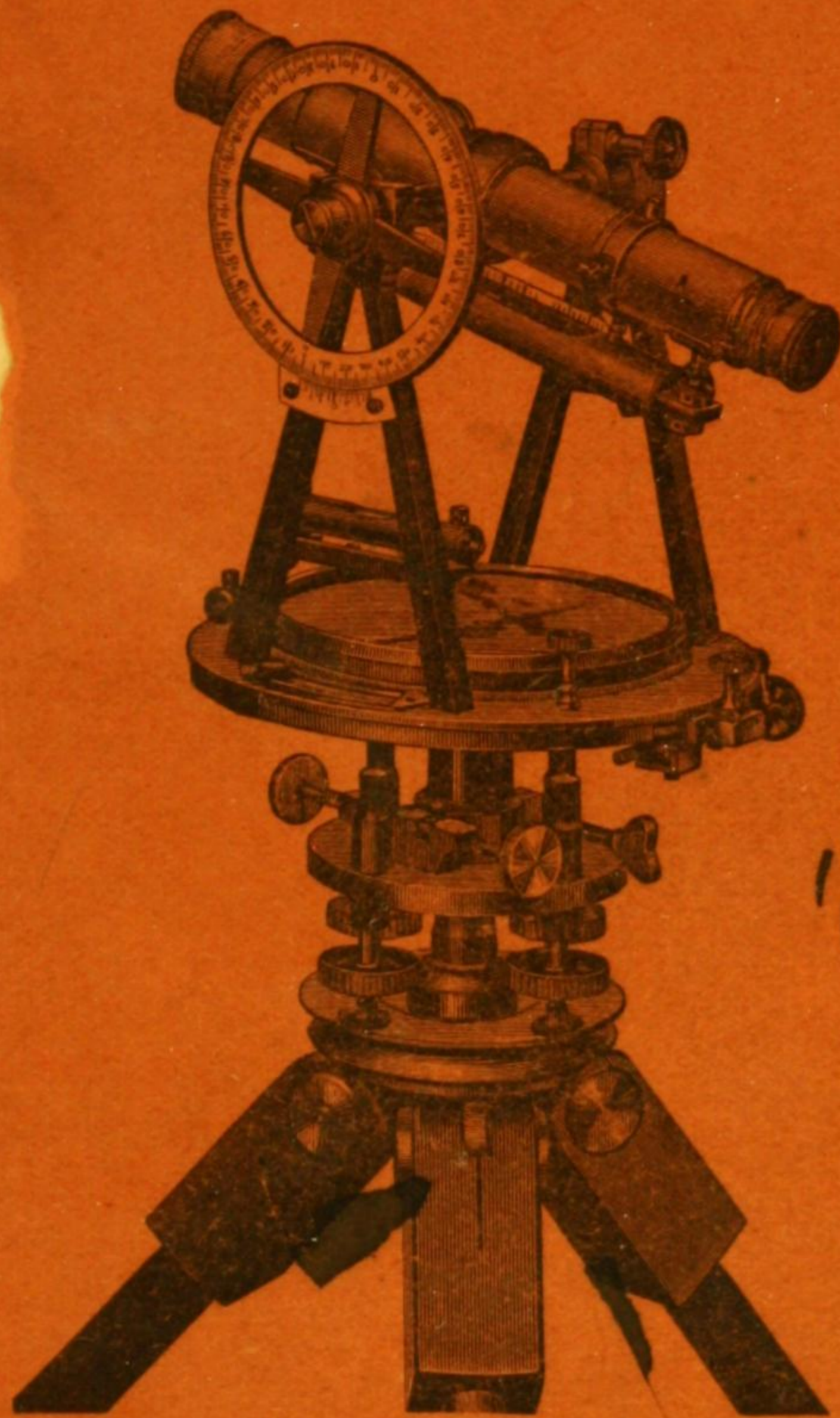


SIXTY-THIRD EDITION.

PART FIRST.

# QUEEN & CO.



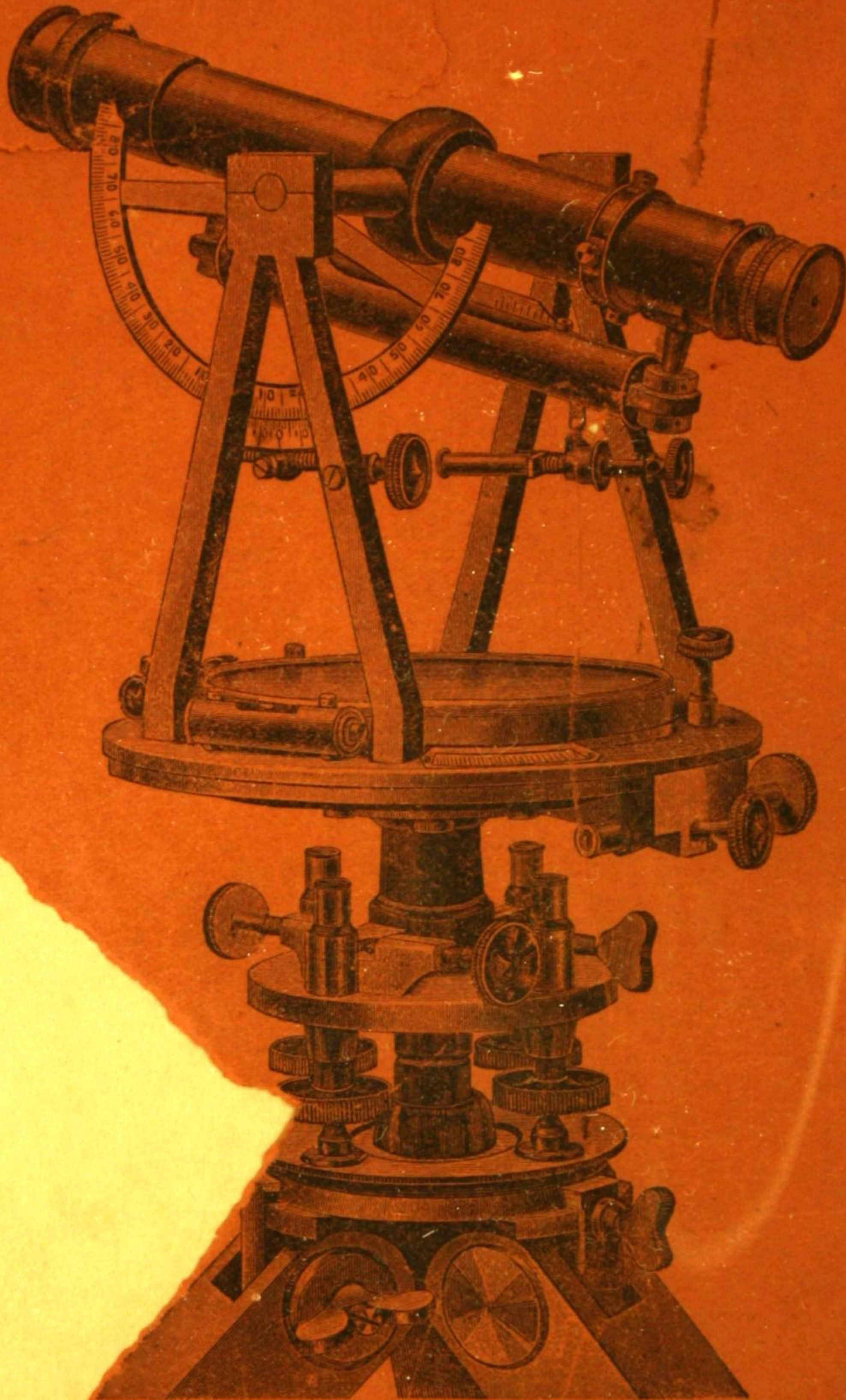
924 CHESTNUT STREET, <sup>and</sup> 925 SANSOM STREET,  
PHILADELPHIA.

Mathematical and Engineering  
Instruments and Materials.

TC  
1D97-0726

CAT 68

QUEEN & CO.,



PHILADELPHIA.

CATALOGUE

—OF—

Mathematical and Engineering

Instruments and Materials,

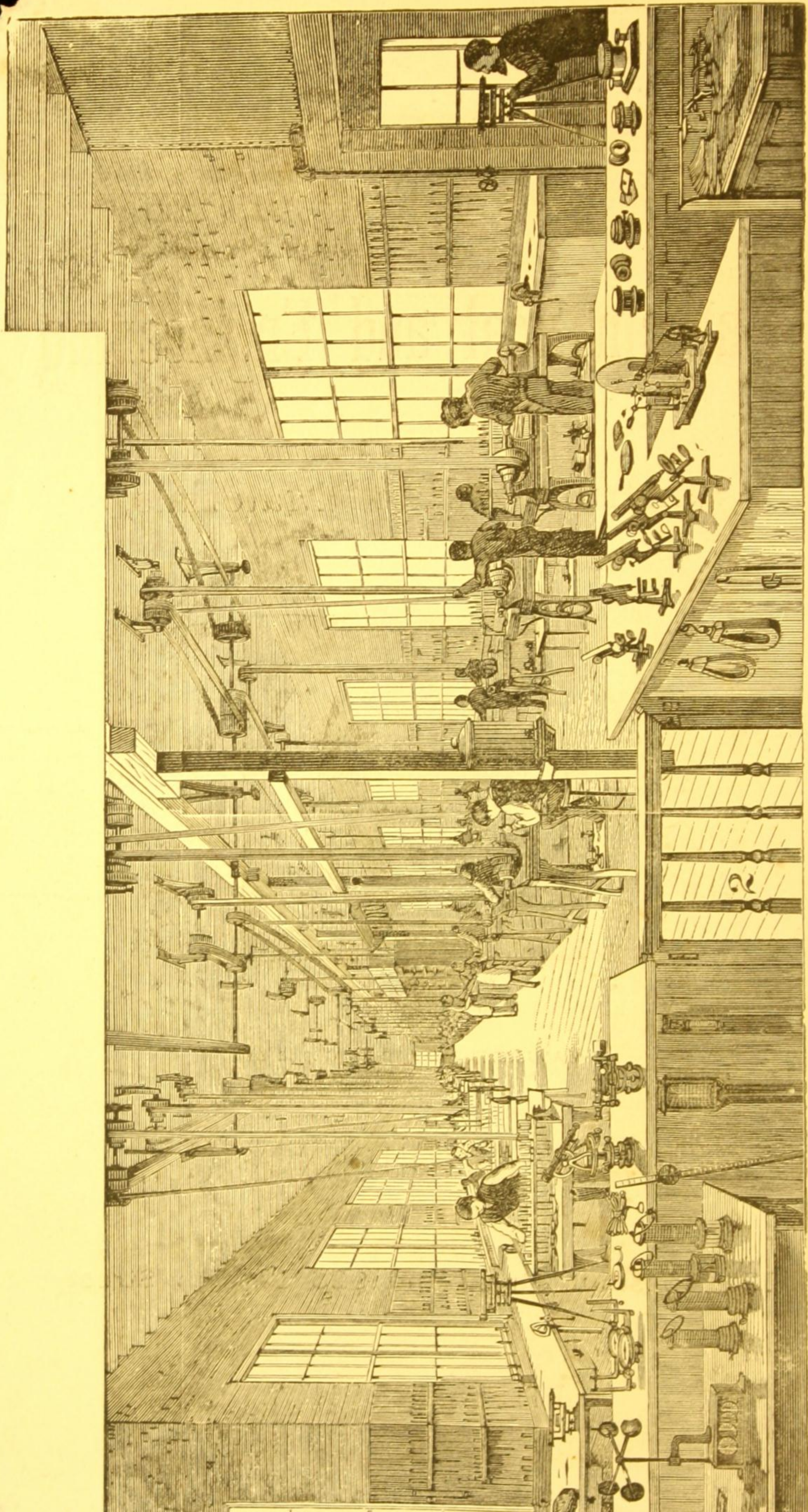


MANUFACTURED AND IMPORTED BY

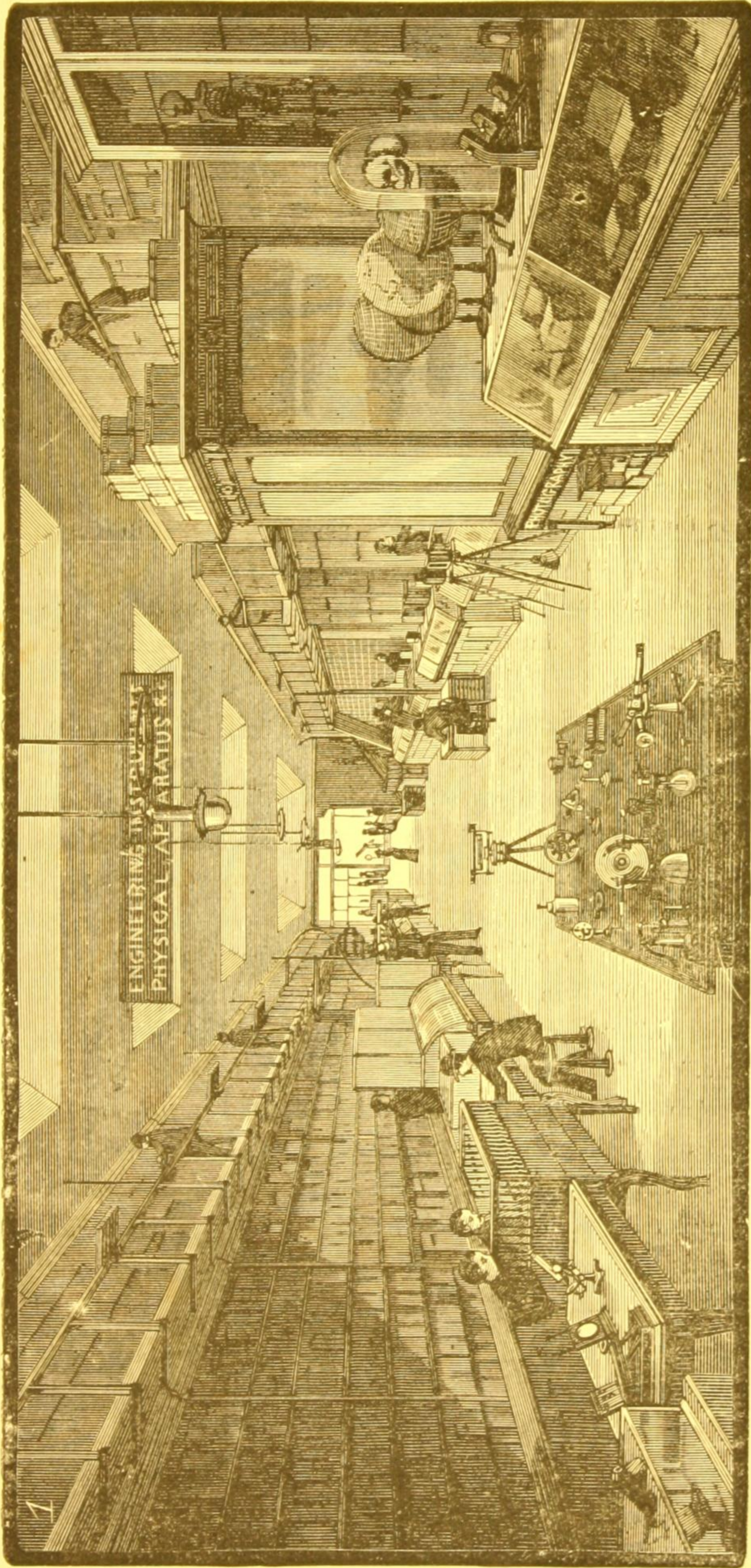
JAMES W. QUEEN & CO.,

924 Chestnut Street and 925 Sansom Street,

PHILADELPHIA.



FACTORY.



SALESROOM.

FACTORY.

## ❖PREFACE❖

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IN presenting this revised edition of our catalogue, we beg to emphasize the fact that this house was the first in this country to give special attention to the needs of the Engineer, the Architect and the Mechanical Draughtsman and that our stock of instruments and materials for the use of these professions is the largest in this country.

In Drawing Instruments, made specially for us abroad, our stock comprises all grades from the ordinary brass instruments for schools to the most highly finished and perfect instruments for the use of professional men.

In meeting the demand for instruments and materials of our own manufacture, we have found it necessary, from time to time to increase our manufacturing facilities, until at the present time, our factory, for the production of high class Engineering Instruments and Instruments of Precision is unsurpassed by any other, either in this country or in Europe.

Drawing Papers of all kinds have our particular attention and we control the following well known brands: "Acme Helio," "Acme," "Bon Accord," "Doppelt," "Papier Pourtout," "Constantia" and "Leonine."

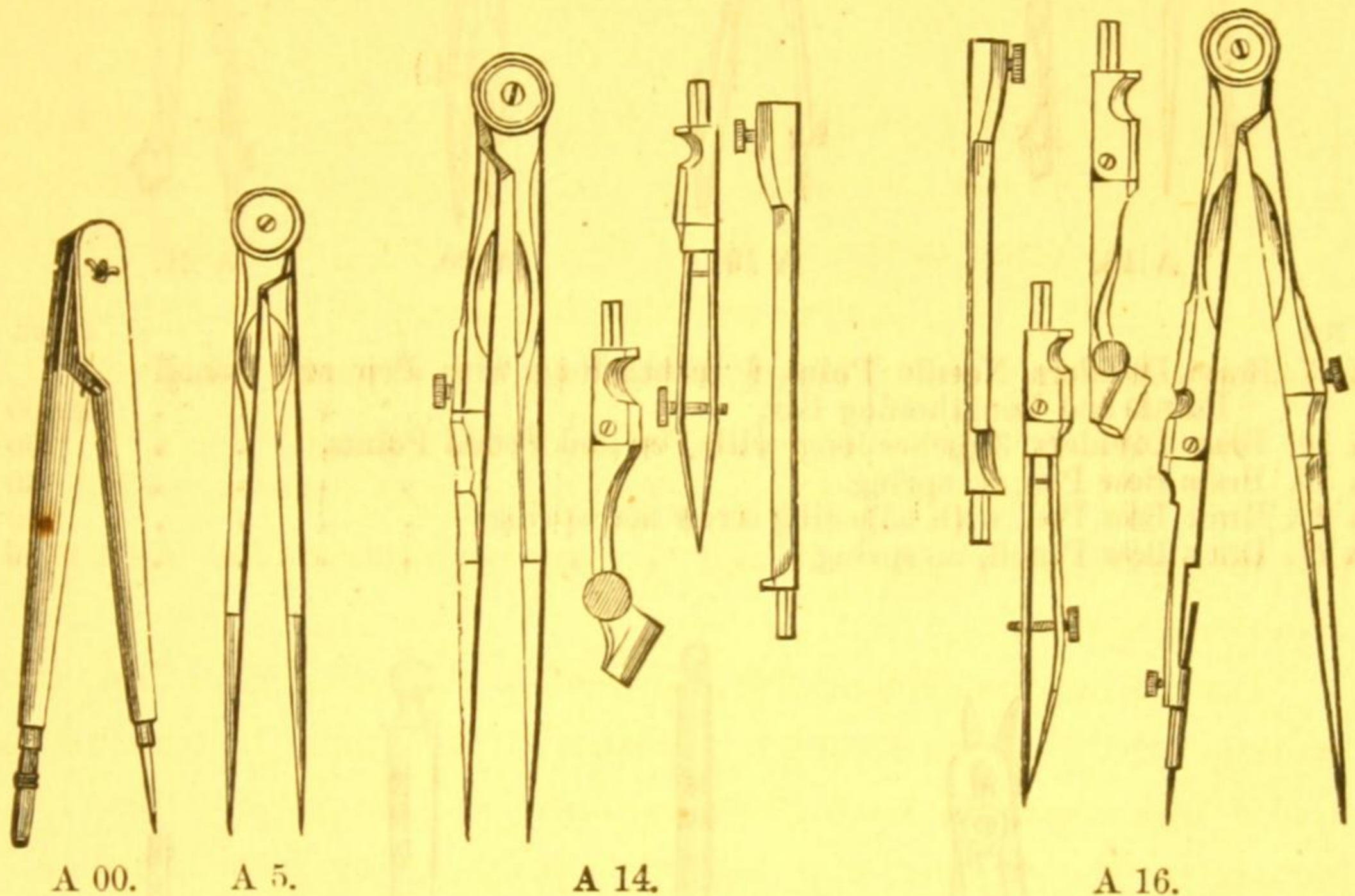
We have recently added an important branch to our business, in accepting the Exclusive Agency for the United States, of the JOHANN FABER LEAD PENCILS, which manufactured by improved machinery under the same supervision which has made the FABER PENCILS famous throughout the civilized world, fully sustain the high reputation of the name.

