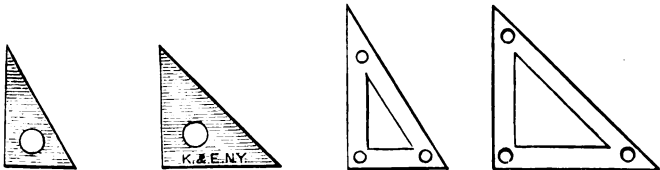


METAL TRIANGLES. STEEL.



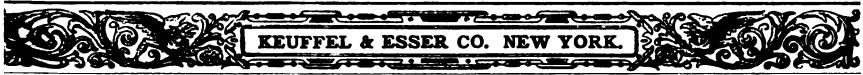
- | | | | |
|---|--------|---------|--------|
| No. 2000. | 2001. | 2002. | 2003. |
| 2000. Steel Triangles, nickel plated, solid, 30 × 60 degrees, | | | |
| | 2 1/4 | 3 | 4 inch |
| each \$ | 65 | 75 | 80 |
| 2001. Steel Triangles, nickel plated, solid, 45 degrees, | | | |
| | 2 | 2 1/2 | |
| each \$ | 65 | 75 | |
| 2002. Steel Triangles, nickel plated, open centre, 30 × 60 degrees, | | | |
| | 6 | 7 | 8 |
| | 10 1/2 | 15 inch | |
| each \$ | 3 25 | 3 75 | 4 00 |
| | | | 4 50 |
| | | | 6 50 |
| 2003. Steel Triangles, nickel plated, open centre, 45 degrees, | | | |
| | 5 | 6 1/2 | 8 |
| | 10 | 12 inch | |
| each \$ | 3 25 | 3 75 | 4 50 |
| | | | 5 50 |
| | | | 6 50 |

GERMAN SILVER.



- | | | | |
|---|-------|---------|---------|
| No. 2005. | 2006. | 2007. | 2008. |
| 2005. German Silver Triangles, solid, 30 × 60 degrees, | | | |
| | 2 | 3 | 3 3/4 |
| each \$ | 60 | 70 | 80 |
| 2006. German Silver Triangles, solid, 45 degrees, | | | |
| | 2 | 2 1/2 | |
| each \$ | 60 | 70 | |
| 2007. German Silver Triangles, open centre 30 × 60 degrees, | | | |
| | 5 1/2 | 7 | 8 |
| | 10 | 12 | 14 inch |
| each \$ | 2 50 | 2 75 | 3 00 |
| | | | 4 00 |
| | | | 5 00 |
| | | | 6 50 |
| 2008. German Silver Triangles, open centre 45 degrees, | | | |
| | 5 | 6 | 8 |
| | 10 | 12 inch | |
| each \$ | 2 50 | 2 75 | 4 00 |
| | | | 5 00 |
| | | | 6 50 |

No. 2007 and 2008 have thin ivory buttons at the corners, to prevent their soiling the paper. These buttons are flat so that they leave no impression on the paper.



STEEL STRAIGHT EDGES.



2020. Steel, with square edges, nickel plated,

	15	18	24	30	36	42	48	60	72 inch	long
	1½	1½	1½	1½	2	2½	2½	2½	3	" wide
	⅞	⅞	⅞	⅞	⅞	⅞	⅞	⅞	⅞	" thick
each \$	1 25	1 50	2 00	3 00	4 00	5 00	6 00	8 50	12 00	

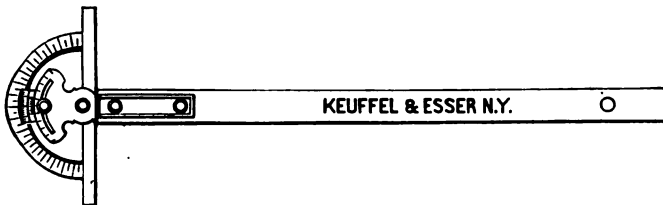


No. 2030.

2030. Steel, one edge beveled, nickel plated,

	15	18	24	30	36	42	48	60	72 inch	long
	1½	1½	1½	1½	2	2½	2½	2½	3	" wide
	⅞	⅞	⅞	⅞	⅞	⅞	⅞	⅞	⅞	" thick
each \$	1 75	2 00	3 00	4 00	5 00	6 50	8 00	11 00	15 00	

STEEL T SQUARES.



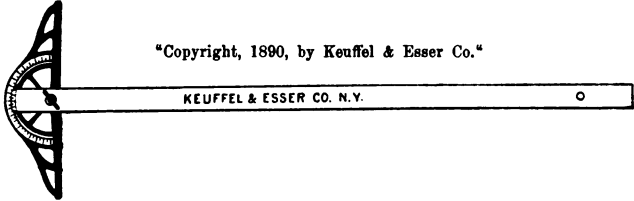
No. 2040.

2040. Protractor T Squares, Steel Blade nickel plated, with German Silver double Protractor Head, the outside one reading to 1 minute, the inside one to 5 minutes, both with vernier.

	24	30	36 inch
each \$	28 00	30 00	32 00



STEEL T SQUARES.



"Copyright, 1890, by Keuffel & Esser Co."

No. 2043.

2043. Protractor T Square, Steel Blade nickel plated, shifting Bronze Head with protractor divided to degrees, vernier on end of blade reading to half degrees, two swivels,

	24	30	36	42 inch
each \$	9 00	9 75	10 75	12 00



No. 2045.

2045. Steel Blade nickel plated, fixed japped Iron Head,

	18	24	30	36 inch long
	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ " wide
	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$ " thick
each \$	3 25	4 50	5 50	6 50



No. 2050.

2050. Steel Blade, nickel plated, shifting japped Iron Head, with two nickel plated swivels,

	18	24	30	36 inch long
	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ " wide
	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$ " thick
each \$	4 75	6 00	7 00	8 00



No. 2055.

2055. Unique, Steel Blade nickel plated, japanned Iron Head, with nickel plated Patent Clamping Lever,

	18	24	30	36 inch long
	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ " wide
	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$ " thick
each \$	5 50	6 75	7 75	8 75

For description of Patent Unique Swivel see page 154.

ENGRAVERS T SQUARES.



No. 2060.

2060. Engravers T Square, Steel Blade, fixed brass head,

	4	6	8 inch
each \$	1 00	1 25	1 50

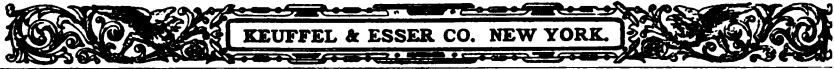


No. 2065.

2065. Engravers T Square, Steel Blade, shifting brass head, with swivel,

	4	6	8 inch
each \$	1 25	1 50	1 75





WOODEN DRAWING TOOLS

MANUFACTURED BY

KEUFFEL & ESSER CO.

All the goods of wood enumerated in this catalogue (Triangles, T Squares, Drawingboards etc.) are our own manufacture and made of material seasoned in our own yards. We have specially designed machinery which insures correctness and as the workmanship of our goods is perfect, we warrant them to remain correct.

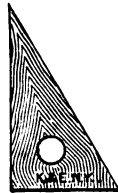
Any carpenter can make a board that looks like a Drawingboard, or put together pieces of wood to look like a Square, but the only guaranty of quality is in the reputation of the maker. As our patterns have been extensively imitated we beg to call special attention to our trademark and firm name:



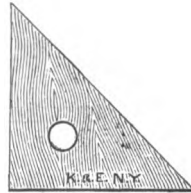
with which each article of our manufacture is stamped, (except Drawingboards which are branded with our firm name) and the quality of goods so marked is warranted by us.

TRIANGLES.

Triangles No. 2100, 30 × 60 degrees, correspond in size to No. 2105, 45 degrees, which latter are placed directly under them in the list, because they have the same length of hypotenuses. This arrangement has been carried through the entire list.



No. 2100.



2105.

Pearwood Triangles, solid, 30 × 60°:

	No. 2100
	<hr/>
	7
each \$	15

	2101
	<hr/>
	9 inch
	20

Pearwood Triangles, solid, 45°:

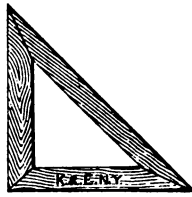
	No. 2105
	<hr/>
	5 1/2
each \$	15

	2106
	<hr/>
	7 3/8 inch
	20

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No. 2110.



2120.

Pearwood Triangles, framed, 30 × 60°:

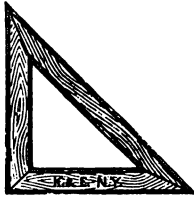
	No. 2110	2111	2112	2113
	7	9	11	14 inch
each \$	20	25	30	40

Pearwood Triangles, framed, 45°:

	No. 2120	2121	2122	2123
	5 ³ / ₈	7 ³ / ₈	9	11 ¹ / ₂ inch
each \$	20	25	30	40



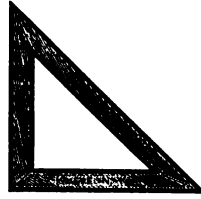
No. 2130.



2140.



2150.



2160.

Pearwood lined Triangles, 30 × 60°:

	No. 2130	2131	2132	2133	2134
	7	9	11	14	17 inch
each \$	25	40	50	60	75

Pearwood lined Triangles, 45°:

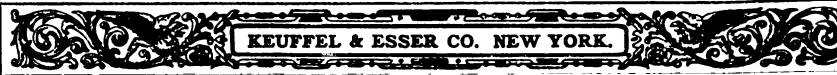
	No. 2140	2141	2142	2143	2144
	5 ³ / ₈	7 ³ / ₈	9	11 ¹ / ₂	14 inch
each \$	25	40	50	60	75

Mahogany Triangles, Ebony lined, 30 × 60°:

	No. 2150	2151	2152	2153	2154	2155
	7	9	11	14	17	20 inch
each \$	60	70	80	1 00	1 25	1 75

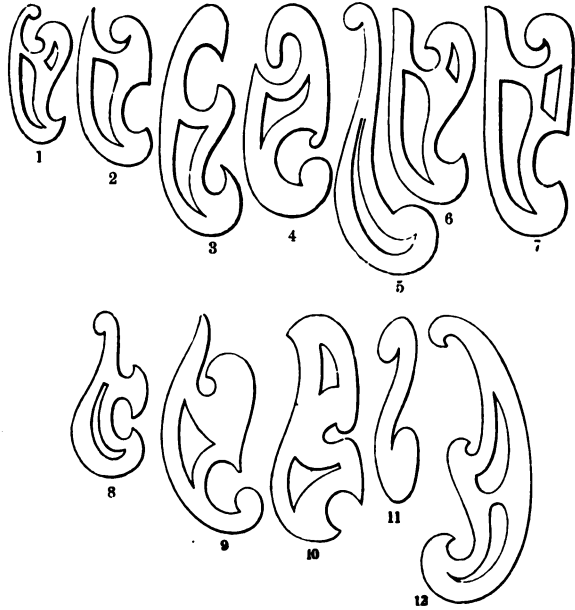
Mahogany Triangles, Ebony lined, 45°:

	No. 2160	2161	2162	2163	2164	2165
	5 ³ / ₈	7 ³ / ₈	9	11 ¹ / ₂	14	16 ¹ / ₂ inch
each \$	60	70	80	1 00	1 25	1 75



KEUFFEL & ESSER CO. NEW YORK.

CURVES.



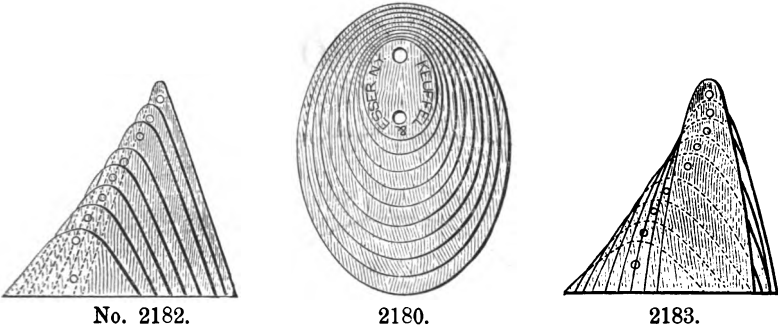
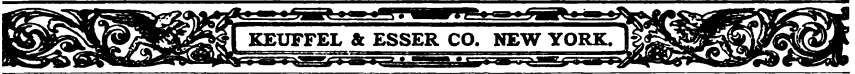
No. 2170.

2170. Pearwood Curves, fine finish,

No.	1	2	3	4	5	6	7	8	9	10	11	12
each \$	25	30	35	35	35	30	35	25	35	35	25	35

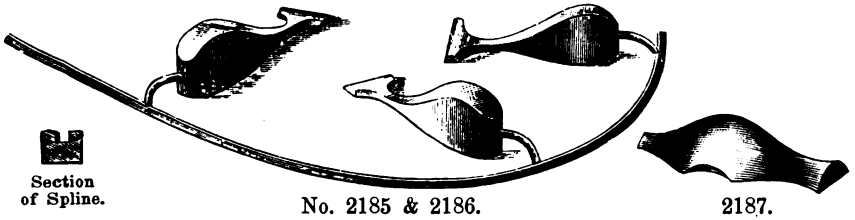
For Rubber Curves see page 136.





No. 2182.	2180.	2183.	
2180. Pearwood Ellipses,	10 in set, from 1½ to 6 inch . . . set	\$ 2 00	
2181. do.	6 " " " 2 " 4½ " . . . " "	1 25	
2182. Pearwood Hyperbolas,	8 " " " 2 " 5½ " . . . " "	1 50	
2183. Pearwood Parabolas,	8 " " " 1½ " 5½ " . . . " "	1 50	
2184. do.	8 " " " 3½ " 14½ " . . . " "	3 00	

For Rubber Ellipses, Hyperbolas and Parabolas see page 137.



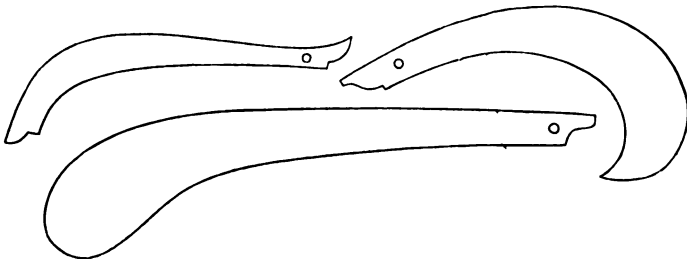
Section of Spline.

No. 2185 & 2186.		2187.
2185. Pearwood Splines, grooved		
	12 18 24 30 36 48 60 inch	
each \$	10 15 20 25 30 40 50	

SPLINE WEIGHTS.

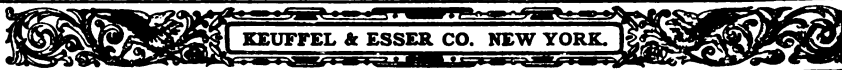
2186. Lead Weights for Splines, with finger	each \$	85
2187. Iron Weights for Splines, without finger	"	50

For Rubber Splines see page 137.

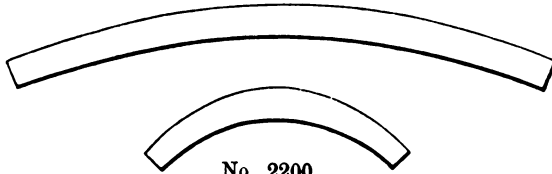


2198. Pearwood Ship Curves, 10 in set	set \$	5 00
2199. do. do. 17 " "	"	8 00

For Rubber Ship Curves see page 139.



PEARWOOD RAILROAD CURVES.



No. 2200.

- 2200. Pearwood Railroad Curves, 10 in set,
viz: 12, 24, 36, 48, 60, 72, 84, 96, 108, 120 inch radius,
in wooden box set \$ 3 50
- 2202. Pearwood Railroad Curves, 17 in set,
viz: 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48,
51, 54, 57, 60 inch radius, in wooden box " 6 00
- 2204. Pearwood Railroad Curves, 44 in set,
viz: 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10,
12, 14, 16, 18, 20, 22, 24, 27, 30, 33, 36, 39, 42,
48, 54, 60, 66, 72, 78, 84, 90, 100, 110, 120, 130,
140, 160, 180, 200 inch radius, in wooden box " 12 00
- Pearwood Railroad Curves of any desired radius cut to order . . each \$ 45

CARD BOARD RAILROAD CURVES.

- 2210. Card Board Railroad Curves, 30 in set,
viz: 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11,
12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 35, 40, 45,
50, 60 inch radius, in wooden box set \$ 5 25
- 2211. Card Board Railroad Curves, 50 in set,
viz: 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½,
9, 9½, 10, 10½, 11, 11½, 12, 14, 16, 18, 20, 22, 24,
26, 28, 30, 32, 34, 36, 38, 40, 45, 50, 55, 60, 65,
70, 75, 80, 85, 90, 95, 100, 110, 120 inch radius,
in wooden box " 8 50
- 2212. Card Board Railroad Curves, 100 in set,
viz: 1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8,
8½, 9, 9½, 10, 10½, 11, 11½, 12, 12½, 13, 13½, 14,
14½, 15, 15½, 16, 16½, 17, 17½, 18, 18½, 19, 19½,
20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32,
33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45,
46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58,
59, 60, 61, 62, 63, 64, 65, 70, 75, 80, 85, 90, 95,
100, 110, 120, 130, 140, 150, 160, 180, 200, 220,
240 inch radius, in wooden box " 14 50

For Rubber Railroad Curves see page 140.



STRAIGHT EDGES.



No. 2250.

2250. Pearwood, one edge beveled, thick,

	12	15	18	24	30	36	42 inch
each \$	15	15	20	25	30	40	50



No. 2260.

2260. Hardwood lined, square edges, thin,

	24	30	36	42	48	54	60	72 inch
each \$	40	50	70	85	1 15	1 50	2 00	3 00



No. 2270.

2270. Mahogany, Ebony lined, square edges, thin,

	24	30	36	42	48	54 inch
each \$	55	70	1 00	1 25	1 60	2 00

For Steel Straight Edges see page 145.

" Rubber " do. " " 143.

BARS FOR BEAM COMPASSES.



No. 2280.

2280. Hardwood Bars for Beam Compasses No. 510, 770 and 1082,

	24	30	36	42	48	60 inch
each \$	35	40	45	55	65	75

2281. Hardwood Bars for Beam Compasses No. 512 and 515,

	24	30	36	42	48	60 inch
each \$	25	30	35	45	55	65



T SQUARES.

In addition to the regular T Squares with fixed single and movable double head we offer also the

Patent Unique T Squares

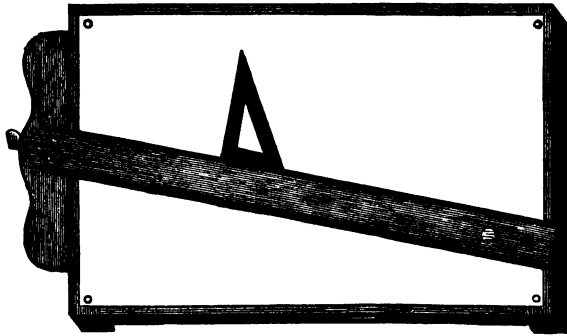
Patented, October 25th 1881

which combine the advantages of those with shifting and with fixed heads.

The Blade is fastened to a single head and can be easily and firmly clamped by the Unique swivel which is **the only swivel that will hold the blade absolutely at any desired angle.**

The head of the Unique T Square lies flush with the surface of the drawing board, so that triangles, scales etc. can be used up to the very edge of the drawing-board.

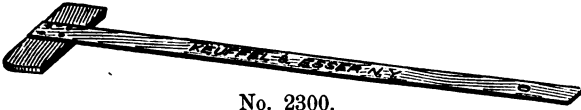
The head can be set in line with the blade to make the T Square more convenient for transportation.



T Square applied to the drawing-board.



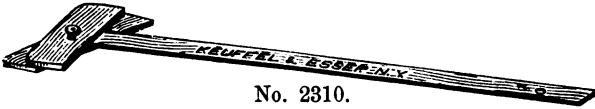
T Square in shape for transportation.



No. 2300.

2300. Pearwood Blade and Head, fixed Head,

	15	18	21	24	30	36	42	48 inch
each \$	30	35	40	45	50	65	75	1 00



No. 2310.

2310. Pearwood Blade and Head, shifting double Head, with brass milled head swivel,

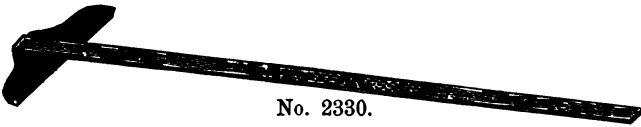
	15	18	21	24	30	36	42	48 inch
each \$	70	75	80	95	1 00	1 15	1 35	1 60



No. 2320.

2320. Unique, Pearwood Blade and Head, with black japanned Patent Clamping Lever,

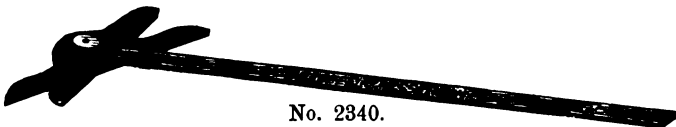
	15	18	21	24	30	36	42	48 inch
each \$	80	90	1 00	1 15	1 25	1 40	1 60	1 85



No. 2330.

2330. Maple Blade, Black Walnut fixed Head,

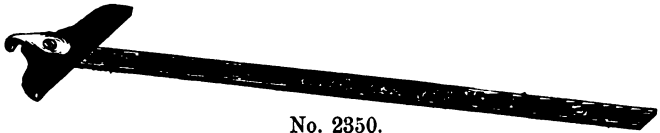
	18	21	24	30	36	42	48	54 inch
each \$	55	65	75	90	1 00	1 15	1 25	1 60



No. 2340.

2340. Maple Blade, Black Walnut shifting double Head, with brass milled head swivel,

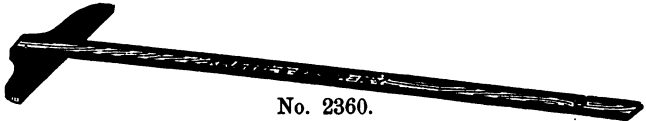
	18	21	24	30	36	42	48	54 inch
each \$	1 00	1 10	1 20	1 35	1 50	1 65	1 75	2 00



No. 2350.

2350. Unique, Maple Blade, Black Walnut Head, with silver bronzed Patent Clamping Lever,

	18	21	24	30	36	42	48	54 inch
each \$	1 00	1 10	1 20	1 35	1 50	1 65	1 75	2 00



No. 2360.

2360. Hardwood lined Blade, Black Walnut fixed Head,

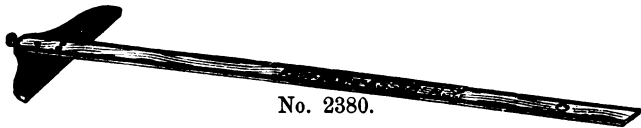
	24	30	36	42	48	54	60	72 inch
each \$	1 00	1 10	1 25	1 50	1 75	2 25	2 75	4 00



No. 2370.

2370. Hardwood lined Blade, Black Walnut shifting double Head, with fine brass milled head swivel,

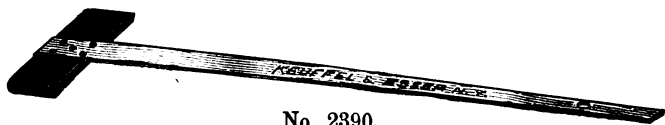
	24	30	36	42	48	54	60	72 inch
each \$	1 50	1 60	1 75	2 00	2 25	2 75	3 50	5 00



No. 2380.

2380. Unique, Hardwood lined Blade, Black Walnut Head, with gold bronzed Patent Clamping Lever,

	24	30	36	42	48	54	60	72 inch
each \$	1 50	1 60	1 75	2 00	2 25	2 75	3 50	5 00



No. 2390.

2390. Hardwood Blade, tapered, Black Walnut fixed Head,

	24	30	36	42	48 inch
each \$	1 00	1 20	1 50	1 75	2 00

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"Copyright, 1887, by Keuffel & Esser."

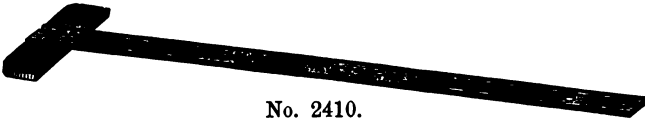


No. 2400.

2400. Mahogany Head and Blade, Ebony lined, bevel edge, fixed Head

The blade is tapered and very wide at the base to prevent spring at the further (free) end. The drawing edge is in line with the middle of the head.

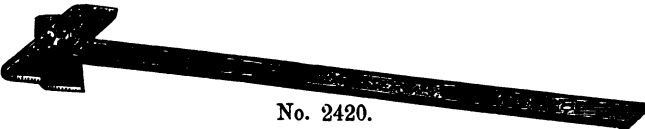
			30	36	42	.48	54 inch
		each \$	1 75	2 00	2 50	3 25	4 00
2401.	do. do.	polished "	2 60	3 00	3 75	4 65	5 60



No. 2410.

2410. Mahogany Head and Blade, Ebony lined, fixed Head,

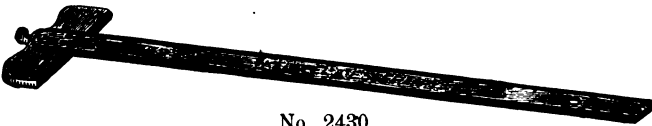
			24	30	36	42	48	54 inch
		each \$	1 20	1 50	1 75	2 00	2 50	3 25
2411.	do. do.	polished "	1 90	2 35	2 80	3 25	3 90	4 85



No. 2420.

2420. Mahogany Head and Blade, Ebony lined, shifting double Head, with fine brass thumb-screw and washer,

			24	30	36	42	48	54 inch
		each \$	2 00	2 35	2 65	3 00	3 50	4 25
2421.	do. do.	polished "	2 80	3 25	3 90	4 50	5 00	6 00



No. 2430.

2430. Unique, Mahogany Head and Blade, Ebony lined with nickel plated Patent Clamping Lever,

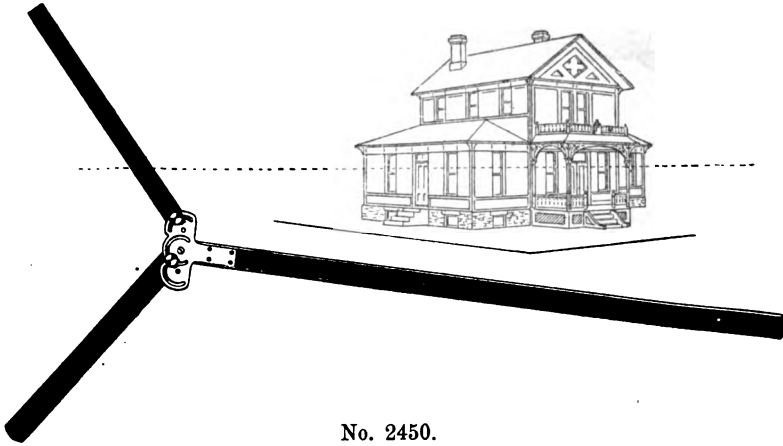
			24	30	36	42	48	54 inch
		each \$	2 00	2 35	2 65	3 00	3 50	4 25
2431.	do. do.	polished "	2 70	3 10	3 50	4 20	4 75	5 75

For Steel T Squares see page 146.
 " Rubber do. " " 143.



CENTROLINEADS.

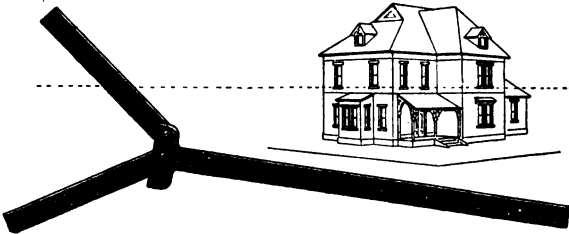
"Copyright, 1890, by Keuffel & Esser Co."



No. 2450.

2450. Keuffel & Esser Co.'s Centrolinead, Ebony, German Silver mountings, Blade 42 inch, Arms 15 inch, with two studs each \$ 11 00
- 2450-2. do. do. hardwood ebonized, brass mountings, Blade 42 inch, Arms 15 inch, with two studs " 7 00

"Copyright, 1890, by Keuffel & Esser Co."



No. 2451.

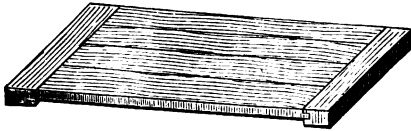
2451. English Centrolinead, pearwood, brass swivels, with two studs, Blade 24 inch, Arms 10 inch each \$ 3 00
2452. do. do. do. do. " 30 " " 11 " " 3 50
2453. do. do. do. do. " 36 " " 12 " " 4 00

The blade of these Centrolineads has two drawing-edges. The above cuts show the position of the instrument in drawing from the left. To draw from the right, attach the outer arm in the hole at the other end of the blade-head and move the middle arm to the corresponding position.

Directions furnished with above.

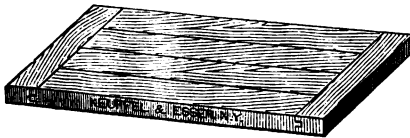
DRAWING BOARDS.

These Drawing Boards are all of our own make and are the best that can be produced. They are made of thoroughly seasoned selected narrow strips of pinewood.



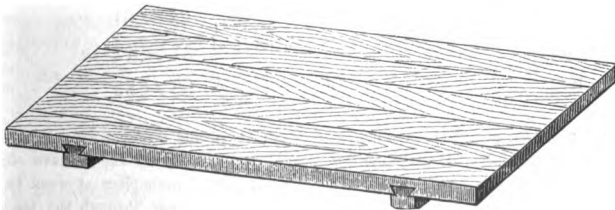
No. 2500.

2500.	Drawing Board, pinewood, with side ledges of pinewood, clamped, 12 × 17 inch	each	\$	75
2501.	do. do. 15 × 21 "	"	"	1 20
2502.	do. do. 20 × 26 "	"	"	1 50



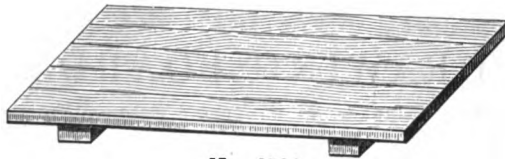
No. 2505.

2505.	Drawing Board, pinewood, with thin ledges of pinewood, both sides presenting drawing surfaces, 12 × 17 inch	each	\$	75
2506.	do. do. 15 × 21 "	"	"	1 20
2507.	do. do. 20 × 26 "	"	"	1 50



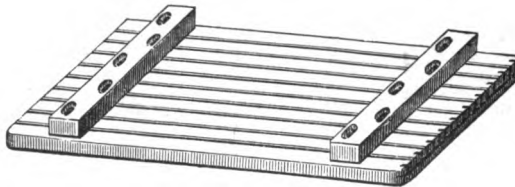
No. 2512.

2512.	Drawing Board, pinewood, hardwood ledges dovetailed into the board to allow contraction or expansion			
		23 × 31 inch	each	\$ 3 00
2513.	do. do.	27 × 34 "	"	3 75
2514.	do. do.	31 × 42 "	"	4 50
2515.	do. do.	38 × 55 "	"	8 00



No. 2520.

2520.	Drawing Board, pinewood, hardwood ledges screwed to the back, the screws are sunk in slots, bushed with metal to allow contraction or expansion, as described under No. 2530	16 × 21 inch	each	\$ 1 50
2521.	do. do.	20 × 26 "	"	2 20
2522.	do. do.	23 × 31 "	"	3 50
2523.	do. do.	31 × 42 "	"	5 50
2524.	do. do.	33 × 55 "	"	9 00



No. 2530.

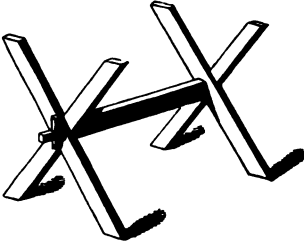
2530.	Drawing Board, pinewood, hardwood ledges, 16 × 21 inch	each	\$ 3 00
2531.	do. " "	20 × 26 "	4 50
2532.	do. " "	23 × 31 "	6 00
2533.	do. " "	31 × 42 "	8 50
2534.	do. " "	33 × 55 "	12 00

The Drawing Board above illustrated is the best and deserves recommendation as it is the only one which possesses all the qualities a good and true board should have. It is made of pinewood, glued up to the required width, with the heart-side of each piece of wood to the surface. A pair of hardwood ledges is screwed to the back; the screws pass through the ledges in oblong slots with metal bushings, which fit closely under the heads and yet allow the screws to move freely when drawn by the contraction of the board. A series of grooves is sunk in half the thickness of the board over the entire back. These grooves take the transverse strength out of the wood to allow it to be controlled by the ledges, leaving at the same time the longitudinal strength of the wood nearly unimpaired.

To make the working edge perfectly smooth, allowing an easy movement with the square, a slip of hardwood is let into the end of the board. The slip is sawed apart at about every inch to permit contraction.

Larger Drawing Boards of any required size made to order.

TRESTLES FOR DRAWING BOARDS.



No. 2550.

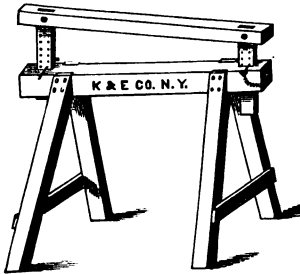
“Copyright, 1887, by Keuffel & Esser.”



No. 2551.

- 2550. Pinewood Trestles, 37 inch high, 38 inch long, 30½ inch spread each \$ 5 50
- 2551. Pinewood Horses, 37 inch high, 35 inch long . . per pair 5 50
- 2551-2. do. do. but without the sloping top ledge “ “ 5 00

“Copyright, 1890, by Keuffel & Esser Co.”



No. 2551-3.

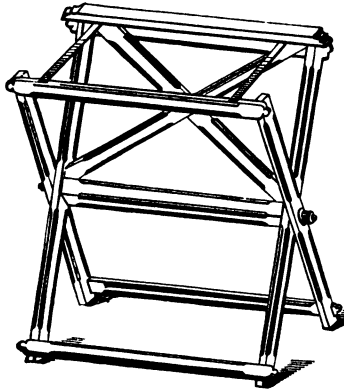
- 2551-3. Adjustable Pinewood Horses, best workmanship, adjustable for height from 37 to 47 inch on level or slope per pair \$ 11 00

Large Drawing Boards of any size required made to order. In ordering please state thickness of board, number, shape and position of ledges.



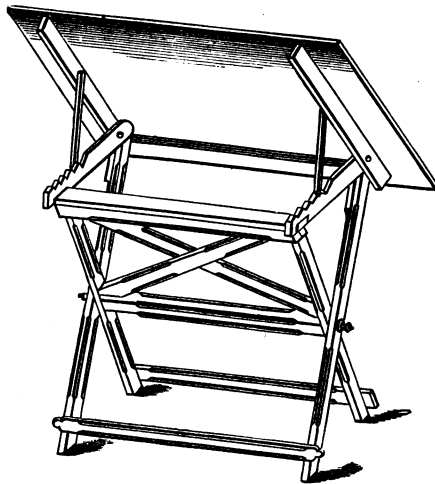


FOLDING TRESTLES.



No. 2552.

2552. Folding hard wood Trestle, 37 inch high, 33 inch long,
26 $\frac{1}{4}$ inch wide each \$ 8 50



No. 2553.

2553. Folding hard wood Trestle, with Drawing Board, 37 inch high. The Drawing Board is made of selected pinewood and hinged to the Trestle on which it can be slanted by means of supports catching in toothplates. Board and Trestle fold up compactly. Board 31 \times 42 inch each \$ 14 00
2554. Folding hard wood Trestle do. do. 33 \times 55 " " 18 00

KEUFFEL & ESSER CO. NEW YORK.

FAVORITE DRAWING TABLES.

PATENTED MARCH 27th 1883

AWARDED

THE ONLY MEDAL

AT THE NATIONAL EXPOSITION OF RAILWAY APPLIANCES, CHICAGO 1883.

The Patent Favorite Drawing Tables embody all desirable improvements and are by their elegant appearance and finish an ornament to any office, library or studio. They are designed for the use of

**Artists, Draughtsmen, Architects, Railroad and Civil Engineers, Designers,
Wood Engravers, Amateurs etc.**

The adjusting and clamping of the top at any desired slant is done by shifting a lever under the front of the table top. It is operated without interruption in working and locks the clamp absolutely.

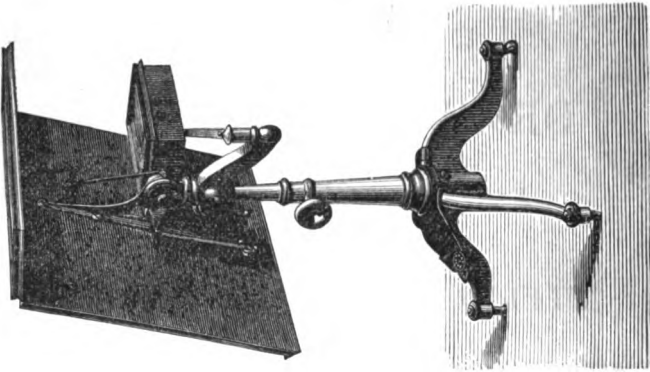
The Bracket-Arm, holding the Shelf and Drawers, can be readily moved to any desired point on either side of the table, and raises or lowers with the table top.

The Iron Foot-Rest, which is detachable, is an improvement of great value, and very ornamental. It admits of a comfortable position while working and prevents accidentally jarring the table.

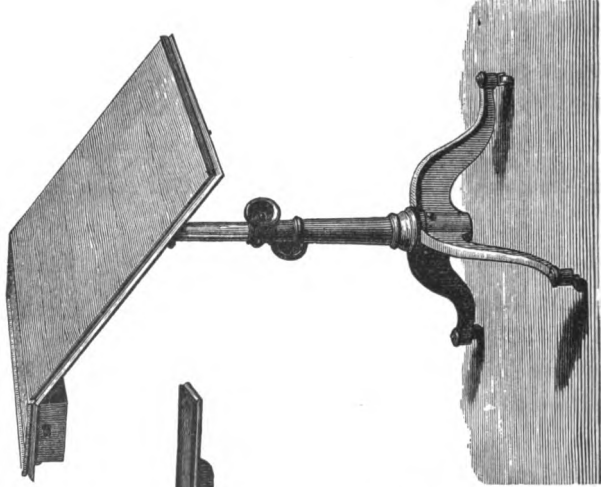
The tables are provided with casters on two of the legs, the third has an iron foot to prevent the table from rolling, except when the iron foot is lifted off the floor.

Tables packed for shipment without extra charge.

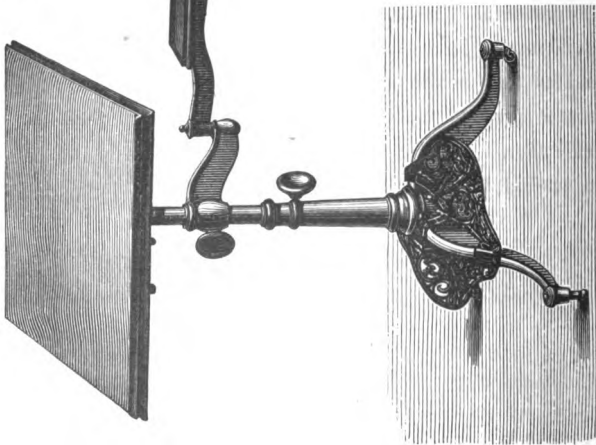
KEUFFEL & ESSER CO. NEW YORK.



No. 2571 B.C.E. \$ 15 50.



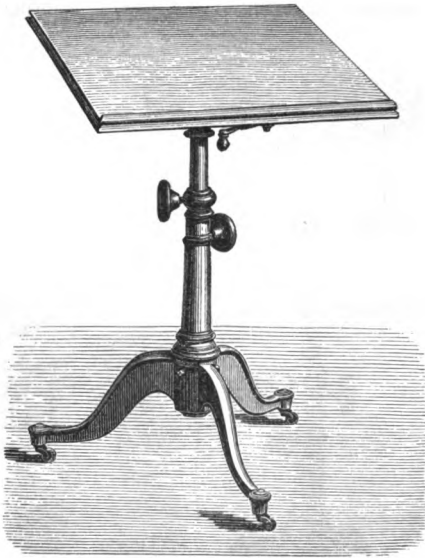
No. 2571 F. \$ 12 50.



No. 2571 A.C. \$ 12 50.

FAVORITE DRAWING TABLES.

PATENTED MARCH 27th 1883.



No. 2570.

2570.	Favorite Drawing Table, ash or oak Top, 21 × 24 inch	each	\$ 9 00
2571	“ do. do. “ “ “ “ 22 × 26 “	“	9 50
	Black Walnut Top	extra	“ 1 00
	Polished Mahogany Top	“	“ 2 00
	Ebonized Top, Stand finely ornamented and gilt	“	“ 5 00

ACCESSORIES

furnished to order with our Drawing Tables:

A.	Folding-Arm, with plain Shelf	each	\$ 1 50
B.	Folding-Arm, with Shelf and Drawer	“	2 50
C.	Detachable Iron Foot-Rest	“	1 50
E.	Top-Shelf, without Drawers, for Tables No. 2571 & 2576	“	2 00
F.	do. with two Drawers, for Tables No. 2571 & 2576	“	3 00

Tables packed for shipment without charge.



FAVORITE DRAWING TABLE.

PATENTED MARCH 27th 1883.

Specially adapted for water-color painting.



No. 2574.

2574. Favorite Drawing Table, ash or oak Top, 21 × 26 inch,
folding Arm with large Shelf, Drawer and two Holders
for water-glasses each \$ 13 50

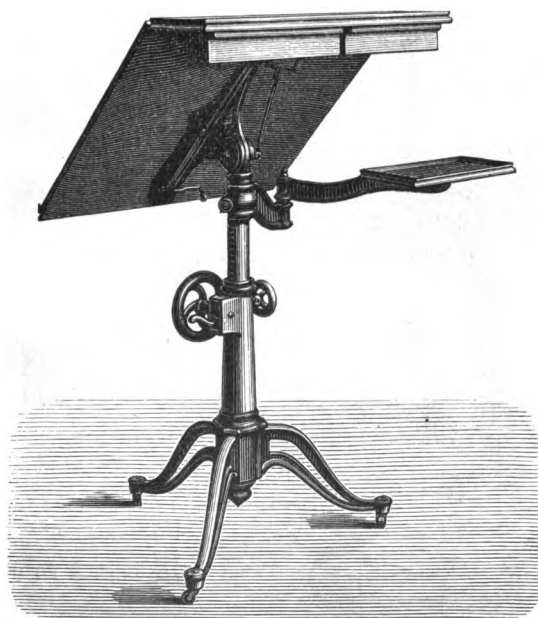
Folding Arm with shelf (as above) separate	“	4 00
Black walnut Top extra	“	1 00
Polished Mahogany Top	“ “	2 00
Ebonized Top, Stand finely ornamented and gilt.	“ “	5 00

Tables packed for shipment without charge.

FAVORITE DRAWING TABLES.

PATENTED MARCH 27th 1883.

These Tables have a Wheel-Lift for raising and lowering the table top. It consists of a rack and pinion movement which is operated by a large wheel and is so simple and easy to operate that a lady or child can handle it.



No. 2576. A. F. \$ 17 00.

2575.	Favorite Drawing Table, ash or oak Top, 21 × 24 inch	each	\$ 12 00
2576.	“ do. do. “ “ “ “ 22 × 26 “	“	12 50
	Black Walnut Top	extra	“ 1 00
	Polished Mahogany Top	“	“ 2 00
	Ebonized Top, Stand finely ornamented and gilt	“	“ 5 00

For Accessories see page 165.

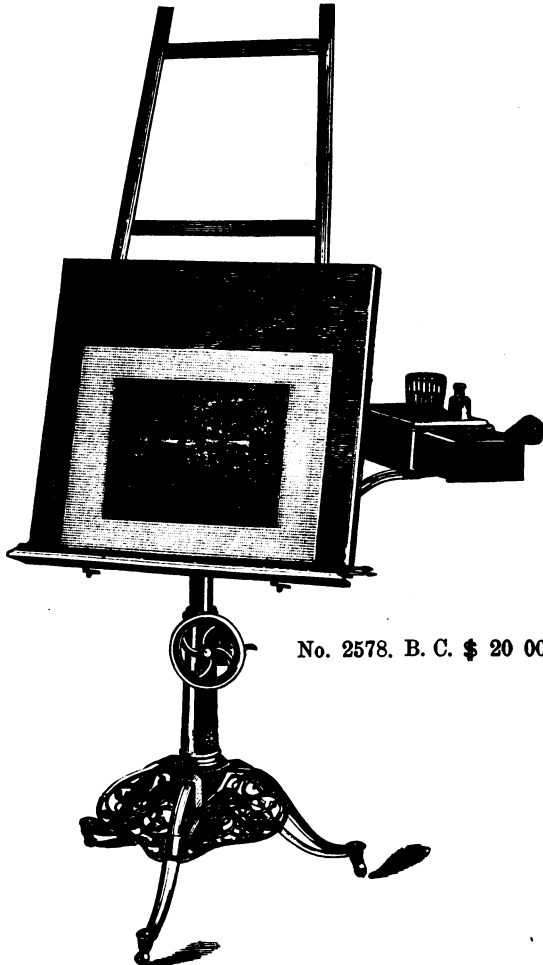
Tables packed for shipment without charge.



FAVORITE DRAWING TABLES.

PATENTED MARCH 27th 1883.

This Table has a Wheel-Lift for raising and lowering the table top as described on page 167. The Table can be converted into an Easel by setting the hinged lower edge of the table top at right angle where it is held by catches. The rack for studies, shown in the cut, can be folded behind the table top when not in use.



No. 2578. B. C. \$ 20 00

2578. Favorite Drawing Table, Black Walnut Top 26×26 inch each \$ 16 00
Ebonized Top, Stand finely ornamented and gilt extra " 5 00

Tables packed for shipment without charge.

KEUFFEL & ESSER CO. NEW YORK.

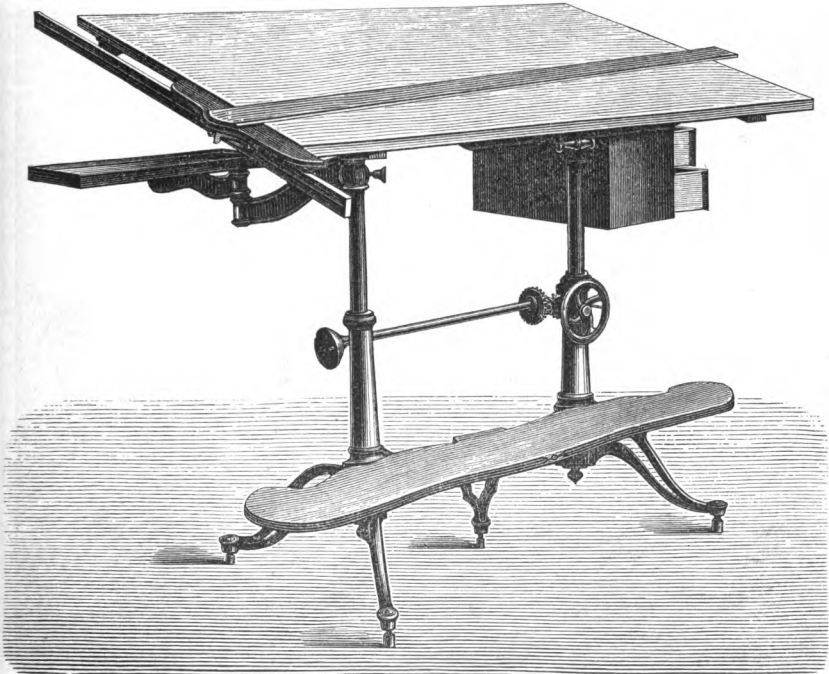
OFFICE FAVORITE DRAWING TABLES.

PATENTED MARCH 27th 1883.

These Tables are intended for office use, for which they will be found excellently well adapted. On each of the two columns is a rack and pinion for raising and lowering the top and a patent clamping attachment for adjusting the slant. Both racks and pinions are operated by one wheel (Wheel-Lift) and both clamps locked by one lever under the front edge of the table.

The Tables have the Folding Arm with Shelf and a case with two drawers with locks and are provided with a foot board.

The Top is in every respect a first class Drawing Board.



No. 2583 with T Square Guide. \$ 55 00.

2582. Office Drawing Table, with Drawing Board 30 × 42 inch, each \$ 40 00

2583. do. do. " " " 33 × 55 " " 45 00

Patent T Square Guide.

The Patent T Square Guide is an iron bar fastened to the left side of the board, on which the specially constructed T Square moves freely, or is held at any part of the bar.

2585. Patent T Square Guide, with T Square No. 2380, for Table No. 2582, each \$ 9 00

2586. do. do. " " " 2380, " " " 2583, " 10 00

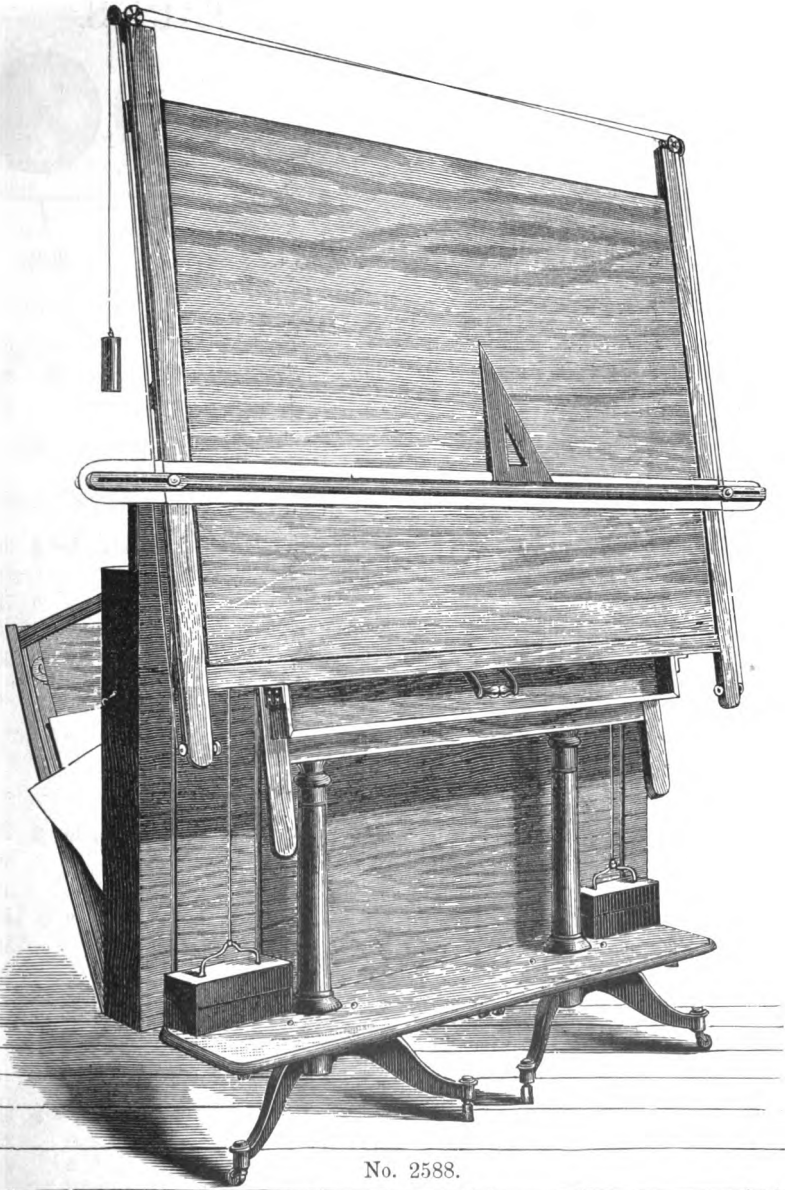
UPRIGHT DRAWING TABLES.

This is the most convenient style of Table for architectural or mechanical drawing, requiring less room than tables with horizontal board, placing the work close to the eye, and obviating entirely the fatiguing and unhealthy working in a stooping position.



No. 2587.

2587. Upright Drawing Table with movable counterbalanced Parallel Ruler, which remains stationary in any given position, horizontal or at any angle, serving as T Square. The Frame, with Drawing Board and Parallel Ruler, can be raised or lowered conveniently to allow working on any part of the Board while sitting or standing. Below the Board is a handy receptacle for tools, etc. Size of Board 31 × 42 inches. Complete \$ 50 00

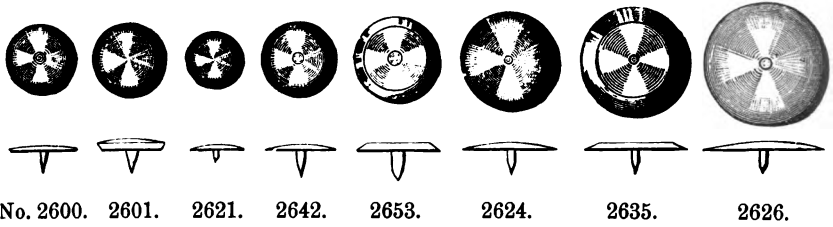


No. 2588.

2588. Upright Drawing Table, same construction as No. 2587 on preceding page, but double stand, counterbalanced Drawing Board 48×64 inches, large receptacle (portfolio) for drawings etc. Complete \$ 125 00



DRAWING PINS OR TACKS.



No. 2600. 2601. 2621. 2642. 2653. 2624. 2635. 2626.

STEEL TACKS.

2600.	Solid Steel Tacks, fine,	$\frac{5}{16}$ inch diam.	doz	\$	80
2601.	do.	do. $\frac{5}{16}$ inch diam.	"	"	20

FINE GERMAN SILVER TACKS.

Steel points, screwed in and riveted.

2621.	Round Head,	$\frac{5}{16}$ inch,	doz	\$	50	2632.	Beveled Head,	$\frac{3}{8}$ inch,	doz	\$	60
2622.	"	"	"	"	60	2633.	"	"	"	"	65
2623.	"	"	"	"	65	2634.	"	"	"	"	75
2624.	"	"	"	"	75	2635.	"	"	"	"	80
2625.	"	"	"	"	80	2636.	"	"	"	"	90
2626.	"	"	"	"	90						

GERMAN SILVER TACKS.

Steel points, riveted.

2641.	Round Head,	$\frac{5}{16}$ inch,	doz	\$	25	2652.	Beveled Head,	$\frac{3}{8}$ inch,	doz	\$	28
2642.	"	"	"	"	28	2653.	"	"	"	"	30
2643.	"	"	"	"	30	2654.	"	"	"	"	35
2644.	"	"	"	"	35	2655.	"	"	"	"	45
2645.	"	"	"	"	45	2656.	"	"	"	"	55
2646.	"	"	"	"	55						

BRASS TACKS.

Steel Points, riveted.

2660.	Round Head,	$\frac{1}{4}$ inch,	doz	\$	10	2672.	Beveled Head,	$\frac{3}{8}$ inch,	doz	\$	20
2661.	"	"	"	"	12	2673.	"	"	"	"	25
2662.	"	"	"	"	20	2674.	"	"	"	"	30
2663.	"	"	"	"	25	2675.	"	"	"	"	35
2664.	"	"	"	"	30	2676.	"	"	"	"	40
2665.	"	"	"	"	35						
2666.	"	"	"	"	40						

KEUFFEL & ESSER CO. NEW YORK.

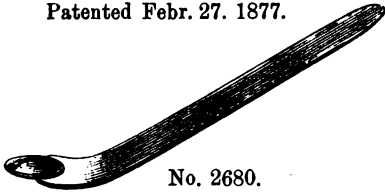
STAMPED STEEL TACKS.



- | | | | | | | |
|-------|---|------------------------|-------|-----|----|----|
| 2677. | Stamped Steel Tacks, made of one piece, | $\frac{5}{16}$ " diam. | . . . | doz | \$ | 10 |
| 2678. | do. do. do. | " " " | " " " | " | " | 12 |
| 2679. | do. do. do. | " " " | " " " | " | " | 15 |

TACK LIFTER.

Patented Febr. 27. 1877.



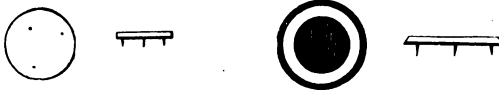
No. 2680.

A handy and simple instrument to extract thumb tacks from the drawing-board. The end of the lifter is placed under the head of the tack and takes it out without bending the point nor wrenching off the head as is done by using a knife.

The handle of this instrument is a Paper-Knife, and is handy for removing drawings which have been glued to the drawing-board, etc.

- | | | | | | |
|-------|--|-------|------|----|----|
| 2680. | Tacklifter and Paper Knife, Brass, Nickel plated | . . . | each | \$ | 25 |
|-------|--|-------|------|----|----|

HORN CENTERS.

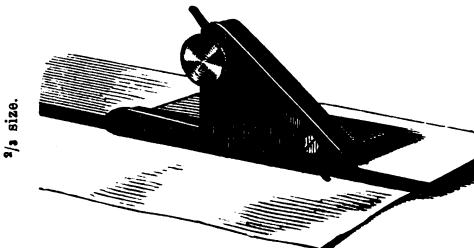


No. 2690.

2691.

- | | | | | | | |
|-------|-------------------|--------------------------|--------------------------|-------|----|----|
| 2690. | Horncentre plain, | $\frac{1}{2}$ inch diam. | . . . | each | \$ | 15 |
| 2691. | do. | with German Silver rim, | $\frac{3}{4}$ inch diam. | . . . | " | 50 |

PAPER CUTTERS.

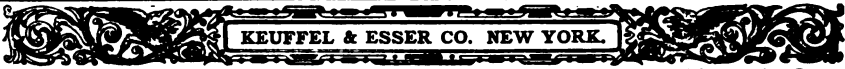


$\frac{3}{4}$ size.

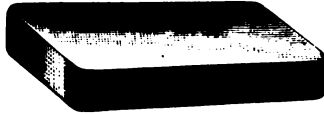
No. 2700.

- | | | | | | |
|-------|---------------------------|-------|------|----|----|
| 2700. | Handy Paper-Cutter, Brass | . . . | each | \$ | 50 |
| 2701. | do. do. Nickelplated | . . . | " | " | 65 |

This little instrument is of important service to Draughtsmen, for cutting drawings from the board, also for cutting any kind of paper or bristol board. It is slid along the ruler or T Square without injuring the edge as is done by using a common knife. The cutter is adjusted by the side screw to cut only the thickness of the paper without striking the Drawing-board.



PAPER WEIGHTS.



No. 2710.

2710. Lead Paper Weight, covered with leather,
 $4 \times 2\frac{1}{4} \times 13/16$ inch, $2\frac{3}{4}$ pounds each \$ 80
 2711. do. do. $4\frac{1}{4} \times 2\frac{1}{4} \times 1$ " $3\frac{3}{4}$ " " 1 00



No. 2715.



2716.

2715. Iron paper Weight, round with knob, small each \$ 50
 2716. do. do. square " " large " 75

ARKANSAS OIL STONES.



No. 2720.

2720. Arkansas Oil Stone, in case with cover, 3 inch each \$ 75
 2721. " do. " " " " 5 " " 1 75
 2725. " do. mounted on wood with handle 3 inch " " 60
 2726. " do. " " " " " 4 " " 1 00
 2727. " do. " " " " " 5 " " 1 50
 2730. " do. Slips each from \$ 25 to \$ 1 50

KEUFFEL & ESSER CO. NEW YORK.

TECHNICAL WATER COLORS.

The Technical Colors introduced by us years ago were highly appreciated by our most eminent Engineers, Architects etc., but had the objection of being dry colors and the cakes not being of convenient shape.

We have therefore prepared Moist Colors of the same excellent quality, in Pans and Half-Pans, and offer to the profession the most desirable and always ready material for tinting drawings. The tints being ready mixed save the work and time of mixing and warrant uniformity at all times.

The selection of tints is made in conformity with those used in Europe. This will facilitate the proper understanding of domestic as well as foreign drawings, an invaluable factor in our extended commercial and scientific relations with foreign countries.



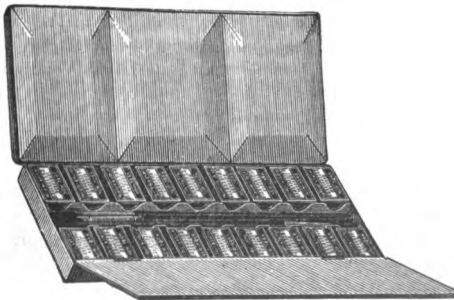
Half Pan.



Full Pan.

No. 2900.

2900.	1. Cast Iron	7. Leather	13. Prussian Blue	} each \$	20	12
	2. Wrought Iron	8. Light Wood	14. Gamboge			
	3. Steel	9. Dark Wood	15. Yellow Ochre			
	4. Copper	10. Brick	16. Vermilion			
	5. Brass	11. Stone	17. Chinese White			
	6. Machinery	12. Brown Stone				
2901.	18. Carmine		"				75	40



No. 2913.

2910.	Japanned Tin Box, contg.:	12 half Pans (No. 1 to 12) of above	each \$	2 25
2911.	do. do.	" 18 " "	" "	3 50
2912.	do. do.	" 12 full " (No. 1 to 12) of above	" "	3 65
2913.	do. do.	" 18 " "	" "	5 65

For empty Tin Boxes see page 178.



WINSOR & NEWTON'S WATER COLORS.

Full Cake.



Full Pan.

Half Cake.



Half Pan.

				Full Cake or Pan.	Half Cake or Pan.
2920.	1. Antwerp Blue	*17. Flake White	31. Olive Green	}	
	2. Bistre	18. Gamboge	32. Orange Chrome		
	3. Blue Black	19. Hooker's Green, No. 1	33. Payne's Grey		
	*4. British Ink	20. Hooker's Green, No. 2	34. Prussian Blue		
	5. Brown Ochre	21. Indigo	35. Prussian Green		
	6. Brown Pink	22. Indian Red	36. Raw Sienna		
	*7. Bronze	23. Italian Pink	37. Raw Umber		
	8. Burnt Sienna	24. Ivory Black	40. Roman Ochre		
	9. Burnt Umber	*25. King's Yellow	41. Sap Green		
	10. Chinese White	26. Lamp Black	42. Terre Verte		
	11. Chrome Yellow	27. Light Red	43. Vandyke Brown		
	12. Cologne Earth	28. Naples Yellow	44. Venetian Red		
	*13. Constant White	29. Neutral Tint	45. Vermilion		
	14. Deep Chrome	30. New Blue	47. Yellow Lake		
	*15. Dragon's Blood		48. Yellow Ochre		
	16. Emerald Green					25	15
2921.	*49. Black Lead	55. Neutral Orange	59. Scarlet Lake	}	
	50. Brown Madder	64. Orange Vermilion	90. Scarlet Madder		
	51. Carmine Lake.	56. Purple Lake	60. Scarlet Vermilion		
	89. Cerulean Blue	57. Roman Sepia	61. Sepia		
	52. Crimson Lake	58. Ruben's Madder	62. Warm Sepia		
	54. Mars Yellow					45	25
2922.	69. Cadmium Orange	75. Intense Blue	77. Pale Cadmium Yellow	}	
	68. Cadmium Yellow	76. Lemon Yellow	79. Pure Scarlet		
	63. Cobalt Blue	87. Mars Orange	65. Violet Carmine		
	71. French Blue	73. Oxide of Chromium	81. Viridian		
	74. Indian Purple				
	58. Indian Yellow					65	35
2923.	66. Aureolin	*85. Field's Orange Vermilion	92. Primrose Aureolin	}	
	91. Aurora Yellow	86. Madder Carmine	82. Purple Madder		
	67. Burnt Carmine	78. Pink Madder	80. Rose Madder		
	70. Carmine		93. Yellow Carmine			90	45
2924.	83. Smalt	84. Ultramarine Ash		1 40	70
2925.	88. Genuine Ultramarine $\frac{1}{2}$ Cake			each \$ 2 25	

Colors marked * are not made in full and half pans.

WINSOR & NEWTON'S WATER COLOR BOXES



No. 2930.



No. 2949.

No. 2934.

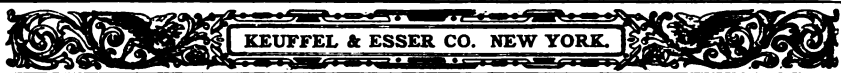


Full Cake Boxes fitted.

2930.	12	Cakes, Polished Mahogany	Slide Lid Box	each	\$ 5 00
2931.	18	“ “ “ “	“ “ “ “	“	7 50
2932.	12	“ “ “ “	Lock Box	“	6 00
2933.	18	“ “ “ “	“ “	“	9 00
2934.	12	“ “ “ “	Lock and Drawer Box	“	7 25
2935.	18	“ “ “ “	“ “ “ “	“	10 00
2936.	12	“ “ “ “	Complete Box fitted	“	9 00
2937.	18	“ “ “ “	“ “ “ “	“	13 50
2938.	24	“ “ “ “	“ “ “ “	“	18 00

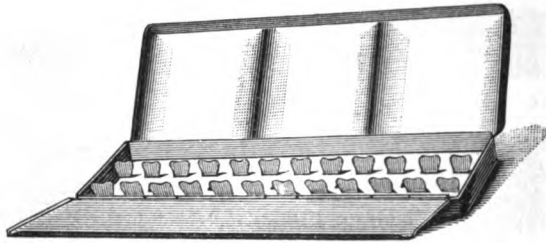
Half Cake Boxes fitted.