JAMES W. QUEEN & CO

C 1097-B 726

# MATHEMATICAL INSTRUMENTS, OF BRASS,

FOR SCHOOLS.



A 00.

A 5.

A 14.

A 16.

No.								PRICE.
A 00.	Wood Dividers,	13 in.	long,	with crayon holder,	for blackboard drawing,			\$1.00
A 0.	Do.	16	do.	do.	do.	do.	do.	1.25
A 1.	Do.	20	do.	do.	do.	do.	do.	1.50
A 2.	Do.	24	do.	do.	do.	do.	do.	1.75
A 3.	Do.	27	do.	do.	do.	do.	do.	2.00
A 4.	Do.	30	do.	do.	do.	do.	do.	2.25
A 4½.	Do.	36	do.	do.	do.	do.	do.	2.50
A 5.	Brass Dividers,	3½	inches long,	screw joint,				.25
A 6.	Do.	4½	do.	do.				.30
A 7.	Do.	5½	do.	do.				.35
A 8.	Do.	6½	do.	do.				.45
A 9.	Do.	4½	do.	rivet joint,				.20
A 10.	Do.	5½	do.	do.				.25
A 11.	Do.	6½	do.	do.				.30
A 12.	Do.	4½	do.	screw joint and pencil leg,				.40
A 13.	Do.	5½	do.	do.	do.			.50
A 13½.	Do.	6½	do.	do.	do.			.60
A 14.	Brass Dividers,	4½	inches long,	with Pen and Pencil Points and Lengthening Bar,				.50
A 15.	Brass Dividers,	6	inches long,	with Pen and Pencil Points and Lengthening Bar,				.75
A 16.	Brass Dividers,	Needle Point,	4½	inches long,	with Pen and Pencil Points and Lengthening Bar,			.75

C 1097-B 726



A 18.



A 19.

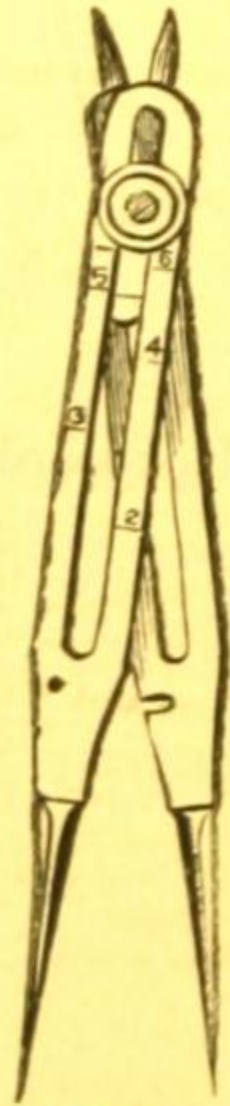


A 20.



A 21.

No.	PRICE
A 17. Brass Dividers, Needle Point, 6 inches long, with Pen and Pencil Points and Lengthening Bar,	\$1.00
A 18. Brass Dividers, 3 inches long, with Pen and Pencil Points,	.60
A 19. Brass Bow Pen, no spring,	.60
A 20. Brass Bow Pen, with adjusting screw and spring,	.70
A 21. Brass Bow Pencil, no spring	.60

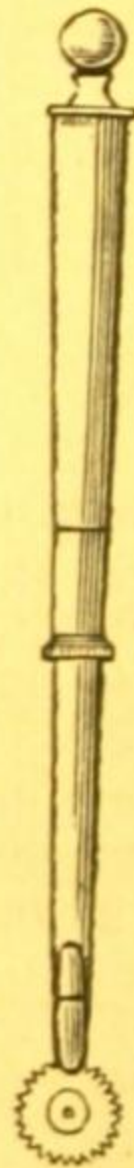


A 22.



A 23.

A 25.



A 26.



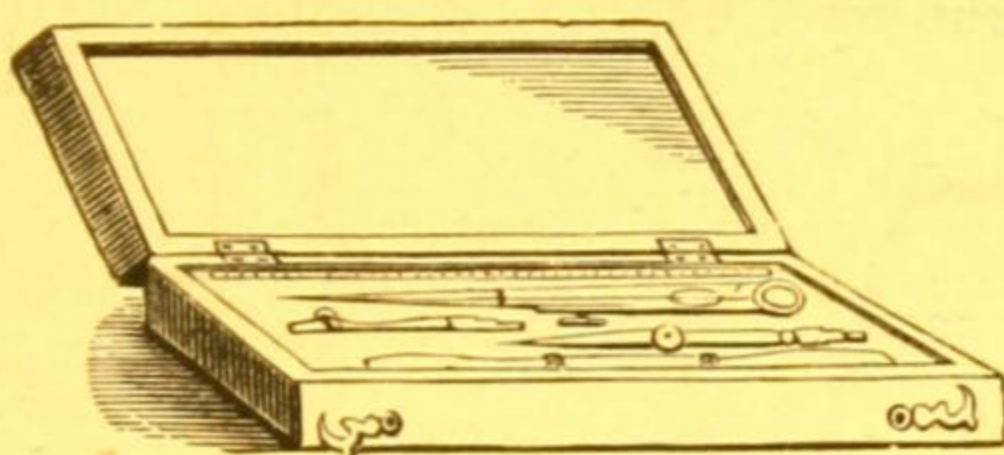
A 29.

A 22. Brass Bisecting Dividers,	.60
A 23. Brass Proportional Divider for lines, in case,	2.00
A 24. Drawing Pen, black handle,	.20
A 25. Drawing Pen, ivory handle,	.30
A 26. Roulette, for dotting lines,	.65
A 26½ Do. do. with three wheels,	.85
A 27. Tracer, or Copying-wheel, for tracing patterns,	.25
A 28. Double Drawing or Railroad Pen, for parallel lines. brass mounted,	2.25
A 29. Fox's Patent Lead Holder, for pencil leg of Dividers,	.25

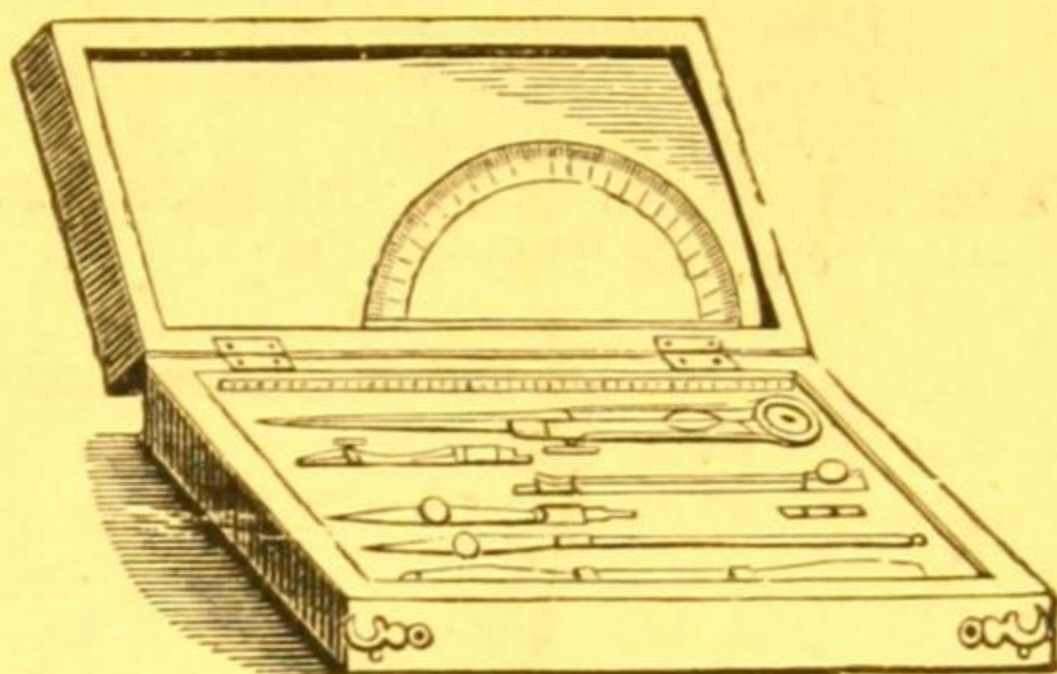


# BRASS DRAWING INSTRUMENTS

FOR SCHOOLS. IN CASES.



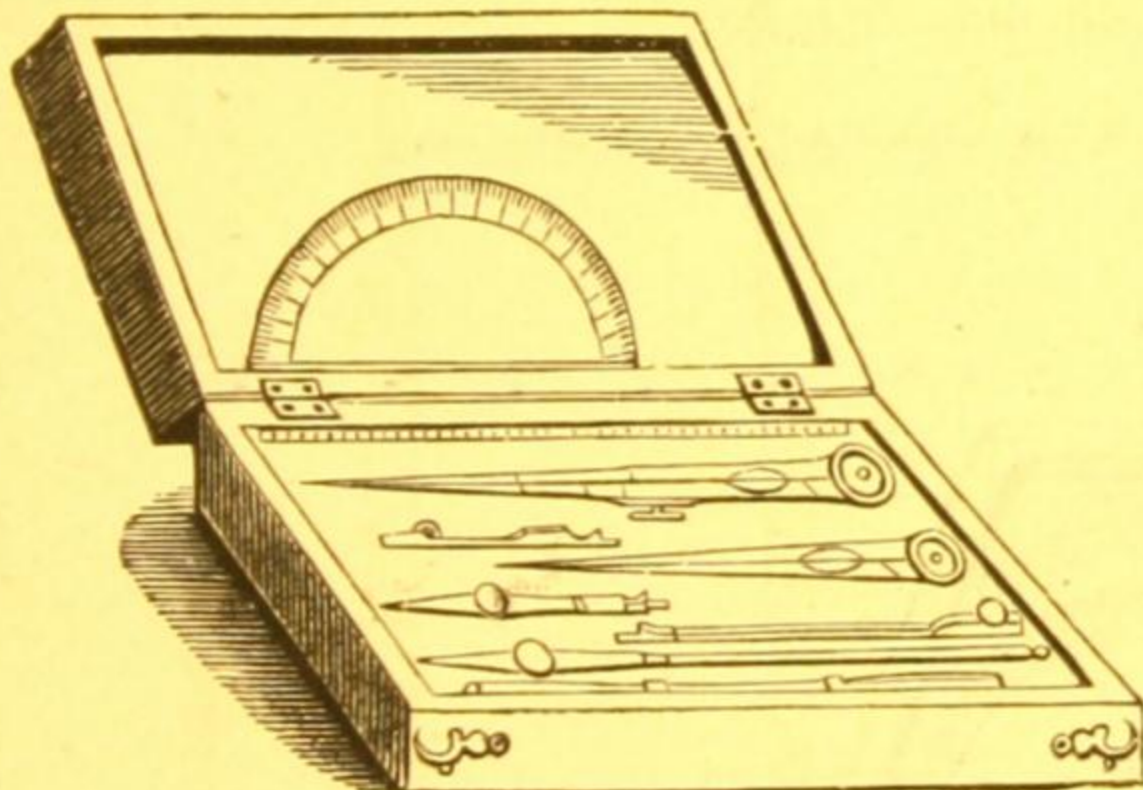
A 48.



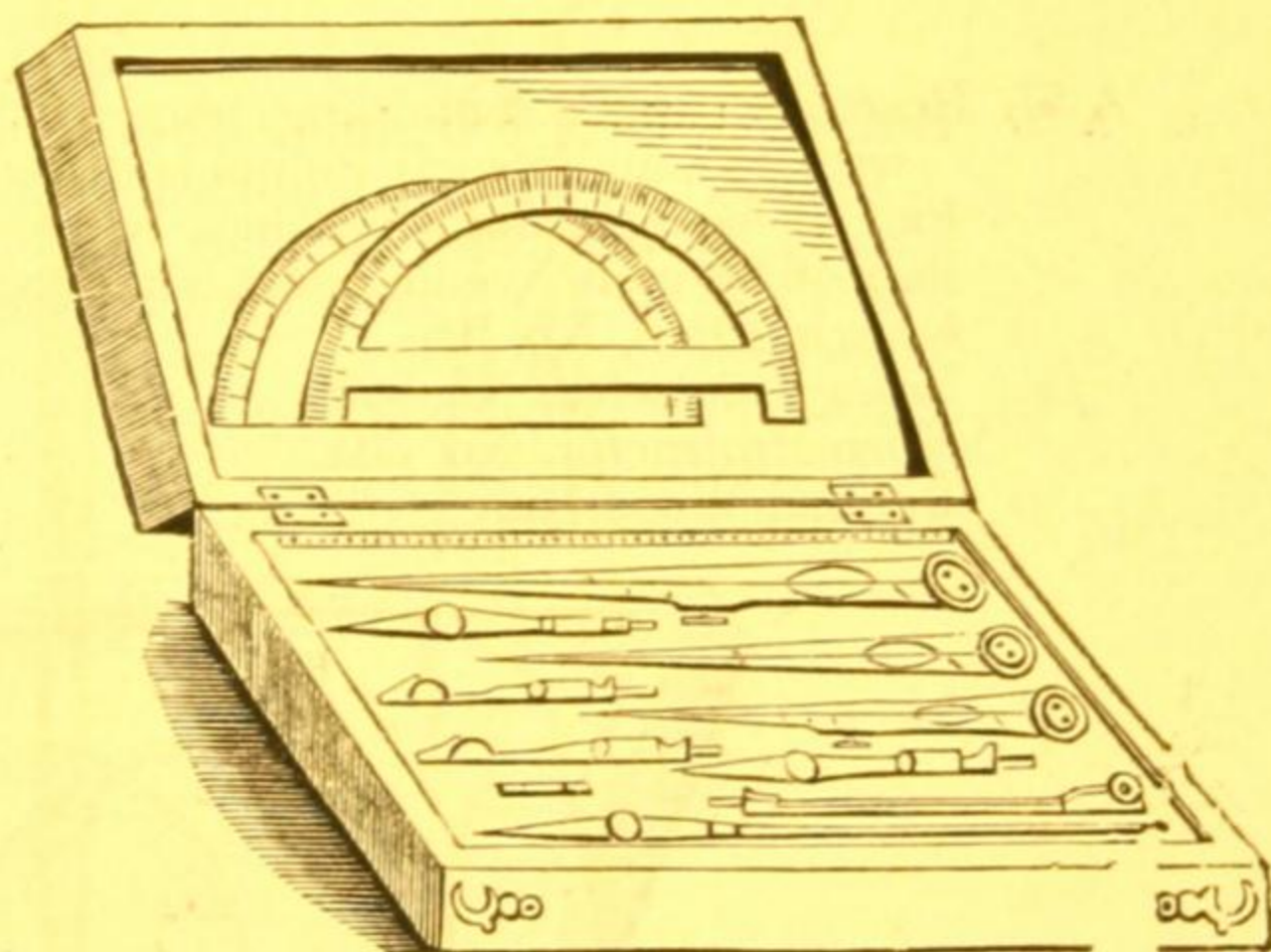
A 49.

All sets of instruments from No. 48 to 64½ are fitted with Fox's Patent Lead Holder, No. 29, when sold at retail.