2940.	12	Half Cakes, Polished Mahogany	Slide Lid Box	each	\$ 2 75
2941.	18	“ “ “ “	“ “ “ “	“	4 00
2942.	12	“ “ “ “	Lock Box	“	4 00
2943.	18	“ “ “ “	“ “	“	5 25
2944.	12	“ “ “ “	Lock and Drawer Box	“	5 25
2945.	18	“ “ “ “	“ “ “ “	“	6 50
2946.	12	“ “ “ “	Complete Box fitted	“	6 00
2947.	18	“ “ “ “	“ “ “ “	“	7 75
2948.	12	“ “ “ “	“ Caddy Lid Box complete fitted	“	8 50
2949.	18	“ “ “ “	“ “ “ “ “ “	“	10 75



EMPTY JAPANED TIN BOXES

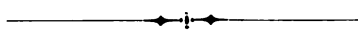
for Moist Colors in Pans.



2950.	For 6 full or 12 half Pans	each \$	80
2951.	" 8 " " 16 " "	"	90
2952.	" 9 " " 18 " "	"	1 00
2953.	" 10 " " 20 " "	"	1 05
2954.	" 12 " " 24 " "	"	1 15
2955.	" 16 " " 32 " "	"	1 30
2956.	" 18 " " 36 " "	"	1 40
2957.	" 20 " " 40 " "	"	1 45
2958.	" 24 " " 48 " "	"	1 60

WATER COLOR LIQUIDS.

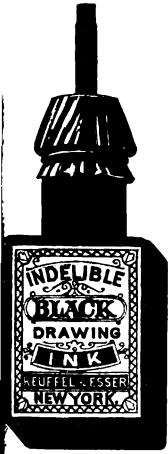
2960.	Winsor and Newton's Chinese White	each \$	30
2961.	" " " Indian Ink	"	30
2962.	" " " Oxgall	"	30
2963.	" " " Gold Ink	"	30
2964.	" " " Carmine	"	30
2965.	" " " Indelible Brown Ink	"	30
2966.	" " " Prout's Brown	"	30
2967.	" " " Sepia	"	30
2968.	" " " Blue	"	30



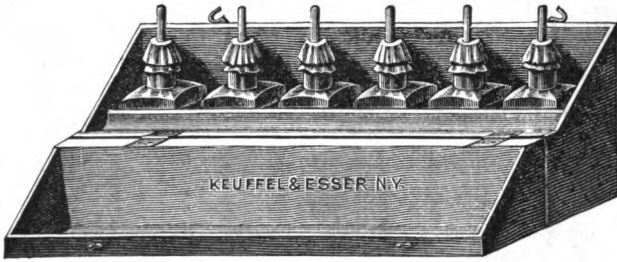
KEUFFEL & ESSER CO. NEW YORK.

LIQUID INDELIBLE DRAWING INK.

"Copyright, 1890, by Keuffel & Esser Co."



No. 3000.



3010.

All these inks are put up with our new INK FILLER (Patented June 10th, 1888), which is far superior to any other device for the purpose. It consists of a glass tube with a compressible rubber bulb, passing through the cork. It effectually prevents evaporation and the consequent thickening of the ink. It is the only cleanly device for charging Drawing Pens, as it does not scatter the ink nor soil the outside of the pen-point, for the point of the glass tube is flattened so that it can be introduced BETWEEN the blades of the pen. The quantity of ink which it takes up and discharges can be varied by sliding the rubber bulb up or down the glass tube, thus changing the size of the vacuum and regulating the quantity of ink necessary for filling drawing pens of any size.

3000.	Liquid Indelible Drawing Ink, Black	each	\$	25
3001.	“ “ “ “ Brown	“	“	30
3002.	“ “ “ “ Blue	“	“	30
3003.	“ “ “ “ Green	“	“	30
3004.	“ “ “ “ Scarlet	“	“	30
3005.	“ “ “ “ Carmine	“	“	30
3006.	“ “ “ “ Yellow	“	“	30
3010.	Set of above colored Inks, except black, in polished Mahogany Box	“	2	55
3011.	do. do. in common Box	“	1	80

These indelible or waterproof drawing inks are a valuable addition to the draughtsman's outfit and specially adapted for mechanical drawing. The lines drawn with these colors are indelible and will not blur nor be defaced by frequently applied brush tints, nor by exposure in outdoor work.

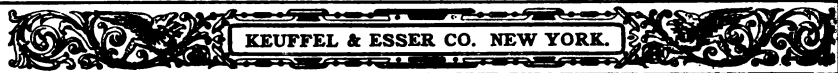


No. 3020.



3021.

3020.	Waterproof Drawing Ink, Black, Keuffel and Esser Co's.	each	\$	25
3021.	Liquid Photo-drawing Ink, deep black	do.	“	25



CHINESE OR INDIAN INK

our own direct importation.

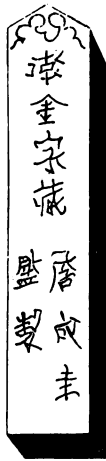
We offer only fine and extra fine India Inks which are adapted for use with pen or brush. The cheaper grades, facsimiles of the better, also made in China, we do not catalogue because we can not recommend them.

These Inks are of a beautiful brown or bluish hue, best adapted for shading and recommended to Artists for the brilliancy of their shade; also preferable to any other ink for tracing purposes.

Illustrations full size.



B.



D.



E.



G.



H.

3030.	A.	Oval, black	cake	\$	25
	B.	“ “ with Lion Head	“		50
	D.	Oblong, gilt	“		40
	E.	“ “	“		60
	F.	Square, black, gilt figures	“		50
	G.	“ “ “ “	“		75
	H.	“ “ “ “	“		1 25

Illustrations full size.



J.



K.



L.



M.

3030.	J.	Oblong, black, blue and gilt figures	each \$ 1 50
	K.	“ “ “ “ “ “	“ 1 25
	L.	“ gilt fine	“ 1 50
	M.	“ “ “	“ 2 00





Illustrations full size.



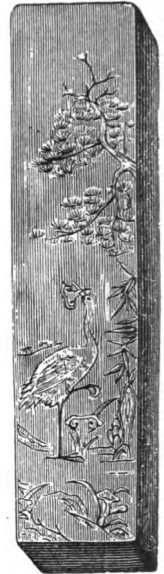
N.



N-2.



T.



AA.

3030.	N.	Square, black, gilt figures, Super Super	each \$ 1 00
	N-2.	“ “ “ “ “ “ small	“ 50
	Q.	Oblong, black, 2½ inch long, fine quality	“ 1 50
	S.	Hexagon, gilt, 4½ “ “ “ “	“ 3 00
	T.	Oblong, black, 3½ “ “ “ “	“ 3 00
	V.	“ “ 2½ “ “ “ “	“ 3 00
	AA.	“ gilt, 2½ “ “ very fine quality	“ 3 00
	AB.	“ black, gilt figures, 4½ inch long, fine quality	“ 8 00
	AC.	“ “ 2½ inch long, fine quality	“ 3 00

Illustrations full size.



AE.



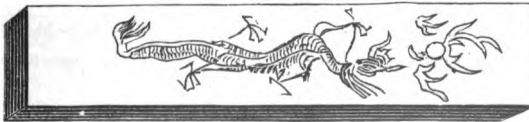
AF.



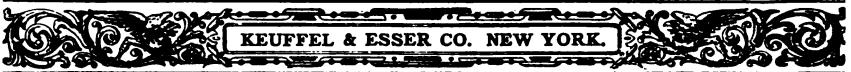
AG.

3030.	AE.	Oblong, black,	gilt and blue figures, 3½ inch long,	very fine quality	each \$ 4 00
	AF.	do. do.	gilt, blue and green figures, 4 inch	long, very fine quality	“ 12 00
	AG.	do. do.	gilt and blue figures, with pearl,	2½ inch long, very fine quality	“ 2 00

Of the finest Chinese Inks we have a still larger variety, not illustrated and described here, as patterns change frequently, per cake \$ 1 00 to 10 00.



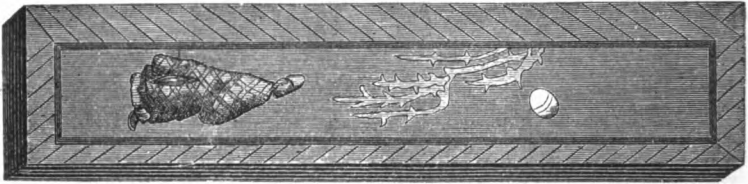
3050.	Blue Chinese Ink, Oblong,	3½ inch long	each \$ 75
3051.	do. do.	2¾ “ “	50
3052.	Red do.	“ 2½ “ “	75
3053.	do. do.	“ 2 “ “	50
3054.	Yellow do.	“ 2¾ “ “	50



JAPANESE INK.

The lines drawn with this Ink will remain clear and distinct and will not be blurred nor defaced when applying brush tints.

Illustration full size.



No. 3060.

- | | | | |
|-------|---|----------|---------|
| 3060. | Oblong, black with figures, best small cake | per cake | \$ 1 00 |
| 3061. | “ “ “ “ “ medium cake | “ “ | 2 00 |
| 3062. | “ “ “ “ “ large “ | “ “ | 3 00 |

Keuffel & Esser Co's

PHOTO-DRAWING INK.

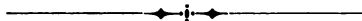
Illustration full size.



No. 3070.

- | | | | |
|-------|-----------------------------|----------|---------|
| 3070. | Photo-Drawing Ink | per cake | \$ 1 00 |
|-------|-----------------------------|----------|---------|

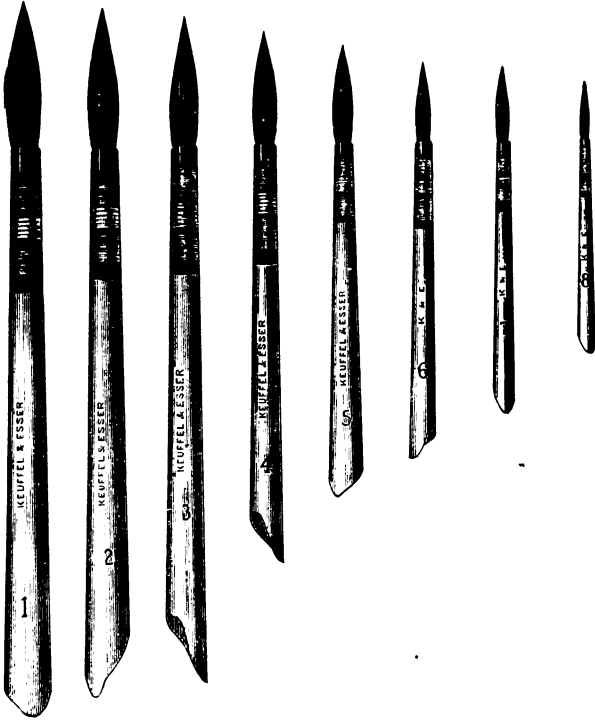
This is a dead black ink specially prepared for drawings to be photographed or reproduced by the blue process and is of great value to Patent Solicitors, Photo-Engravers and Photo-Lithographers.



BRUSHES.

Illustrations full size.

“Copyright, 1887, by Keuffel & Esser.”



3100. Black Sable in Quills,

No.	1	2	3	4	5	6	7	8
each \$	50	40	35	30	20	18	15	12

3101. Red Sable in Quills,

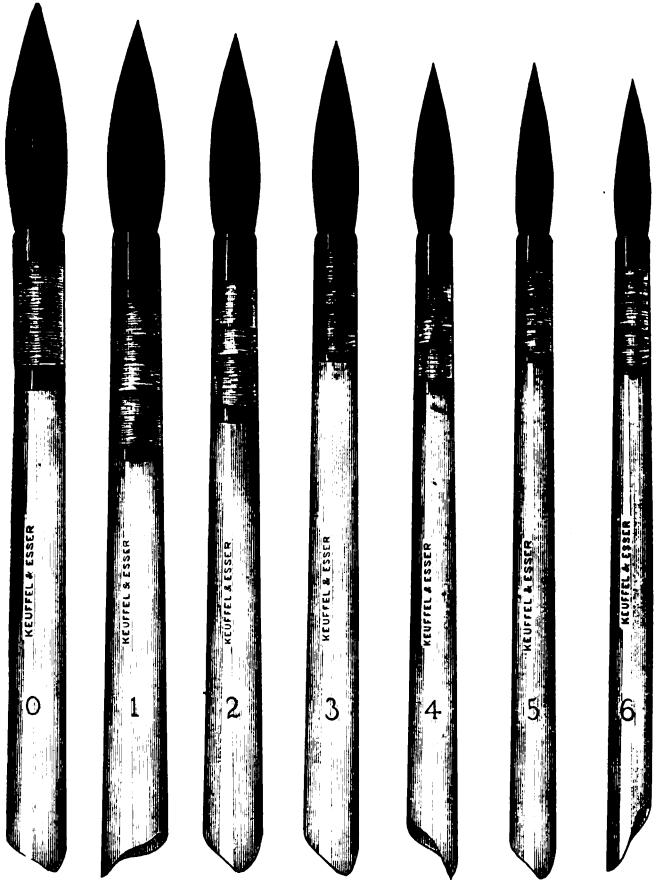
No.	1	2	3	4	5	6	7	8
each \$	70	60	50	40	30	25	20	18

3102. Camel Hair in Quills,

No.	1	2	3	4	5	6	7	8
each \$	10	10	8	8	6	6	5	5

Illustrations full size.

Copyright, 1887, by Keuffel & Esser.*



3110. Black Sable in Swan Quills,

No.	0	1	2	3	4	5	6
each \$	3 25	2 50	2 00	1 35	1 00	75	65

3111. Red Sable in Swan Quills,

No.	0	1	2	3	4	5	6
each \$	2 85	2 35	1 85	1 50	1 20	95	70

3112. Camel Hair in Swan Quills;

No.	0	1	2	3	4	5	6
each \$	70	60	45	35	25	20	15

Illustrations full size.

Copyright, 1887, by Keuffel & Esser.



3120. Black Sable, round, in Albata, with black handle,

	No. 1	2	4	6	8	10	12	14	16	18	20	22
each \$	20	20	25	30	38	45	55	75	1 25	1 75	2 35	3 15

3121. Red Sable, round, in Albata, with black handle,

	No. 1	2	4	6	8	10	12	14	16	18	20	22
each \$	16	18	22	30	35	45	60	90	1 20	1 50	2 00	2 75

Illustration 1/2 size.



No. 3123.

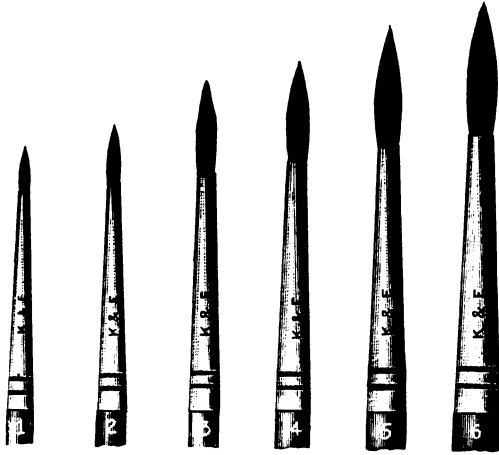
3123. Red Sable, round, in Albata, with 2 points,

	No. 1	2
each \$	1 00	1 25



Illustrations full size.

"Copyright, 1887, by Keuffel & Esser."



No. 3132.

3132. Camel Hair in Tin, with red handle,

No.	1	2	3	4	5	6
each \$	10	10	10	12	12	15

Illustrations full size.

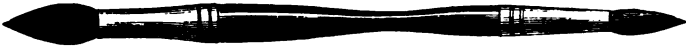


No. 3133.

3133. Camel Hair Sky or Wash Brush, in Tin, with polished black handle,

No.	0	1	2	3
each \$	25	30	35	40

KEUFFEL & ESSER CO. NEW YORK.



No. 3135.

3135. Camel Hair in Tin, with 2 points, sizes about equal to No. 3133,

No.	0	1	2	3
each \$	45	50	60	75

Illustration full size.



No. 3136-3.

3136. Camel Hair Sky or Wash Brush, extra fine, round, in Albata,

No.	1	2	3
each \$	50	65	80

3137. Camel Hair Sky or Wash Brush, extra fine, flat, in Albata,

No.	1	2	3
each \$	50	65	80



No. 3138.

3138. Camel Hair in Albata, with 2 flat points, sizes about equal to No. 3136,

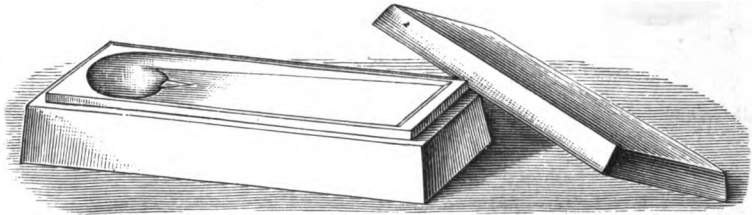
No.	1	2
each \$	1 00	1 25



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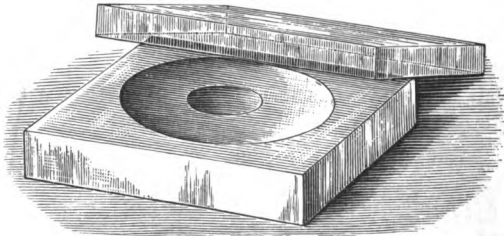
CHINA AND GLASS WARE.



No. 3150.

The steadily increasing sale of these slabs, in spite of the many new patterns offered in competition, is the best proof that we are not claiming too much, when we call them the very best for the purpose.

- | | | | | | |
|-------|--|--|---|----|----|
| 3150. | Keuffel and Esser Co.'s Pat. Ink Slab, with cover, | $1\frac{3}{4} \times 4\frac{1}{2}$ inch, | each | \$ | 50 |
| 3151. | do. | do. | | | 60 |
| 3153. | do. | do. | Slate Slab, glass cover | | 80 |
| | | | $2\frac{1}{2} \times 5\frac{1}{2}$ inch | | 66 |

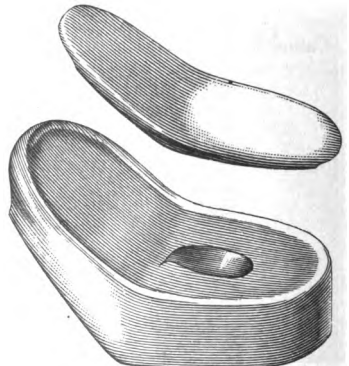


No. 3154.

3154. Slate Ink Cup, with glass cover, $3\frac{1}{2} \times 3\frac{1}{2}$ inch each \$ 35



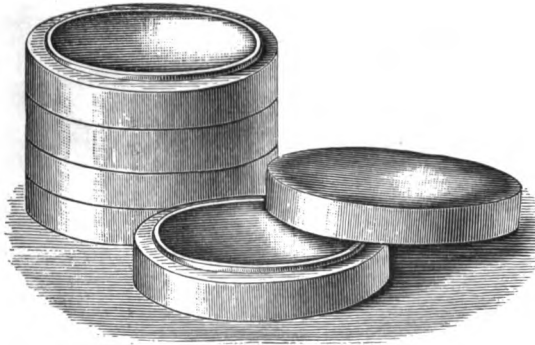
No. 3156.



3158.

3156. Chinese Ink Cup, of opal glass, $3\frac{1}{2}$ inch diam. with cover each \$ 50
 3158. Poole's Patent Ink Slab " 75

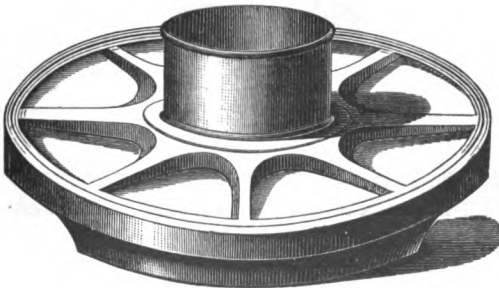
No. 3160.



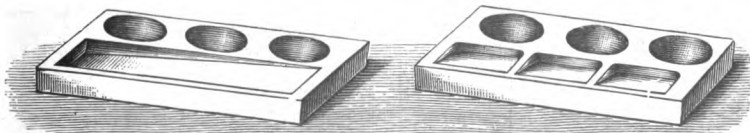
3160.	Nest of Cabinet Saucers, 6 in set, $2\frac{3}{8}$ inch	set	\$	55
3161.	do. 6 " " $2\frac{5}{8}$ "	"	"	65
3162.	do. 6 " " $3\frac{1}{4}$ "	"	"	75
3163.	do. 6 " " $3\frac{3}{4}$ "	"	"	90
3164.	do. deep 4 " " $2\frac{5}{8}$ "	"	"	1 20
3165.	do. " 4 " " $3\frac{1}{4}$ "	"	"	1 50
3166.	do. " 4 " " $3\frac{3}{4}$ "	"	"	1 75

A "Nest of 6" consists of 5 saucers and cover; a "Nest of 4" of 3 saucers and cover.

No. 3169.



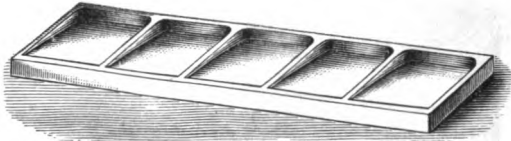
3169. Architect's Slant and Basin with 8 divisions and cup. . each \$ 1 00



No. 3170.

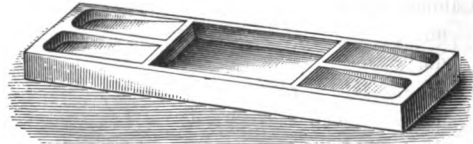
3174.

3170.	Ink or Color Slab, 3 Wells and Slope, $1\frac{1}{2} \times 2\frac{1}{2}$ inch .	each	\$	12
3171.	do. 3 " " " $2\frac{3}{8} \times 3\frac{5}{8}$ " .	"	"	20
3172.	do. 3 " " " $2\frac{1}{4} \times 4\frac{1}{4}$ " .	"	"	25
3173.	do. 3 " " " $3 \times 4\frac{1}{2}$ " .	"	"	30
3174.	do. 3 " " 3 Slopes, $2\frac{1}{2} \times 4$ " .	"	"	20
3175.	do. 5 " " 5 " $4 \times 7\frac{1}{2}$ " .	"	"	50



No. 3178.

3176.	Sloping Tile, 3 divisions,	$2\frac{1}{2} \times 4$	inch	each	\$	15
3177.	do.	4	"	$3\frac{1}{8} \times 7\frac{3}{4}$	"	25
3178.	do.	5	"	$3\frac{1}{8} \times 7\frac{3}{4}$	"	35
3179.	do.	6	"	$3\frac{1}{8} \times 7\frac{3}{4}$	"	40
3180.	do.	8	"	$6 \times 7\frac{3}{8}$	"	50
3181.	do.	10	"	$6 \times 7\frac{3}{8}$	"	60
3182.	do.	12	"	$6 \times 7\frac{3}{8}$	"	70



No. 3183.

3183.	Centre Slab, 5 divisions,	$2\frac{3}{8} \times 6$	inch	each	\$	35
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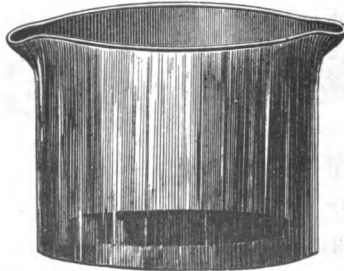
No. 3184.

3184.	China Color Cups	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	inch diam.
	each \$	4	8	10	15	25	



No. 3185.

3185.	China Brush Rest,	$5\frac{1}{4}$	inch long	each	\$	15
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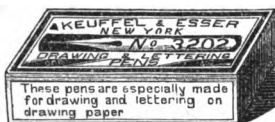


No. 3186.

3186.	Artists' Water Glass,	$2\frac{3}{8}$	inch diam.	each	\$	15
3187.	do.	$3\frac{1}{4}$	"	"	"	25
3188.	do.	$3\frac{3}{4}$	"	"	"	35
3189.	do.	$4\frac{1}{4}$	"	"	"	45

KEUFFEL & ESSER CO. NEW YORK.

STEEL PENS.

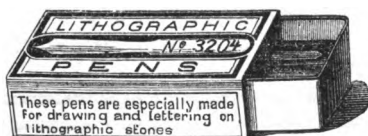


No. 3200.

3202.

- | | | |
|---|---------|----|
| 3200. Keuffel & Esser Co.'s Crow Quill Pens, 1 dozen in box | doz. \$ | 60 |
| 3202. " Drawing and Lettering Pens, 1 dozen in box | " | 60 |

The above pens No. 3200 and 3202 are specially made for draughtsmen for drawing and lettering on drawing paper which has a more or less coarse surface. They have longer nibs and less sharp points than most others, possess great elasticity and permit of more rapid lettering or drawing without annoying the draughtsmen by scratching or by catching in the grain of the paper. Draughtsmen will prefer these pens to any other kind, as all others are intended principally for drawing on stone.



No. 3204.

- | | | |
|--|---------|----|
| 3204 Keuffel & Esser Co.'s Lithographic Pens, 1 dozen in box | doz. \$ | 60 |
|--|---------|----|

The Pens No. 3204 differ from all other Lithographic Pens in having shorter (and therefore firmer) nibs, and points of the utmost fineness.

- | | | |
|--|-----|----|
| 3210. Lithographic Crow Quill Pens, Joseph Gillott's | doz | 60 |
| 3211. Superfine long shoulder Crow Quill Pens do. | " | 75 |
| 3212. Lithographic Pens, do. | " | 60 |
| 3213. Mapping " do. | " | 60 |
| 3214. " or Ladies Pens (No. 170) do. | " | 10 |
| 3215. Lettering Pens (No. 303) do. | " | 15 |
| 3216. do. (No. 404) do. | " | 10 |
| 3217. Crow Quill Pens, with holder, French | " | 40 |



No. 3220.

- | | | |
|--------------------------------------|---------|----|
| 3220. Improved Crow Quill Pen Holder | each \$ | 10 |
|--------------------------------------|---------|----|

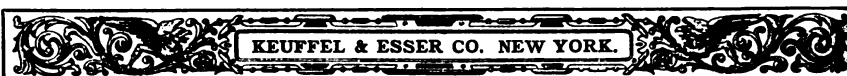


No. 3221.

- | | | |
|-------------------------------------|---------|----|
| 3221. Improved Lettering Pen Holder | each \$ | 10 |
|-------------------------------------|---------|----|

These holders for crow quill and lettering pens are of the thickness of an ordinary penholder; a great improvement over the thin sticks generally used.

For Round Writing Pens etc. see page 200.



LEAD PENCILS.

A. W. Faber's.



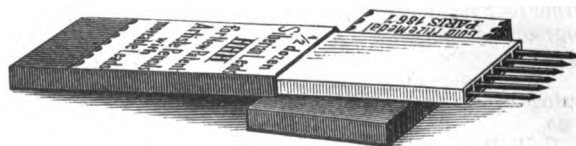
No. 3350.

3350.	Hexagon, very best Siberian, No. 2 B to 6 H	doz	\$ 1 25
3351.	“ “ Drawing, No. 1—5	“	75
3352.	Black round, best, No. 1—4	“	60
3353.	Yellow polished, round, No. 4 B to 4 H	“	60
3354.	Hexagon, for Math. Instruments, No. 4	“	70
3355.	Round “ do. No. 4	“	60



No. 3361.

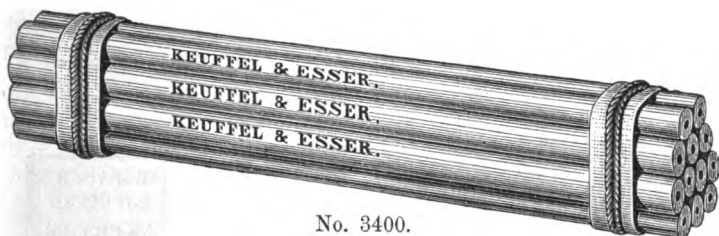
3360.	Artist Pencil with Siberian lead, double pointed	each	\$ 35
3361.	“ do. “ “ “	“	25
3362.	“ do. best	“	20



No. 3370.

3370.	Leads for Artist Pencils, Siberian, 6 in box	box	\$ 65
3371.	“ “ best 6 “ “	“	35
3372.	Hexagon carmine and blue pencils	doz	1 25
3373.	Round “ “ “ “	“	1 00
3374.	“ blue	“	75
3375.	A. W. Faber's Wax Crayons	doz	\$ 1 25 each 12
	No. 1. White, 2. Yellow, 13. Darkblue, 30. Sienna,		
	38. Vermilion, 54. Purple, 62. Orange, 63. Lightgreen,		
	69. Darkgreen, 75. Carmine, 88. Lightblue. Black.		
3376.	A. W. Faber's Wax Crayons in Boxes		
	6	12	18
	24	36	48
	ass'd colors		
	each \$ 80	1 50	2 00
		2 50	3 50
			4 50

3380.	A. W. Faber's Pencil Cases				
	with 5 Siberian Lead Pencils	each	\$	1	00
3381.	" 7 " do.	"		1	25
3382.	" 10 " do.	"		1	75
3383.	" 5 " do. Rubber and Knife	"		1	25
3384.	" 5 Yellow round do.	"			60
3385.	" 7 " " do.	"			75
3386.	" 10 " " do.	"			85
3387.	" 5 " " do. Rubber and Knife	"		1	00

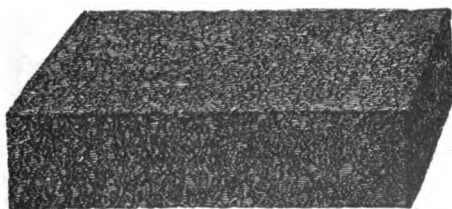


No. 3400.

3400.	Red Chalk in Cedar for marking Stakes	doz	\$	75
3401.	do. " " " " " very thick	"		1 25
3402.	do. in Sticks covered with paper, thin	"		25
3403.	do. " " " " " medium	"		50
3404.	do. " " " " " thick	"		75

SPONGE RUBBER

for cleaning drawings.

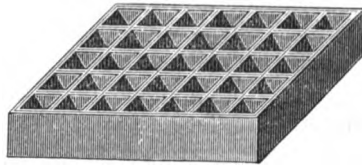


No. 3412.

3410.	Small Cakes, about 1 × 1 × 1 inch	each	\$	10
3411.	Medium Size, Rubber Back 2½ × 1½ × ½ inch	"		25
3412.	Large Size, 4 × 2 × 1 inch	"		60
3413.	Mammoth Size, 6 × 4 × 1 inch	"		1 80



ERASING RUBBER.



No. 3420.

This is the finest quality of erasing rubber and can be used for cleaning drawings (like sponge rubber) or for erasing pencil marks. It attacks the surface of the paper less than any other erasing rubber.

- | | | | | | |
|-------|----------------------------|---|------|----|----|
| 3420. | Red, Moulded Pencil Rubber | $1\frac{1}{8} \times 1\frac{1}{4}$ inch | each | \$ | 15 |
| 3422. | do. | $2\frac{1}{8} \times 1\frac{1}{8}$ " | " | " | 30 |



No. 3425.

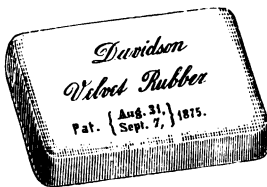


3445.

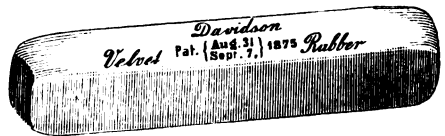


3440.

- | | | | | | | | | | | |
|-------|--------------------------------|-------------|----|----|----|----|----|----|------|------|
| 3425. | A. W. Faber's Artist's Rubber, | per cake \$ | 6 | 8 | 10 | 12 | 15 | 20 | 25 | 50 |
| 3430. | " Black Rubber, | per cake \$ | 10 | 12 | 15 | 20 | 25 | 50 | | |
| 3440. | " Ink Eraser | | | | | | | | cake | \$ 5 |
| 3441. | " do. large | | | | | | | | " | 10 |
| 3442. | " do. extra large | | | | | | | | " | 20 |
| 3445. | Ink and Pencil Eraser in wood | | | | | | | | " | 15 |
| 3446. | do. do. Mammoth | | | | | | | | " | 25 |



No. 3460.



3461.

- | | | | | | | | | |
|-------|---------------------------------|-------------|----|----|----|----|----|----|
| 3460. | Davidson's Velvet Rubber, flat, | per cake \$ | 10 | 12 | 15 | 20 | 25 | 50 |
| 3461. | " do. oblong | " " | 12 | 20 | | | | |

KEUFFEL & ESSER CO. NEW YORK.

DEPOSE F & B PARIS

No. 3470.

3470.	Rubber Stumps, 2½ inch	each	\$	5
3471.	3¼ "	"		8
3472.	4 "	"		10

STEEL ERASERS.

No. 3480.



No. 3481.