No.		PRICE.
A 48.	Wood Box; containing pair 4½-inch Dividers, with Pen and Pencil Points,	\$0.50
A 49.	Wood Box; containing pair 4½-inch Dividers, with Pen and Pencil Points and Lengthening Bar, No. 14. Ebony handle Drawing Pen, No. 24. Brass Protractor and Divided Rule,	.80



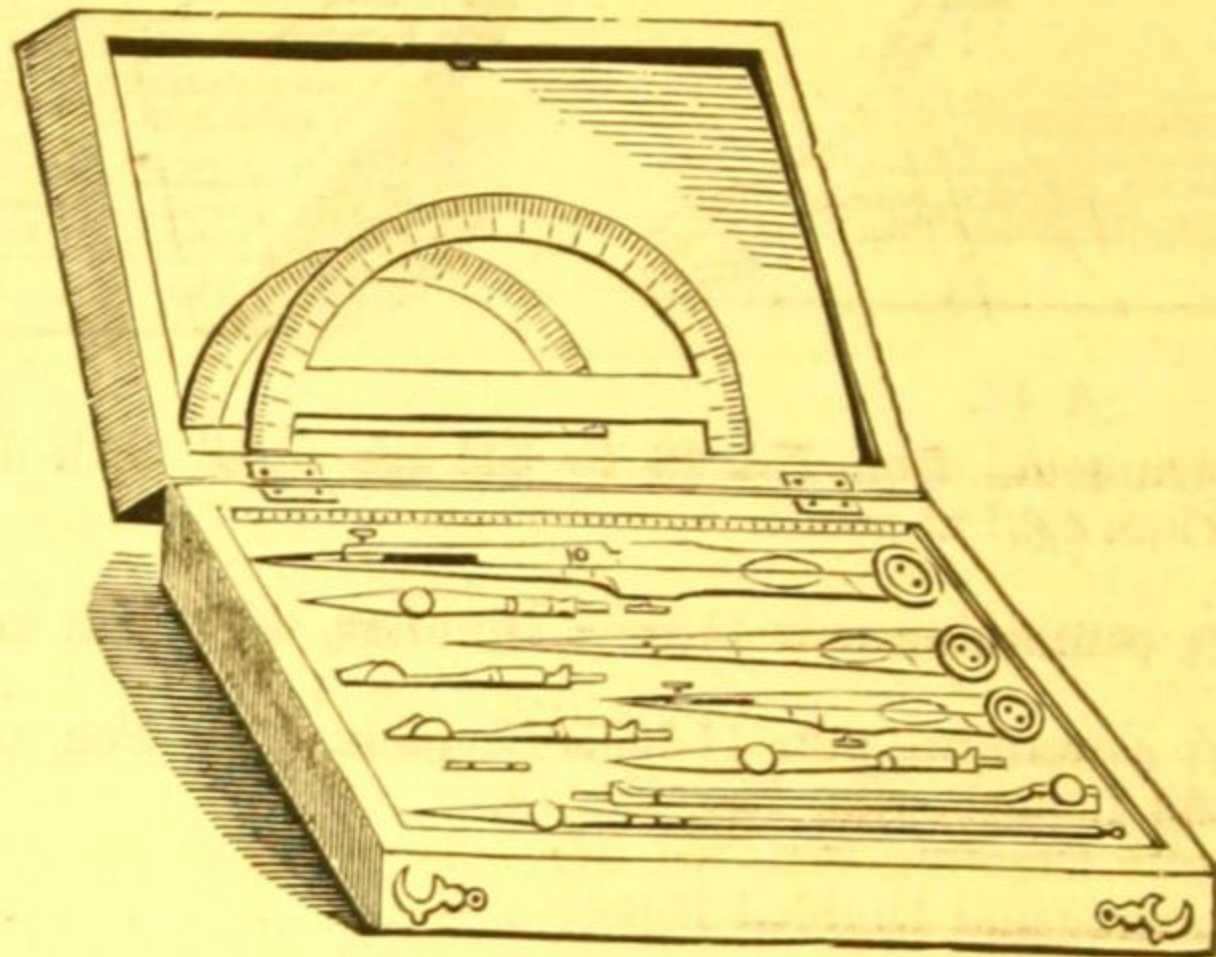
A 50 and 51.



A 55.

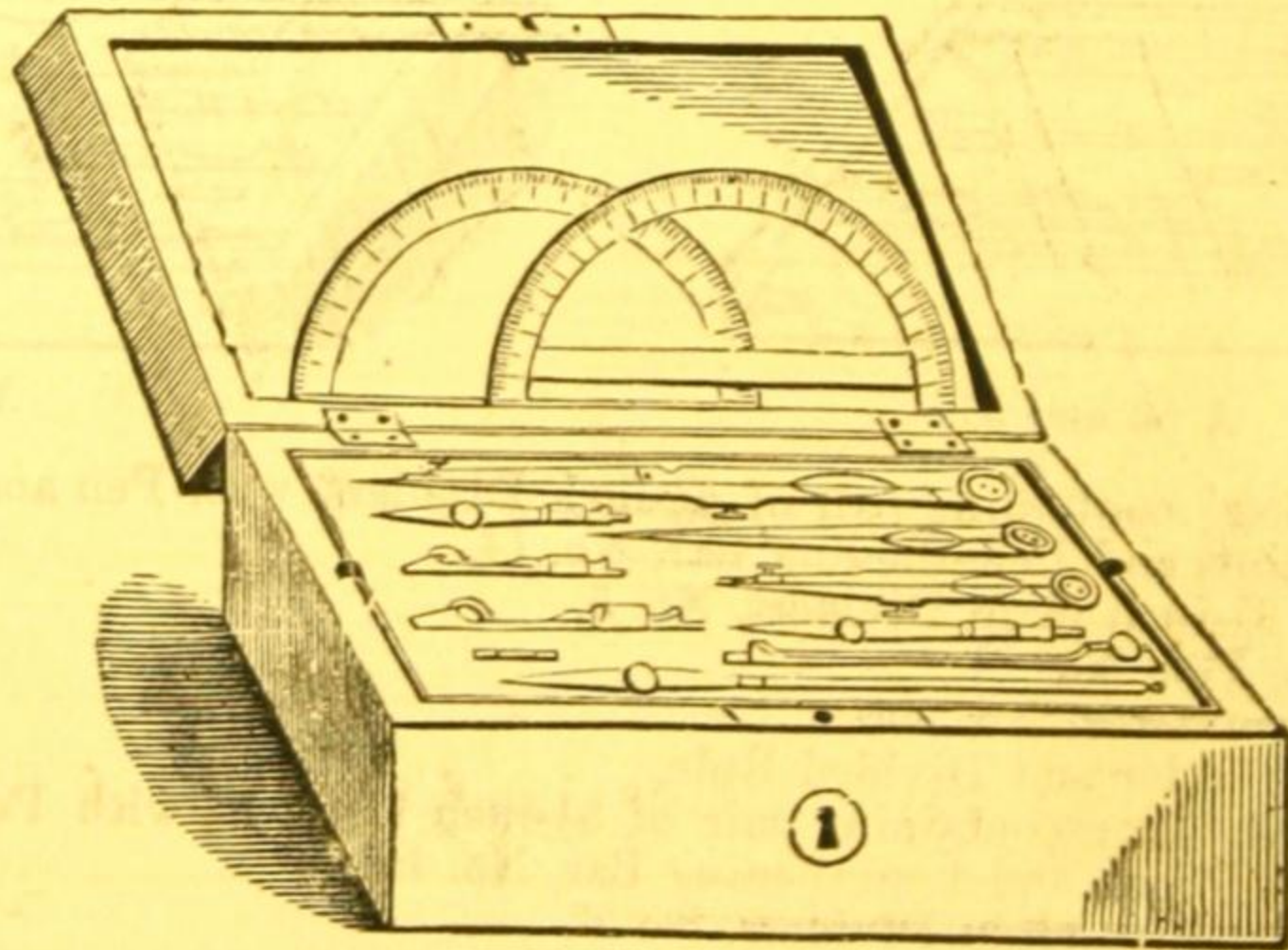
A 50.	Wood Box; containing pair of 4½-inch Dividers, with Pen and Pencil Points and Lengthening Bar, No. 14. Pair of 3½-inch plain Dividers, No. 5. Drawing Pen, No. 24. Brass Protractor, No. 306. Crayon Holder and Divided Rule,	1.00
A 51.	Rosewood Box; containing pair of 5½-inch Dividers, with Pen and Pencil Points and Lengthening Bar, No. 15. Pair of 4½-inch plain Dividers, No. 6. Drawing Pen, No. 24. Brass Protractor and Divided Rule,	1.30
A 52.	Same as No 51, with Parallel Ruler,	1.50

- | No.  | PRICE  |
|--|--------|
| A 55. Rosewood Box; containing pair of 6 inch Dividers, with Pen and Pencil Points and Lengthening Bar, No. 1.<br>Pair of 4½-inch plain Dividers, No. 6.<br>Pair of 3½-inch Dividers, with Pen and Pencil Points.<br>Drawing Pen, No. 24.<br>Brass Protractor, No. 306.<br>Horn Protractor, No. 301.<br>Divided Wood Rule, . . . . . | \$2.00 |
| A 56. Same as No. 55, but with the instruments set in a tray, so that colors, etc., may be put below, . . . . .  | 2.25   |



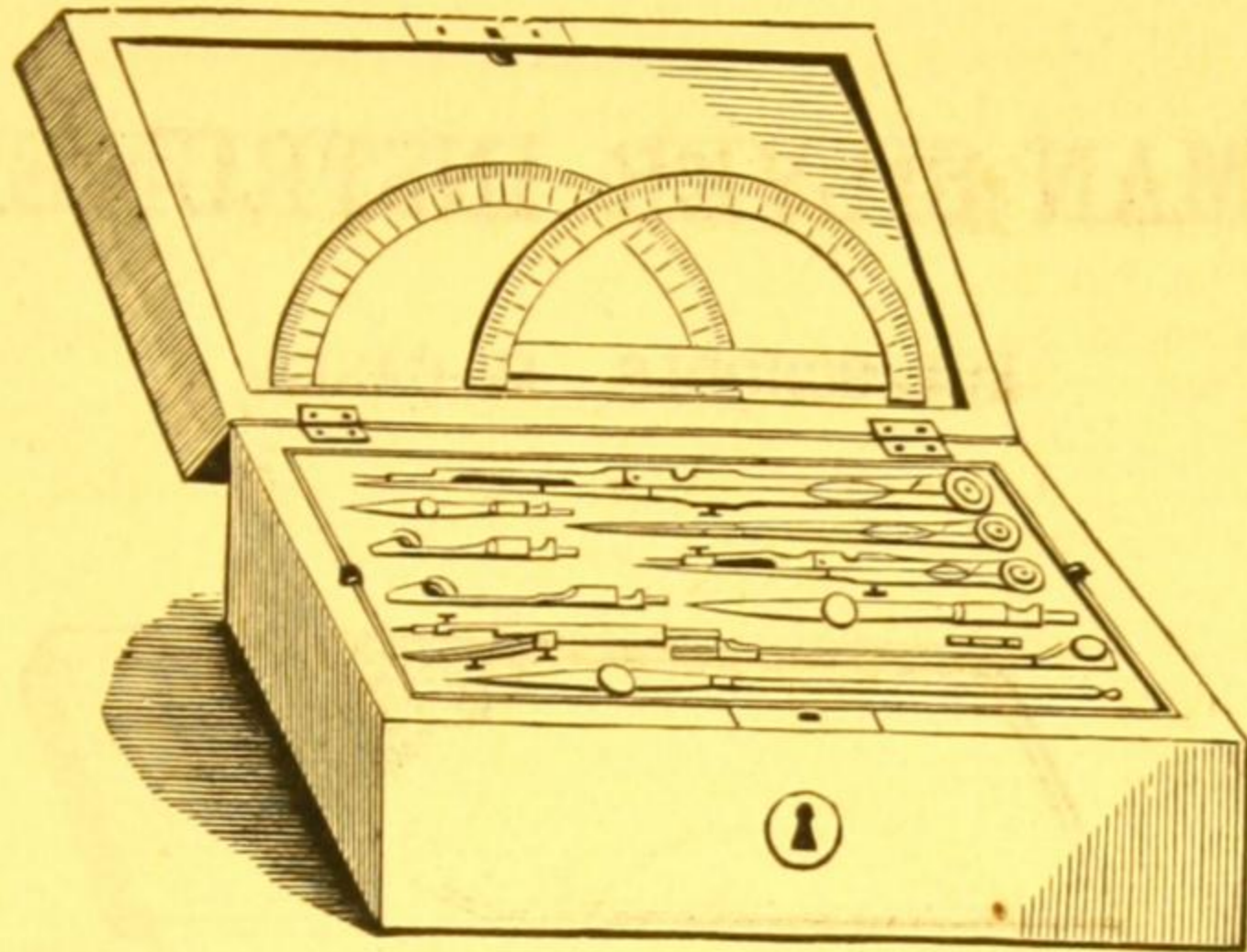
A 57.

- |   |      |
|---|------|
| A 57. Rosewood Box; containing pair of 6-inch Needle-point Dividers, with Pen and Pencil Points and Lengthening Bar, No. 17.<br>Pair of 4½-inch plain Dividers, No. 6.<br>Pair of 3½-inch Needle point Dividers, with Pen and Pencil Points.<br>Drawing Pen, No. 24.<br>Brass Protractor, No. 306.<br>Horn Protractor, No. 301.<br>Divided Wood Rule, . . . . . | 2.75 |
|---|------|



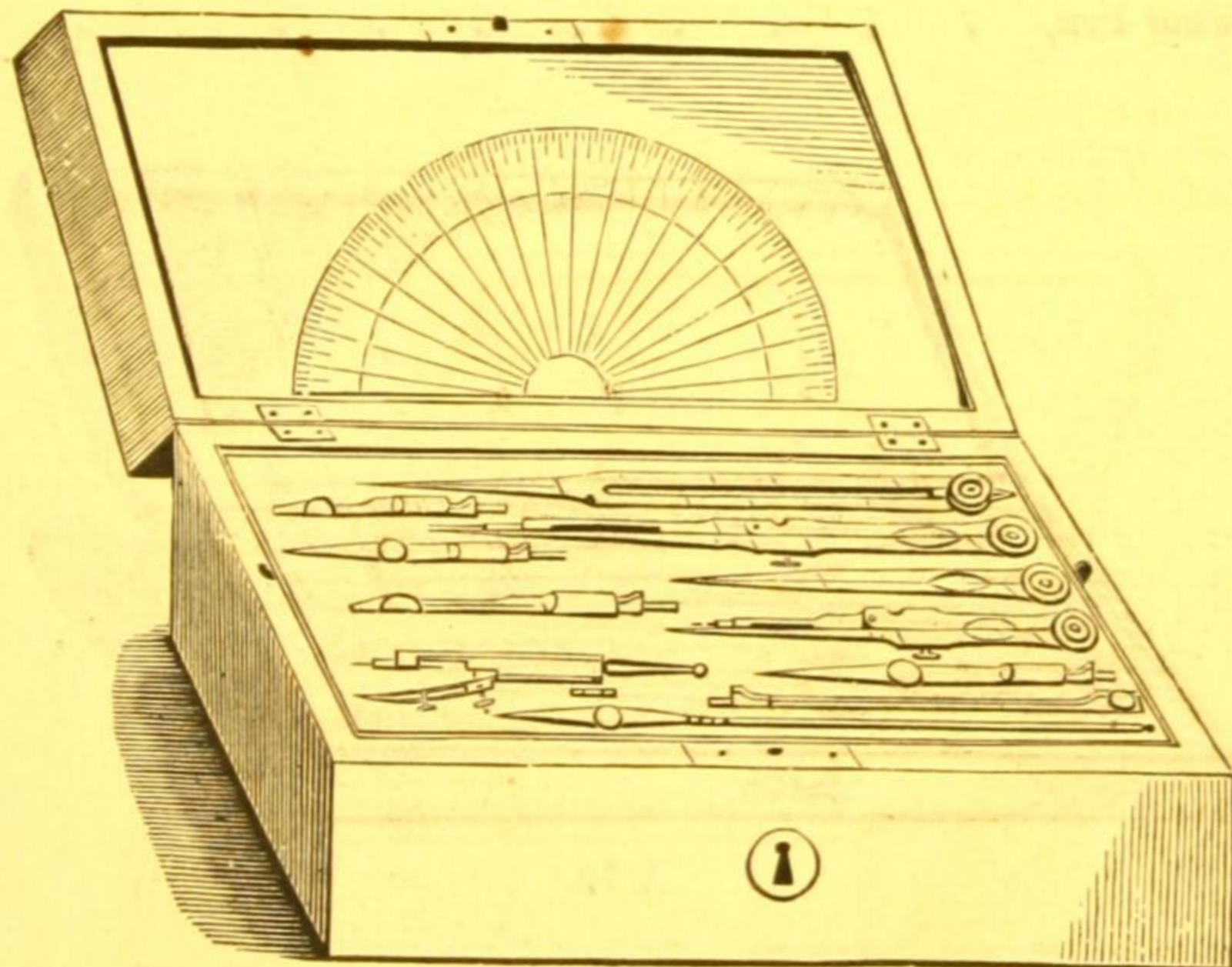
58.

- |  |      |
|--|------|
| A 58. Same as No. 57, but with lock and key, and the instruments set in a tray, so that colors may be put below, . . . . . | 3.00 |
|--|------|



A 62.

- | No.  | PRICE. |
|--|--------|
| A 62. Rosewood Box, with lock and key, the instruments set in a tray, so that colors, etc., may be put below, containing:<br>Pair of 6-inch Needle-point Dividers, with Pen and Pencil Points and Lengthening Bar, No. 17.<br>Pair of 4½-inch plain Dividers, No. 6.<br>Pair of 3½-inch Needle-point Dividers, with Pen and Pencil Points.<br>Spring Bow Pen, with Needle Point, No. 20.<br>Drawing Pen, No. 24.<br>Brass Protractor, No. 306.<br>Horn Protractor, No 301.<br>Divided Wood Rule, . . . . . | \$4.00 |

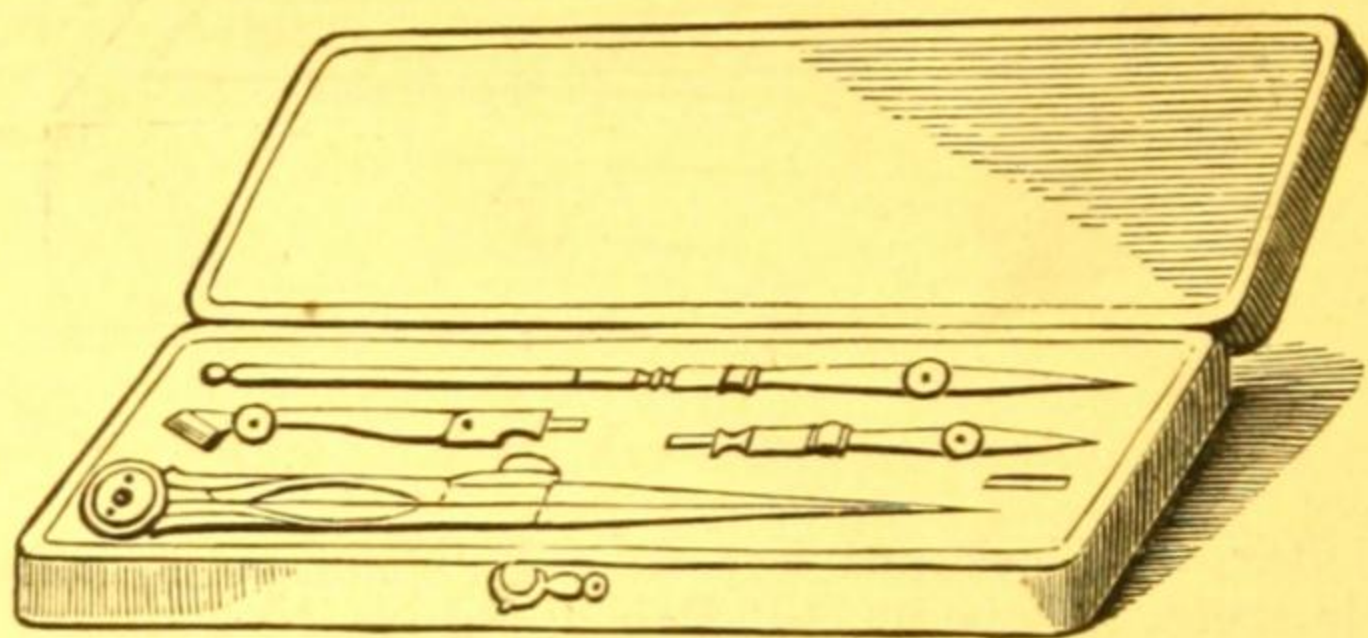


A 64.