3480.	Steel Eraser with long blade, Ivory Handle	each	\$	1 00
3481.	do. do. " " " Coco "	"		50



No. 3486.

3485.	Steel Eraser with short blade, Ivory Handle	each	\$	65
3486.	do. do. " " " Coco "	"		35

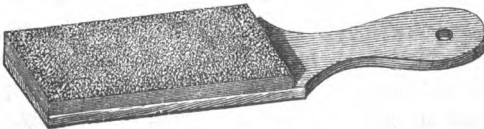
PENCIL POINTERS.

These Pencil Pointers consist of a number of sheets of flint paper made into a block.



No. 3500.

3500.	Pencil Pointer 2 × 2½ inch	each	\$	10
3501.	" " 2½ × 4 "	"		15
3502.	" " 1½ × 4 "	"		12

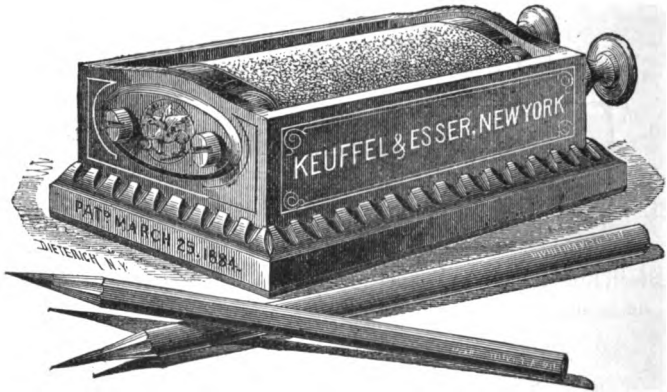


No. 3507.

3505.	Pencil Pointer with wooden handle, 2 × 2½ inch	each	\$	15
3506.	" " " " " 2½ × 4 "	"		20
3507.	" " " " " 1½ × 4 "	"		15

KEUFFEL & ESSER CO. NEW YORK.

THE
"CONVENIENT"
PENCIL POINTER AND PAPER WEIGHT.



Patented March 25th, 1884.

3510. "Convenient" Pencil Pointer and Paper Weight, about 2½ lbs. each \$ 1 00

Will not soil the Hands nor Papers.

Can be used when only one hand is disengaged.

Combines two useful apparatus in one.

Useful and ornamental for every Office or Draughting-room.

All Pencil Pointers brought before the public so far, had the great disadvantages of soiling the hands and all articles with which they came in contact and of requiring the use of both hands in pointing a pencil. The "Convenient" Pencil Pointer and Paper Weight entirely obviates these drawbacks. The filings of the Pencil-lead fall into the box which forms the body of the apparatus, while its weight holds it in place when pointing a pencil, so that a pencil can be sharpened with one hand while the other holds the scale, triangle, protractor or other drawing implement. The arched surface of the sandpaper permits of pointing the lead quicker, very much better, and with far less waste than would be possible on a flat surface. The sandpaper is mounted on rollers, so that all parts of it can be used successively, and it is easily replaced when worn.

This Pencil Pointer is an excellent Paperweight, handy and easily found, even on a crowded desk or draughting-table. The bottom is cloth-lined. It is handsomely finished, so that it is an ornament to any Office or Draughting-room.

KEUFFEL & ESSER CO. NEW YORK.

Round Writing

F. SOENNECKEN'S system of ornamental writing, called Round-Writing, has met with such flattering success that hardly any recommendation on our part is necessary.

The Methodical Text-Book for self-instruction is a complete guide for acquiring this beautiful hand in a very short time (ten to fourteen hours suffice for a complete course in schools), and there is scarcely any profession but could advantageously make use of this writing in many ways.

Engineers, Architects and Draughtsmen are enabled to letter drawings, maps etc. in Round Writing more elegantly and in considerably less time than by any other method.

Bankers and Merchants will find it most valuable and appropriate in heading books, filling out checkblanks, price-lists etc. etc.

Insurance Companies and Lawyers cannot use more distinct letters for filling out or writing policies and legal documents.

Store-keepers can write their show-cards in this hand without expense.

N O T I C E.

IN ORDER TO LEARN ROUND WRITING.

It is **indispensable** to thoroughly study and strictly observe the directions given in the

Methodical Text Book

especially with respect to the holding of the pen and to the exercises in writing.

The book plainly shows the scientific principles on which this Writing-System is based; all efforts made to master it by using the pens without the Text-Book will be without any success, vainly wasting time and labor. The correct and artistic execution of the characters does not depend, as may erroneously be supposed, on the

ADROITNESS OF THE HAND,

but merely on the thorough knowledge of the manner of holding the pen and of the system of the characters as exhibited in the

METHODICAL TEXT BOOK.



3520. Methodical Text-Book to Round Writing by F. Soennecken (published by Keuffel & Esser Co., New York) including an assortment of 25 single and double pointed pens each \$ 1 00 post paid \$ 1 10
3521. do. do. do. without pens " 65 " " 70
3522. do. do. do. bound in cloth, with 25 pens " 1 60 " " 1 78
3523. Copy-Book without instructions (School Ed.) including an assortment of 25 pens . " 70 " " 80
3524. do. do. do. without pens " 35 " " 39



Pens, single pointed,

	No. 1	2	2½	3	3½	4	5	6	
	BBB	BB	B	M	MF	F	FF	FFF	
3530.						per gross	\$ 1 10	post paid	\$ 1 25
3531.						" ¼ "	35	" "	41



Pens, double pointed,

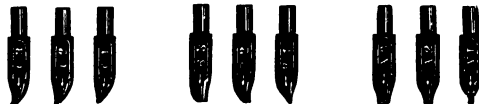
	No. 10	20	30	
	B	M	F	
3532.	per ¼ gross	\$ 1 00	post paid	\$ 1 06
	" doz	50	" "	53

Every gross or ¼ gross box contains Pens of one number only.

3533. Sample-Assortment of Single and Double pointed Pens,
25 in a box \$ 35 post paid \$ 41



3535. Inkholder to be applied to Single and Double Pens, specially for writing with India Ink and Autograph Ink,
per box of 6 \$ 30 each \$ 10



3536. Round Writing Instrument, complete with 9 pens,
each \$ 1 00 postage paid \$ 1 10
3537. Minute Pens only doz 75 each 10

With this Instrument 2 or 3 parallel lines can be made with one motion, it is used exactly in the same manner as the above single and double round-writing-pens.

The accompanying 9 minute pens admit of producing 144 different double and 504 different triple lines, by changing or interchanging the pens in the different places in the holder.

KEUFFEL & ESSER CO. NEW YORK.

FLUENT WRITING PENS



No.	203	204	205	206	207	208	square pointed	
	103	104	105	106	107	108	oblique pointed	
	BBB	BB	B	M	F	FF		
							per gross	\$ 1 10 postage paid \$ 1 25
							" 1/4 "	" 35 " " " 41
Sample box contg.:	25 pens assortd					"	25	" " " 31



3560. Penholders for Round-Writing Pens each \$ 10



3561. Double Penholders for Round-Writing Pens each \$ 10



3564. Parcel-Pens, in 4 widths, for bold and large lettering.

No.	F	M	B	BB	
	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{8}$	$\frac{3}{8}$	inch wide each \$ 25

Cedar Boxes with Round Writing Pens.

3565. Box containing an assortment of 11 penholders with pens,
each penholder bearing the same number as the pen . each \$ 2 00

Ruled Paper in sheets,

6 patterns for the different sizes of letters of Round-Writing per sheet \$ 6

Those sheets are placed under plain paper to serve as lines to write on.

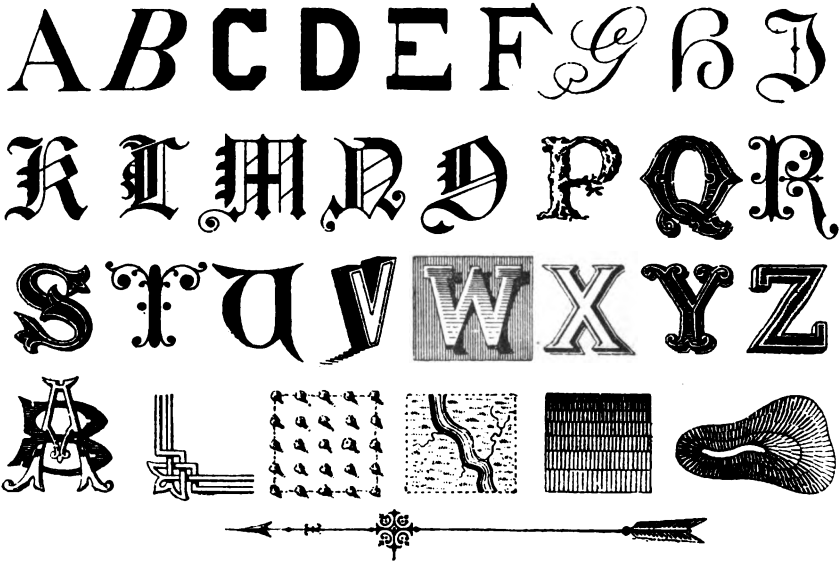




DRAUGHTSMAN'S ALPHABET

BY

KEUFFEL & ESSER CO., NEW YORK.



The above cut shows reduced specimens of our New Edition of the "Draughtsman's Alphabet", which has been entirely revised and much enlarged.

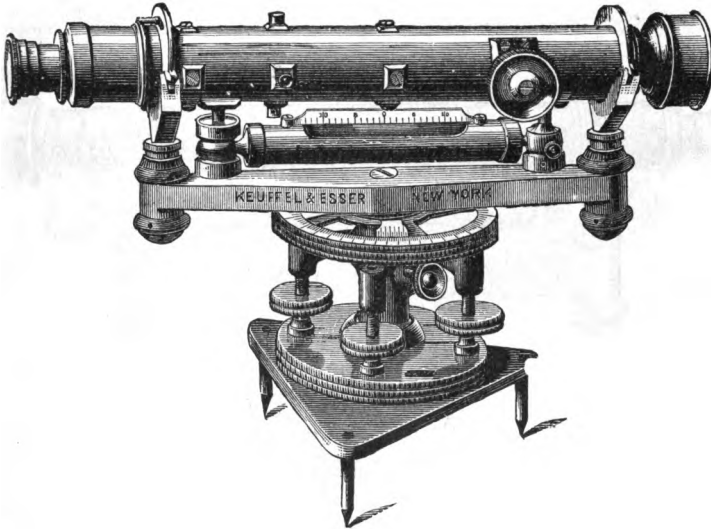
The book gives on 32 pages a larger variety of Alphabets, Numbers, Topographical Signs, etc., than any other book of the same size, and will be found the most useful to any draughtsman. The selection of the contents of the book is made with great care, and it is engraved with reference to practical use, so that each letter, number or sign may be imitated without difficulty, which is almost an impossibility with the fine copper and steel engraved books, made only for the purpose of showing fine and elaborate engraving.

We trust that this work will be approved generally, as it has been by many draughtsman of our city, who have contributed to it, by suggestions for making it perfect and indispensable to every one needing such a work.

3570. Cloth bound, with gilt imprint on cover, size 7x10 1/4 inches each \$ 1 50

3571. Student's Alphabets, a selection of the most useful Alphabets of above book, in paper cover " 25

ARCHITECT'S LEVEL.



No. 5000.

5000. Architect's or Builder's Y Level, telescope 11 inch, with dust shade and cross-hairs, fine divided bubble, object glass with rack-movement, eyepiece adjustable. Horizontal circle 3 inch divided to degrees with vernier reading to 5 minutes. A most serviceable and compact instrument.

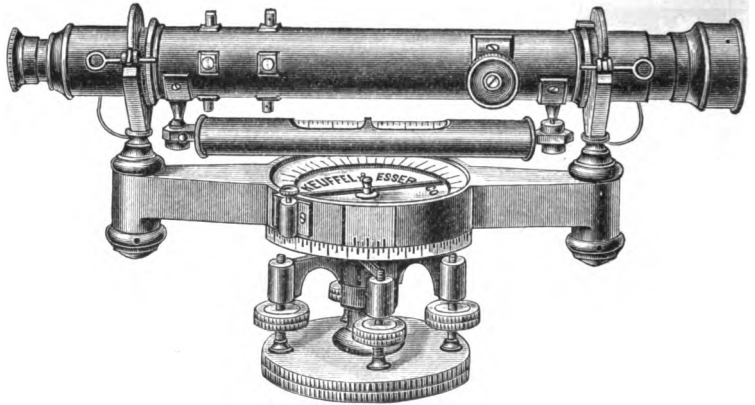
Level complete with metal trivet, plumb bob and adjusting pins, in polished mahogany box and with hardwood tripod each \$ 45 00

For Architects Leveling Rods see page 253.



ARCHITECT'S LEVEL WITH COMPASS.

Copyright, 1890, by Keuffel & Esser Co.



No. 5003.

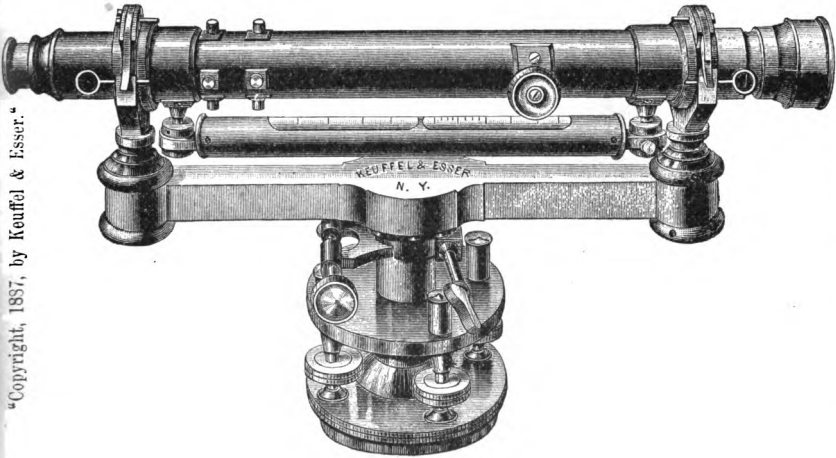
5003. Architect's or Builder's Y Level, telescope 11 inch, with dust shade and cross-hairs, fine divided bubble, object glass with rack-movement, eyepiece adjustable, compass divided to degrees, fine needle, horizontal circle 3 inch, divided to degrees, with vernier reading to 5 minutes. A most serviceable and compact instrument.

Level complete with metal trivet, plumb bob and adjusting pins, in polished mahogany box and with hardwood tripod each \$ 60 00

For Architects Leveling Rods see page 253.

SMALL ENGINEER'S Y LEVEL.

Copyright, 1887, by Keuffel & Esser.



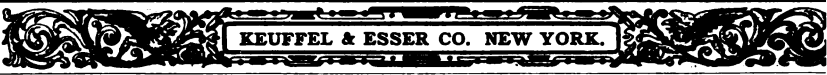
No. 5005.

5005. Small Engineer's Y Level, achromatic terrestrial telescope, 15 inch, magnifying about 24 times, with dust and sunshade object glass 1½ inch, with rack-movement, adjustment to eyepiece; stops for placing telescope so that cross-hairs, are vertical and horizontal. Graduated bubble 6 inch. One of the Y's adjustable. Long gun-metal centre. Clamp and tangent screws with compensating spring.

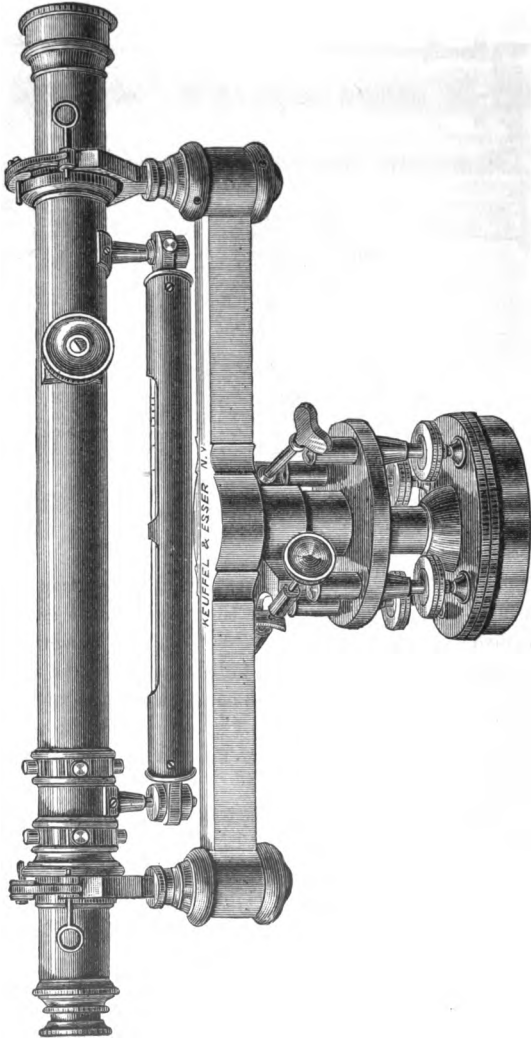
Level complete with adjusting pins etc. in fine polished mahogany box and with tripod each \$ 100 00

5007. do. do. do. but with three leveling screws " 110 00

For Attachments and Extras see page 222.



ENGINEER'S Y LEVEL.



No. 5010.

"Copyright, 1887, by Keuffel & Esser."

ENGINEER'S Y LEVEL.

5010. Engineer's Y Level, achromatic terrestrial telescope, 18", magnifying about 30 times, with dust and sunshade, object glass 1 $\frac{3}{8}$ " with rack-movement, adjustment to eyepiece. Fine graduated bubble 7 inch, adjustable vertically and horizontally. The bar is of gunmetal and shaped to combine greatest strength with least weight. The telescope rests in Ys, one of which is adjustable for altitude, and it is provided with stops for placing telescope so that the cross-hairs are vertical and horizontal. The centreplate, of gun-metal, has four leveling screws. The clamp and tangent screws are attached to the long gun-metal centre so that they revolve with the bar. Tangent screw with compensating spring.

The instrument complete, with adjusting pins, etc., packed in fine polished mahogany box and with tripod \$ 130 00

5012. Engineer's Y Level, like No. 5010, but with telescope 20 inch " 135 00

5013. Engineer's Y Level, like No. 5010, but with telescope 22 inch " 140 00

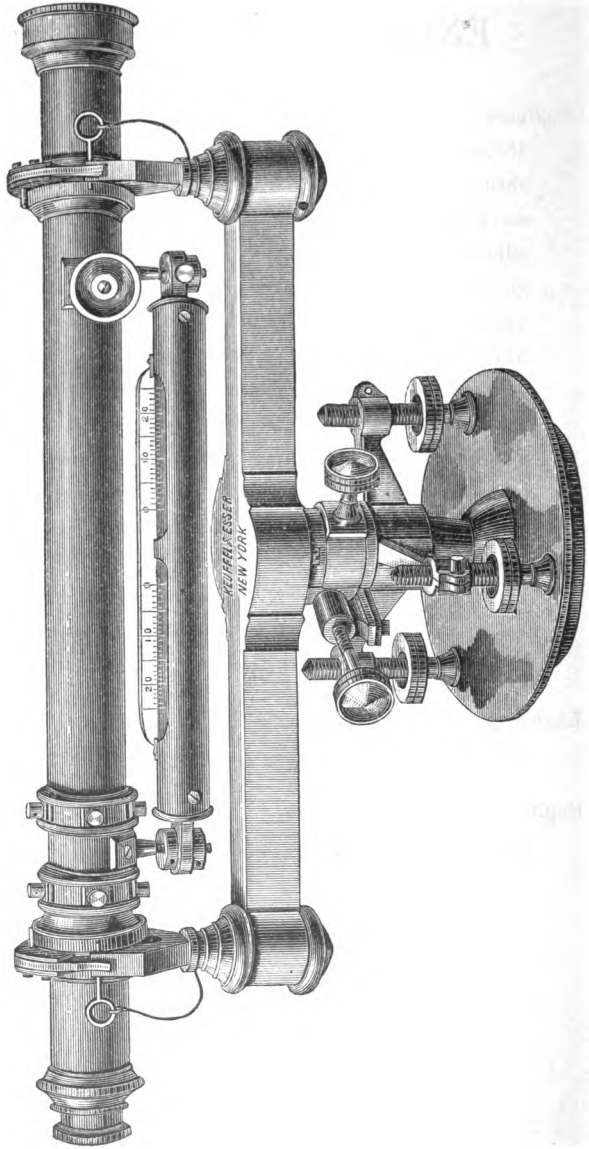


For Attachments and Extras see page 222.

KEUFFEL & ESSER CO. NEW YORK.

ENGINEER'S Y LEVEL

with 3 Leveling Screws.



No. 5015.

“Copyright, 1897, by Keuffel & Esser.”

ENGINEER'S Y LEVEL

with three Leveling Screws.

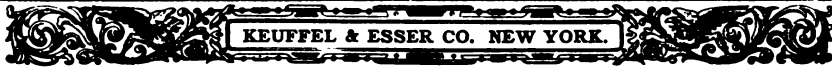
5015. Engineer's Y Level, achromatic terrestrial telescope, 18", magnifying about 30 times, with dust and sunshade, object glass $1\frac{3}{8}$ ", with rack-movement, adjustment to eyepiece. Fine graduated bubble, 7 inch, adjustable vertically and horizontally. The bar is of gun-metal and shaped to combine greatest strength with least weight. The telescope rests in gun-metal Y's, one of which is adjustable for altitude and is provided with stops for placing the telescope so that the cross-hairs are vertical and horizontal. The centre-plate made of gun-metal has three leveling screws. The clamp and tangent screws are attached to the long gun-metal centre so that they revolve with the bar. Tangent screw with compensating spring.

The instrument complete, with adjusting pins, etc.,
packed in fine polished mahogany box and with tripod \$ 140 00

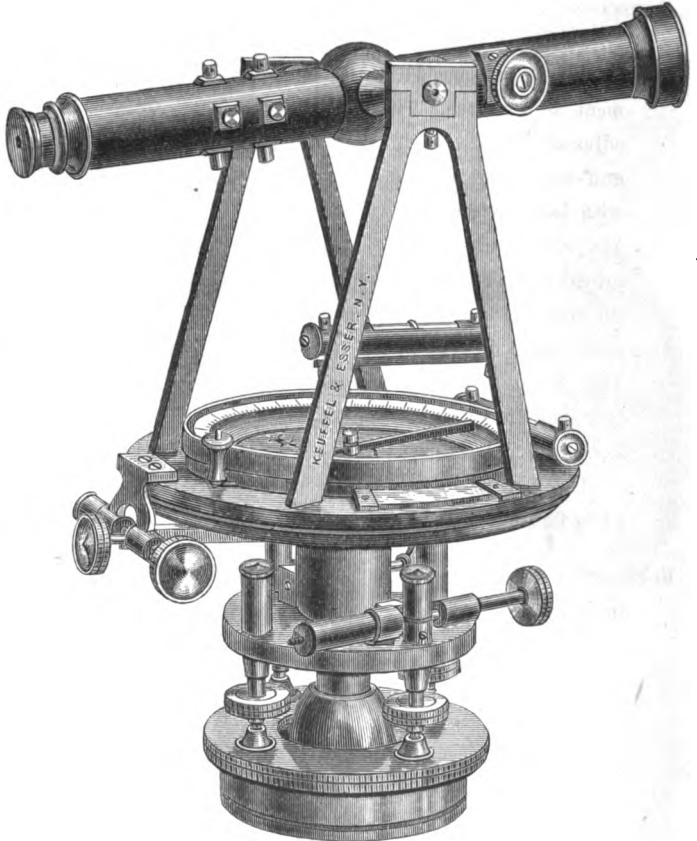
5016. Engineer's Y Level, like No. 5015, but with telescope with
inverting eyepiece (astronomical telescope) \$ 140 00



For Attachments and Extras see page 222.



ENGINEER'S TRANSITS.



"Copyright, 1887, by Keuffel & Esser."

No. 5030.



ENGINEER'S TRANSITS.

5030. Plain Engineer's Transit (for repeating angles) with achromatic terrestrial telescope 11 inch, magnifying about 24 times, with dust and sunshades, object glass $1\frac{1}{8}$ inch, with rack-movement, eyepiece and cross-hairs adjustable. Compass ring divided to half degrees numbered from 0 to 180. Needle $4\frac{1}{4}$ inch, horizontal limb 6 inch graduated to half degrees, two verniers reading to minutes. Two fine graduated bubbles for leveling the plates. Clamp for centre with micrometer screw of improved pattern with compensating spring. Shifting centre.

The instrument complete with plumb bob, adjusting pins etc., packed in fine polished mahogany box and with tripod. each \$ 185 00

5032. Engineer's Transit like No. 5030, but needle 5 inch, horizontal limb $6\frac{1}{2}$ inch " 190 00

Horizontal limb and verniers divided on silver to 20 minutes, reading to 30 seconds extra " 10 00

The above instruments with three leveling screws extra " 10 00

No extra charge for telescopes with inverting eye-piece (astronomical telescope).

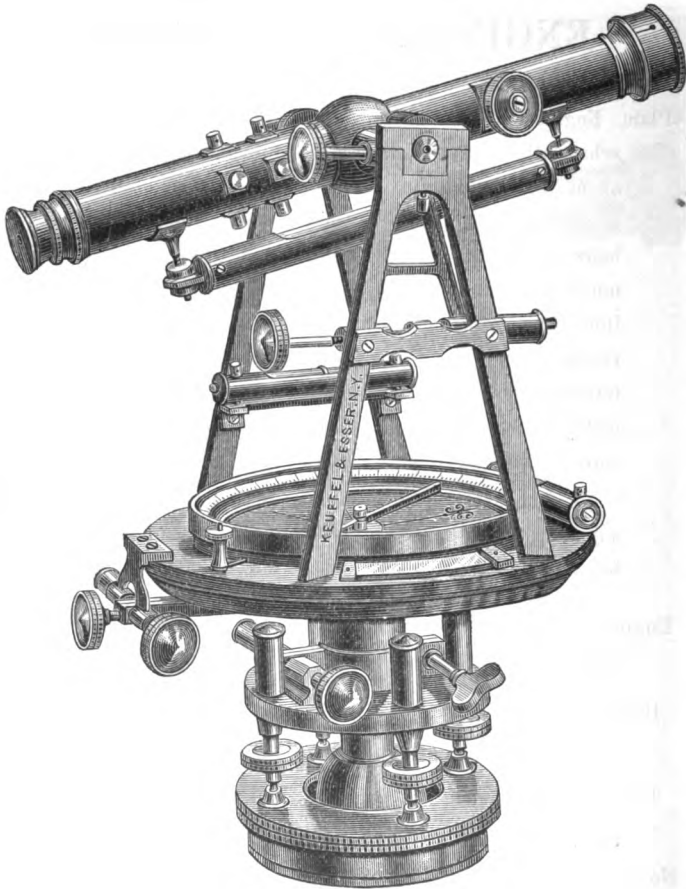


For Attachments and Extras see page 222.



ENGINEER'S TRANSITS.

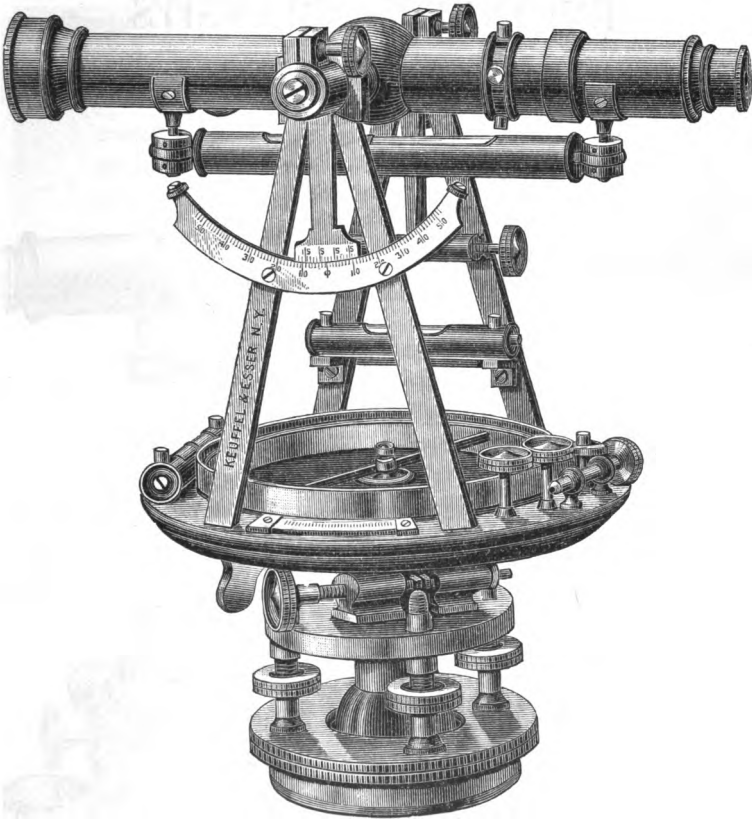
"Copyright, 1887, by Keuffel & Esser."



- | | | |
|-------|---|-----------|
| 5040. | Engineer's Transit as described under No. 5030, but with fine graduated bubble to telescope and micrometer screw of improved pattern with compensating spring, needle $4\frac{1}{4}$ ", horizontal limb 6", with tripod, etc. | \$ 205 00 |
| 5042. | Engineer's Transit like No. 5040, but needle 5", horizontal limb $6\frac{1}{2}$ ", complete | 210 00 |
| | Horizontal limb and verniers graduated on silver to 20 minutes, reading to 30 seconds extra | 10 00 |
| | The above Instruments but with three leveling screws " | 10 00 |
- No extra charge for telescopes with inverting eye-piece (astronomical telescope).

For Attachments and Extras see page 222.

ENGINEER'S TRANSITS.



"Copyright, 1887, by Keuffel & Esser."

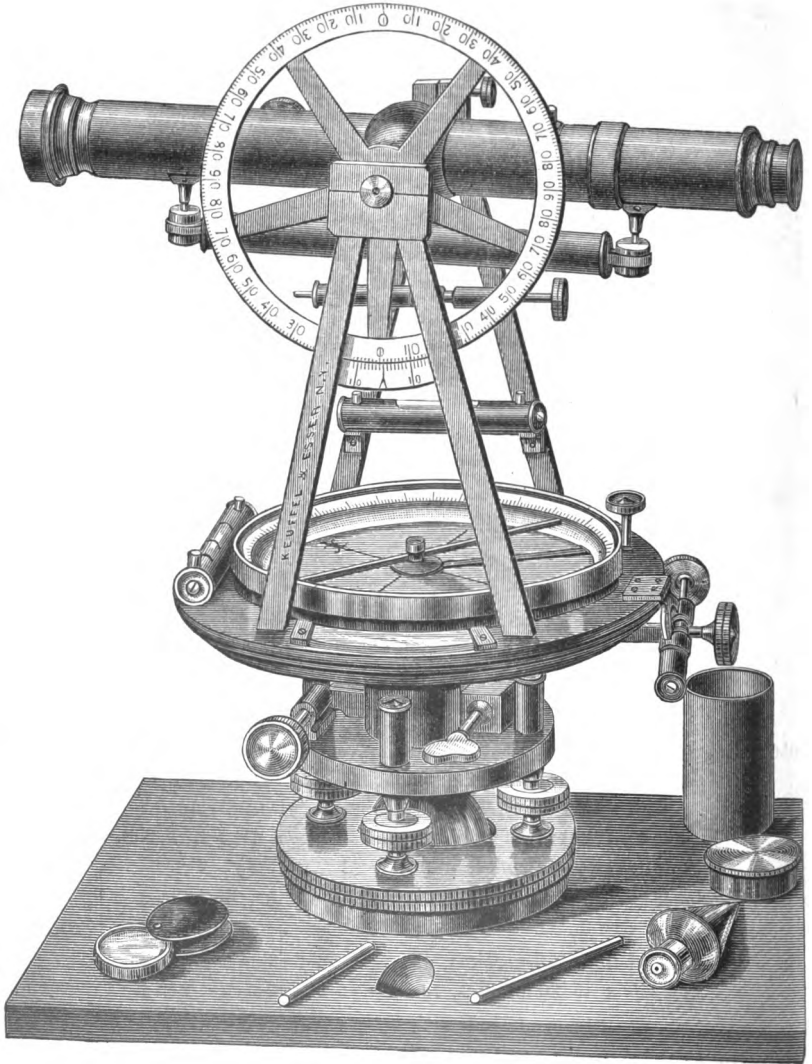
5050. Engineer's Transit as described under No. 5030 but with fine graduated bubble to telescope, and arc graduated to $\frac{1}{2}$ degrees, vernier reading to minutes, with micrometer screw of improved pattern, with compensating spring, needle $4\frac{1}{2}$ " , horizontal limb 6" \$ 220 00
5052. Engineer's Transit, like No. 5050, but needle 5" , horizontal limb $6\frac{1}{2}$ " 225 00
- Horizontal limb and verniers, also arc and vernier graduated on silver to 20 minutes, reading to 30 seconds extra 12 00
- The above Instruments but with three leveling screws " 10 00
- No extra charge for telescopes with inverting eye-piece (astronomical telescope).