- |  |      |
|--|------|
| A 64. Same as No. 62, with the addition of a pair of Proportional Dividers, has no brass Protractor, but has wood Triangle and Irregular Curves, | 6.00 |
|--|------|

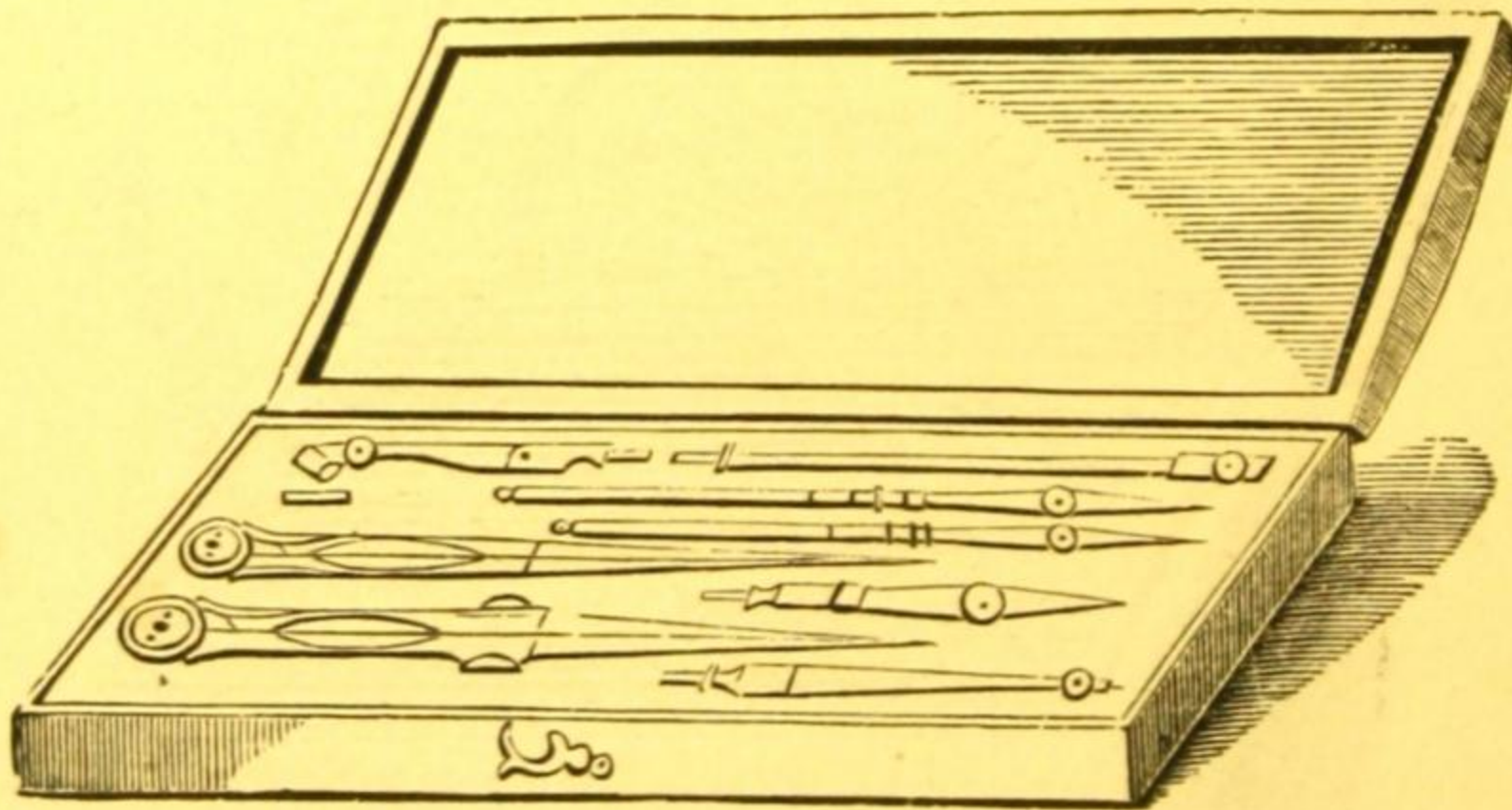
# GERMAN SILVER INSTRUMENTS,

FOR SCHOOLS. IN CASES.



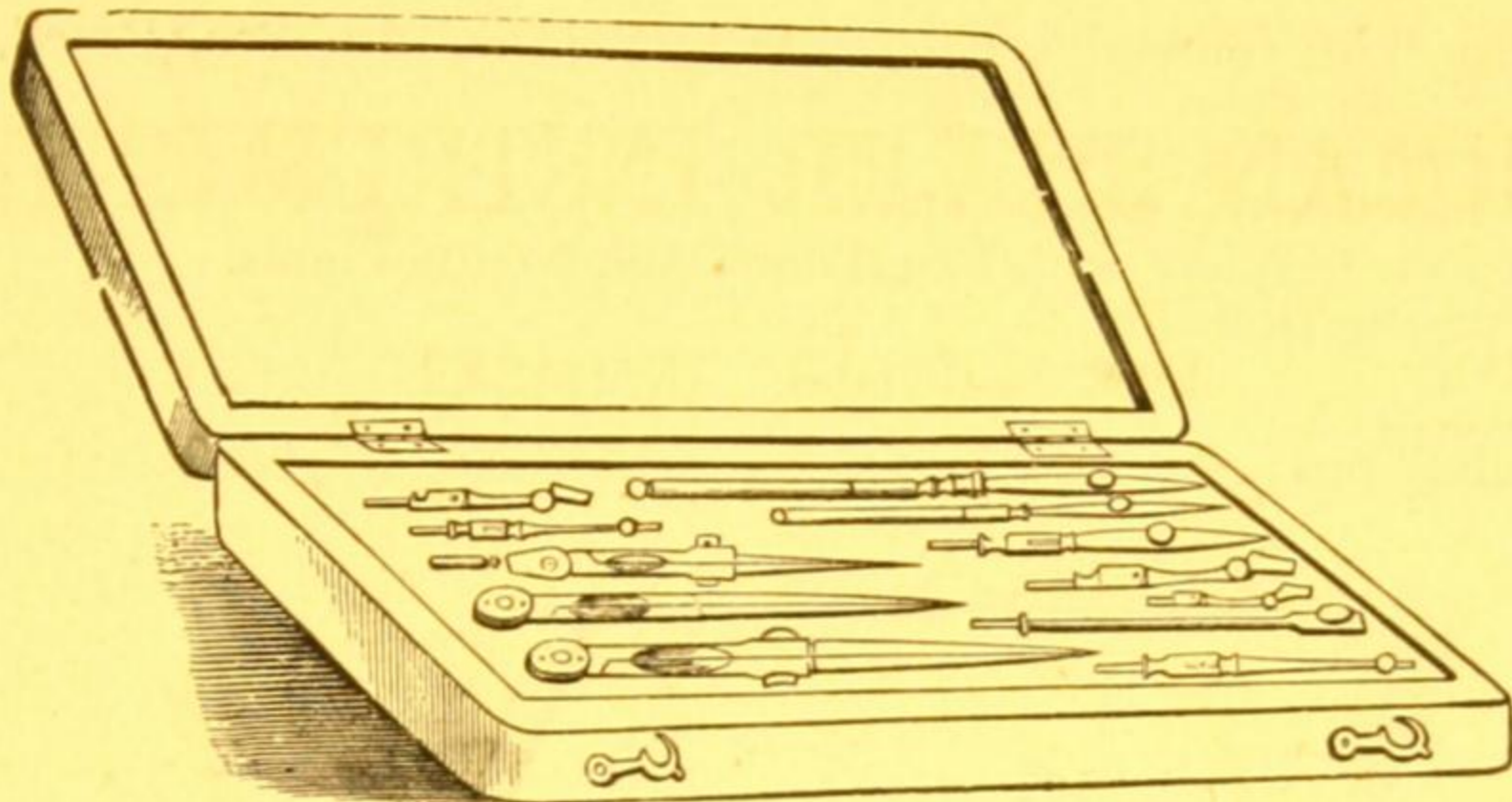
A 70.

No.	PRICE.
A 70. Morocco Box; containing pair of 5½-inch Dividers, with Pen and Pencil Points. Drawing Pen, . . . . .	\$2.00
A 71. Morocco Box; containing pair of 5¼-inch Dividers, with Pen and Pencil Points and Lengthening Bar. Pair of 5-inch plain Dividers. Drawing Pen, . . . . .	3.00



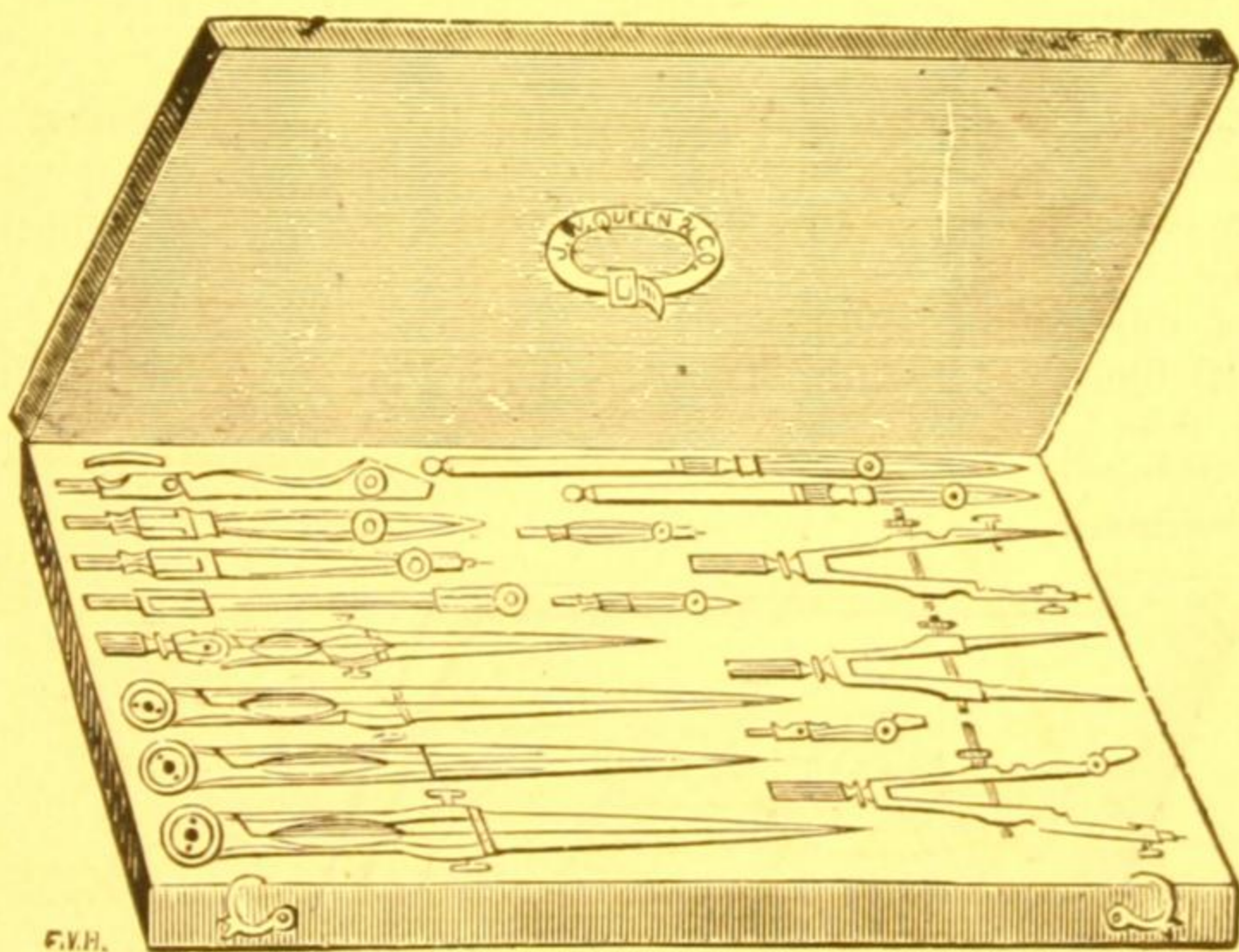
A 72.

A 72. Morocco Box; containing pair of 5¼-inch Dividers, with Pen, Pencil, and Needle Points and Lengthening Bar. Pair of 5-inch plain Dividers. 2 Drawing Pens, . . . . .	4.00
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A 73.

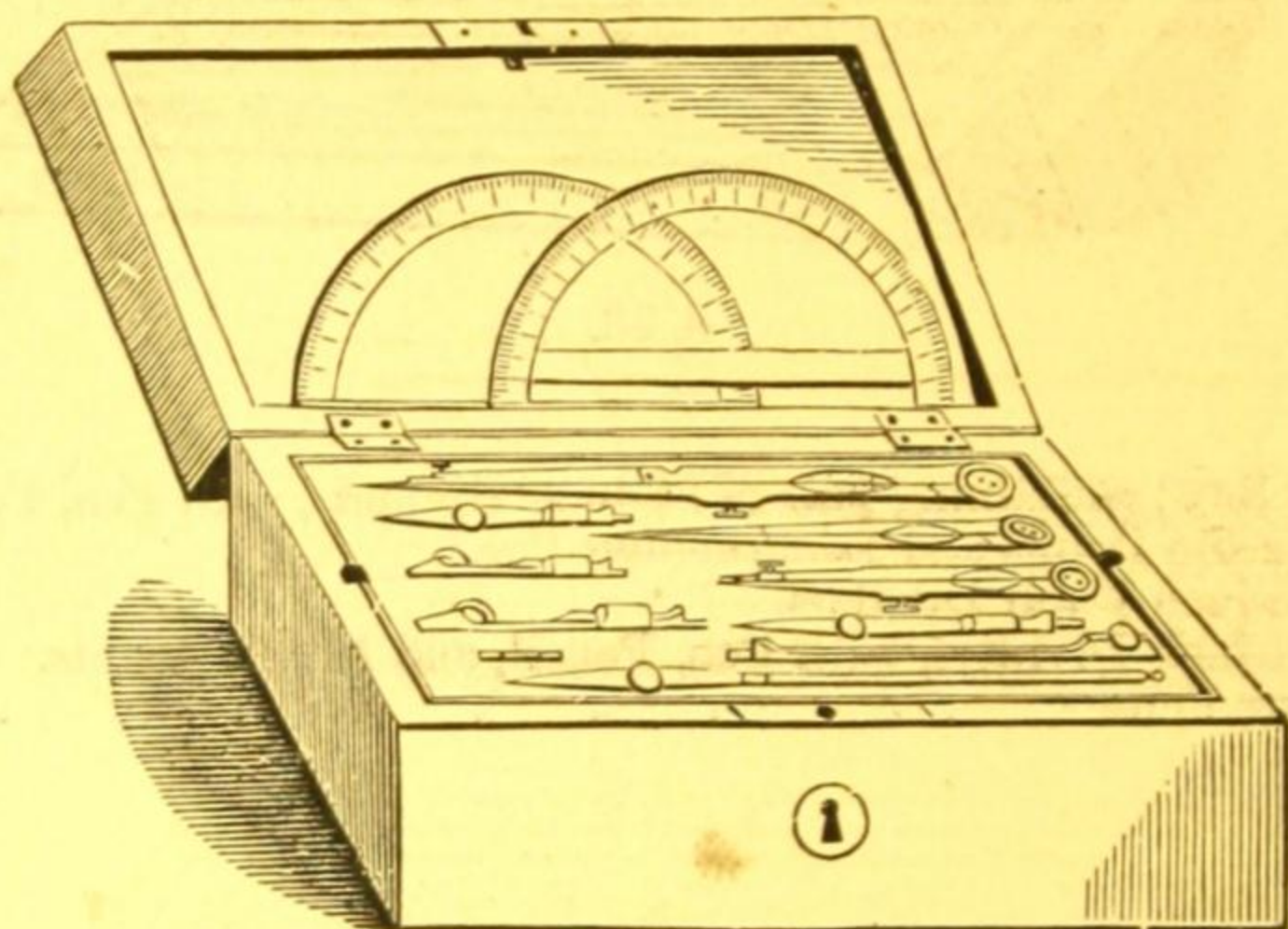
No.	PRICE.
A 73. Morocco Box ; containing pair of 5 $\frac{1}{4}$ -inch Dividers, with Pen, Pencil, and Needle Points and Lengthening Bar.	
Pair of 5-inch Plain Dividers.	
Pair of 4-inch Dividers, with Pen, Pencil, and Needle Points.	
2 Drawing Pens, . . . . .	\$6.50



A 75.