For Attachments and Extras see page 222.



ENGINEER'S TRANSITS

"Copyright, 1887, by Keuffel & Esser."



No. 5060.

ENGINEER'S TRANSITS.

5060. Engineer's Transit as described under No. 5030 but with fine graduated bubble to telescope, and vertical limb graduated to half degrees, vernier reading to minutes, with micrometer screw of improved pattern, with compensating spring, needle 4½", horizontal limb 6" . \$ 235 00

5062. Engineer's Transit like No. 5060, but needle 5", horizontal limb 6¼" 240 00

Horizontal limb and verniers, also vertical limb and vernier graduated on silver to 20 minutes, reading to 30 seconds extra 15 00

The above Instruments but with 3 leveling screws " 10 00

No extra charge for telescopes with inverting eye-piece (astronomical telescope).

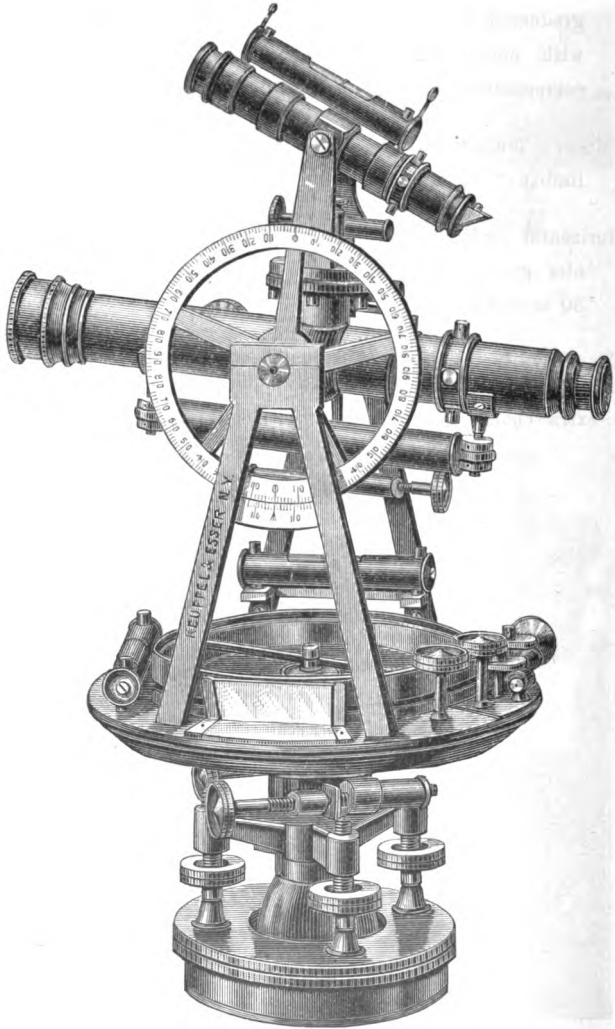


For Attachments and Extras see page 222.

KEUFFEL & ESSER CO. NEW YORK.

LIGHT MOUNTAIN AND MINING TRANSIT

with Solar Attachment.

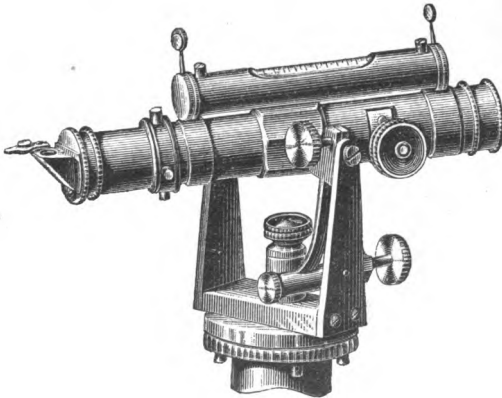


LIGHT MOUNTAIN AND MINING TRANSITS.

5070. Light Mountain and Mining Transit (for repeating angles) with achromatic terrestrial telescope, 8½ inch, magnifying about 20 times, with sun and dust shades, object-glass 1 inch, with rack-movement, eyepiece and crosshairs adjustable, compass ring divided to half degrees, numbered from 0 to 180. Needle 4 inch, horizontal limb 5½ inch, graduated to half degrees, two verniers reading to minutes. Two fine graduated bubbles for leveling the plates; clamp for centre with micrometer screw with compensating spring. Shifting centre.
- The instrument complete with plumb bob, adjusting pins etc., packed in fine polished mahogany box and with tripod each \$ 170 00
5072. Light Mountain and Mining Transit like No. 5070, but with graduated bubble to telescope " 190 00
5074. Light Mountain and Mining Transit like No. 5070, but with graduated bubble to telescope and vertical arc reading to minutes " 205 00
5076. Light Mountain and Mining Transit like No. 5070, but with graduated bubble to telescope and vertical limb reading to minutes " 220 00
- The above instruments but with three leveling screws, extra " 10 00

For Attachments and Extras and Divisions on Silver see page 222.

SAEGMULLER SOLAR ATTACHMENT.



Patented May 3, 1881.

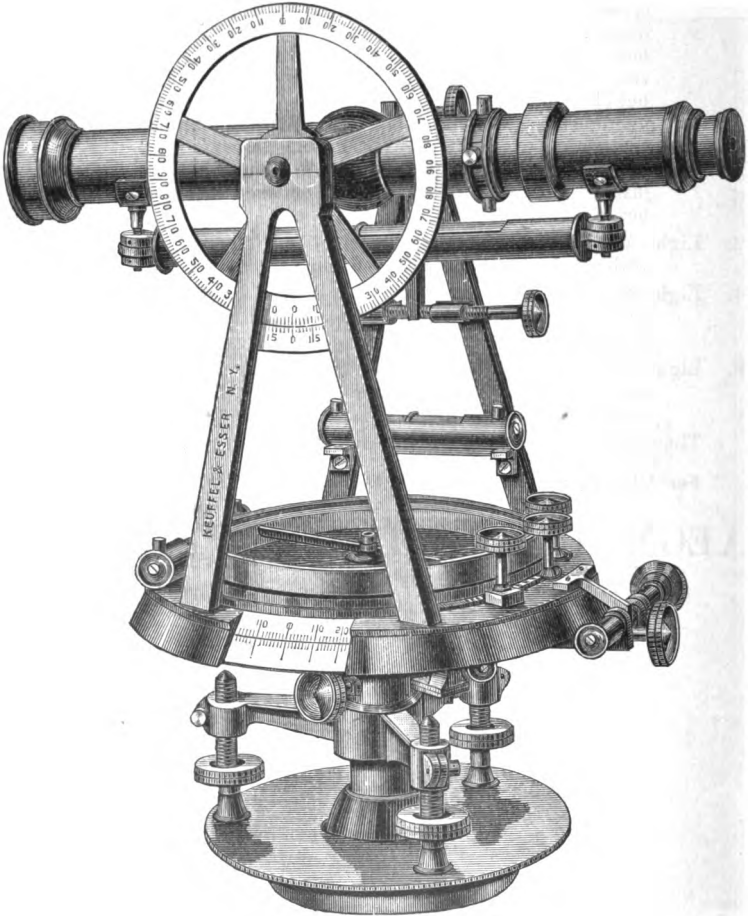
5090. Solar Attachment with prism to eyepiece (fitting to transit included) \$ 50 00

This attachment to the regular Engineer's Transit, by means of which the astronomical meridian may be obtained in a few minutes with an accuracy scarcely thought possible, has met with such success that it bids fair to supersede all other methods for the determination of the meridian by means of engineering instruments. Attached to any transit which has a telescope with bubble and a vertical circle, it will give the meridian within the nearest minute. By using instruments which have a finer graduated vertical circle and better levels such as are found on our transits, the meridian can be determined with still greater accuracy.

KEUFFEL & ESSER CO. NEW YORK.

ENGINEER'S TRANSIT

graduated on beveled edge.



No. 5106.

These instruments are also furnished with four leveling screws.



ENGINEER'S TRANSITS

graduated on beveled edge.

WITH THREE LEVELING SCREWS.

5100. Plain Engineer's Transit (for repeating angles) with achromatic terrestrial telescope 11 inch magnifying about 24 times, with sun and dust shades, object glass $1\frac{1}{2}$ inch, with rack-movement, eyepiece and cross-hairs adjustable, compass ring graduated to half degrees, numbered from 0 to 180. Needle $4\frac{1}{2}$ inch; horizontal limb $6\frac{1}{2}$ inch, graduated to 20 minutes, two verniers reading to 30 seconds. Limb and verniers graduated on silver. Two finely graduated bubbles for leveling the plates. Clamp for centre with micrometer screw with compensating spring. Shifting centre, tripod head of gunmetal.
- The instrument complete with plumb bob, adjusting pins etc. in fine polished mahogany box and with tripod each \$ 215 00
5102. Engineer's Transit like No. 5100, but with bubble to telescope, tangent screw etc. " 235 00
5104. Engineer's Transit like No. 5100, but with bubble to telescope, tangent screw, vertical arc divided on silver to half degrees and reading to 1 minute " 250 00
5106. Engineer's Transit like No. 5100, but with bubble to telescope, tangent screw, vertical limb divided on silver to half degrees and reading to 1 minute . . " 265 00



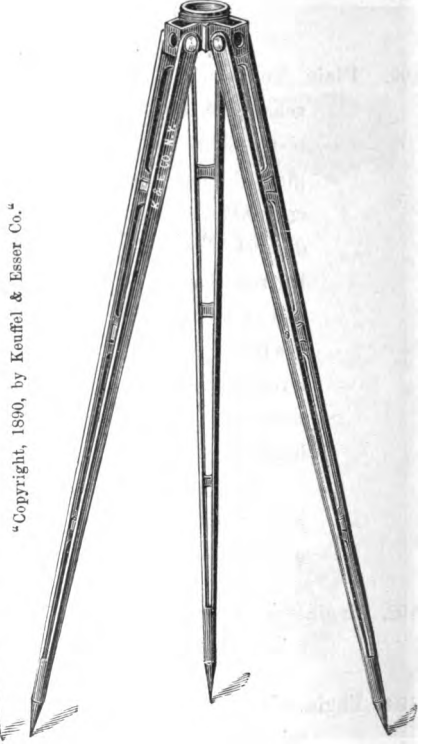
For Attachments and Extras see page 222.



TRIPODS FOR LEVELS AND TRANSITS.



No. 5175.



No. 5177.

“Copyright, 1890, by Keuffel & Esser Co.”

5175. Hardwood Tripod for levels and transits each \$ 10 —

This is the style of tripod which we furnish with our surveying instruments No. 5005 and following, except those with three leveling screws, which require special tripods.

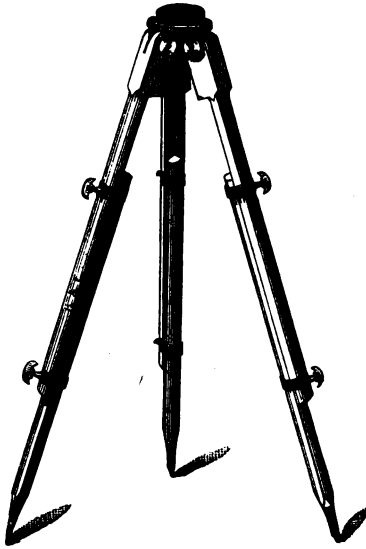
5177. Hardwood Tripod for levels and transits, latest construction, very strong, extremely light (total weight about 95 oz^s) each \$ 12 50

If furnished with levels or transits in place of No. 5175, extra “ 2 50





PATENT EXTENSION-TRIPOD.



PATENTED AUGUST 24. 1886.

No. 5180.

5180. The Patent Extension-Tripod combines stiffness, easy manipulation and light weight to such a degree that we can safely recommend it as the best Extension-Tripod now made. — It is certainly the strongest Tripod in the market, and is so constructed that it can neither wear loose nor bind, but always moves easily. Total weight about 8 lbs., much less than any other Extension-Tripod each \$ 12 50

If furnished with levels or transits in place of No. 5175, extra “ 2 50





ATTACHMENTS AND EXTRAS

for

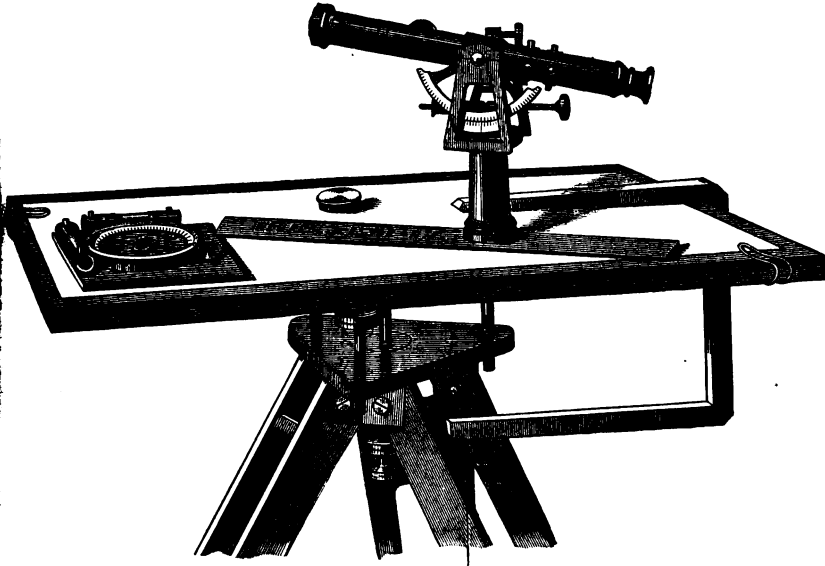
TRANSITS AND LEVELS.

Saegmuller's Solar Attachment, with prism to eyepiece	\$ 50 00
Prism to eyepiece	8 00
Fixed Stadia hairs in telescope	2 50
Adjustable " " " "	6 00
Gradienter screw to telescope extra	10 00
" " " " and tangent screw with clamp	18 00
Reflector for illuminating cross and stadia hairs	4 00
Rack and pinion movement to eyepiece	5 00
Theodolite axis to telescope	10 00
Variation plate to compass ring, if furnished with instrument	5 00
Graduation on Silver horizontal limb and verniers	10 00
" " " compass ring	3 00
" " " arc to telescope	2 00
" " " vertical limb to telescope	5 00
Graduations to 20 seconds on horizontal limb or arc	5 00
do. " 10 or 15 seconds do. do.	10 00



PLANE TABLE.

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5200. Plane Table, small pattern, achromatic terrestrial telescope 11 inch, with sunshade, object glass $1\frac{1}{2}$ inch, with rack-movement, adjustment to eyepiece, magnifying about 24 times. The telescope revolves in axis mounted on standards $6\frac{1}{2}$ inch high, arc graduated to half degrees, vernier reading to 1 minute. Brass alidade 18 inch, 2 inch wide, one edge beveled. Easily detachable well seasoned table 18×24 inch, mounted on a split tripod by a large plate ($9\frac{3}{8}$ inch), three leveling screws. Compass with 3 inch needle, on square brass plate with 2 bubbles.

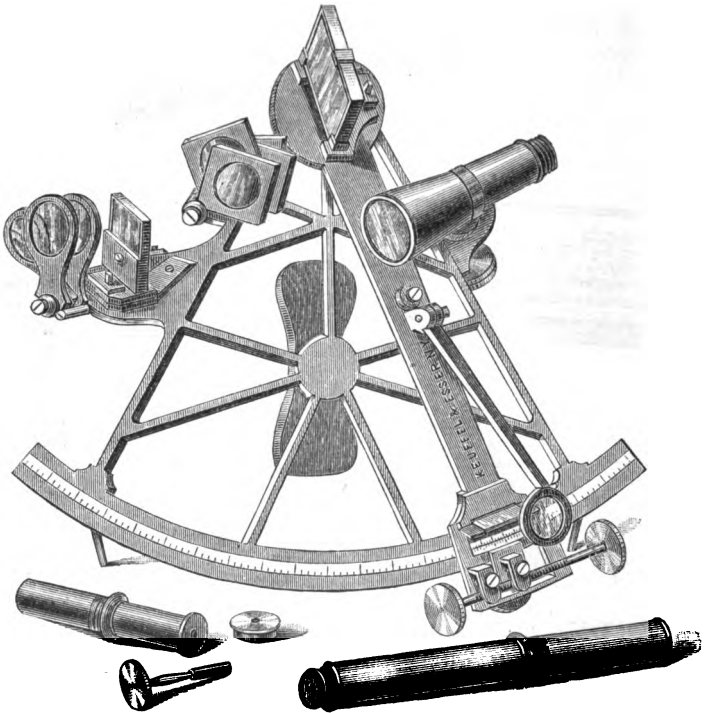
Instrument in polished mahogany box including split tripod each \$ 130 00





SEXTANTS AND OCTANTS.

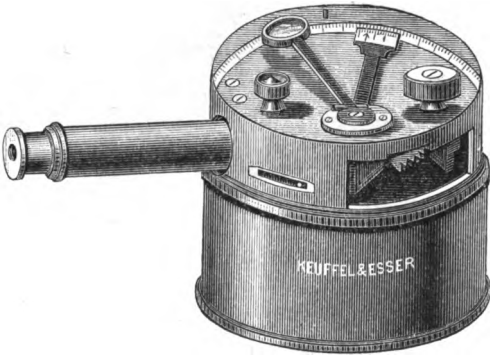
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- 5220. Sextant of gunmetal, light but very strong, 7 inch radius, 120 degrees, graduated on silver to 10 minutes, vernier reading to 10 seconds, 2 astronomical telescopes magnifying 6 and 10 times, 1 terrestrial telescope, seven neutral glasses, and two mirrors.
Instrument complete in polished mahogany box . each \$ 120 00
- 5221. Sextant, the same as No. 5220, but radius 6 inch . . . " 100 00
- 5230. Octant of gunmetal, 9 inch radius, 90 degrees, graduated on silver to 20 minutes, vernier reading to 10 seconds. Astronomical and terrestrial telescopes, seven neutral glasses and 2 mirrors. Instrument complete in polished mahogany box " 80 00

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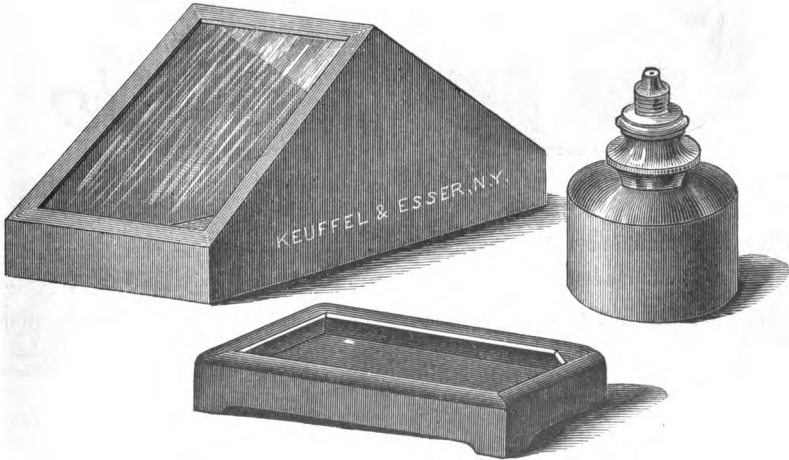


No. 5240.

5240. Pocket or Box Sextant, graduated on silver to 30 minutes, vernier reading to 1 minute, with telescope, 2 neutral glasses, reading lens and tangent adjusting screw. Metal Box 3 inch diameter, 1½ inch high, in leather sling case each \$ 42 50

ARTIFICIAL HORIZONS.

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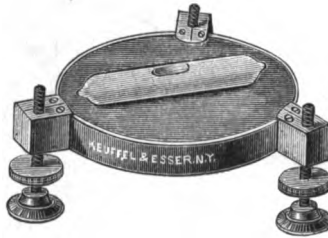


No. 5250.

5250. Mercurial Horizon, iron trough, iron bottle with screw stopper and funnel cap, glazed metal roof, 3½ × 7 inch. All in polished mahogany box set \$ 27 50



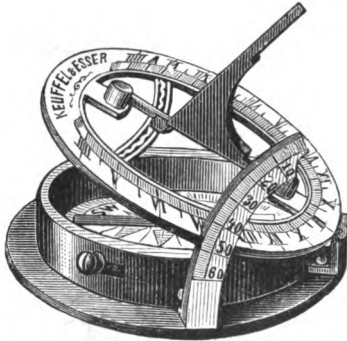
“Copyright, 1887,
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No. 5251.

5251. Reflecting Horizon, black glass plane mounted in brass, diam. $3\frac{1}{2}$ inch, with three leveling screws and spirit level, in polished mahogany case each \$ 16 00

SUN-DIALS.



No. 5270.



5275.

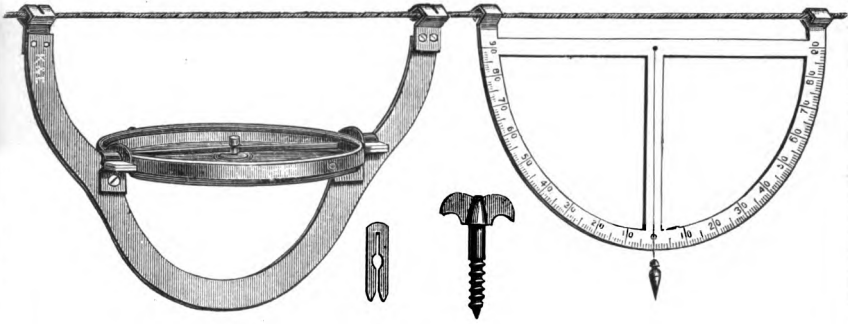
5270. Universal Sun-dial and Compass for both North and South Latitudes, best make, $2\frac{1}{2}$ inch, in morocco case . . each \$ 14 50

5275. Sun-dial and Compass, German Silver, 2 inch “ 3 50



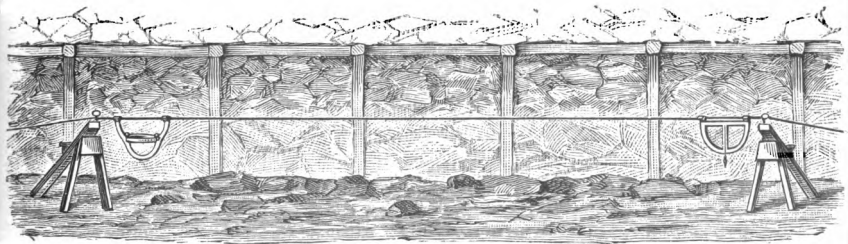
KEUFFEL & ESSER CO. NEW YORK.

MINING COMPASS.



No. 5280.

5280. Mining Compass, graduated to half degrees, suspended in universal joint (gimbal) in a frame with hooks, needle $3\frac{1}{4}$ inch, with stop. Clinometer with hooks, 7 inch diameter, graduated to half degrees, with plumb bob, screws for cord and brass stop, in chamois lined leather sling case. each \$ 50 00



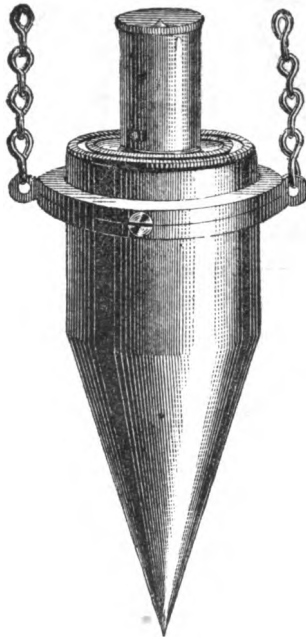
Mining Compass and Clinometer in use.

1 pair station bucks each \$ 5 00
 80 feet water-proof cord, on reel " 5 00



MINING LAMP AND PLUMMET.

A large brass Plummet with steel point, 2 inch diameter, 6½ inch long, mounted in universal joint (gimbal) suspended by chains. The upper part is hollow, for oil, and provided with a burner, forming a lamp. The sight is taken to centre of flame.



1/8 size.

No. 5285.

5285. One Plummet in mahogany box with strap each \$ 13 00
5286. Two do. in one mahogany box with strap pair 25 00



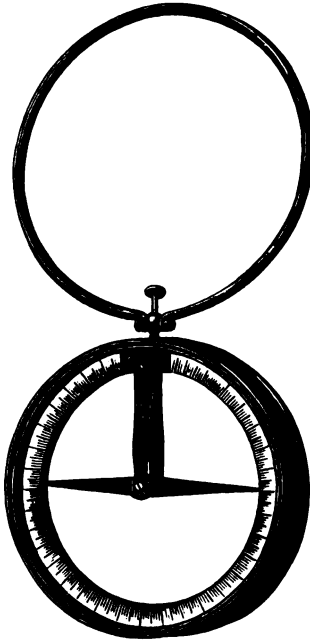
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MINER'S COMPASSES.



No. 5290.

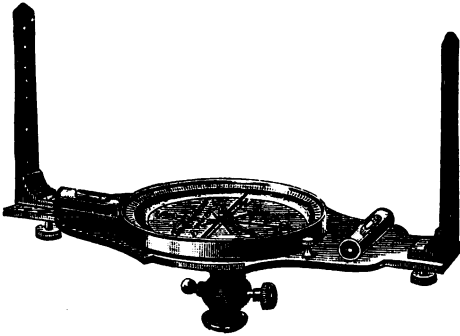
5290. Miner's Compass or Dipping Needle with Norwegian needle, glass and brass covers on both sides, stop to needle, 3 $\frac{1}{4}$ inch each \$ 14 00



No. 5293.

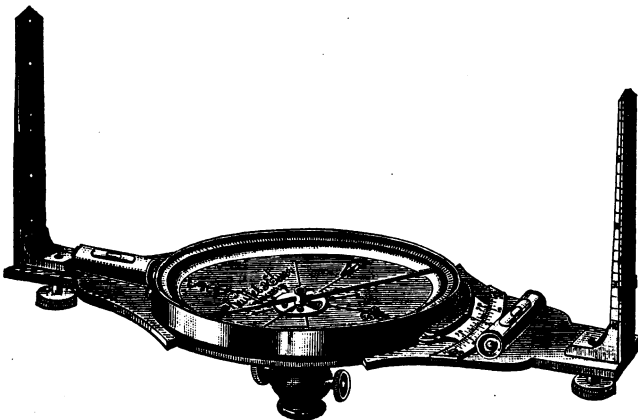
5293. Miner's Compass or Dipping Needle, stop to needle, glass and brass covers on both sides, 3 $\frac{1}{4}$ inch each \$ 10 00

SURVEYING COMPASSES.



No. 5300.

- | | | | |
|-------|---|------|----------|
| 5300. | Large Surveying Compass with sights, graduated to half degrees, needle 4 inch, plate 12½ inch, 2 bubbles, ball joint and socket for jacob staff mounting, in polished mahogany case | each | \$ 32 00 |
| 5302. | do. do. needle 5 inch, plate 15½ inch | " | 35 00 |
| 5304. | do. do. " 6 " " 16½ " | " | 40 00 |

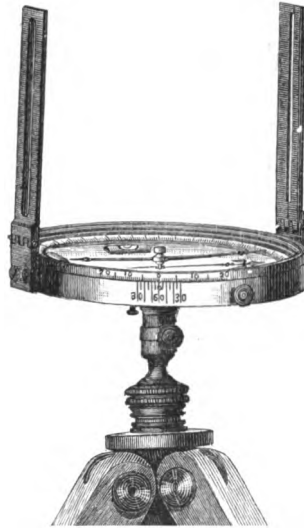


No. 5306.

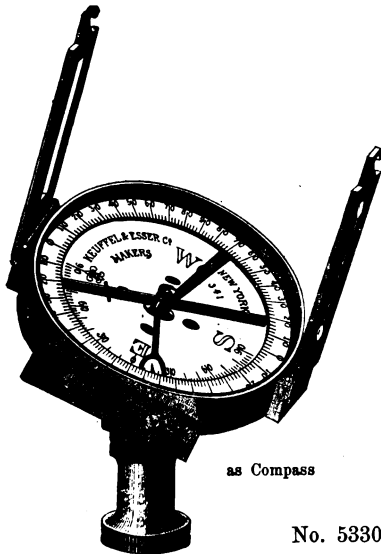
- | | | | |
|-------|--|------|----------|
| 5306. | Large Surveying Compass, with graduated sights, compass graduated to half degrees, variation plate with rack-movement, needle 4 inch, plate 12½ inch, two bubbles, ball joint and socket for jacob staff mounting, in polished mahogany case | each | \$ 40 00 |
| 5308. | do. do. needle 5 inch, plate 15½ inch | " | 45 00 |
| 5310. | do. do. " 6 " " 16½ " | " | 50 00 |

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No. 5320.



5320. Surveying Compass, with folding sights, graduated to 1 degree variation plate on side of compass box, two bubbles, ball joint and socket for jacob staff mountings, needle 3½ inch, in polished mahogany case each \$ 16 00
5321. do. do. " 4 " " " " " " " 18 00
5322. do. do. " 4½ " " " " " " " 20 00



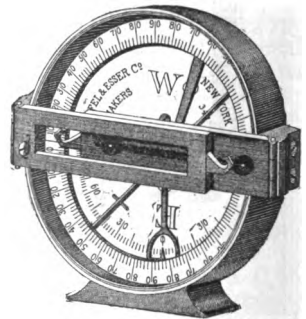
as Compass

No. 5330.

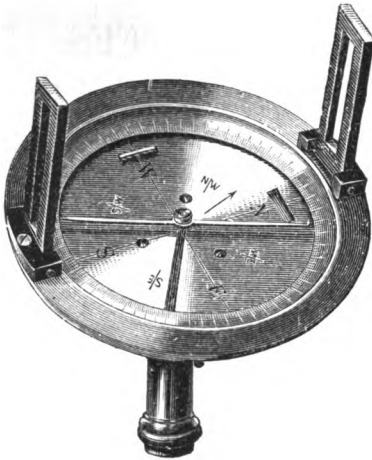
5330. Surveying Compass and Clinometer, with folding sights ending in hooks, graduated to 1 degree, with ball joint and socket for jacob staff mounting, needle 2 inch, in mahogany case, each \$ 12 50
5331. do. do. " 2½ " " " " " " 14 00

For Jacob Staffs and Tripods see page 234.

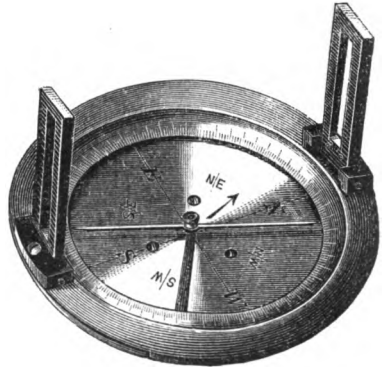
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as Clinometer



No. 5332.



No. 5339.

5332. Surveying Compass, with folding sights, graduated to 1 degree, with two bubbles, ball joint and socket for jacob staff mounting,

needle 3 inch, in mahogany case each \$ 13 00

5333.	do.	do.	"	3½	"	"	"	"	13 50
5334.	do.	do.	"	4	"	"	"	"	15 00

5335. Surveying Compass, with folding sights, graduated to 1 degree, with ball joint and socket for jacob staff mounting,

needle 2½ inch, in mahogany case " 10 00

5336.	do.	do.	"	3	"	"	"	"	11 00
5337.	do.	do.	"	3½	"	"	"	"	12 00
5338.	do.	do.	"	4	"	"	"	"	13 50

5339. Surveying Compass, with folding sights, graduated to 1 degree,

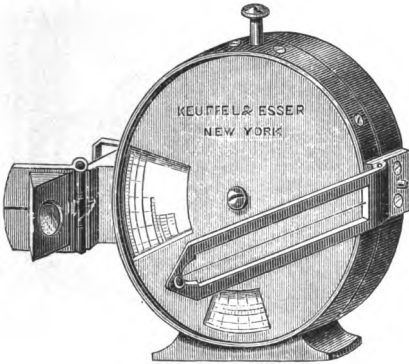
needle 2 inch, in mahogany case " 7 50

5340.	do.	do.	"	2½	"	"	"	"	8 00
5341.	do.	do.	"	3	"	"	"	"	9 50

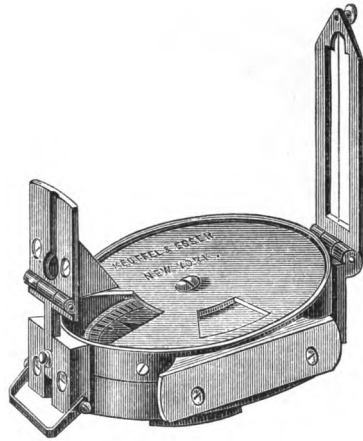
For Jacob Staffs and Tripods see page 234.

PRISMATIC COMPASSES.

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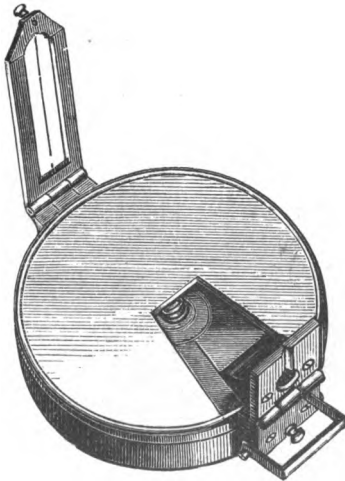
as Clinometer.



as Compass

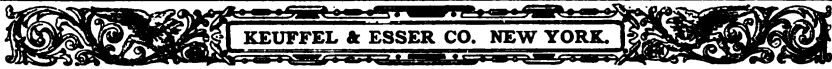
No. 5400.

5400. Prismatic Compass and Clinometer, bronzed, pocket size, compass dial and altitude circle 2½ inch diameter, graduated to ¼ degrees. Altitude circle with scale of rise and fall in inches per yard, in morocco case each \$ 36 00

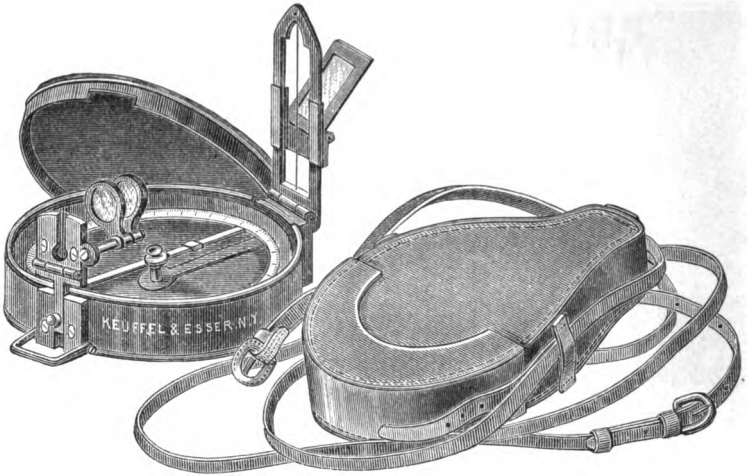


No. 5410.

5410. Hutchinson's Prismatic Compass, bronzed, of improved pattern, nearly enclosed top, floating card dial, 2 inch, in morocco case each \$ 11 00
5411. do. do. do. 3 inch, in leather sling case " 17 50



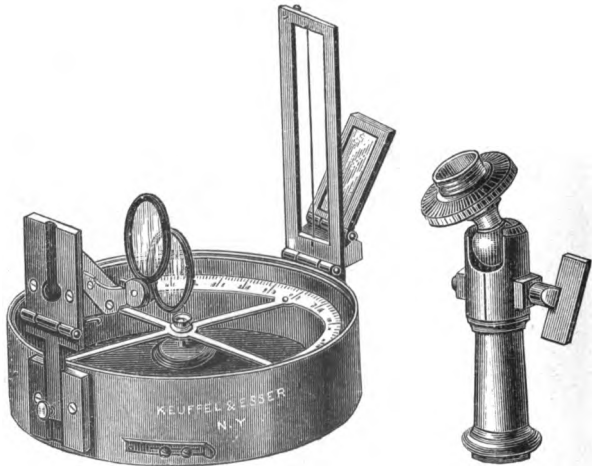
"Copyright, 1887, by Keuffel & Esser."



No. 5420.

5420. Prismatic Compass complete with azimuth glasses, consisting of shades and mirror, with divided aluminum ring, 3 inch, in leather sling case. Best quality instrument each \$ 33 75
5422. do. do. with ball joint and socket, mahogany tripod with best brass mountings " 48 00

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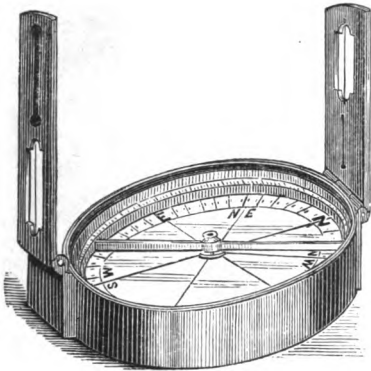


No. 5429.

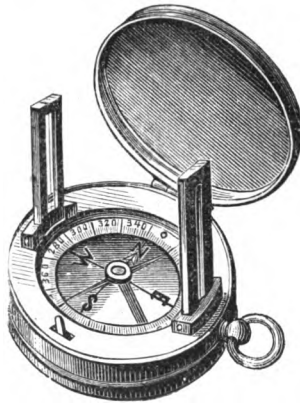
5428. Prismatic Compass, 3 inch, with floating metal dial, ball joint and socket for Jacob Staff, in mahogany case each \$ 15 00
5429. do. do. 3 3/4 inch, with azimuth glasses, in mahogany case " 24 00

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SIGHT COMPASSES.



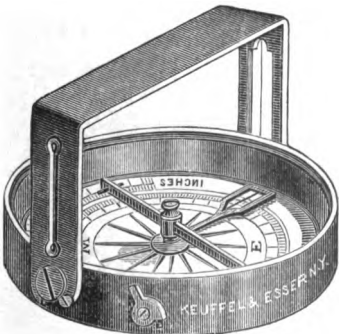
No. 5441.



5450.

- | | | | | | |
|-------|---|-------------------|---------|---------|---------|
| 5440. | Bronzed Pocket Compass, with folding sights; edge bar | | | | |
| | | needle with stop, | 2½ inch | each | \$ 5 25 |
| 5441. | do. | do. | do. | 3 " " | 7 50 |
| 5450. | Bronzed Pocket Compass, watch pattern, with folding sights, | | | | |
| | stop to needle, | 1½ | 2 | 2⅝ inch | |
| | each | \$ 3 75 | 4 25 | 4 75 | |

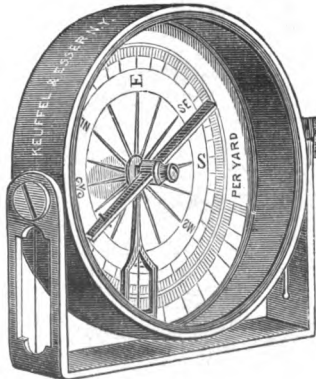
SIGHT COMPASS AND CLINOMETER.



as Sight Compass.

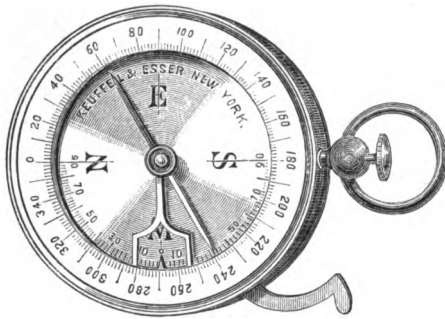
No. 5460.

as Clinometer.



5460. Bronzed Sight Compass and Clinometer, metal dial graduated to 1 degree, edge bar needle with stop. The sights are pivoted to the compass box and connected by a cross-bar, which is turned down to serve as foot when the instrument is used as clinometer. The clinometer gives inclinations in inches per yard and in degrees,
- | | | | | | | |
|-------|-----|-----|----------|----------------|------|---------|
| | | | diameter | 2½ inch in box | each | \$ 7 85 |
| 5461. | do. | do. | do. | 3 " " " " | " | 9 75 |
| 5462. | do. | do. | do. | 4 " " " " | " | 11 70 |

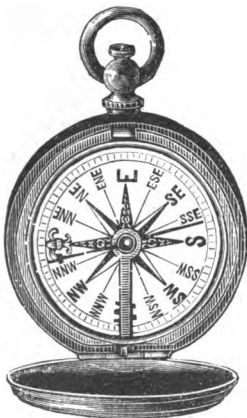
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No. 5470.

5470. Pocket Compass and Clinometer, 2½ inch, German Silver, bar needle with agate cap and stop, shifting clinometer foot, in case each \$ 4 50

MAGNETIC POCKET COMPASSES.



No. 5490.

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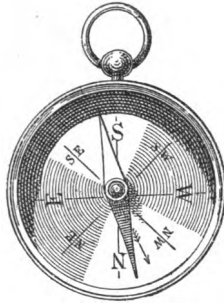
5493.

- | | | | |
|-------|---|---------|------|
| 5490. | Fine Watch pattern Compass, nickel plated, hunting case, edge bar needle, metal dial, 1½ inch | each \$ | 2 75 |
| 5491. | do. do. do. do. 1¾ " | " | 3 00 |
| 5492. | do. do. do. Singer's card dial, 1½ inch | " | 2 20 |
| 5493. | do. do. do. " " " 1¾ " | " | 2 50 |
| 5494. | do. do. do. " pearl " 1¾ " | " | 3 60 |

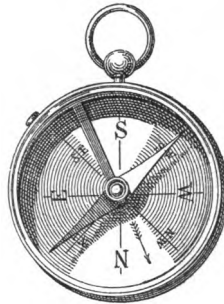
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No. 5550.



5553.

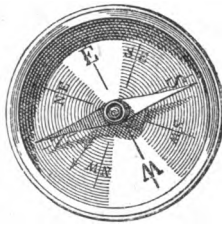


5556.

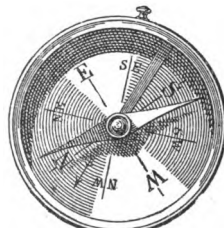
5550.	Pocket Compass, brass, watch pattern, paper dial	1 1/4	1 3/8	1 5/8 inch
	each \$	20	25	30
5553.	do. brass, watch pattern, metal dial	1	1 3/8	1 3/4 inch
	each \$	40	45	50
5556.	do. brass, watch pattern, metal dial, stop to needle	1	1 3/8	1 3/4 inch
	each \$	50	55	60



No. 5575.



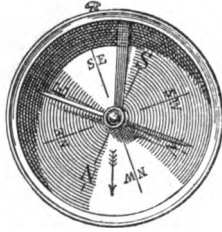
5581.



5585.

5559.	Pocket Compass, brass, watch pattern, metal dial, divided to 2 degrees, stop to needle, agate centre	1 3/8	1 3/4	2 inch
	each \$	90	1 00	1 20
5562.	do. brass, like No. 5559, but divisions on raised ring	1 3/8	1 3/4	1 3/4 inch
	each \$	1 20	1 40	
5575.	Pocket Compass, brass, pull off cover, paper dial	1 1/4	1 3/8	1 5/8 inch
	each \$	25	30	35
5578.	do. nickel plated, otherwise like No. 5575	1 1/4	1 3/8	1 5/8 inch
	each \$	35	40	50
5581.	do. brass, pull off cover, metal dial	1 3/8	1 3/4	1 3/4 inch
	each \$	70	85	
5583.	do. nickel plated, otherwise like No. 5581	1 3/8	1 3/4	1 3/4 inch
	each \$	1 10	1 25	
5585.	do. brass, pull off cover, metal dial, stop to needle	1 3/8	1 3/4	1 3/4 inch
	each \$	85	1 00	
5587.	do. nickel plated, otherwise like No. 5585	1 3/8	1 3/4	1 3/4 inch
	each \$	1 25	1 40	

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No. 5590.



5592.

5590. Pocket Compass, brass, pull off cover, metal dial, stop to needle, agate centre

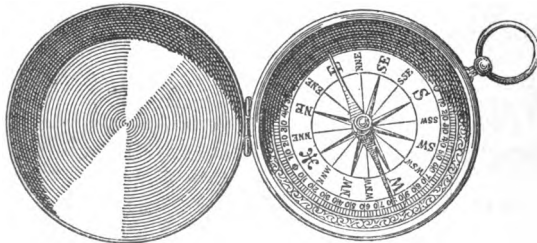
$1\frac{3}{8}$	$1\frac{3}{8}$ inch
each \$ 1 10	1 25

5592. do. brass, pull off cover, enameled card dial, divided to 2 degrees, edge bar needle with agate centre and stop

$1\frac{1}{2}$	$2\frac{3}{8}$ inch
each \$ 1 60	2 00

5600. do. square mahogany case with cover, stop to needle card dial divided to degrees

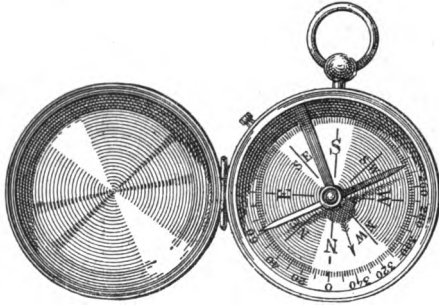
2	3 inch
each \$ 1 25	2 00



No. 5620.

5620. Pocket Compass, nickel plated, watch pattern, hinged cover, paper dial

$1\frac{1}{4}$	$1\frac{5}{8}$	2 inch
each \$ 45	50	60



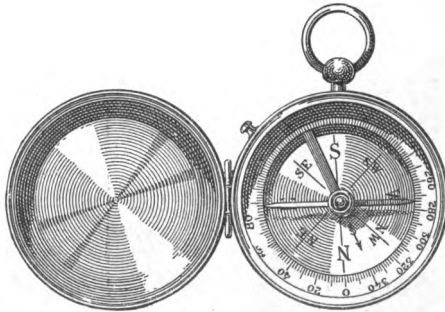
No. 5623.

5623. Pocket Compass, brass, watch pattern, hinged cover, metal dial, divided to 2 degrees, stop to needle, agate centre

	$1\frac{3}{8}$	$1\frac{1}{2}$ inch
each \$	1 50	1 75

5625. do. nickel plated, otherwise like No. 5623

	$1\frac{3}{8}$	$1\frac{1}{2}$ inch
each \$	2 00	2 25



No. 5627.

5627 Pocket Compass, brass, watch pattern, hinged cover, metal dial, divided to 2 degrees on raised ring, stop to needle, agate centre

	$1\frac{3}{8}$	$1\frac{1}{2}$ inch
each \$	1 75	2 00

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HAND LEVELS.

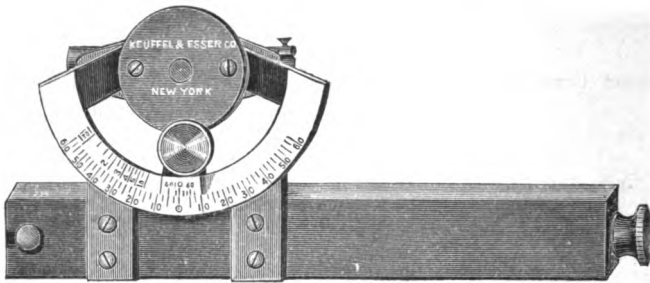
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No. 5700.

- 5700. Locke's Hand Level, German Silver, in case, 5 inch . . . each \$ 10 00
- 5701. do. do. Brass, in case, 5 inch " 9 00
- 5702. do. do. Brass, common, in case 5 inch " 6 00

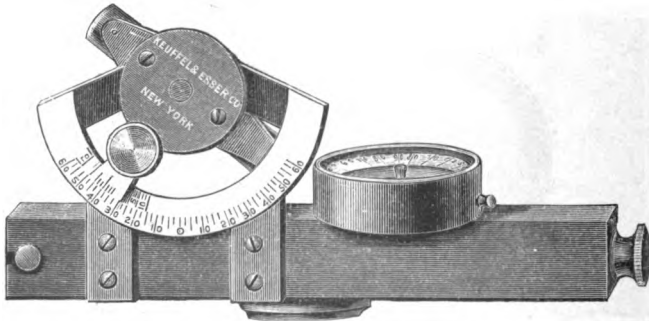
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No. 5710.

- 5710. Abney's Reflecting Level or Pocket Altimeter, 5 inch, improved, with divided arc to show gradients, in mahogany case each \$ 15 00

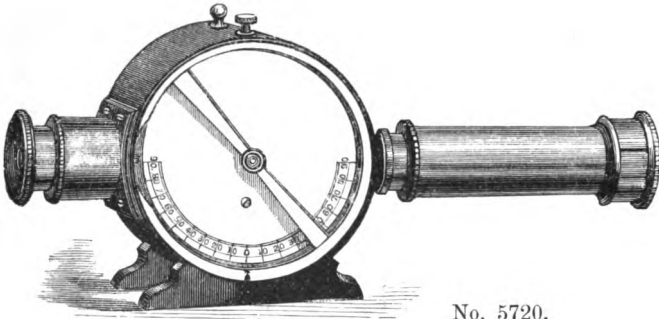
"Copyright, 1890, by Keuffel & Esser Co."



No. 5711.

- 5711. Abney's Reflecting Level or Pocket Altimeter, 5 inch, improved, with bar needle compass and socket for jacob staff each \$ 18 00

POCKET ALT-AZIMUTH.



No. 5720.

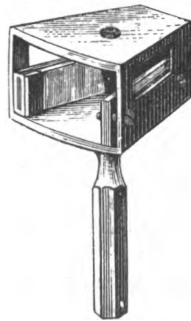
5720. Pocket Alt-Azimuth with fine telescope. A good azimuth compass with aluminum ring and weighted disk for altitudes, both graduated also on edge to read through the adjustable eye-piece of the telescope. A colored glass is fitted in the cap of the object glass for observing the sun.

Instrument, 6½ inch long, 2½ inch diam., 1½ inch thick, weight 13 oz., in morocco case each \$ 50 00

ANGLE MIRRORS AND PRISMS.



No. 5750.



No. 5751.

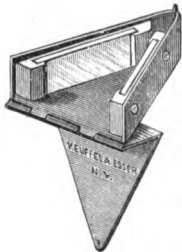
5750. Angle Mirror, for angles of 90 degrees, with small plumb bob.

The handle can be detached and stored in frame of instrument. Size of instrument 2½ × 2 × 1½ inch . each \$ 8 50

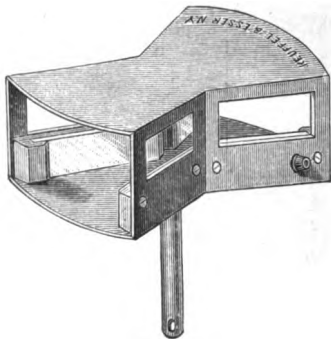
5751. Angle Mirror, plain, for angles of 90 degrees, in morocco case " 5 00

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No. 5752.



5760.

- 5752. Angle Mirror, for angles of 90 degrees, in brass case, $2\frac{1}{4} \times 2\frac{3}{4} \times \frac{1}{2}$ inch, cover folding back to serve as handle each \$ 5 00
- 5760. Double Angle Mirror, one side for angles of 90 degrees, the other for angles of 45 degrees, in mahogany case " 10 00
- 5761. do. do. for angles of 90 and 60 degrees . . . " 10 00

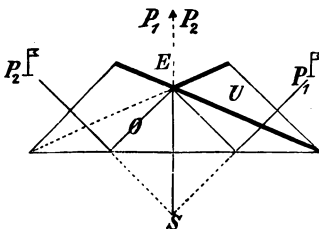


No. 5762.



No. 5763.

- 5762. Rectangular Prism, for angles 90 degrees, $2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{8}$ inch, in morocco case each \$ 5 00
- 5763. Double Prism, for angles of 90 and 45°, in morocco case " 10 00



This neat and simple instrument consists of two prisms of $22\frac{1}{2} \times 45$ and $112\frac{1}{2}$ °, placed one above the other in brass mounting, to the handle of which a plumb line can be attached. The longer sides of the prisms are placed in one plane, facing the observer and the reflecting surfaces cross each other at E.

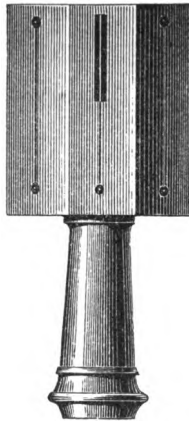
When one prism is used alone an angle of 45° can be set out. By using both prisms, the observer will see the object P₂ in the upper prism to the right and object P₁ in the lower prism to the left. When the position is shifted, so that the two objects are seen as being one vertically above the other, the observer is in the apex of the right angle, between the two objects.

This instrument is very useful in cross sectioning and dividing up land, also for laying out building-ground.

KEUFFEL & ESSER CO. NEW YORK.

STAFF

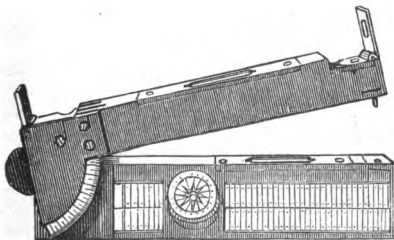
HEADS.



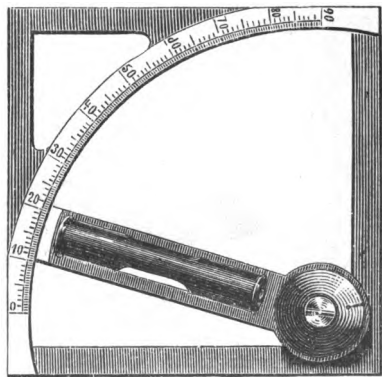
No. 5770.

- 5770. Cross Staff Head, octagonal, $2\frac{1}{2}$ inch, for Jacob Staff, in case each \$ 3 00
- 5772. do. 3 inch, with magnetic compass divided to 2 degrees on raised ring, needle $1\frac{1}{4}$ inch " 5 00
- 5775. do. revolving, with rack-movement, German Silver rim graduated to 1 degree, with vernier reading to 3 minutes, compass graduated to 2 degrees, $2\frac{1}{2}$ inch needle with agate cap and stop " 12 00

CLINOMETERS.



No. 5801.

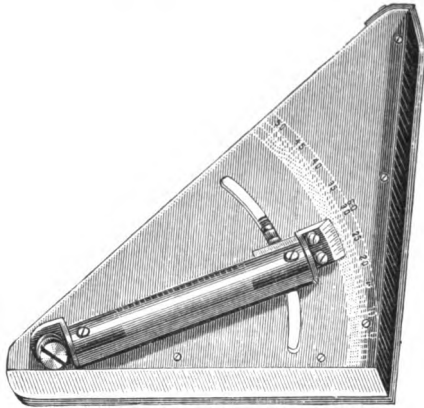
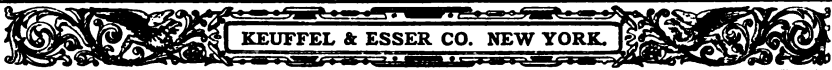


No. 5805.

- 5800. Boxwood Clinometer, with 2 levels, compass and inclination scale, 6 inch, in leather pocket case each \$ 8 50
- 5801. do. do. do. with sights " 11 50

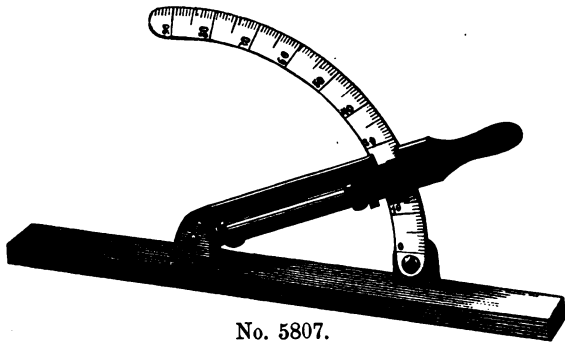
The inclination scale marked upon these clinometers, gives the value of any angle, as follows: The angle ascertained from the divided arc upon the instrument, refers to that degree in the column, marked "angle" and opposite in another column, will be found the rise or fall in any given measured distance. For instance, say the degree shown on the divided arc is 18, opposite to this number on the scale, is 3, thus indicating one part fall or rise in three, or 1 mile in 3 miles, 1 foot in 3 feet.

- 5805. Clinometer or Slope Level, of brass, square frame, 4 inch, with arc divided to $\frac{1}{2}$ degrees, in case each \$ 12 00



No. 5806.

5806. Clinometer or Slope Level, of brass, triangular frame, $4\frac{1}{4}$ inch side, divided to $\frac{1}{4}$ degrees, vernier reading to 3 minutes, in substantial leather case each \$ 12 00



No. 5807.

5807. Clinometer or Slope Level of brass, 9 inch long, with folding arc, and vernier reading to 3 minutes, in case each \$ 12 00



KEUFFEL & ESSER CO. NEW YORK.

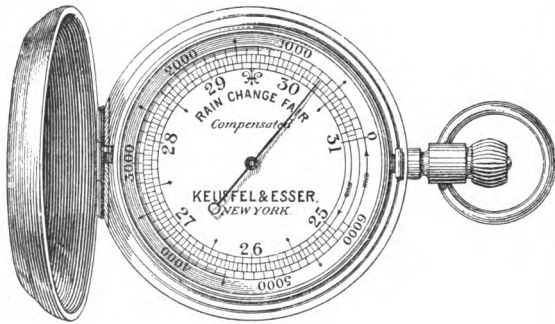
ANEROID BAROMETERS.

For measuring heights and atmospheric pressure.

"Copyright, 1887, by Keuffel & Esser."

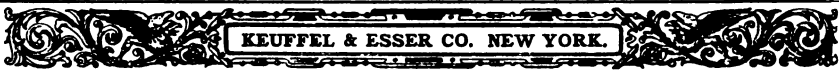


No. 5855.

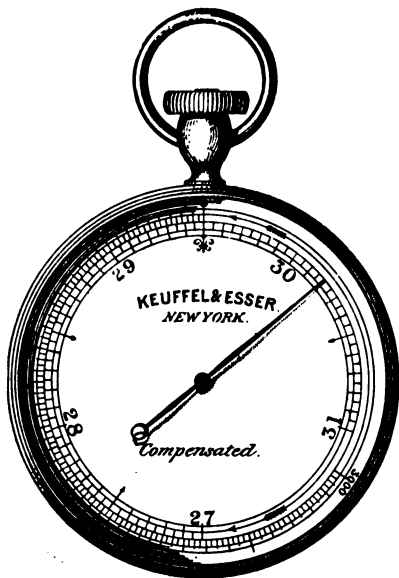


5871.

5850.	Watch size, gilt case, 1 $\frac{3}{4}$ inch diam. silvered metal dial, revolving altitude scale 8000 feet, in morocco case	\$ 12 00
5855.	do. gilt case, 1 $\frac{3}{4}$ inch diam., silvered metal dial, revolving altitude scale 3000 feet, compensated for temperature, in morocco case	" 19 50
5856.	do. do. do. altitude scale 6000 feet	" 18 25
5857.	do. do. do. " " 12000 "	" 19 50
5858.	do. do. do. " " 18000 "	" 21 00
5860.	do. gilt case, 1 $\frac{3}{4}$ inch diam., silvered metal dial, altitude scale 8000 feet, bar-needle compass on reverse (to detach), compensated for temperature, in morocco case	" 28 75
5861.	do. do. do. altitude scale 18000 feet	" 30 00
5870.	do. nickel spring hunting case, 2 inch, silvered metal dial, revolving altitude scale 3000 feet, compensated for temperature	" 22 75
5871.	do. do. do. altitude scale 6000 feet	" 21 50
5872.	do. do. do. " " 12000 "	" 23 50
5873.	do. do. do. " " 18000 "	" 24 75



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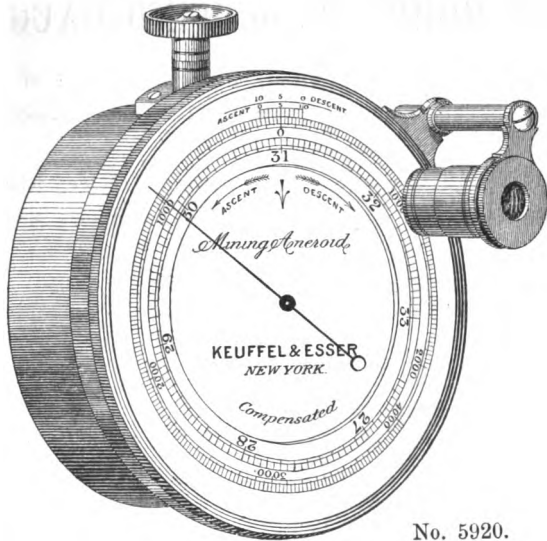


No. 5890.

5880.	Pocket size, brass case, 2¼ inch diam., silvered metal dial, revolving altitude scale 3000 feet, compensated for temperature, in morocco case	each \$ 19 50
5881.	do. do. altitude scale 6000 feet	" 18 50
5882.	do. do. " " 12000 "	" 19 50
5883.	do. do. " " 18000 "	" 20 50
5890.	do. bronzed case, 2¾ inch diam., silvered metal dial, revolving altitude scale with rack and pinion and movable pointer or index attached to a revolving milled ring, which being separate actions, can be used as a revolving or fixed altitude scale altitude scale 3000 feet, in leather sling case	" 32 50
5891.	do. do. " " 6000 " " " " " " " " " "	" 31 20
5892.	do. do. " " 12000 " " " " " " " " " "	" 32 50
5893.	do. do. " " 18000 " " " " " " " " " "	" 33 80
5895.	Mining Aneroid, bronzed case, same as above, but reading 2000 feet below and 6000 feet above sea level . .	" 33 80

KEUFFEL & ESSER CO. NEW YORK.

"Copyright, 1887, by Keuffel & Esser."



No. 5920.

- | | | |
|-------|---|---------------|
| 5900. | Barometer, English Government Pattern, 5 inch diam., brass case, best engraved silvered dial, raised ring for divisions, curved thermometer, altitude scale 6000 feet, revolving index, compensated for temperature, in morocco case | each \$ 30 00 |
| 5902. | do. do. but altitude scale 12000 feet, | " 33 00 |
| 5904. | do. do. but altitude scale 18000 feet, | " 35 50 |
| 5910. | Surveying Barometer, 3 inch diam., brass case, best engraved silvered dial, altitude scale 14800 feet, with rack vernier scale, reading to 5 feet, compensated for temperature, in leather sling case | " 47 00 |
| 5915. | do. do. 5 inch diameter, brass case, best engraved silvered metal dial, raised ring for divisions, altitude scale 5000 feet, with rack vernier scale reading to 1 foot, and magnifying lens, in leather sling case | " 50 00 |
| 5916. | do. do. but altitude scale 14900 | " 70 00 |
| 5920. | Mining Barometer, 5 inch diam., best engraved silvered metal dial, raised ring for divisions, altitude scale 2000 feet below and 4000 feet above sea level, with rack vernier scale reading to 1 foot, and magnifying lens, in leather sling case | " 50 00 |

The instruments No. 5910 to 5920 have been constructed specially for ascertaining slight variations in gradients, levels etc. Their extreme sensitiveness is of great value in mining and surveying work generally. Another improvement of these instruments is an arrangement of the scale of altitude permitting the reading by a vernier, hitherto impracticable, owing to the altitude scale in ordinary use being a gradually diminishing one to which a vernier cannot be applied. In the present instruments the action has been so adjusted as to give accurate readings upon a regular scale of altitudes, the barometrical scale of inches having been made progressive so as to afford the correct relative readings with the scale of altitudes.

The instruments are also constructed for measuring greater altitudes, i. e., 10,000, 15,000 or 20,000 feet, but with these scales the measurements cannot be made quite so minute as in the more open scales.

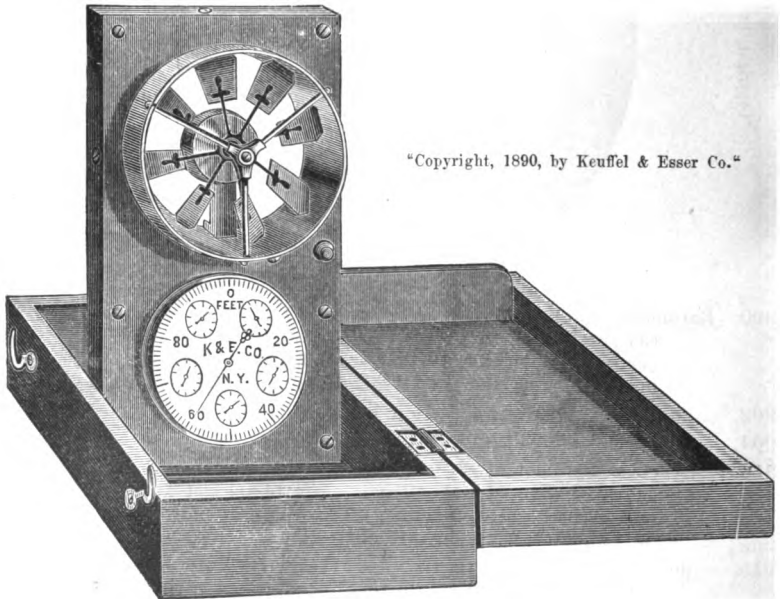
Leather Sling Cases for Barometers, 5 inch diam. each \$ 4 00



ANEMOMETERS or WIND-GAUGES.

Anemometers are used for measuring the velocity of air currents in mines, hospitals, public buildings, sewers etc. They serve manifold and important sanitary and scientific purposes.

The fans must always face the current. The long hand registers feet on the large circle, while on the small circles hundreds thousands etc. are registered.