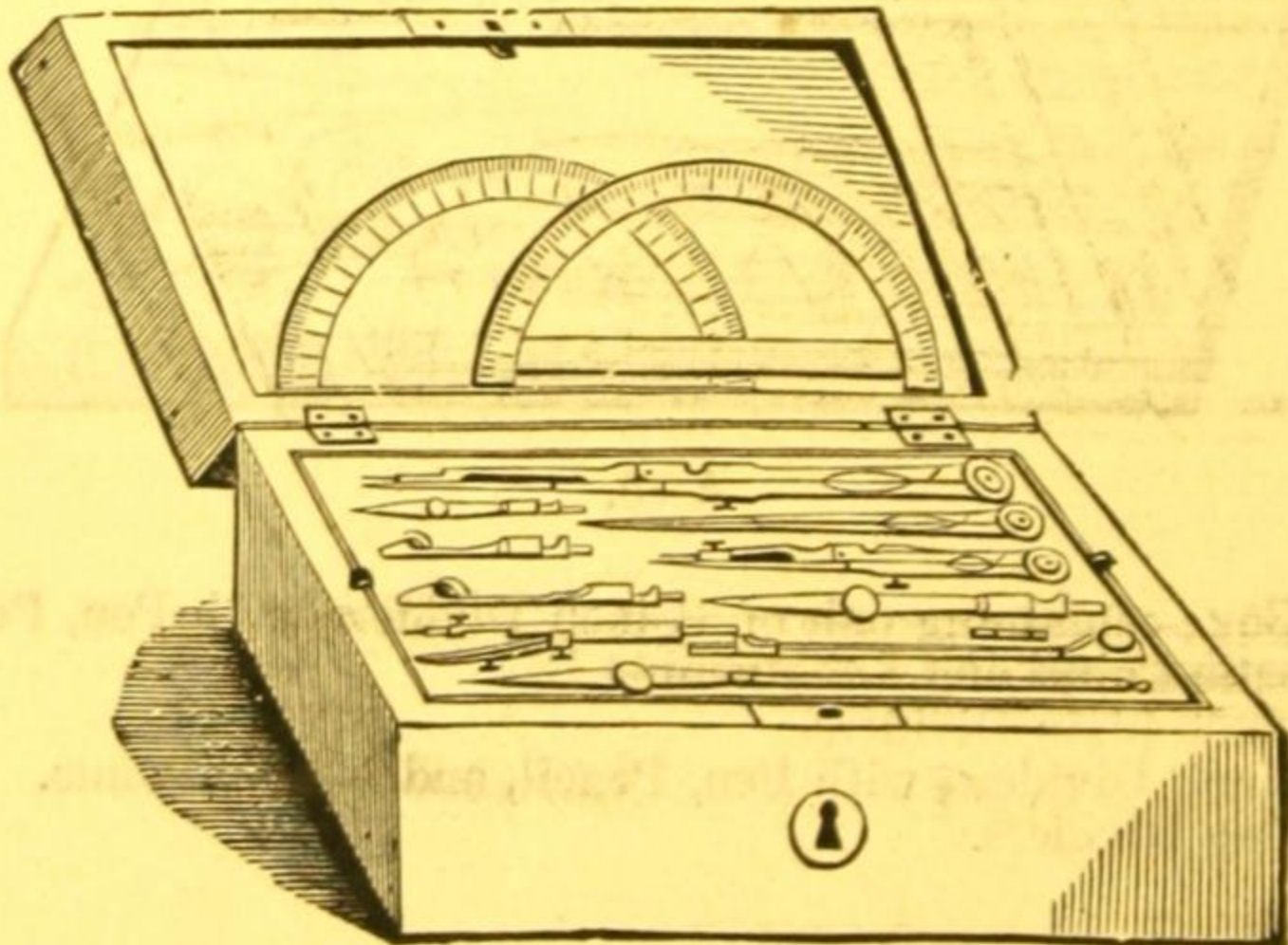
A 74. Morocco Box ; containing pair of 5 $\frac{1}{2}$ -inch Dividers, with Pen, Pencil, and Needle Points and Lengthening Bar.	
Pair of 5-inch plain Dividers.	
Pair of 4-inch Dividers, with Pen, Pencil, and Needle Points.	
Pair Spacing Dividers.	
Bow Pen.	
Bow Pencil.	
2 Drawing Pens, . . . . .	10.00

- | No.   | PRICE   |
|---|---------|
| A 75. Morocco Box; containing pair 5½-inch Dividers, with Pen, Pencil, and Needle Points and Lengthening Bar,<br>Pair 5-inch plain Dividers.<br>Pair 5-inch Hair-spring Dividers.<br>Pair 4 inch Dividers, with Pen, Pencil, and Needle Points.<br>Pair Spacing Dividers.<br>Bow Pen.<br>Bow Pencil.<br>2 Drawing Pens, . . . . . | \$12.50 |



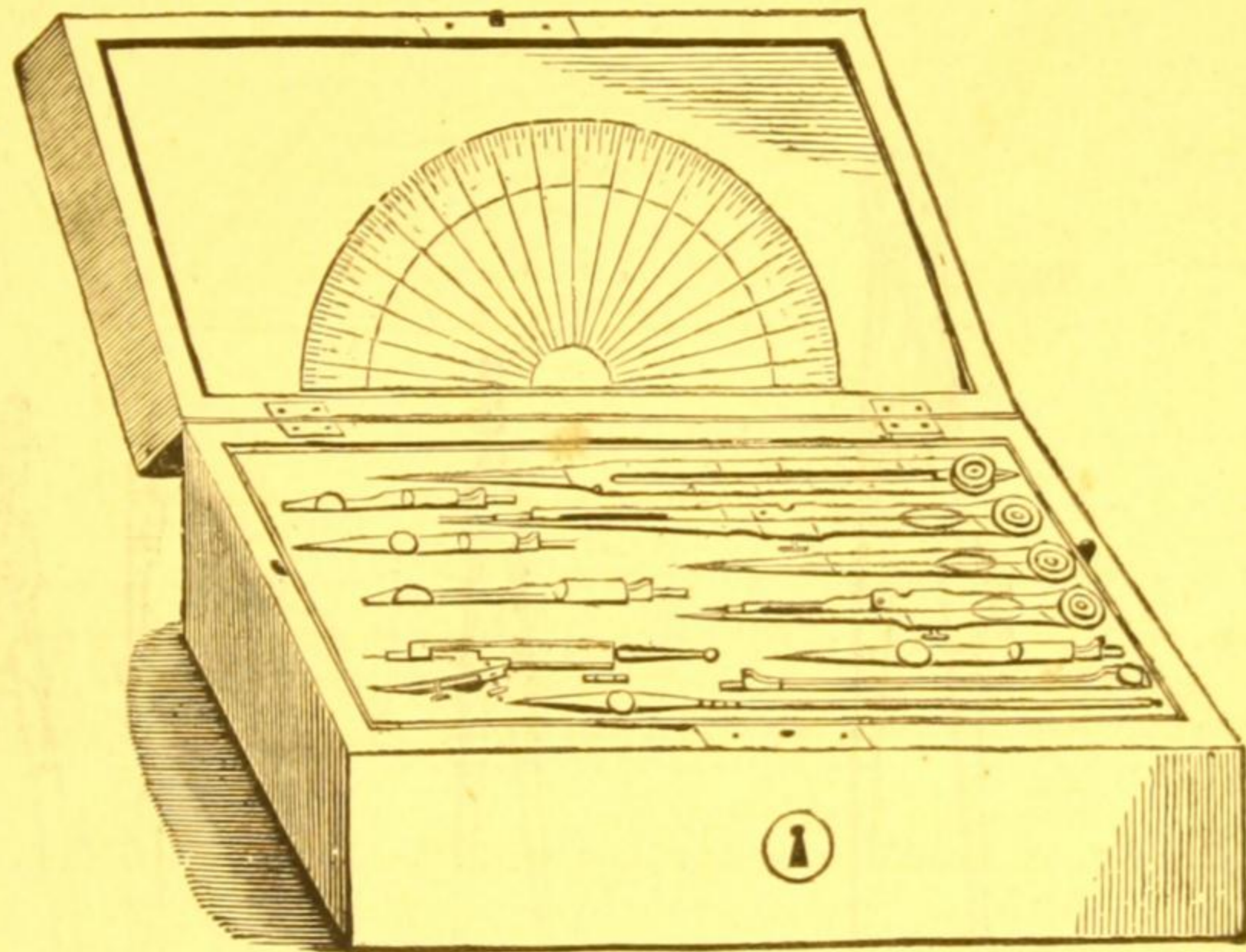
A 76.

- |   |      |
|---|------|
| A. 76. Rosewood Box, with lock and key and the instruments set in a tray, so that colors, etc., may be put below; containing pair of 6-inch Needle-point Dividers with Pen and Pencil Points and Lengthening Bar,<br>Pair of 4½-inch plain Dividers.<br>Pair of 3½-inch Needle-point Dividers, with Pen and Pencil Points.<br>Drawing Pen.<br>Brass Protractor.<br>Horn Protractor, . . . . . | 6.75 |
|---|------|



A 77.

No.	PRICE.
<p><b>A 77.</b> Rosewood Box, with lock and key, the instruments set in a tray, so that colors, etc., may be put below; containing pair of 6-inch Needle-point Dividers, with Pen and Pencil Points and Lengthening Bar.                      Pair of 4½-inch plain Dividers.                      Pair of 3½-inch Needle-point Dividers, with Pen and Pencil Points.                      Spring Bow Pen, with Needle-point.                      Drawing Pen.                      Brass Protractor.                      Horn Protractor,</p>	\$7.50



A 78.

<p><b>A 78.</b> Rosewood Box, with lock and key, the instruments set in a tray, so that colors, etc., may be put below; containing pair of 6-inch Needle-point Dividers, with Pen and Pencil Points and Lengthening Bar.                      Pair of 4½-inch plain Dividers.                      Pair of 3½-inch Needle-point Dividers, with Pen and Pencil Points.                      Spring Bow Pen, with Needle Point.                      Drawing Pen.                      German silver Protractor.                      Horn Protractor.                      Irregular Curve of Wood.                      2 Triangles of Wood.                      Pair Proportional Dividers, 7½ inches long,</p>	10.75
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# GERMAN SILVER INSTRUMENTS.

FOR HIGH SCHOOLS AND COLLEGES.



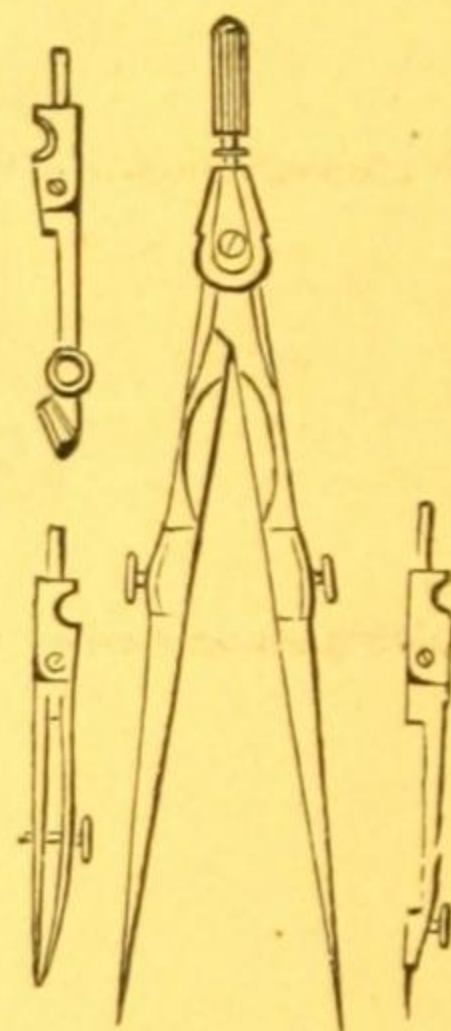
A 80.



A 84.



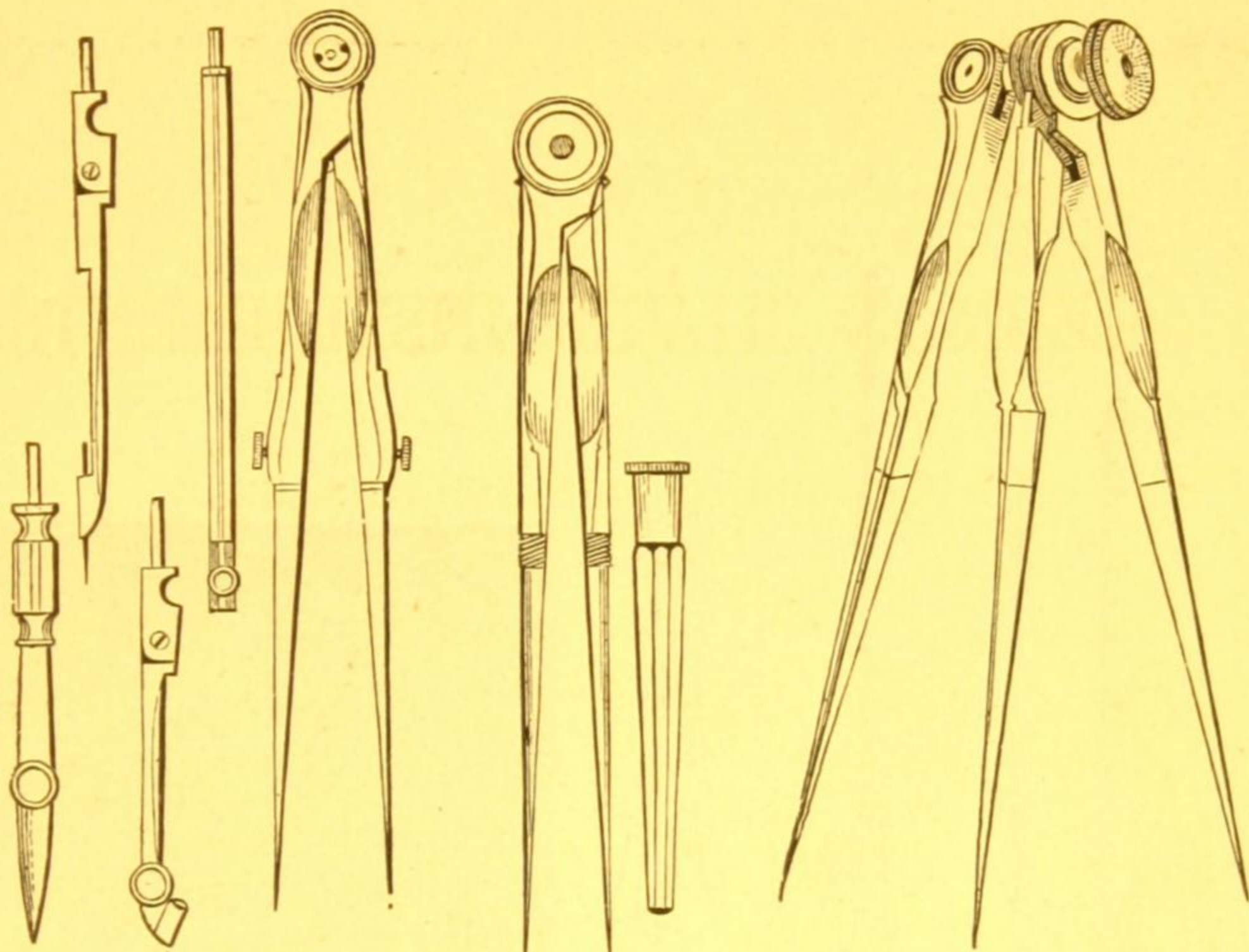
A 87.



A 90.

No.							PRICE.
A 80.	Dividers, German silver,	4 inches long,	steel joints,	.	.	.	\$0.60
A 81.	Do.	do.	5 do.	do.	do.	.	.70
A 82.	Do.	do.	6 do.	do.	do.	.	.90
A 84.	Do.	do.	4 do.	do.	do.	with hair spring,	1.00
A 85.	Do.	do.	5 do.	do.	do.	do.	1.50
A 86.	Do.	do.	6 do.	do.	do.	do.	2.00
A 87.	German silver Plain Dividers,	3 inches long,	with handle,	.	.	.	.60
A 90.	Dividers, German silver,	3 inches long,	with Pen, Pencil, and Needle	.	.	.	2.25
	Points,	.	.	.	.	.	



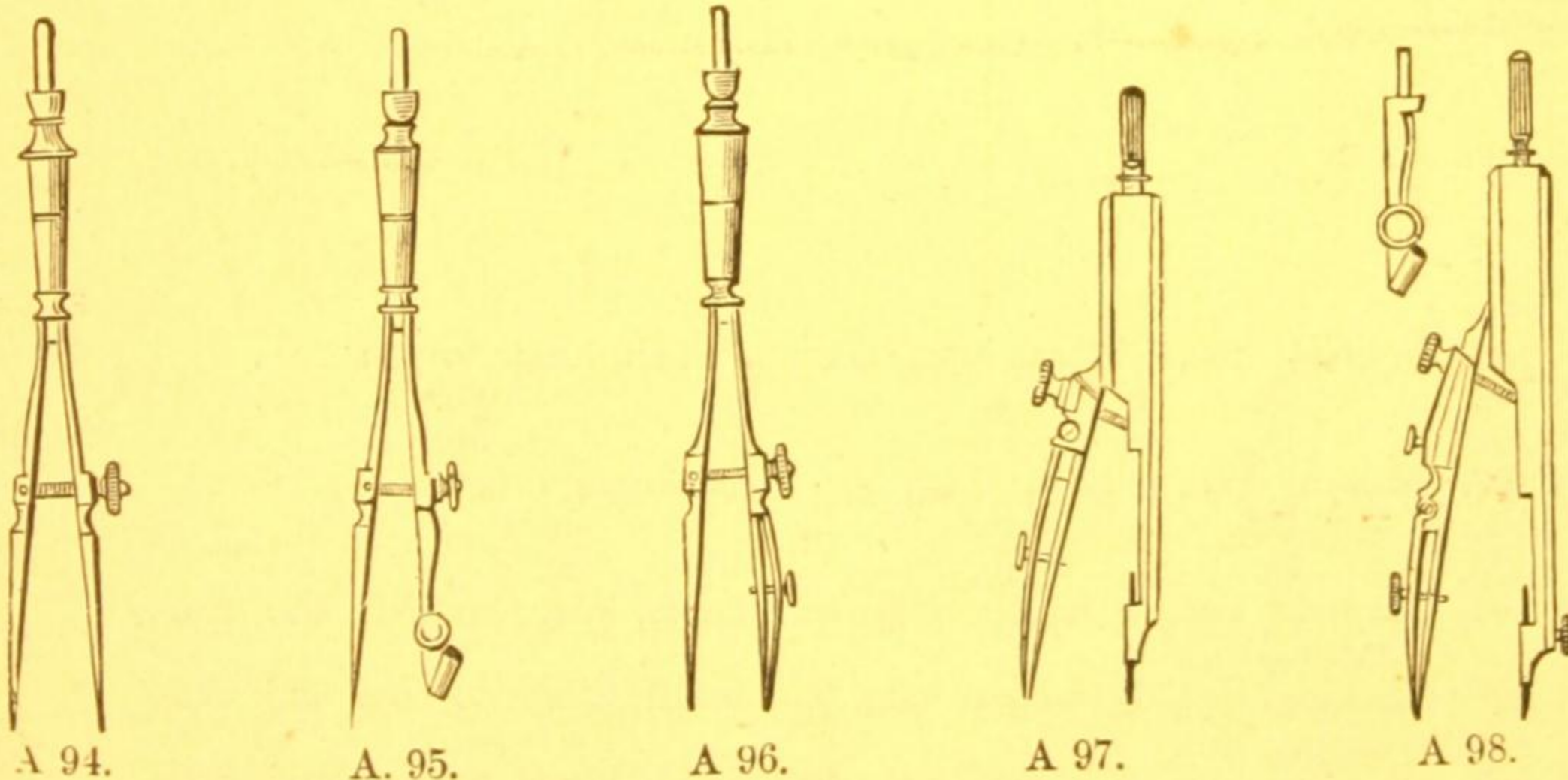


A 91.

A 92.

A 93.

No.	PRICE.
A 91. Dividers, German silver, 6 inches long, steel joints, with Pen, Pencil, and Needle Points and Lengthening Bar,	\$3.00
A 92. Dividers, German silver, 5 inches long, steel joints, with shield for pocket,	1.50
A 93. Dividers, German silver, 5 inches long, steel joints, with three legs,	3.50



A 94.

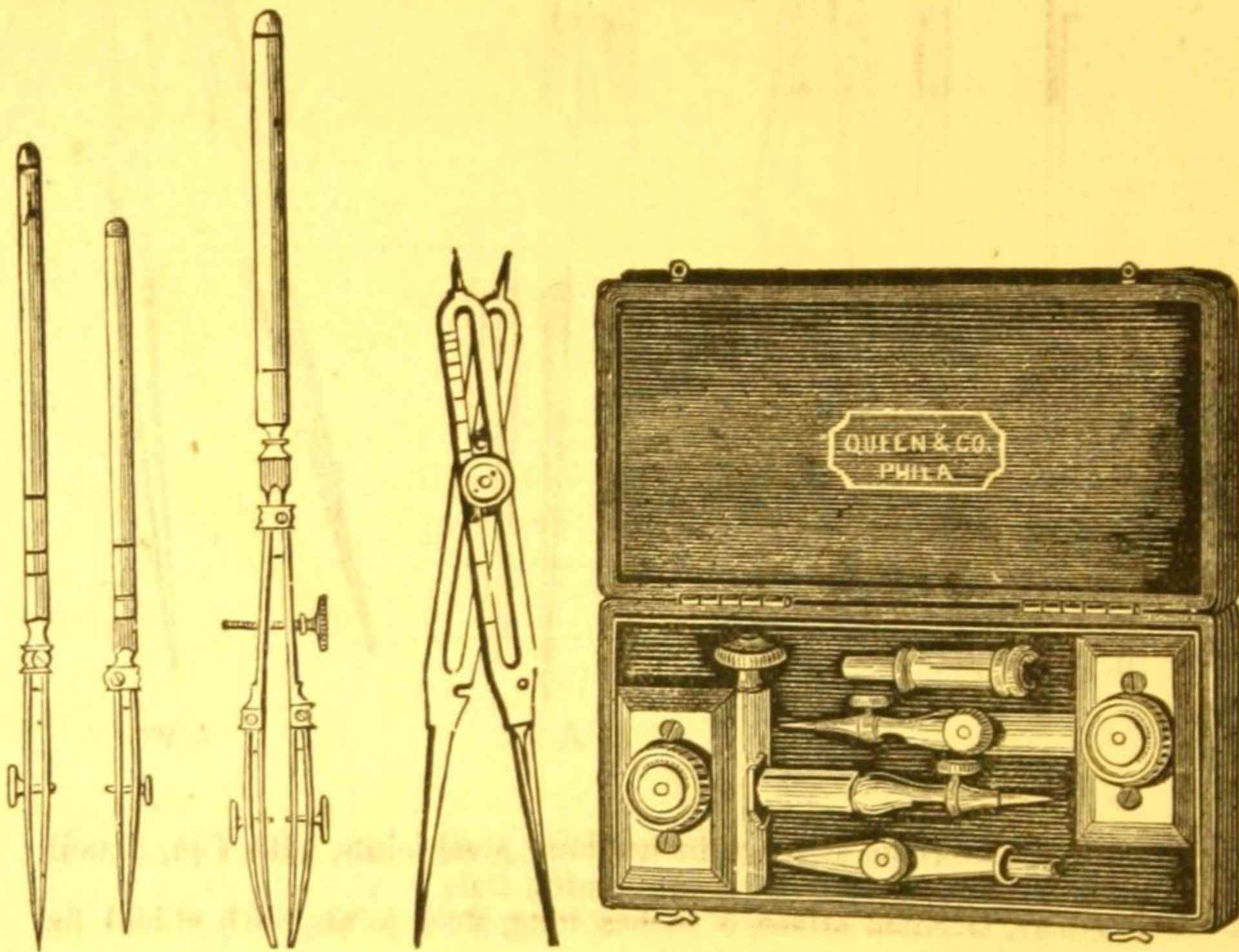
A. 95.

A 96.

A 97.

A 98.

A 94. Spacing Dividers, all steel,	\$1.00
A 95. Bow Pen, all steel,	1.40
A 96. Bow Pencil, all steel,	1.40
A 97. Bow Pen, German silver, with spring and adjusting screw,	1.50
A 98. Bow Pen, German silver, with Pencil Point,	2.10



A 100 to 102.

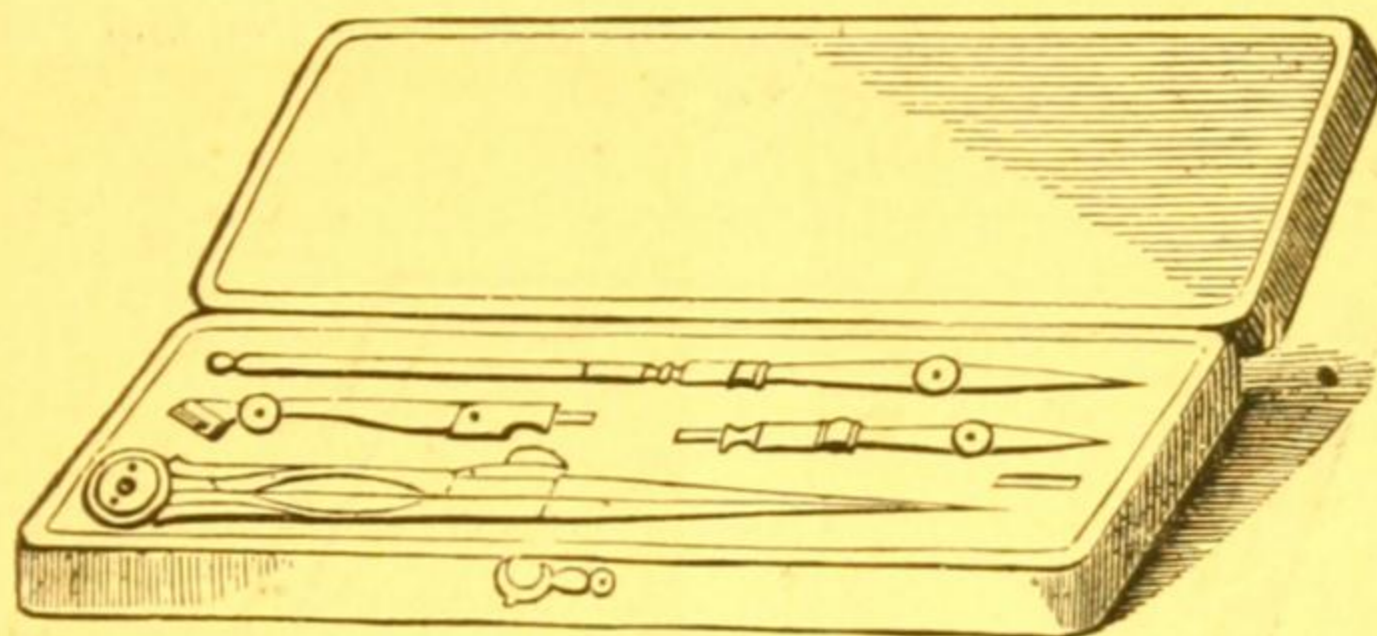
A 110

A 111.

No.		PRICE.
A 100.	Drawing Pen, 4 inches long, medium finish, hinge to pen, . . .	\$0.30
A 101.	Do. 5 do. do. do. . . . .	.35
A 102.	Do. 6 do. do. do. . . . .	.40
A 103.	Drawing Pen, 4 inches long, fine finish, hinge to pen, . . .	.40
A 104.	Do. 5 do. do. do. . . . .	.45
A 105.	Do. 6 do. do. do. . . . .	.50
A 106.	Drawing Pen, 4 inches long, fine finish, hinge to Pen and Pro- tracting Pin, . . . . .	.70
A 107.	Drawing Pen, 5½ inches long, fine finish, hinge to Pen and Pro- tracting Pin, . . . . .	.75
A 108.	Drawing Pen, 6 inches long, fine finish, hinge to Pen and Pro- tracting Pin, . . . . .	.80
A 109.	Drawing Pen, 5½ inches long, German silver Points for Red Ink, . .	.70
A 110.	Proportional Dividers, 6½ inches long, divided for lines, . . . .	2.50
A 111.	Furniture for Beam Compasses, with adjusting screw, in morocco case, . . . . .	5.00

# GERMAN SILVER INSTRUMENTS,

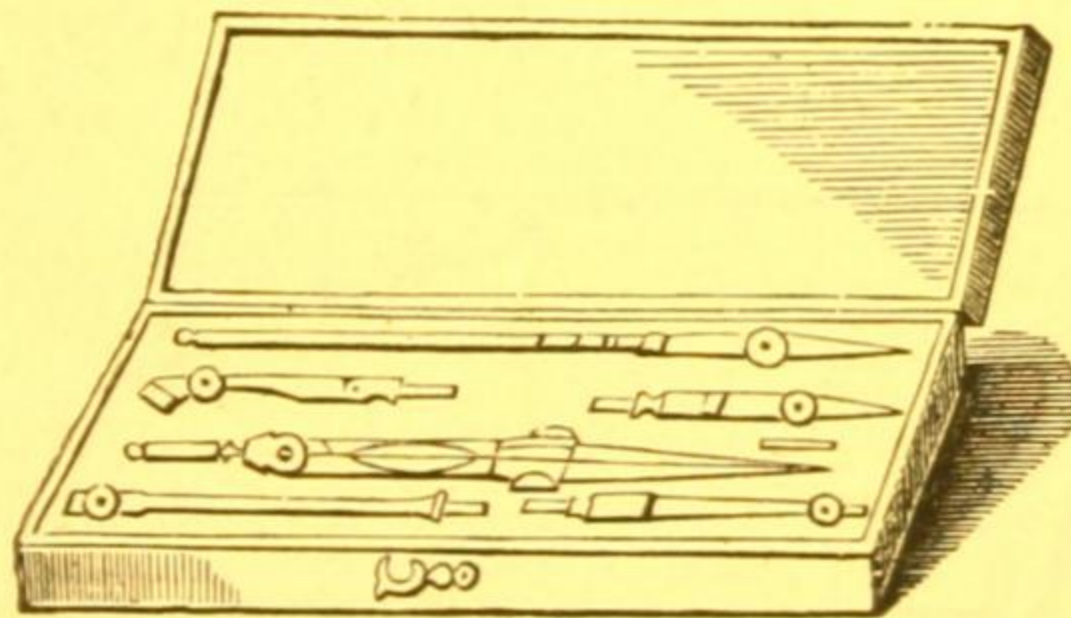
FOR HIGH SCHOOLS AND COLLEGES. IN CASES.



A 120.

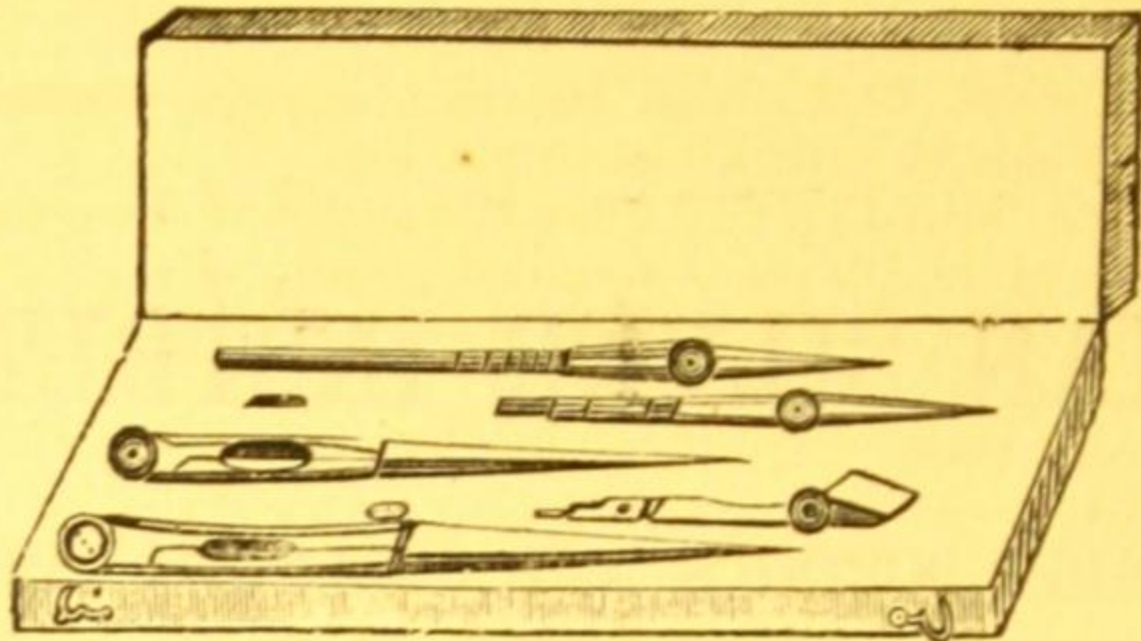
All sets of instruments from No. 100 to 134½ fitted with Fox's Patent Lead Holder, No. 78½, when sold at retail.

No.	PRICE.
A 120. Morocco Box; containing pair of 5½-inch Dividers, with Pen and Pencil Points.	
1 Drawing Pen, No. A 104,	
1 Box Leads, . . . . .	\$3.00



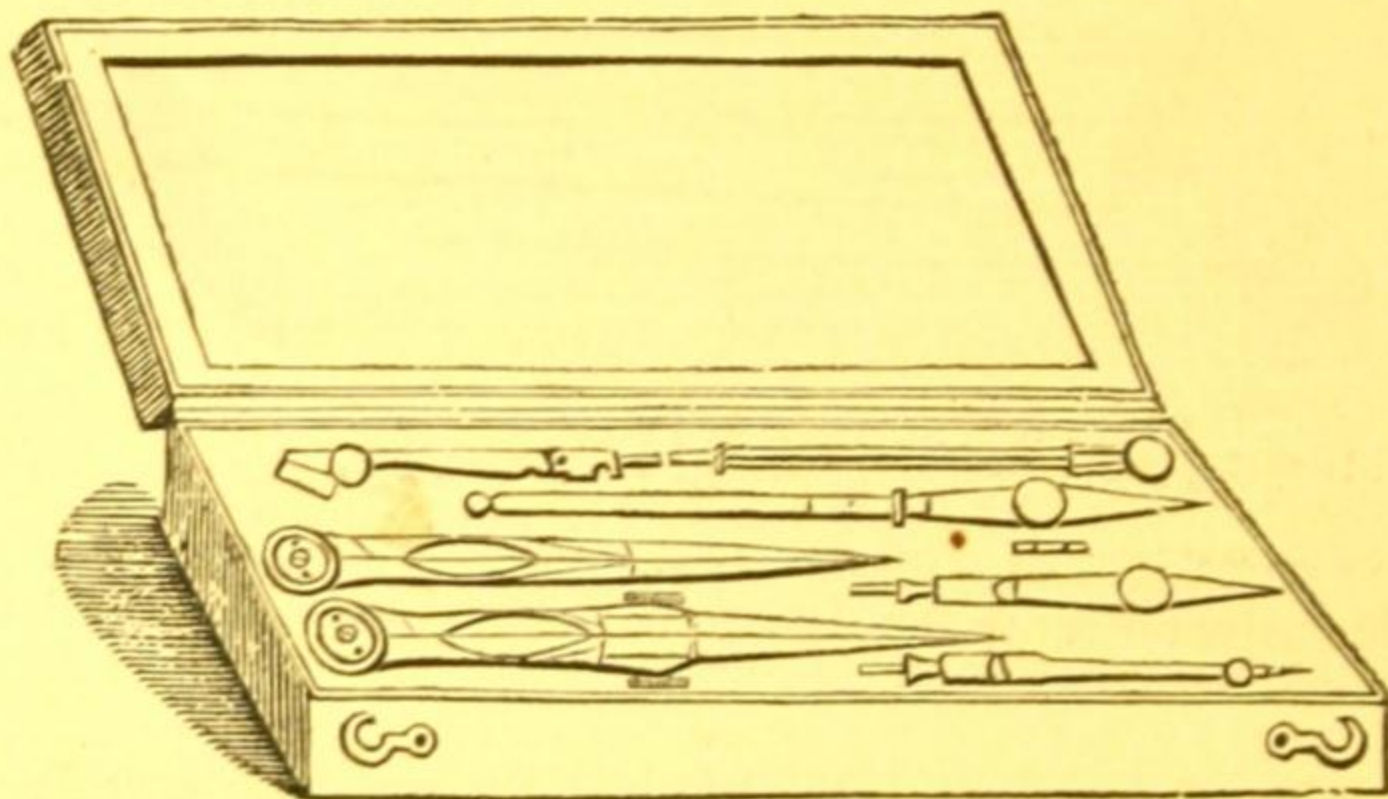
A 121.

A 121. Morocco Box; containing pair of 3-inch Dividers, with Pen, Pencil, and Needle Points and Lengthening Bar. No. A 90.	
1 Pair 3½-inch Plain Dividers,	
1 Drawing Pen, No. A 107,	
1 Box Leads, . . . . .	4.25



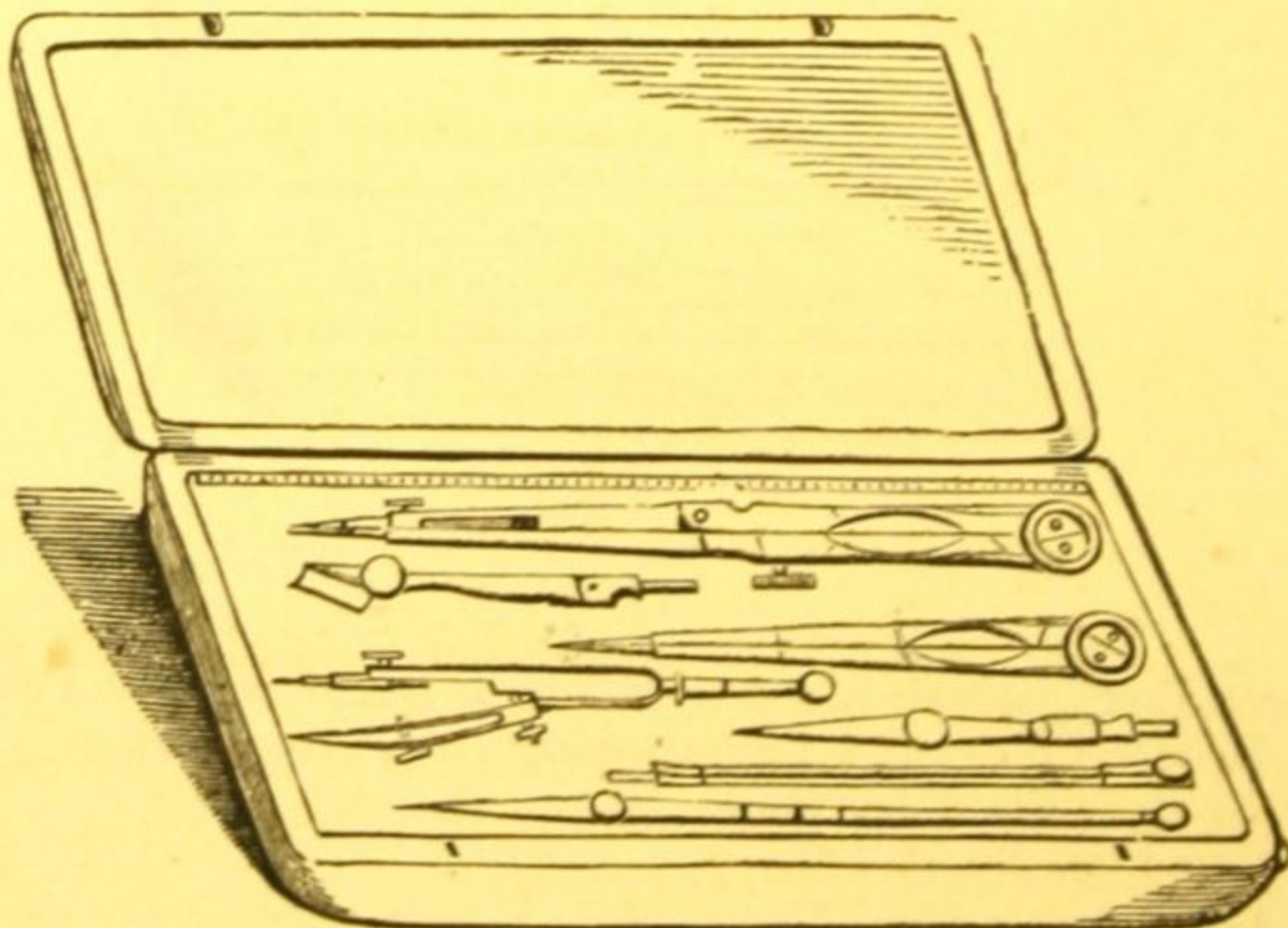
A 122.