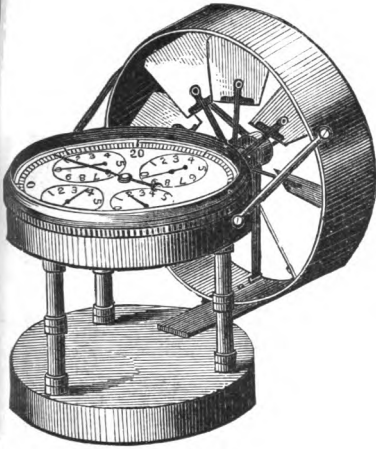
No. 5940.

5940. Improved Portable Air Gauge, with disconnector, registering
10,000,000 feet, in case each \$ 35 00

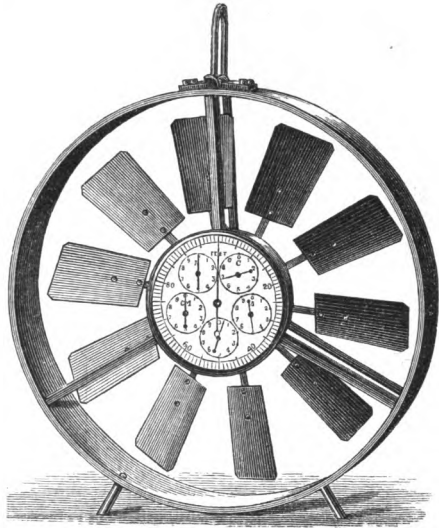
No. 5940 is an improvement over the older styles of Portable Air Gauges, as the fans and the dial are mounted in a strong metal frame and much better protected. The solid mahogany box in which the instrument is packed serves also as a foot or base for it during use, as shown in above cut.

Correction Table for above (not included in price of instrument) \$ 5 00





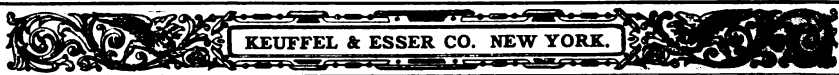
No. 5952.



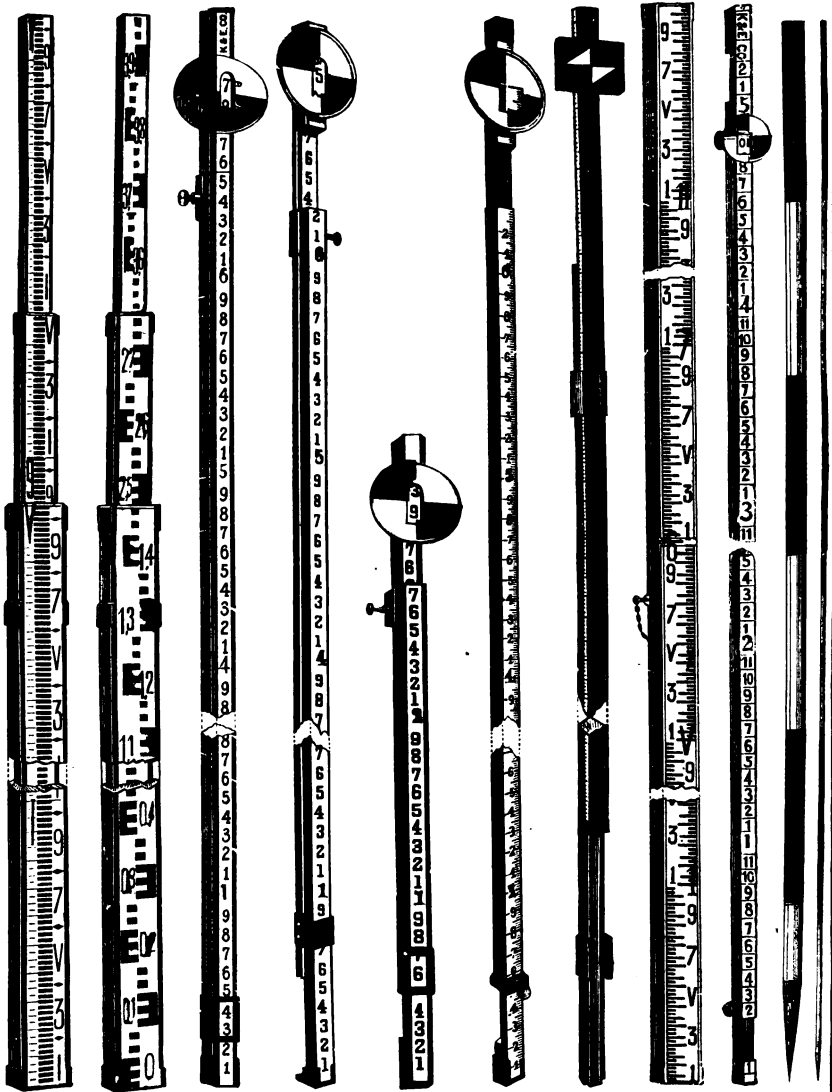
No. 5965.

5950.	Improved Portable Air Gauge, with disconnecter,	registering 10,000 feet, in wooden case	each	\$ 17 00
5952.	do. do. do.	registering 10,000,000 feet	"	22 50
5955.	Biram's Anemometer, 4 inch diam.	reading to 100 feet	"	17 00
5957.	do. do.	4 " " " " 1000 "		
		with disconnecter . . .	"	28 50
5959.	do. do.	4 inch diam., 10,000,000 feet with disconnecter	"	34 50
5961.	do. do.	6 inch diam., 1000 feet	"	25 50
5963.	do. do.	6 " " 1000 " with disconnecter	"	28 00
5965.	do. do.	6 inch diam., 10,000,000 feet with disconnecter	"	35 50
	Correction Table for above (not included in price of instrument)		"	5 00





KEUFFEL & ESSER'S LEVELING RODS AND POLES Warranted.



No. 6300. 6301. 6305 P. 6307. 6310. 6316. 6320. 6321. 6325. 6354. 6354.

KEUFFEL & ESSER CO. NEW YORK.



The
ONLY MEDAL
for
LEVELING RODS

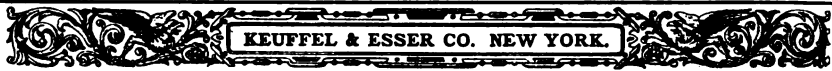


was awarded to **KEUFFEL & ESSER** at the

NATIONAL EXPOSITION OF RAILWAY APPLIANCES, CHICAGO 1883.

6300.	English self-reading Rod , telescoping, Mahogany, with strong Brass Mountings, 5 feet long, sliding out to 14 feet	each \$ 24 00
6301.	do. Metric , 1,5 meter, sliding out to 4 meter	“ 24 00
6305.	Philadelphia Rod , with Target Vernier and Clamp, 7 feet sliding out to 12 feet	“ 16 00
6305 P.	do. but with Patent Rolling Angle Target	“ 16 00
6306	like 6305, but metric, 2,2 meter sliding out to 4 meter	“ 16 00
6307.	Light Philadelphia Rod , with Target, Vernier and Clamp 6½ feet, sliding out to 12 feet	“ 14 00
6307 P.	do. but with Patent Rolling Angle Target	“ 14 00
6308	like 6307, but metric, 2 meter sliding out to 3,7 meter	“ 14 00
6310.	Mining Rod , with Target, Vernier and Clamp, 3 feet, sliding out to 5 feet	“ 13 50
6311.	do. do. 5 feet, sliding out to 9 feet	“ 14 00
6316.	New York Rod , Hardwood of light color, with Target, Vernier and Clamp, 6½ feet sliding out to 12 feet	“ 14 00
6316 P.	do. but with Patent Rolling Angle Target	“ 15 00
6317	like 6316, but metric, 2 meter sliding out to 3,7 meter	“ 14 00
6320.	Boston Rod , Mahogany, machine divided on Satinwood, with Target, Vernier at each end, 6½ feet sliding out to 11½ feet	“ 16 00
6320 P.	do. but with Patent Rolling Angle Target	“ 16 00
6321.	Telemeter Rod , self-reading, folding, with solid bronze hinge, 12 feet, folding to 6 feet	“ 12 00
6323.	do. do. but 14 “ “ “ 7 “	“ 13 50
6325.	Architects Rod , light colored Hardwood, brass mounted, with Target, Vernier and Clamp, divided to inches and 8ths, 5½ feet, sliding out to 10½ feet	“ 6 00
6326.	do. do. divided to 10ths and 100ths of a foot	“ 6 00

For description of Patent Rolling Angle Target see next page.

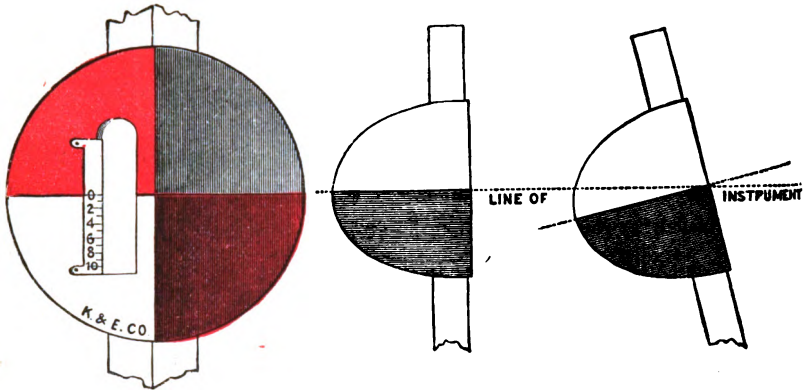


THOMPSON'S IMPROVED LEVELING TARGET

(Pat'd June 11, 1889,) with

KEUFFEL & ESSER CO.'S PATENT ROLLERS.

(Patented March 16, 1886.)



The advantages of this Leveling Target are so manifest as to readily commend it to Engineers and Surveyors.

The horizontal dividing line on the target is carried over two surfaces at right angle to one another, and will therefore show as a broken line except when the rod is held perfectly plumb. It therefore insures absolute perpendicularity to the line of sight in both directions, thus making its action positive when used either as a level or offset target.

The position of the rod is always under the control of the man at the instrument, and a positive check is thus furnished on a careless rodman.

It presents a greater bearing surface to the rod and is steadier than the ordinary form, and, combined with Keuffel & Esser Co.'s Patent Rollers, it is the easiest Target to set, the most convenient to move, and the most positive in its action, as it is entirely free from any unsteadiness or jerking when making a slight movement.

Above Targets furnished separately.

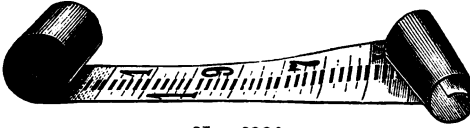
Target for Philadelphia Rods	each \$ 7 50
“ “ New York and Boston Rods	“ 7 00

In ordering Targets separately, give Cross-section of Rod.

For Rods with above Targets see preceding page.

KEUFFEL & ESSER CO. NEW YORK.

FLEXIBLE OR POCKET LEVELING RODS.



No. 6330.

6330.	Flexible or Pocket Leveling Rod, 8 feet, divided to			
		10 ^{ths} and 100 ^{ths} of a foot	each	\$ 3 00
6331.	do. do.	10 feet	"	3 25
6332.	do. do.	12 "	"	4 00
6335.	do. do.	12 feet, divided		
		inches and $\frac{1}{8}$ inch. . .	"	4 00
6340.	do. do.	Metric, 3,5 meter		
		divided to centimeter .	"	4 00

These Rods are strips of prepared canvas, 3 inches wide, divided like self-reading rods. For use they are fastened to a straight board with thumb tacks. When rolled up they are easily carried in the pocket.

LEVELING POLES.

For Illustrations see page 252.

6350.	Iron tubular Transit Poles, $\frac{1}{2}$ inch diameter, steel shoes, painted red and white alternately every foot				
		5	6	8	10 feet
	each \$	2 75	3 25	4 00	5 00
6354.	Leveling Poles of best seasoned wood, painted red and white alternately every foot				
		5	6	8	10 feet
	each \$	2 25	2 50	3 00	3 50
6358.	do. metric, painted red and white alternately every half meter.				
		2	2 $\frac{1}{2}$	3 meter	
	each \$	2 50	3 00	3 75	

STANDARD MEASURES,

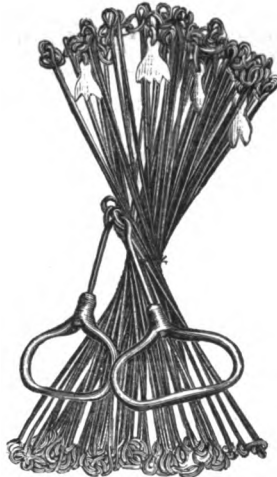
of U. S. Standard or any foreign measure made to order.

KEUFFEL & ESSER CO. NEW YORK.

MEASURING CHAINS.

Steel.

"Copyright, 1887, by Keuffel & Esser."



No. 6400.

6400.	Steel, W. G. 12,	Brass Handles, oval rings,	50 feet . .	each	\$ 4 50
6401.	do. " " 12	" " " "	100 " . .	"	8 00
6402.	do. " " 12	" " " "	33 " . .	"	3 50
6403.	do. " " 12	" " " "	66 " . .	"	6 50
6410.	do. " " 12	" " brazed links and rings,	50 " . .	"	6 00
6411.	do. " " 12	" " " "	100 " . .	"	11 50
6412.	do. " " 12	" " " "	33 " . .	"	5 50
6413.	do. " " 12	" " " "	66 " . .	"	10 00

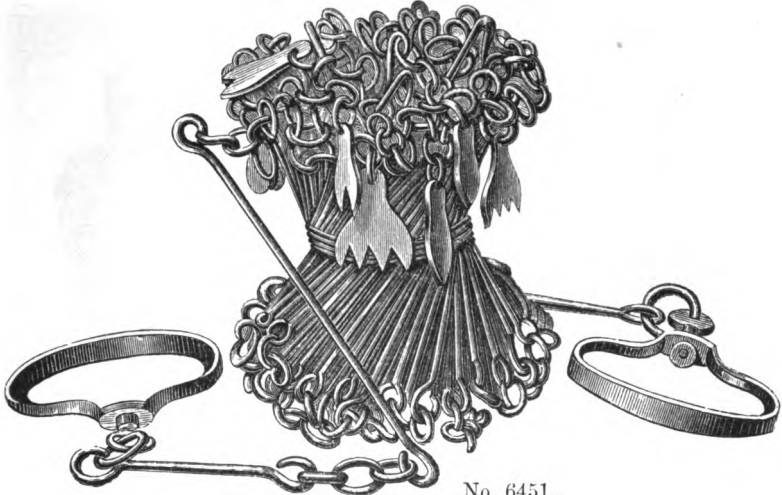
Chain 6411 has a spring hook (snap) at 50 feet, so that the handle can be attached there for using as a 50 foot chain.

METER AND VARA.

6420.	Steel, W. G. 12,	Brass Handles, oval rings,	10 meter .	each	\$ 3 50
6421.	do. " " 12	" " " "	15 " .	"	5 00
6422.	do. " " 12	" " " "	20 " .	"	6 20
6424.	do. " " 12	" " brazed links and rings,	10 meter .	"	5 50
6425.	do. " " 12	" " " "	15 " .	"	7 50
6426.	do. " " 12	" " " "	20 " .	"	10 00
6430.	do. " " 12	" " oval rings,	10 Varas . . .	"	3 50
6431.	do. " " 12	" " " "	20 " . . .	"	6 50
6434.	do. " " 12	" " brazed links and rings,	10 Varas .	"	5 50
6435.	do. " " 12	" " " "	20 " .	"	10 00



Iron.



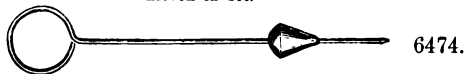
No. 6451.

6440.	Iron, W. G. 8, Brass Handles, 2 round rings, 50 feet . . .	each \$	2 50
6441.	do. " " 8 " " " " 100 " . . .	"	3 50
6442.	do. " " 8 " " " " 33 " . . .	"	2 00
6443.	do. " " 8 " " " " 66 " . . .	"	3 20
6450.	do. " " 8 " " 3 sawed oval " 50 " . . .	"	3 50
6451.	do. " " 8 " " " " " 100 " . . .	"	5 50
6452.	do. " " 8 " " " " " 33 " . . .	"	2 70
6453.	do. " " 8 " " " " " 66 " . . .	"	4 25

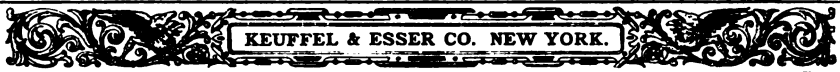
ARROWS.



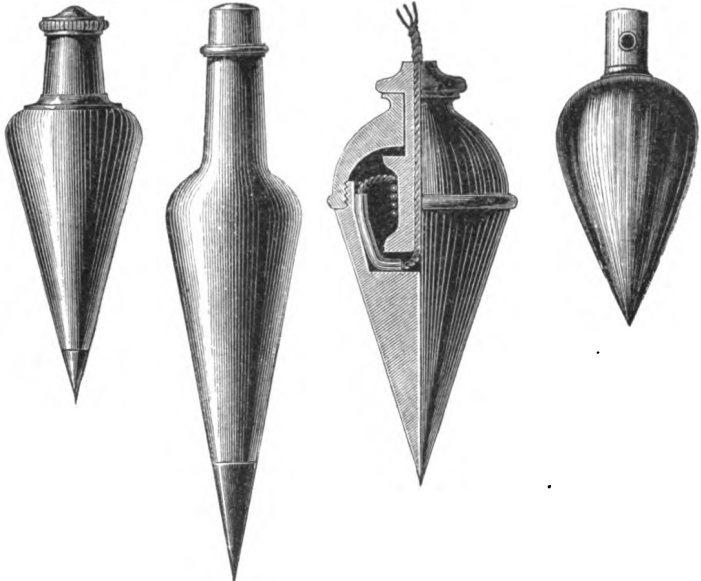
Eleven in set.



6460.	Steel Arrows, W. G. 6, bright, 14 inch	set \$	1 50
6461.	" " " " 9 " 14 "	"	1 00
6462.	" " " " 9, jap ^d 12 "	"	1 20
6463.	" " " " 11 " 12 "	"	90
6464.	Brass " " " 6 12 "	"	2 00
6470.	Iron " " " 9, bright, 14 "	"	60
6474.	Steel " Weighted, W. G. 10, 14 "	"	3 00
6475.	" " " " 8, 14 "	"	3 00



PLUMB BOBS.



No. 6480. 6483. 6487. 6488.

6480.	Brass Plumb Bob, about 6 ounces, steel point, screw cap . each	\$ 2 00
6481.	“ do. “ 8 “ “ “ “ “ . “	2 25
6482.	“ do. “ 12 “ “ “ “ “ . “	2 50
6483.	“ do. “ 14 “ “ “ “ “ “ with long neck “	2 75
6484.	“ do. “ 24 “ “ “ “ “ “	4 00
6485.	“ do. “ 32 “ “ “ “ “ “	5 00
6486.	“ do. “ 48 “ “ “ “ “ “	6 00
6487.	“ do. with concealed reel, on which the line is wound and held by friction at any point of its length “	2 50
6488.	Iron Plumb Bob, about 7 ounces “	75
6489.	Common Brass Plumb Bob, iron point “	1 25

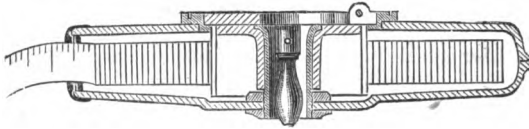


KEUFFEL & ESSER CO. NEW YORK.

The EXCELSIOR TAPES

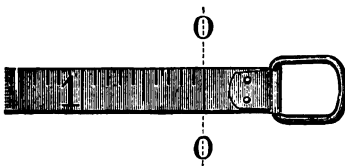
Patented Oct. 19. 1880
 “ April 22. 1884
 “ March 23. 1886
 “ April 21. 1887

are made by us and we can recommend them as superior to any other in
Accuracy, Construction, Material and Workmanship.

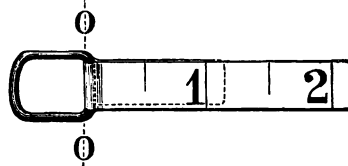


The new patent centre with flush folding handle, as shown in cut, has a large drum which winds the tape more quickly and avoids the close coiling which injures the steel lines.

There is substituted a long swiveling handle for the metal button formerly used; this handle, when closed protrudes beyond the centre of the tape-case, so that the crank can be thrown open by pressing against the projecting end of the handle. The larger centre permits using a longer crank to gain more leverage.



STEEL TAPE.



WOVEN TAPE.

All our Steel Tapes, except those with detachable handle, begin on the line, clear of the end-ring and its fastening.

All our Woven Tapes begin at end of line, and the end-ring is not included in the measurement.

When Tapes are wanted different, it must be stated on the order.

We are prepared to nickelplate our tape lines in the best and most substantial manner (for protection against rust) at the following prices:

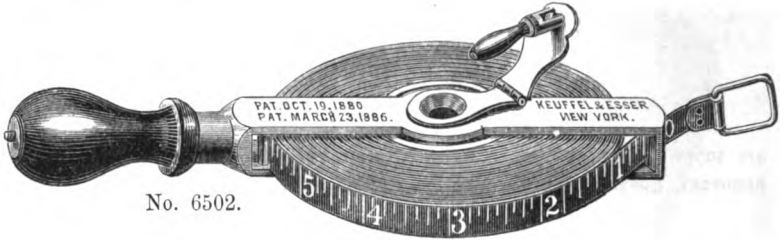
	25	33	50	66	75	100 feet
each \$	75	1 00	1 50	2 00	2 25	3 00



EXCELSIOR STEEL MEASURING TAPES.

Our Steel Lines are of superior quality, made by an Improved method which insures correct dividing and legible divi.

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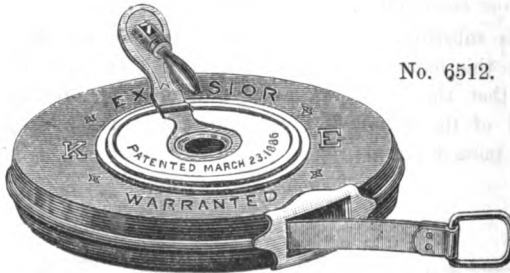


No. 6502.

Stevens Excelsior Steel Tapes, $\frac{1}{2}$ inch wide, on Patent Brass Frame, with Patent folding Handle

			50	100 feet
6502.	Feet divided in 10 ^{ths}	each	\$ 6 75	12 00
6503.	“ “ “ 12 ^{ths}	“	6 75	12 00
6508.	“ “ “ 10 ^{ths} with Links	“	7 15	12 75
6509.	“ “ “ 12 ^{ths} “	“	7 15	12 75
6510.	“ “ “ 12 ^{ths} “ Meter	“	7 15	12 75

"Copyright, 1887, by Keuffel & Esser."



No. 6512.

Columbia Excelsior Steel Tapes, $\frac{1}{2}$ inch wide, in red bent leather Case, with Patent folding flush Handle

			33	50	66	75	100 feet
6512.	Feet divided in 10 ^{ths}	each	\$ 5 00	6 75	8 50	9 50	12 00
6513.	“ “ “ 12 ^{ths}	“	5 00	6 75	8 50	9 50	12 00
6518.	“ “ “ 10 ^{ths} with Links	“	5 30	7 15	9 00	10 00	12 75
6519.	“ “ “ 12 ^{ths} “	“	5 30	7 15	9 00	10 00	12 75
6520.	“ “ “ 12 ^{ths} “ Meter	“	5 30	7 15	9 00	10 00	12 75

Cornell Excelsior Steel Tapes, $\frac{3}{8}$ inch wide, in red bent leather Case, with Patent folding flush Handle

			25	33	50	66	75	100 feet
6532.	Feet divided in 10 ^{ths}	each	\$ 3 85	4 50	6 10	7 65	8 50	10 70
6533.	“ “ “ 12 ^{ths}	“	3 85	4 50	6 10	7 65	8 50	10 70
6536.	“ “ “ 10 ^{ths} with Links	“	4 00	4 75	6 40	8 10	9 00	11 35
6537.	“ “ “ 12 ^{ths} “	“	4 00	4 75	6 40	8 10	9 00	11 35

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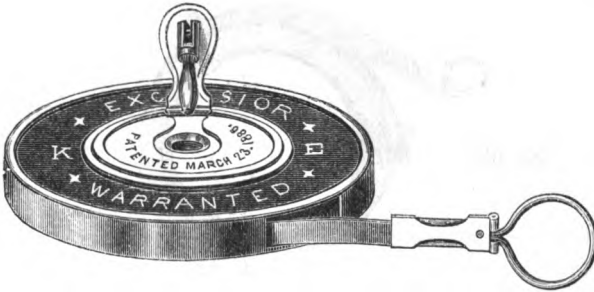


No. 6542.

Nonsselac Excelsior Steel Tapes, $\frac{5}{16}$ inch wide, in red bent leather Case, with Patent folding flush Handle.

		50	66	75	100 feet
6542.	Feet divided in 10ths . . . each	\$ 6 40	8 10	9 00	11 35
6543.	" " " 12ths . . . "	6 40	8 10	9 00	11 35

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No. 6552.

Madison Excelsior Steel Tapes, $\frac{5}{16}$ inch wide, in japanned metal Case, with Patent folding flush Handle.

		50	66	75	100 feet
6552.	Feet divided in 10ths . . . each	\$ 5 75	7 50	8 35	10 60
6553.	" " " 12ths . . . "	5 75	7 50	8 35	10 60

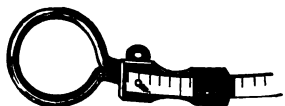
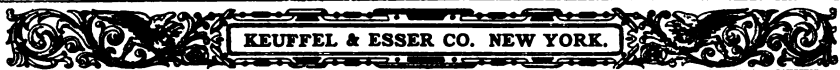
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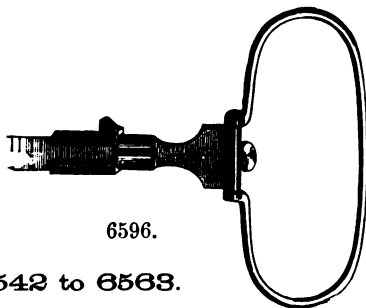
No. 6562.

Siincoton Excelsior Steel Tapes, $\frac{5}{16}$ inch wide, in japanned metal Case, with plain folding Handle.

		25	33	50	66	75	100 feet
6562.	Feet divided in 10ths each	\$ 3 30	4 00	5 00	7 00	7 95	10 30
6563.	" " " 12ths "	3 30	4 00	5 00	7 00	7 95	10 30



No. 6595.



6596.

for tapes No. 6542 to 6563.

6595.	Plain Brass Handles	each	\$	50
6596.	Compensatory Handles for tapes 50 feet long	pair		3 00
6597.	do. do. " " 100 " "	"		3 00



No. 6572.

Boston Excelsior Steel Tapes, $\frac{1}{4}$ inch wide, on japanned metal frame; line has rings at both ends and is not attached to frame, quality same as

No. 6502 etc.		50	100
6572.	Feet divided in 10 ^{ths}	each \$	5 50 10 50
6573.	" " " 12 ^{ths}	"	5 50 10 50

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No. 6605.

Sale Excelsior Steel Tape, in German Silver case, folding flush Handle, a very handy tape, 25 feet long, $\frac{5}{16}$ inch wide, case $2\frac{1}{2}$ inch diameter. Preferable to Metallic and Steel Tapes in leather cases on account of it's small size and light weight.

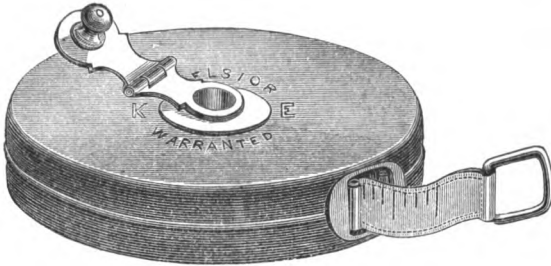
6605.	Feet divided in 10 ^{ths}	each	\$	4 00
6606.	" " " 12 ^{ths}	"		4 00
6607.	" " " 10 ^{ths} with Meter	"		4 50
6608.	" " " 12 ^{ths} " "	"		4 50

KEUFFEL & ESSER CO. NEW YORK.

WARD'S ENGINEER'S TAPE.

Patented Aug. 21. 1877.

“Copyright, 1887,
by Keuffel & Esser.”



No. 6648.

6648. Excelsior Engineer's Tape, Ward's Patent, of same quality as No. 6660 in bent leather Case with folding Handle, 50 feet long each \$ 2 75

This Tape is All Linen, in best bent-leather case. One side is marked as usual in feet and tenths of a foot, for ordinary measurements.

The other side is marked for setting slope stakes, or finding the centre from slope stakes after the centre stake is removed. From the ring end of the tape the half width of proposed road-bed is laid off (say 9 feet for single track, or 14 for a double), and divided into feet and half feet. These feet are numbered backward from the ring, so that zero comes either 9 or 14 feet from the end of the tape. Beyond this zero the marking is continued, but $1\frac{1}{2}$ feet is used for the unit (corresponding to a slope of $1\frac{1}{2}$ to 1), which, of course, is sub-divided into 10 parts, and marked in a different color and style from the other side of the tape, to prevent any possible confusion in use.

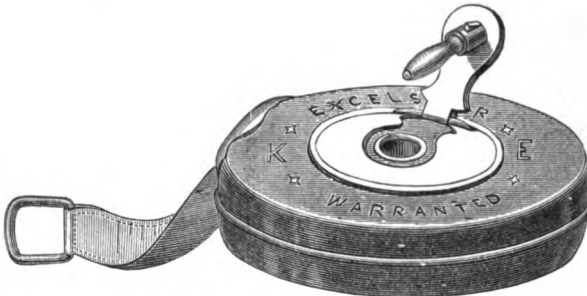
The usual method of finding the proper place for a slope stake is to hold the level-rod where the stake probably belongs, and finding how much that point is above or below grade. That height and one half that height, and one half of the width of the road-bed are added, and that distance from the centre stake to the point where the rod is held is measured, and if it is found to agree the proper place is found — if not, — it must be tried again till they agree. For instance it is an 18 feet road-bed and 4.3 cutting is found, the addition will be $4.3 + 2.15 + 9.0 = 15.45$, and that distance measured, but in using the "ENGINEER'S TAPE" the point marked 4.3 will indicate the required distance WITHOUT CALCULATION, thus not only saving time but liability to error.

Tapes are made for 28 feet road-bed and slopes of $1\frac{1}{2}$ to 1, and can be used, of course, for any road-bed or ditch of less width and by temporarily attaching an additional piece of tape or string, they can be used for wider ones.



EXCELSIOR ALL LINEN MEASURING TAPES.

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No. 6650.

Franklin Excelsior All Linen Tapes, $\frac{5}{8}$ inch wide, in bent leather Case, with Patent folding flush Handle and Patent leather End

		25	33	50	66	75	100 feet
6650.	Feet divided in 10 ^{ths} . . . each \$	1 75	2 00	2 40	2 90	3 30	3 90
6651.	" " " 12 ^{ths} . . . "	1 75	2 00	2 40	2 90	3 30	3 90
6652.	" " " 10 ^{ths} with Links "	1 85	2 10	2 50	3 00	3 40	4 00
6653.	" " " 12 ^{ths} " " "	1 85	2 10	2 50	3 00	3 40	4 00

London Excelsior All Linen Tapes, $\frac{5}{8}$ inch wide, in bent leather Case, with folding Handle and Patent leather End, see illustration No. 6680

		25	33	50	66	75	100 feet
6660.	Feet divided in 10 ^{ths} . . . each \$	1 50	1 65	2 00	2 30	2 65	3 10
6661.	" " " 12 ^{ths} . . . "	1 50	1 65	2 00	2 30	2 65	3 10
6662.	" " " 10 ^{ths} with Links "	1 55	1 70	2 10	2 40	2 80	3 25
6663.	" " " 12 ^{ths} " " "	1 55	1 70	2 10	2 40	2 80	3 25

Excelsior All Linen Tapes, $\frac{5}{8}$ inch wide, **Lines only** (without case)

		25	33	50	66	75	100 feet
6666.	Feet divided in 10 ^{ths} . . . each \$	75	85	1 05	1 25	1 40	1 85
6667.	" " " 12 ^{ths} . . . "	75	85	1 05	1 25	1 40	1 85
6668.	" " " 10 ^{ths} with Links "	80	90	1 15	1 35	1 55	2 05
6669.	" " " 12 ^{ths} " " "	80	90	1 15	1 35	1 55	2 05

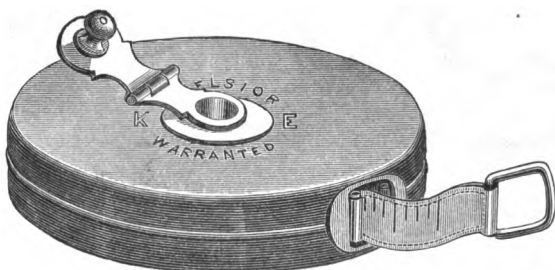
Tapes as above but in Metric measure furnished to order at very short notice.