- | No.  | PRICE  |
|--|--------|
| <p>▲ 122. Morocco Box; containing 1 pair Dividers, with Pen and Pencil Points,<br/>                     1 pair 5-inch Plain Dividers, No. A 81,<br/>                     1 Drawing Pen, No. A 104,<br/>                     1 Box Leads, . . . . .</p> | \$3.25 |



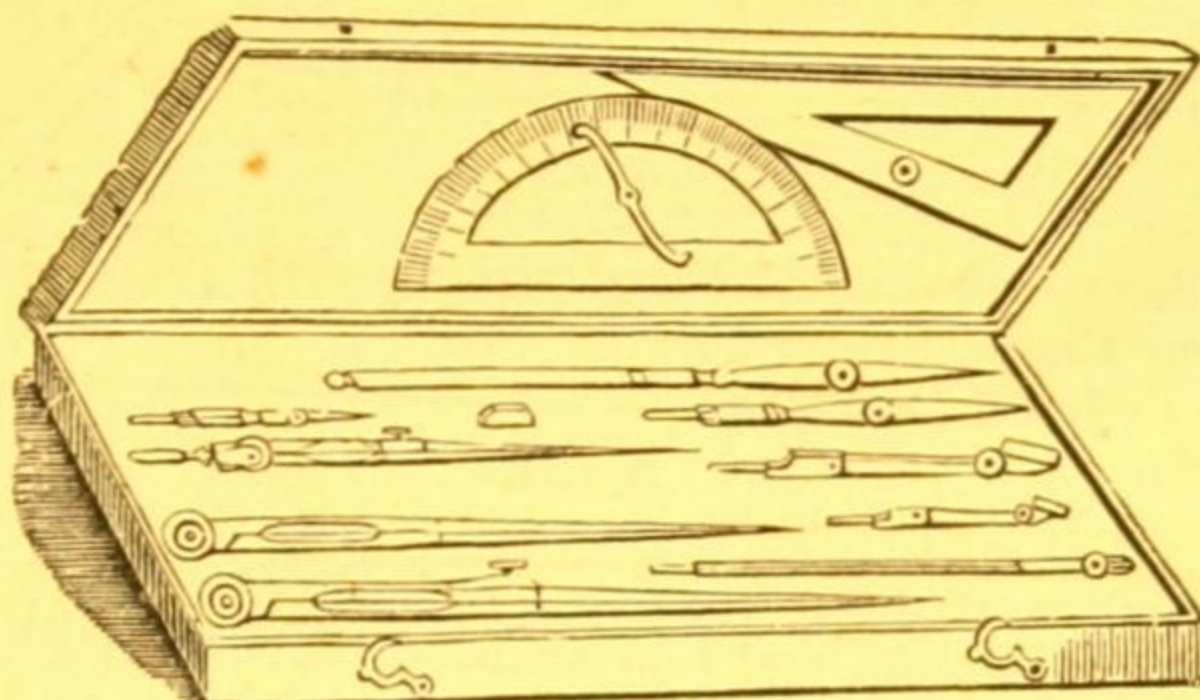
A 123.

- |   |      |
|---|------|
| <p>▲ 123. Morocco Box; containing 1 pair Dividers, 6 inches long, with Pen,<br/>                     Pencil and Needle Point, and Lengthening Bar, No. A 91,<br/>                     1 pair Plain Dividers, No. A 81,<br/>                     1 Drawing Pen, No. A 107,<br/>                     1 Box Leads, . . . . .</p> | 4.50 |
| <p>▲ 124. Same as No. A 123; but with Polished Walnut Box, with lock and<br/>                     key and tray, . . . . .</p>   | 7.00 |



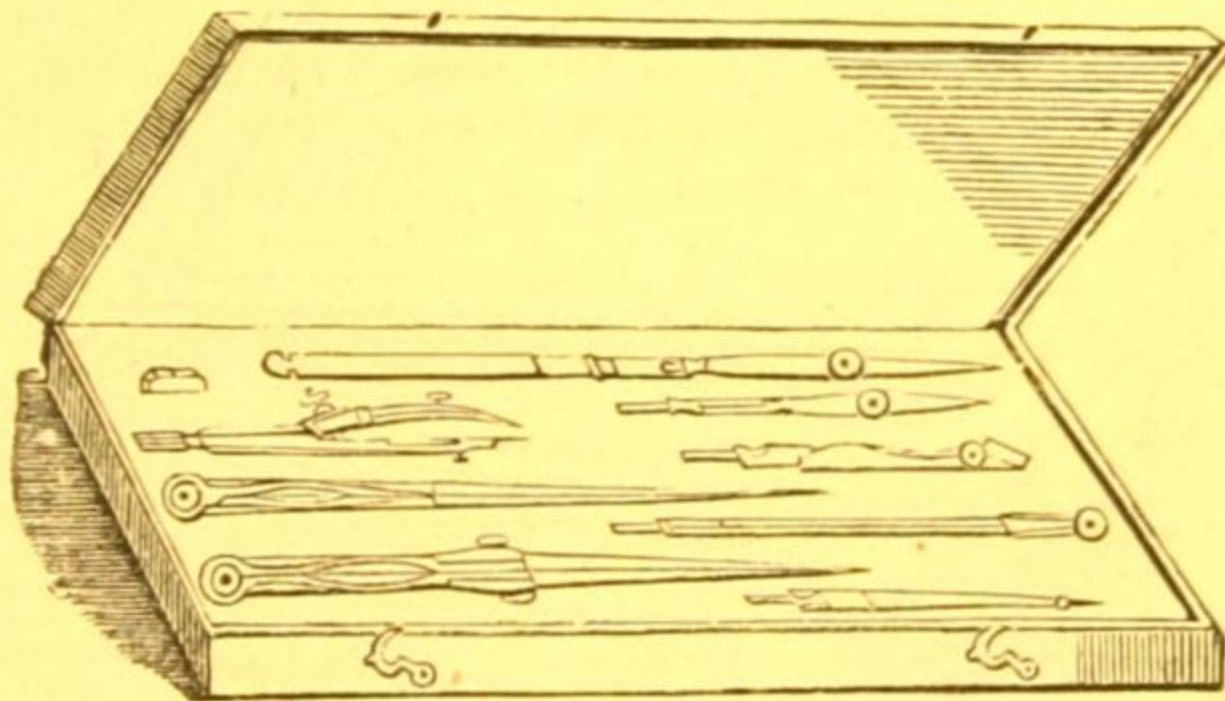
A 125.

- | No.  | PRICE. |
|--|--------|
| A 125. Morocco Pocket Case, with rounded corners, containing 1 pair<br>$4\frac{1}{4}$ inch Dividers, with hinge in one leg,<br>Needle Points, with Pen and Pencil Points, and Lengthening Bar,<br>1 pair 4-inch plain Dividers, rounded points,<br>1 Spring Bow Pen, Needle Point,<br>1 Drawing Pen, No. A 106,<br>1 5-inch Ivory Rule, divided to eighths,<br>1 Box Leads | \$7.00 |



A 126.

- |  |       |
|--|-------|
| A 126. Morocco Box; containing 1 pair $5\frac{1}{2}$ -inch Dividers, with Pen and<br>Pencil Points and Lengthening Bar, No. A 91,<br>1 pair 3-inch Dividers, with Pen and Pencil Points,<br>1 pair 5-inch Plain Dividers, No. A 81,<br>1 Drawing Pen, No. A 107,<br>1 German silver Protractor,<br>1 German silver Square,<br>1 Box Leads, | 8.00  |
| A 127. Same as No. A 126; but with Polished Walnut Box, with lock and<br>key, and tray,  | 10.00 |



A 128.

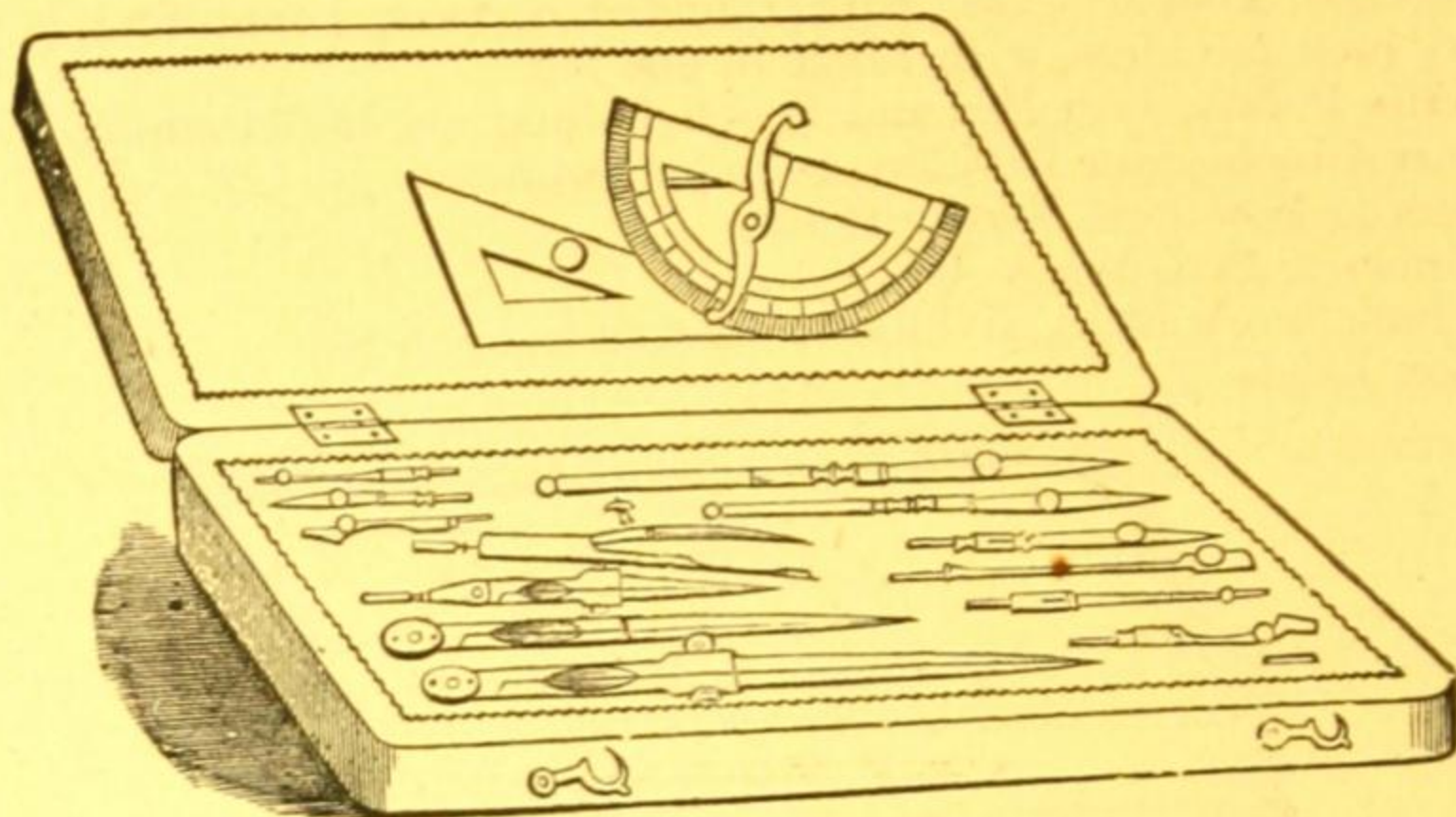
- |  |      |
|--|------|
| A 128. Morocco Box; containing 1 pair $5\frac{1}{2}$ -inch Dividers, with Pen, Pencil,<br>and Needle Points, and Lengthening Bar, No. A 91,<br>1 pair 5-inch Plain Dividers, No. A 81,<br>1 Spring Bow Pen, No. A 97,<br>1 Drawing Pen, No. A 107,<br>1 Box Leads,   | 6.00 |
| A 129. Same as No. A 128; in Polished Walnut Box, with lock, and key,<br>and tray,   | 8.50 |
| A 130. Morocco Box; containing 1 pair 6-inch Dividers, with Pen, Pencil,<br>and Needle Points, and Lengthening Bar, No. A 91,<br>1 pair 5-inch Plain Dividers, No. A 81,<br>1 pair Spacing Dividers, No. A 94,<br>1 Bow Pen, No. A 69,<br>1 Bow Pencil, No. A 95,<br>1 Drawing Pen, No. A 104,<br>1 Box Leads, | 9.50 |

Price  
Points,

\$3.25

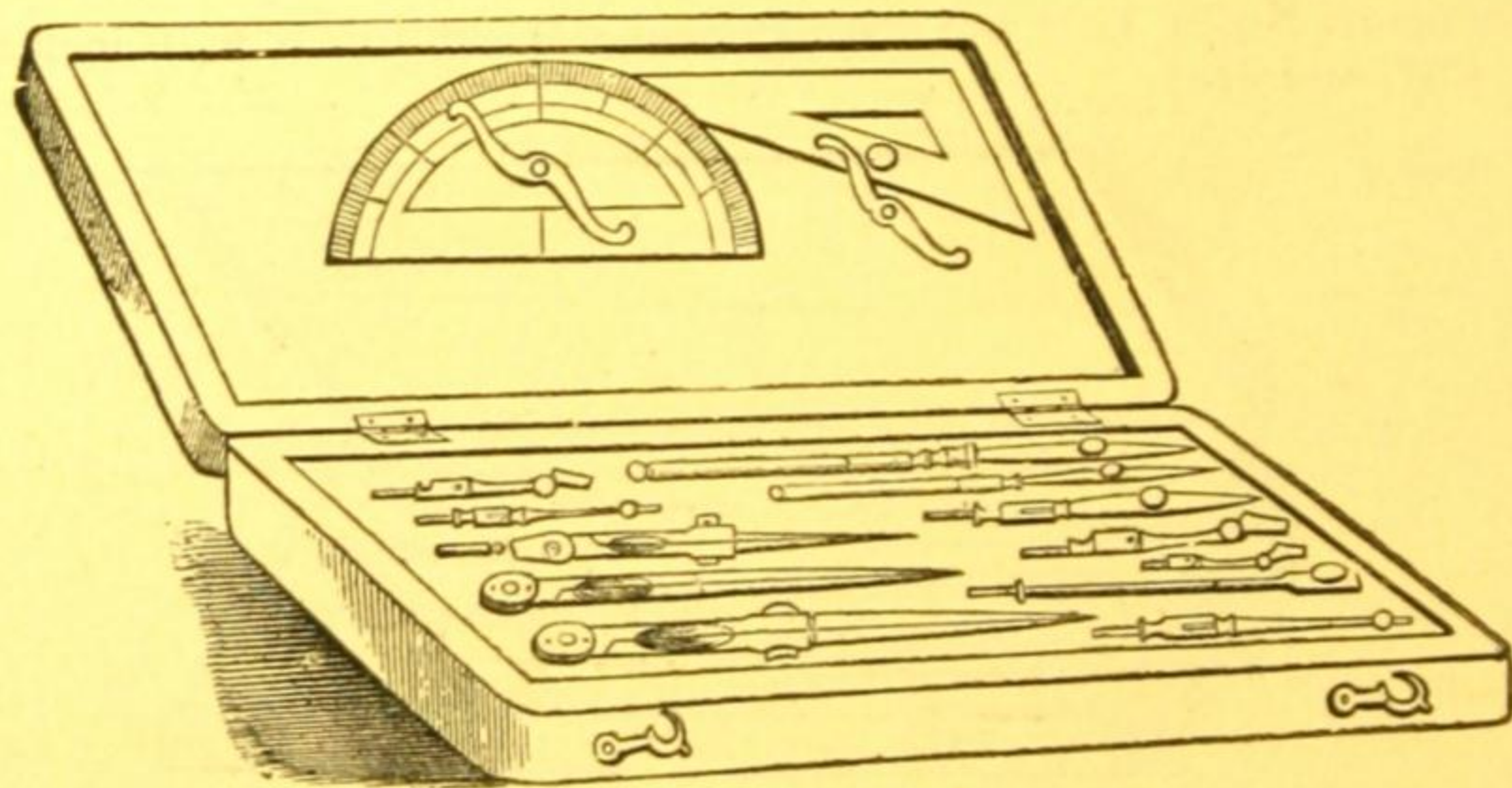
4.50

7.00



A 131.