KEUFFEL & ESSER CO. NEW YORK.

EXCELSIOR METALLIC MEASURING TAPES.

We offer Metallic Tape Lines only in deference to popular prejudice and against the teachings of long experience. What is generally called the "Wires" in metallic Tapes is only metal tinsel around a strain of the warp, and serves to destroy the line instead of adding to its strength. Our improved "All Linen" line is stronger and more durable than any "metallic" line.

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No. 6680.

Dartmouth Excelsior Metallic Tapes, $\frac{5}{8}$ inch wide, of best linen thread interwoven with metal, in bent leather Case with folding Handle and Patent leather End

	25	33	50	66	75	100 feet
6680. Feet divided in 10ths each \$	1 60	1 80	2 20	2 60	3 00	3 55
6681. " " " 12ths "	1 60	1 80	2 20	2 60	3 00	3 55
6682. " " " 10ths with Links "	1 65	1 85	2 30	2 70	3 15	3 75
6683. " " " 12ths " " "	1 65	1 85	2 30	2 70	3 15	3 75

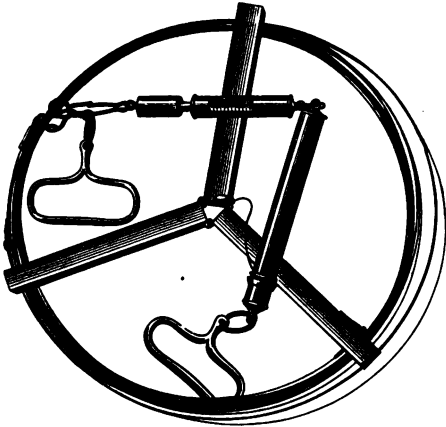
Excelsior Metallic Tapes, $\frac{5}{8}$ inch wide, **Lines only** (without case)

	25	33	50	66	75	100 feet
6686. Feet divided in 10ths each \$	85	1 00	1 30	1 55	1 65	2 35
6687. " " " 12ths "	85	1 00	1 30	1 55	1 65	2 35
6688. " " " 10ths with Links "	90	1 05	1 40	1 65	1 80	2 55
6689. " " " 12ths " " "	90	1 05	1 40	1 65	1 80	2 55

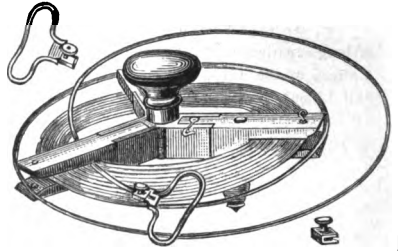
Tapes as above but in Metric measure furnished to order at very short notice.



FLAT WIRE TAPES.



No. 6740.



6750.

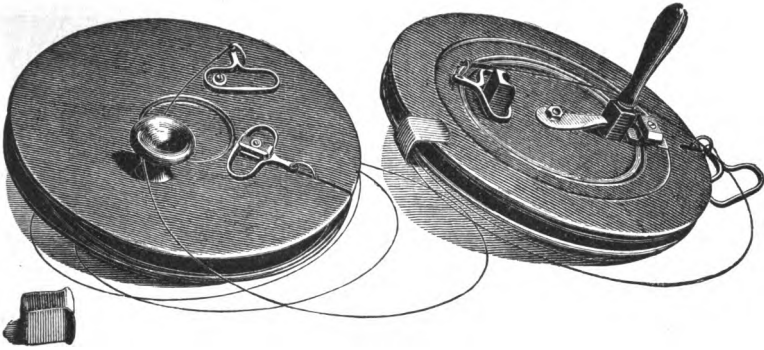
6740. City Engineer's Standard Tape, $\frac{3}{8}$ inch wide, 50 feet, with Spring Balance, Spirit Level, Thermometer and Brass Handles. Spring Balance adjustable for temperature. each \$ 20 00

The following Tapes are furnished either $\frac{3}{8}$ or $\frac{1}{2}$ inch wide and in lengths from 100 to 1000 feet without joints. They are graduated and numbered on small brass plates soldered or riveted to the tape and provided with brass handles at both ends.

In ordering please state length of the tape desired, how it is to be graduated and what style of reel. We recommend graduations only to 100, 50, 25 or 10 feet, finer graduations we can make but they are not advisable.

6745. Narrow Steel Tape, $\frac{3}{8}$ or $\frac{1}{2}$ inch wide, 100 feet, with two brass handles, graduated at every 50 feet, on plain reel, like No. 6740 each \$ 5 50
 Each additional 100 feet, graduated the same " 3 30
6750. Narrow Steel Tape, $\frac{3}{8}$ or $\frac{1}{2}$ inch wide, 100 feet, with two brass handles to unship, graduated at every 25 feet, on fine reel with handle and crank " 7 75
 Each additional 100 feet, graduated the same " 3 70

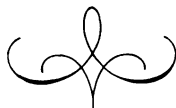
KEUFFEL & ESSER CO. NEW YORK.



No. 6755.

6760.

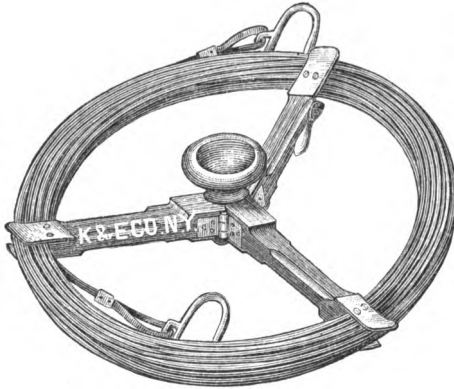
6755. Narrow Steel Tape, $\frac{1}{8}$ or $\frac{1}{4}$ inch wide, 100 feet, with two brass handles to unship, graduated at every 25 feet, on large wooden reel, very substantial and easy to handle	each	\$ 12 00
Each additional 100 feet graduated the same	“	3 70
6760. The same as No. 6755, but on improved wooden reel	“	16 00
Each additional 100 feet, graduated the same	“	3 70
Additional divisions and numbering	“	20
Brass Handles	per pair	75
“ Clamping Handles to attach to any part of a tape	each	75
Etching first foot to 10 ^{ths} and 100 ^{ths}	“	50





EXCELSIOR BAND CHAINS.

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No. 6762.

The Excelsior Band Chains are a great improvement over the Linked Wire Chains. While they cannot take the place of Engineers' Steel Tapes, they will be found far more correct than chains, and their advantages are obvious. They are of $\frac{1}{4}$ inch wide tempered steel band, divided by rivets and numbered on brass plates riveted to the Tape. The reel is made to fold, so that it may be put in the pocket while using the line.

6761.	Excelsior Band Chains, 50 feet, div. every foot, end foot to tenths, each	\$ 4 00
6762.	“ “ “ 100 “ “ “ “ “ “	5 00
6763.	“ “ “ 200 “ “ “ “ “ “	7 50
6764.	“ “ “ 200 “ “ 5 feet “ “ “	6 00
6771.	“ “ “ 50 “ “ foot “ to twelfths, “	4 00
6772.	“ “ “ 100 “ “ “ “ “ “	5 00
6773.	“ “ “ 200 “ “ “ “ “ “	7 50
6774.	“ “ “ 200 “ “ 5 feet “ “ “	6 00
6775.	“ “ “ 66 “ “ link	5 00

6777. Excelsior Band Chains, **extra heavy**, for Railroad work, etc., $\frac{1}{2}$ inch wide, very thick steel band, divisions on flush brass plates, swiveling chain handles attached by strong spring hooks and strong soldered rings, best quality and workmanship throughout; a very substantial Band Chain for rough work, 100 feet, div. every foot, and foot to tenths each \$ 10 00

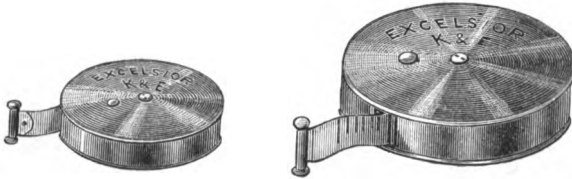
Band chains nickel-plated at the following prices:

		50	66	100	200 feet
Nickel-plating	each	\$ 1 50	1 50	2 00	3 00
“ “ and Polishing	“	2 50	3 00	3 50	

KEUFFEL & ESSER CO. NEW YORK.

EXCELSIOR POCKET TAPES.

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by Keuffel & Esser.*



No. 6780.

Excelsior Steel Pocket Tape, in German Silver Case, with Spring and Stop

		3	5	6	9	12 feet
6780.	Div. 16ths inch each	\$ 1 10	1 40	1 60	2 35	3 25
6781.	“ 100ths foot. “			2 00		
6782.	“ 16ths inch and meter “	1 30	1 75	2 00	3 00	4 00

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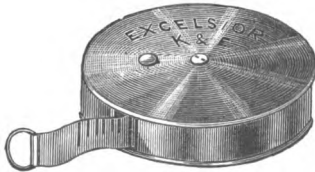


No. 6790.

Excelsior Steel Pocket Tape, in German Silver Case, 1 inch diameter with Spring and Stop, 3 feet long

6790.	Div. 16ths inch each	\$ 1 10
6791.	“ 16ths “ and meter. “	1 25

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by Keuffel & Esser.*



No. 6795.

Excelsior Linen Pocket Tape, in German Silver Case, with Spring and Stop

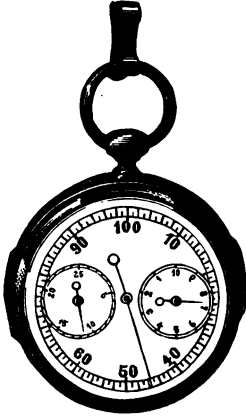
		3	5	6	8 feet
6795.	Div. in inches and meter . . each	\$ 80	1 00	1 05	1 35

Excelsior Linen Pocket Tape, $\frac{3}{8}$ inch wide, in German Silver Case, with Spring and Stop, 12 feet

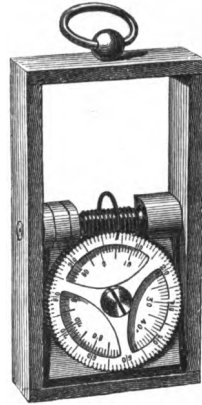
6797.	Div. 8ths inch each	\$ 2 25
6798.	“ 8ths “ and meter “	2 50



PEDOMETERS & ODOMETERS.



No. 6905.



6910.

6900. Pedometer, watch pattern, nickel case, 1½ inch, registering
12 miles by ¼ mile each \$ 4 50

6901. do. do. registering 50 miles, by 80 yards “ 5 25

Pedometers No. 6900 and 6901 indicate the **distance** walked. The hand advances in proportion to the length of stride as they are adjustable to the length of stride of the bearer by an easily adjustable screw.

6905. Pedometer, watch pattern, nickel case, 1½ inch, registering
to 100,000 steps each \$ 6 50

Pedometer No. 6905 registers the **number of steps** walked and is not adjustable to length of stride. The distance can be computed from the number of steps registered.

6910. Odometer of Brass, with silvered dials, in dust proof
leather case with straps each \$ 15 00

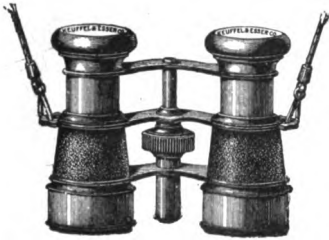
The odometer is attached to the spokes of a wheel near the hub. It registers the number of revolutions of the wheel up to 10,000 and the distance travelled is determined by multiplying the circumference of the wheel by the number of revolutions which the dial indicates.



KEUFFEL & ESSER CO. NEW YORK.

FIELD AND MARINE GLASSES.

We keep in stock the finest and best quality of Field and Marine Glasses as only those are desirable and required for Engineering.



No. 6921.

“Copyright, 1890,
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6923.

6921. Field and Marine Glass, object glass 14 lines, power about 2½ times, in soft morocco case, with handle, shoulder strap and leather cord each \$ 7 25

6923. do. do. do. object glass 15 lines, power about 4 times, in solid leather sling case, with leather cord “ 8 25



No. 6924.

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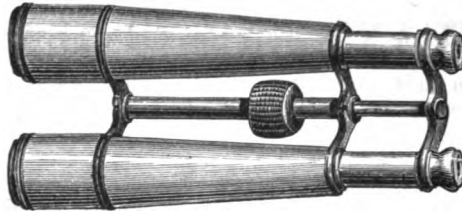
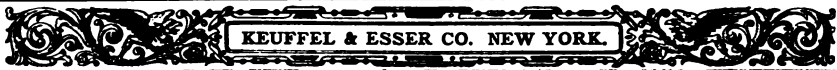


6925.

6924. Field and Marine Glass, same as No. 6923 but with sunshades each \$ 8 60

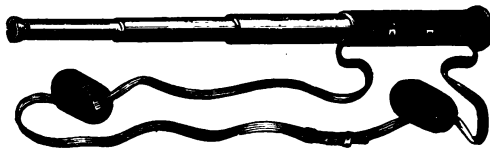
6925. do. do. aluminum case trimmed with black morocco, object glass 15 lines, power about 4 times, in solid leather sling case, with leather cord “ 21 00

Engineers and others who use glasses frequently, will welcome these little Field glasses which are of about the size of Opera glasses. They are specially adapted for the use of Engineers etc., have a large field, good light and good definition and as much power as the older style large and heavy glasses. The low prices at which we are offering them should not be taken as an indication of their quality.



No. 6938.

- 6936. Binocular Telescope, bronzed, and covered with morocco, with jointed body to adjust the distance between the eyes, with sun shade, object glasses 15 lines, in solid leather sling case. Very powerful, specially adapted for military and naval service each \$ 44 50
- 6938. do. do. bronzed, and covered with turkey morocco, jointed body to adjust the distance between the eyes, with sun shade, object glasses 15 lines, in strong leather case and strap. A superior article with 16 glasses, very powerful " 60 00
- 6940. do. do. Aluminum, covered with turkey morocco, jointed body to adjust the distance between the eyes, with sun shade, object glasses 16 lines, in solid leather sling case. A very fine article of wonderful lightness, most convenient for carrying " 100 00

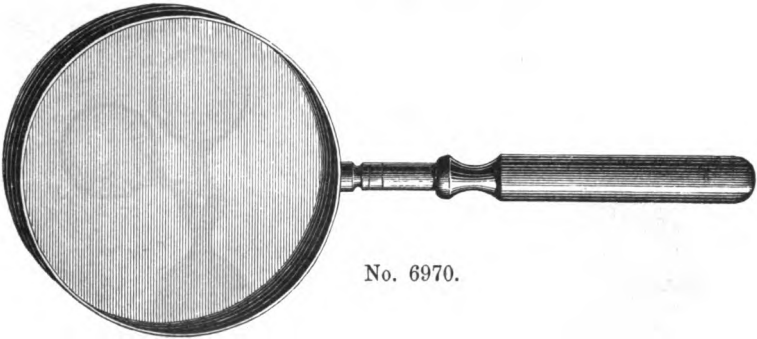


No. 6950.

- 6950. Improved Telescope, bronzed, and covered with morocco, 17 inch long, 3 draws, closing up to 6 inch, object glass 13 lines, with sun shade sling caps and strap; Power 20 times each \$ 8 25
- 6952. do. do. 21 inch long, 4 draws, closing up to 6½ inch, object glass 16 lines; Power 30 times " 11 00
- 6954. do. do. 33 inch long, 4 draws, closing up to 9 inch, object glass 22 lines; Power 35 times " 22 00



MAGNIFYING GLASSES.



No. 6970.

6970. Reading Glasses, German Silver Rim, Ebony Handle, **Best Quality**

	1½	2	2½	3	3½	4	4½	5 inch
each \$	55	75	1 15	1 25	1 75	2 20	3 00	5 75

POCKET MAGNIFYING GLASSES

mounted in metal.



No. 6980.



6986.

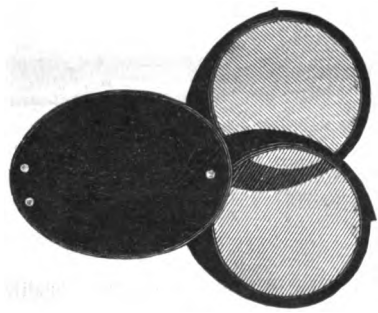
6975.	round,	nickel plated frame,	1 lens,	1 inch	. . . . .	each \$	75
6980.	do.	bronzed frame,	1 "	1 "	. . . . .	"	55
6981.	do.	" "	2 "	1 "	. . . . .	"	70
6982.	do.	" "	3 "	1 "	. . . . .	"	1 00
6985.	do.	German Silver frame,	1 "	1 "	. . . . .	"	90
6986.	do.	" "	" 2 "	1 "	. . . . .	"	1 25
6987.	do.	" "	" 3 "	1 "	. . . . .	"	1 75

These glasses have a large field and very good magnifying power and are well adapted for reading graduations on Surveying Instruments. As they are mounted in metal they are very durable.



POCKET MAGNIFYING GLASSES

mounted in Rubber.

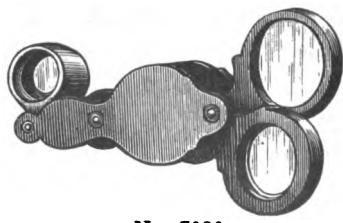


No. 7002.



7008.

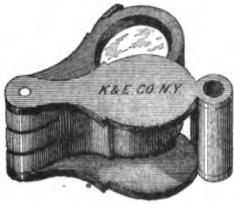
7000.	Oval Pattern,	1 lens	1 inch diam.	. . . . .	each \$	35
7001.	do. do.	1 "	1 1/2 "	" "	"	55
7002.	do. do.	2 lenses	1 "	" "	"	60
7003.	do. do.	2 "	1 1/2 "	" "	"	1 00
7006.	Round Pattern,	1 lens	1/8 "	" "	"	40
7007.	do. do.	1 "	1 "	" "	"	45
7008.	do. do.	2 lenses	7/8 "	" "	"	55
7010.	do. do.	2 "	1 "	" "	"	65
7012.	do. do.	3 "	1/8 "	" "	"	75
7013.	do. do.	3 "	1 "	" "	"	90



No. 7020.

7020. Pocket Magnifier mounted in horn, one end two lenses to be used either separate or together, other end a very powerful Coddington lens each \$ 2 50

KEUFFEL & ESSER CO. NEW YORK.



No. 7021.

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7022.

7021. Pocket Magnifier, in bronzed brass frame, lense $\frac{1}{2}$ inch,
power 5 times, a very fine glass with good definition
for examining ore etc. each \$ 8 00
7022. do do. but in brass cylinder case " 6 50



No. 7023.

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7024.

7023. Pocket Magnifier, in bronzed brass frame, lense $\frac{1}{4}$ inch,
power 12 times, a glass of extra power. each \$ 6 50
7024. do. do. do. do. lense $\frac{1}{2}$ inch, power 5 times " 4 75



No. 7026.



7031.

7025. Coddington Lense, brass frame and handle, nickelplated,
 $\frac{3}{4}$ inch . . . each \$ 1 50
7026. do. do. " " 1 " . . . " 1 75
7027. do. do. " wooden handle $1\frac{1}{4}$ " . . . " 2 30
7030. Stanhope Lense, German Silver case " 1 75
7031. do. do. " " with cover " 2 50
7035. Thread Counter, brass frame, $\frac{1}{4}$ inch field " 30
7036. do. " " $\frac{1}{2}$ " " " 60
7037. do. " " 1 " " " 2 00

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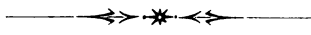


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INDEX.

	Page		Page
A.			
Abney Hand Level	242	Binocular Telescopes	272
Adjustable Horses	161	Biram's Anemometer	251
Adjusting Keys	71	Black Process Paper	11
Air Meters	250. 251	Blueprint Frames	12
All Linen Tapes	264	Blue Process Papers	10
Alphabet Books	202	Blunck's Section Liner	109
Alt-Azimuth Compass	243	Books of Alphabets	202
Altimeter, Abney's	242	" Cross Section	17. 20
Anemometers	250. 251	" Field	18—21
Aneroid Barometers	247—249	" Level	18
Angle Mirrors	243. 244	" Profile	17
Angle Targets	254	" Round Writing	200
Anvil Drawing Paper	4. 5. 6	" Scientific	276—284
Architect's Levels	203. 204	" Transit	18
Architect's Level Rods	253	Border Pens	36
Arkansas Stones	174	Bow Pencils 24. 30. 31. 32. 33. 52.	
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Arrows	257	57. 61. 66. 67. 102	
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" Gum	196	Boxes R. W. Pens and Holders	201
" Pencils	194	Box Sextant	225
" Waterglasses	192	Boxwood Clinometers	245
Attachments for Transits and Levels	222	Boxwood Pocket Rules	130
B.			
Band Chains	268	" Protractors	115
Bath Trays	12	" Scales	120—123
Barometers, Aneroid	247—249	Bristol Board	2
Bars for Beam Compasses	153	" " for Patent Office	3
Beam Compasses	34. 35. 68. 102	" " Protractors	114
		Brushes	185—189
		Builder's Level	203
		" " with Compass	204



C.	Page
Cabinet Saucers	191
Calculating Instruments	131
Camelhair Pencils	185
Card Board Railroad Curves	152
Cases for Instruments	90
" of Instruments 38—51. 54—56.	
73—80. 83—89. 91—99	
Casey's Section Liner	109
Centrolineads	158
Chains, Measuring	256. 257
Chain Scales 117. 119. 121. 123	
Chain Tapes	268
China Ware	190—192
Chinese Ink	180—183
Circular Protractors. 110—114. 142	
Clinometers	245. 246
Clinometer Compasses 232. 235. 237. 238	
Cloth backed Papers	6. 7
Coddington Lenses	275
Color Boxes	175. 177. 178
Color Slabs	191. 192
Colors, Technical	175
Compass, Altazimuth	243
" Miner's	229
" Mining	227
" Prismatic	235. 236
Compasses, Surveying	231—233
" Drawing 24—27. 52. 53.	
57. 58. 61. 62. 63. 71.	
81. 100. 101. 102	
Continuous Profile Books	17
Convenient Pencil Pointer	198
Copenhagen Curves	138. 139
Cross Section Books	20
" Papers	14—16
" Tracing Papers 14. 15	
Cross Staff Heads	245
Crow Quill Pens.	193
Crozet Protractor	110
Curve, Logarithmic	137
Curve Pens	36. 60
Curves, Railroad	140. 141. 152
" Rubber	136—141
" Ship	138. 139. 151
" Wood.	150—152

D.	Page
Detail Papers	3. 4
Developer for Nigrosine	11
Dipping Needles	229
Dividers 24. 25. 52. 53. 57. 61. 62.	
81. 102	
Dotting Pens	37. 68. 70. 103
Draughtsman's Alphabets.	202
Drawing Boards	159. 160
" Board, Unchangeable	7
" Instruments	22—103
" Inks, Liquid Indelible 179	
" Papers, in Rolls	4. 6
" Papers, in Sheets	1. 2
" Parchment	5
" Pens 36. 37. 59. 60. 69.	
70. 82	
" Scales	116—129
" Tables	163. 171
" Tacks	172—173
Duplex Papers	2. 4. 5

E.

Ebony Parallel Rulers	133
Eccentrolineads	108
Economy Sketching Paper	3
Ellipses	137. 151
Embankment Triangles	135
Empty Cases for Instruments	90
Engineer's Levels	205—209
" Transits	210—219
English Instruments	57—59
Engraver's T Squares	147
Erasing Fluid.	11
Erasers, Rubber	196. 197
" Steel.	197
E. T. Paper	10. 11
Excelsior Band Chains	268
Excelsior Tapes	259—265. 269
Extension Tripods	221. 234
Extras for Transits and Levels. 222	

F.

Favorite Drawing Tables 163—171	
Field Books	18—21
" Glasses	271. 272

	Page
Flag Poles	252. 255
Flat Scales	116—126
“ Wire Tapes	266—268
Flexible Leveling Rods	255
Fluent Pens	201
Folding Trestles	162
Frames for Blue Printing	12
French Curves	136. 150
French Instruments	91—103
Furniture for Beam Compasses	34. 35. 68. 102

G.

Gelatine	2
German Instruments	61—89
“ “ in sets	73—80. 83—89
German Silver Triangles	143
Glass Paper	2
Gold Ink	178

H.

Handles for Tapes	262. 267
Hand Levels	242. 243
Handy Paper Cutters	173
Hairspring Dividers	24. 25. 52. 53. 57. 62. 81
Hardrubber Drawing Tools	134—143
Hatching Pens	60. 69. 70
Heliographic Papers	10
Helios Erasing Fluid	11
“ Papers	10. 11
Horizon, Artificial	225. 226
Horn Centres	173
“ Protractors	114
Horses for Drawing Boards	161
Hutchinson's Compasses	235
Hyperbolas	137. 151

I.

Imperial Tracing Cloth	7
Impression Papers	2

	Page
Improved Drawing Pens	60
Improved Triangular Scales	127
Indelible Drawing Inks	179
Indian Inks	180—183
India Rubber	195—197
Ink Eraser, Steel	197
“ “ Rubber	196
Ink Slabs	190. 191
Instrument Cases	90
Irregular Curves	136. 150
Ivory Pocket Rules	130
“ Protractors	115
“ Scales	116. 117. 122. 123. 128

J.

Jacob Staff	234
Japanese Ink	184
Japanned Tin Color Boxes	178

K.

“Key“ Brand Instruments	61—80
Keys for Dividers	71

L.

Land Chains	256. 257
Lead Pencils	194. 195
Leads for Artist's Pencils	194
Leads for Instruments	71
Lettering Pens	193
“ Triangles	136
Levels	208—209
Level Books	18
Leveling Poles	252—255
“ Rods	252—255
Linen Provers	275
Linen Tapes	264. 269
Liquid Indelible Drawing Inks	179
“ Water Colors	178
Lithographic Compasses	71
“ Pens	193
Locke's Hand Levels	242
Logarithmic Curve	137



	Page
M.	
Magnetic Compasses	226. 227.
231—233. 235—241	
Magnifying Glasses	273—275
Mapping Pens	193
Marine Glasses	271. 272
Marking Pins	257
Mathematical Instruments	
in cases 38—51. 54—56.	
73—80. 83—89. 91—99	
“ cases for	90
“ English	57—59
“ French	91—103
“ German	61—89
“ Pivot Joint	52—56
“ Parts for	72
“ Superior Swiss	23—56
Measuring Chains	256. 257
“ Tapes	259—269
Metallic Tapes	265
Metal Parallel Rules	132
Metal Scales	128
Metal Triangles	144
Methodical Textbooks	200
Metric Chains	256
“ Rods	252. 255
“ Scales	121. 128. 129
Miner's Compasses	229
Mining Aneroids	248. 249
“ Compasses	227
“ Lamp and Plummet	228
“ Rods	252. 253
“ Transits	217
Mounted Drawing Papers	6. 7
Mountain Transits	217

N.	
Narrow Steel Tapes	266. 267
Nests of Cabinet Saucers	191
Nigrosine Process	11
Normal Drawing Paper	2

O.	
Octant	224
Odometer	270

	Page
Odontograph	108
Office Drawing Tables	169
Offset Scales	117. 121. 127
Oil Stones	174
Opisometer	37
Optical Squares	243. 244

P.	
Paine's Tapes	261
Pantographs	106. 108
Paper, Black Process	11
“ Blue “	10. 11
Paper Cutters	173
“ Drawing	1—7
“ Protractors	114
“ Scales	129
“ Weights	174. 198
Parabolas	137. 151
Paragon Papers	4. 5. 6. 7
Paragon Scales	118. 119
Parallel Rules	132. 133
Parcel Pens	201
Parchment	2
“ Drawing Papers	5
“ Tracing Paper	9
Parts for Instruments	72
Patent Office Bristol Board	3
Pedometers	270
Pencils	194. 195
Pencil Pointers	197. 198
Pens	193
Pen Holders	193. 201
Perspective Lineads	158
Photo-Drawing Inks	179. 184
Pillar Compasses	27
Pivot Joint Instruments	52—56
Plane Table	223
Planimeters	104. 105
Plotting Scales	126
Plumb Bobs	258
Plummet Lamps	228
Pocket Alt-Azimuth	243
“ Aneroids	247. 248
“ Cases for Instruments	90
“ Compasses	27. 64. 103

	Page
Pocket Compasses, Magnetic	238—241
“ Levels	242. 243
“ Leveling Rods	255
“ Magnifiers	273—275
“ Rules	130
“ Sextant	225
“ Tapes	269
Polar Planimeters	104. 105
Poles, Leveling	252—255
Prepared Blue Process Papers .	10
Pricker	37
Print Frames	12
Prisms	244
Prismatic Compasses	235—236
Profile Books	17
“ Papers	13. 14
“ Tracing Papers.	13
Proportional Dividers	28. 29. 65. 103
Protractors	110—115. 142
Protractor T Squares	145. 146

R.

Railroad Curves	140. 141. 152
“ Curve Protractors	114
“ Pens	36. 37. 60. 70
“ Pencil	37
Reading Glasses	273
Red Chalk	195
Reflecting Horizons	225. 226
Reynolds Bristol Board	2
Roll Drawing Papers	4—6
Rolling Angle Target	254
Rolling Parallel Rules	132. 133. 142
Roofpitches	135
Round Writing Books	199. 200
“ Pens	200. 201
Rubber, Erasing	195—197
“ Drawing Tools	134—143
Ruling Pens	36. 37. 59. 60. 69. 70
	82. 103

S.

Sable Brushes	185—187
Scale Guard	129

	Page
Scales	116—129
Scales in sets	119. 122. 123
“ of Inches	121. 129
Scale Rules	130
Scales to order	124. 125
Scientific Books	276—284
Section Liners	109
Sextants.	224. 225
Ship Curves	138. 139. 151
Sight Compasses	231—233. 235—237
Simplex Paper	3
Slate Ink Slabs	190
Slide Boxes for Instruments .	100
Slide Rules	131
Slope Levels	245. 246
Sloping Tiles	192
Solar Attachment	217
Spiral Curve	137
Splines	137. 151
Spline Weights	151
Split Tripod	220
Sponge Rubber	195
Spring Bows	30—33. 66. 67
Staff Heads	245
Standard City Tape	266
“ Cross Section Papers	14. 15
“ Profile Papers	13. 14
Stanhope Lenses	275
Station Pointer	110
Steel Erasers	197
“ Pens	193
“ Spring Bows	30—33. 66. 67
“ Straight Edges	145
“ Tapes	260—262. 266—269
“ Triangles	144
“ T Squares	145—147
Straight Edges	143. 145. 153
Student's Alphabets.	202
Sun-Dials	226
Superior Swiss Instruments	23—56
Surveying Aneroids	247—249
“ Compasses	231—233
“ Instruments.	205—219
Swiss Instruments, pivot joint	52—53
“ “ tongue “	24—28



T.		Page
Tacks, Thumb	172.	173
Tack Lifter		173
Tapes, Measuring	259—	269
Technical Water Colors		175
Telescopes		272
Textbook to Round Writing		200
Theodolites	201—	219
Thacher's Calculating Instrument		131
Thread Counters		275
Three Arm Protractor		110
" Legged Dividers	28.	64
Thumb Tacks	172.	173
Tin Boxes, japanned		178
Tinted Drawing Papers	2.	5
Torchon Papers		1
Tracer		37
Tracing Cloth		7
" Paper in sheets		8
" " in rolls		9
Transfer Papers		2
Transits	210—	219
Transit Books		18
" Poles	252—	255
Trestles for Drawing Boards	161.	162
Triangles, Metal		144
" Rubber	134—	136
" Wood	148—	149
Triangular Compasses	28.	64
" Scales	127.	128
" " Guard		129
Trigonometer		230
Tripods	220.	221. 234
T Squares, Steel	145—	147
" Rubber		143
" Wood	154—	157
" Guide		167
Tubular Beam Compass		34
Tubular Compasses		58

U.		Page
Unchangeable Drawing Board		7
Union Tracing Cloth		7
Unique T Squares	143. 147.	154—157
Universal Drawing Papers	2. 4. 5.	6
Upright Drawing Tables	170.	171

V.

Vegetable Tracing Paper		8
Vara Chains		256
Vernier Protractors	110.	111
Vellum Cloth		7
Velvet Rubber		196

W.

Ward's Engineer's Tape		263
Water Colors	176—	177
" " Brushes	185—	189
" " Technical		175
" " Boxes	175—	178
Water Color Liquids		178
Water Glasses, Artist's		192
Waterproof Drawing Inks		179
Wax Crayons		194
Weights for Paper	174.	198
" " Splines		151
Whatman's Drawing Papers	1.	7
Wheel Attachments	34.	35
Whole and Half Dividers	28.	64
William's Section Liner		109
Wind Gauges	250.	251
Wire Tapes	266—	268

Y.

Y Levels		208—209
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