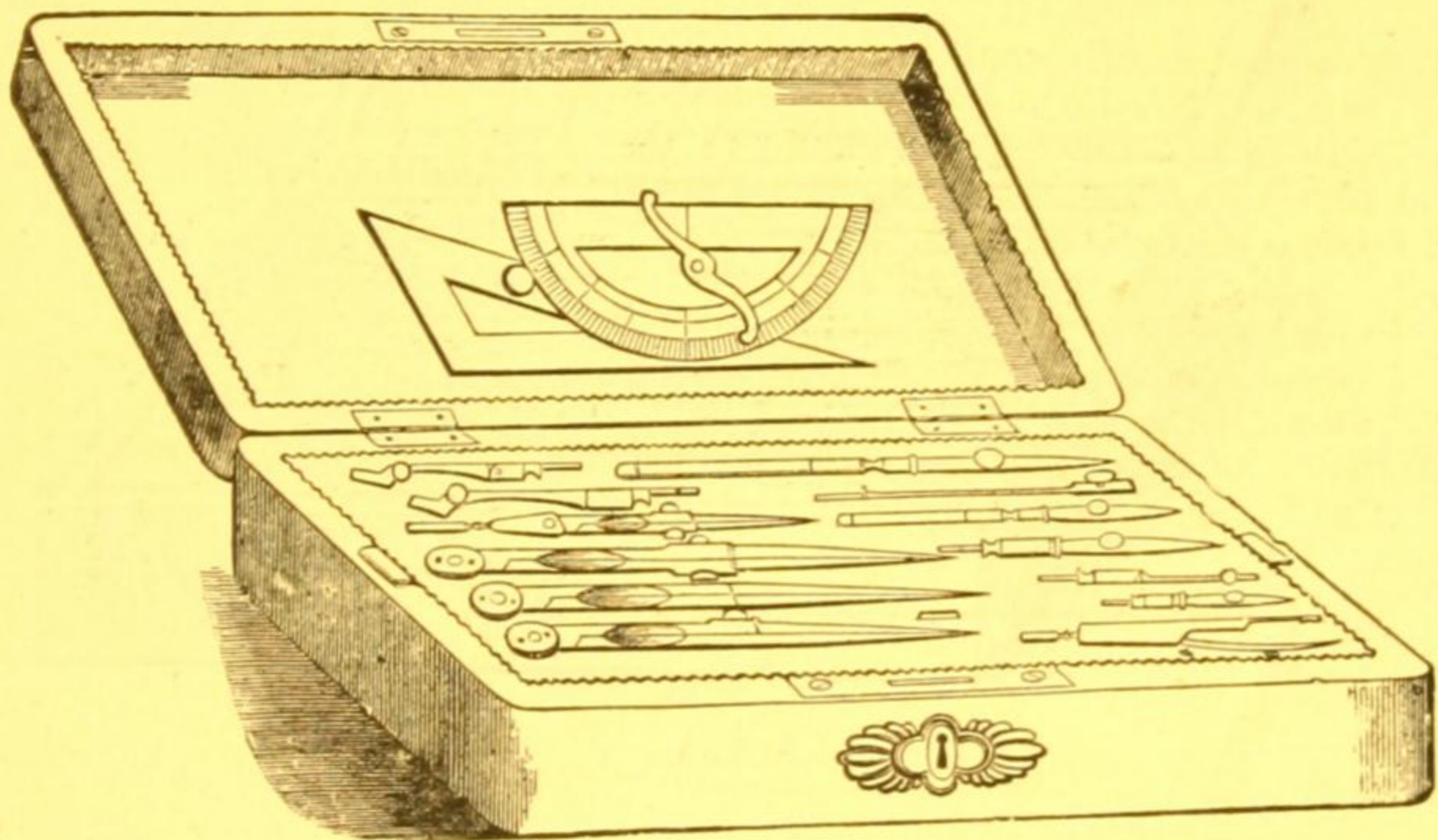
- | No.  | PRICE |
|--|-------|
| A 131. Morocco Box; containing 1 pair 5½-inch Dividers, with Pen, Pencil, and Needle Points, and Lengthening Bar, No. A 91,<br>1 pair 5-inch Plain Dividers, No. A 81,<br>1 pair 3-inch Dividers, with Pen, Pencil, and Needle Point, No. A 90,<br>1 Drawing Pen, No. A 106,<br>1 do do do. 107,<br>1 German silver Protractor,<br>1 German silver or Rubber Square,<br>1 Box Leads, | 29.00 |
| A 132. Same as No. A 131, in Polished Walnut Box, with lock and key and tray,  | 11.00 |



A 133.

- |  |       |
|--|-------|
| A 133. Polished Walnut Box; containing pair of 5½-inch Dividers, with Pen, Pencil, Needle Point, and Lengthening Bar, No. A 91.<br>1 pair 5-inch Plain Dividers, No. A 81,<br>1 pair 3-inch Dividers, Pen, Pencil, and Needle Point, No. A 90,<br>1 Spring Bow Pen, No. A 97,<br>1 Drawing Pen, 4-inch, No. A 106,<br>1 do do. 5½-inch, No. A 107,<br>1 German silver or Rubber Square,<br>1 German silver Protractor,<br>1 Box Leads, | 11.75 |
| A 134. Same as No. A 133, in Polished Walnut Box, with lock and key and tray,  | 12.75 |

No.	PRICE.
A 135. Polished Walnut Box; containing 1 pair of 5½-inch Dividers, with Pen, Pencil, and Needle Points, and Lengthening Bar. No. A 91, 1 pair 5-inch plain Dividers No. A 81, 1 pair 5-inch Hair Spring Dividers, No. A 85, 1 pair 3-inch Dividers, Pen, Pencil, and Needle Points, No. A 90, 1 Spring Bow Pen, No. A 97, 1 Drawing Pen, 4½-inch, No. A 106, 1 do. do 5½-inch, No. A 107, 1 German silver or Rubber Square, 1 German silver Protractor, . . . . .	\$12.00



A 136.

A 136. Same as No. A 135, but with tray and lock and key. . . . .	14.50
A 137. Polished Walnut Box, with lock and key and tray; containing 1 pair of 6-inch Dividers, with Pen, Pencil, and Needle Points, and Lengthening Bar, No. A 91, 1 pair 5-inch Plain Dividers, No. A 81, 1 pair 5-inch Hair Spring Dividers, No. A 85, 1 pair 3-inch Dividers, with Pen, Pencil, and Needle Points, No. A 90, 1 Bow Pen, No. A 97, 1 Drawing Pen, 4½ inch, No. A 106, 1 do. do. 5½-inch, No. A 107, 1 Red Ink Pen, No. A 109, 1 Road Pen, 1 Pair Proportionals, No. A 110, 1 Protractor, 1 Triangle, 1 Boxwood Triangular Scale, 12 inches long, . . . . .	24.50

PRICE

29.00

11.00

ers, with

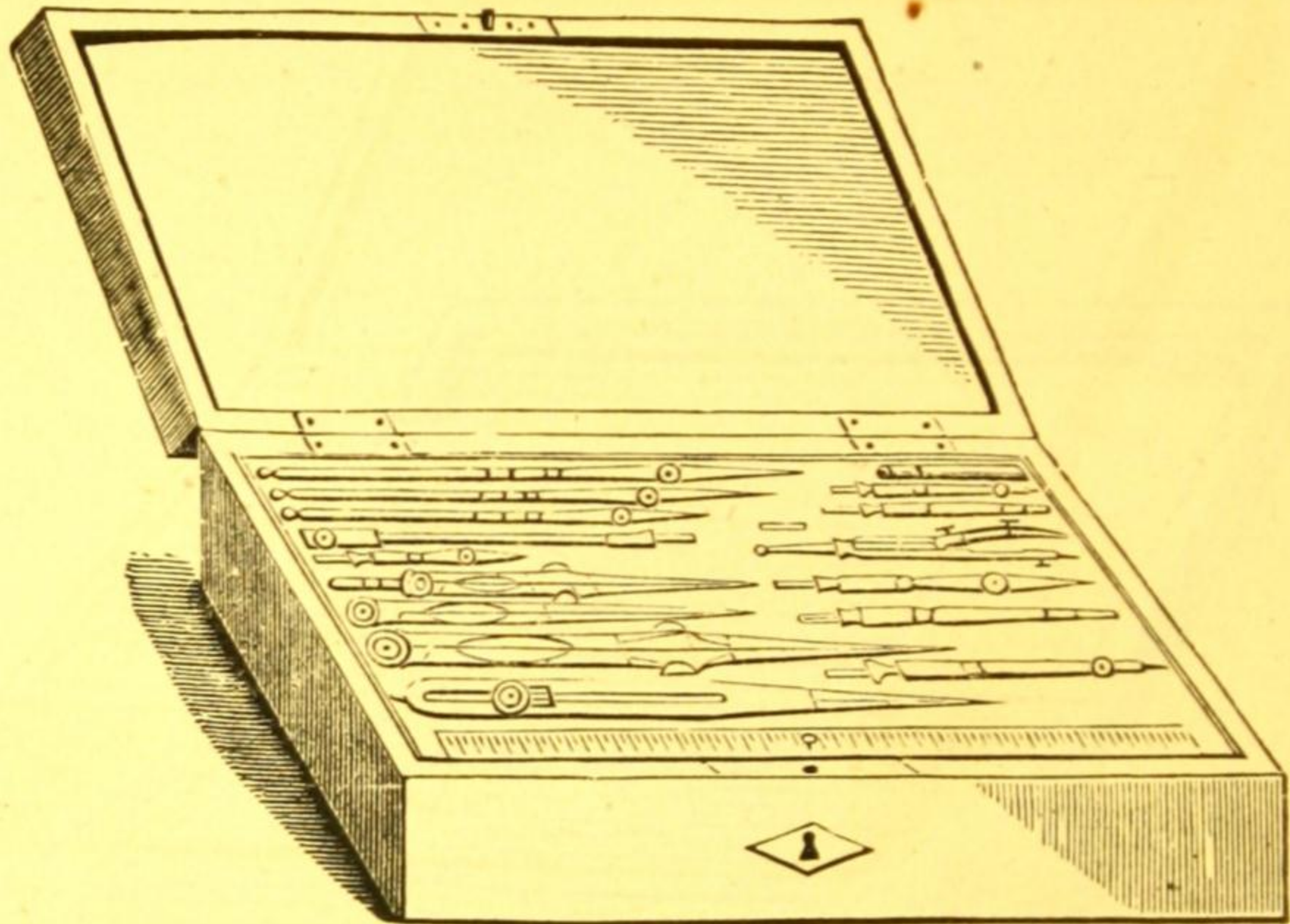
l.

A 90,

11.75

and key and

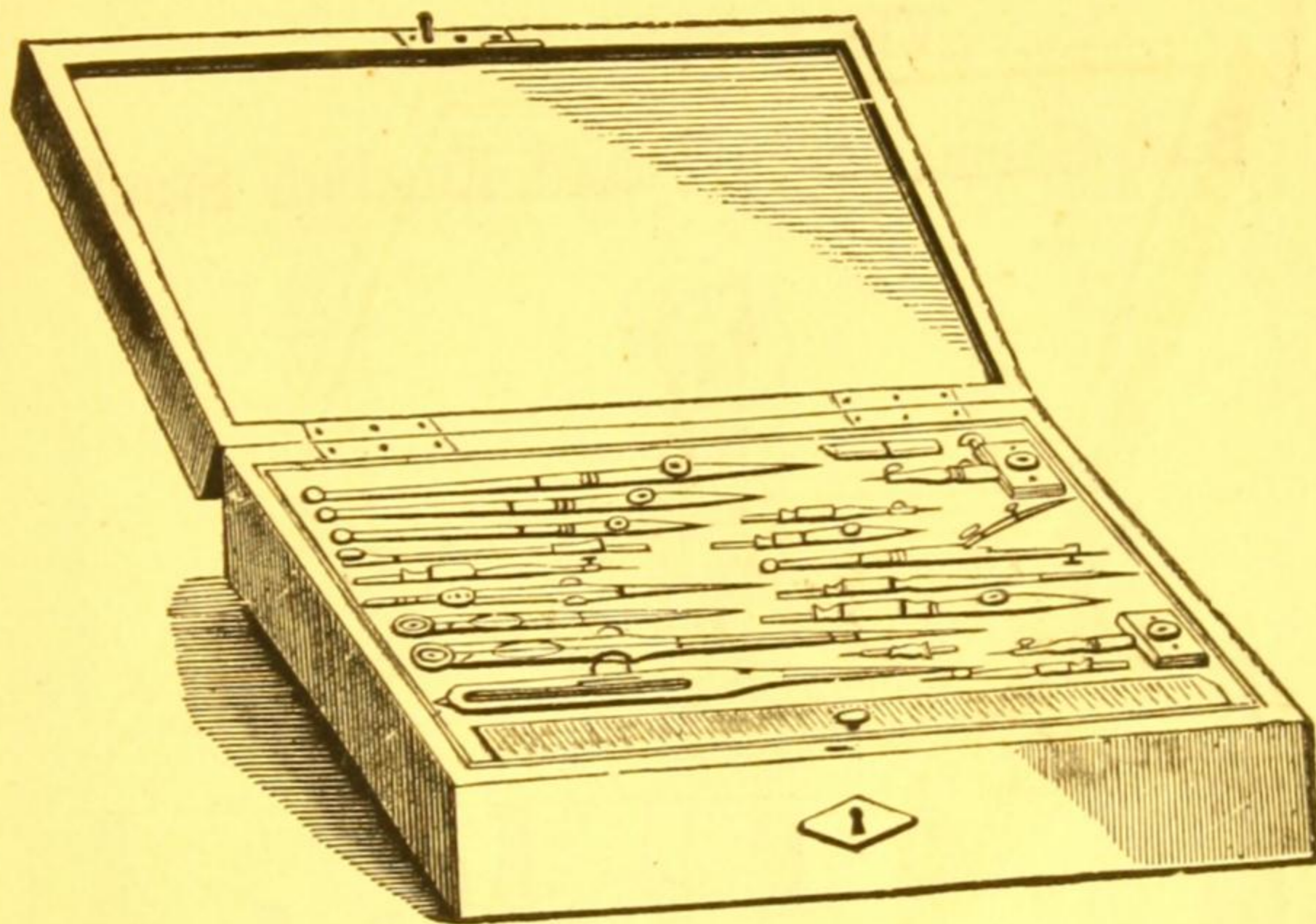
12.75



A 138.

No.	PRICE
A 138. Polished Rosewood Box, inlaid, lock and key, with tray, leaving space below for paints, rules, etc.; containing pair 6½-inch Needle-point Dividers, with Pen and Pencil Points and Lengthening Bar, Pair of 4½-inch plain Dividers, Pair of 4-inch Needle-point Dividers, with Pen and Pencil Points, Pair of 7-inch Proportional Dividers, 3 Drawing Pens, Horn Protractor, 1 Wood Curve and 2 Wood Squares, Spring Bow Pen, Ivory Rule, 8 inches long, . . . . .	\$27.00





A 139.

PRICE

- No. A 139. Polished Rosewood Box, inlaid, with brass edges, lock and key, with tray, leaving space below for paints, rules, etc.; containing pair of 6-inch Needle-point Dividers, with Pen and Pencil Points and Lengthening Bar,  
 Pair of 4½-inch Dividers, rounded points,  
 Pair of 4-inch Dividers, Needle Points, with Pen and Pencil Points,  
 Pair of 7½-inch Proportional Dividers,  
 Spring Bow Pen, Needle Point,  
 3 Drawing Pens,  
 Furniture for Beam Compass, with Micrometer Screw,  
 9-inch Horn Protractor,  
 Ivory Scale, 8 inches long, one edge divided to inches and eighths, the other to centimeters and millimeters, . . . . . \$34.00

Pair  
 tray, leaving  
 6-inch Needle-  
 Lengthening Bar,  
 Pencil Points,

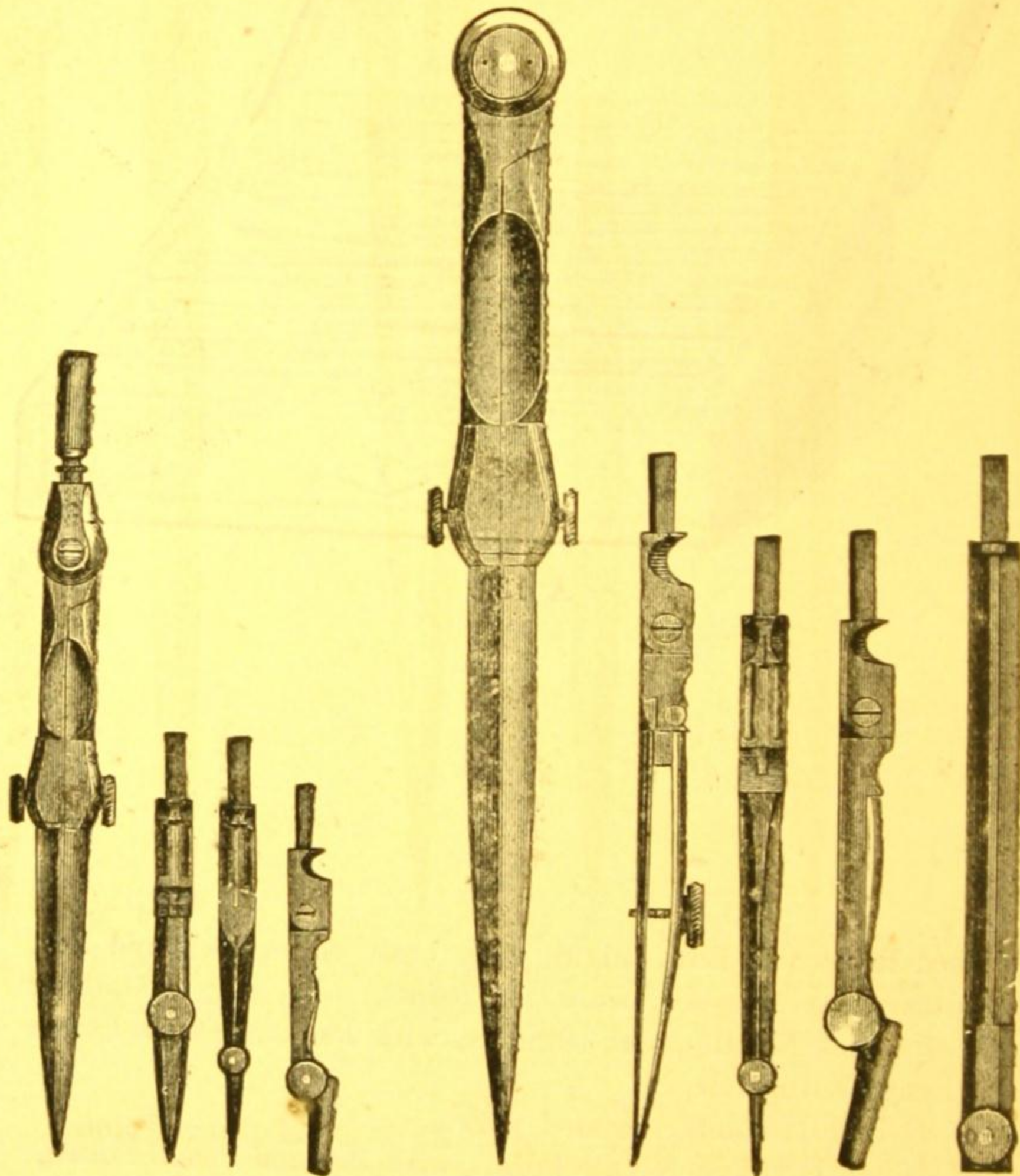
\$27.00

# GERMAN-SILVER INSTRUMENTS.

FOR ENGINEERS, ARCHITECTS, AND MECHANICAL DRAUGHTSMEN

VERY BEST MAKE.

Best German-Silver and English Steel.

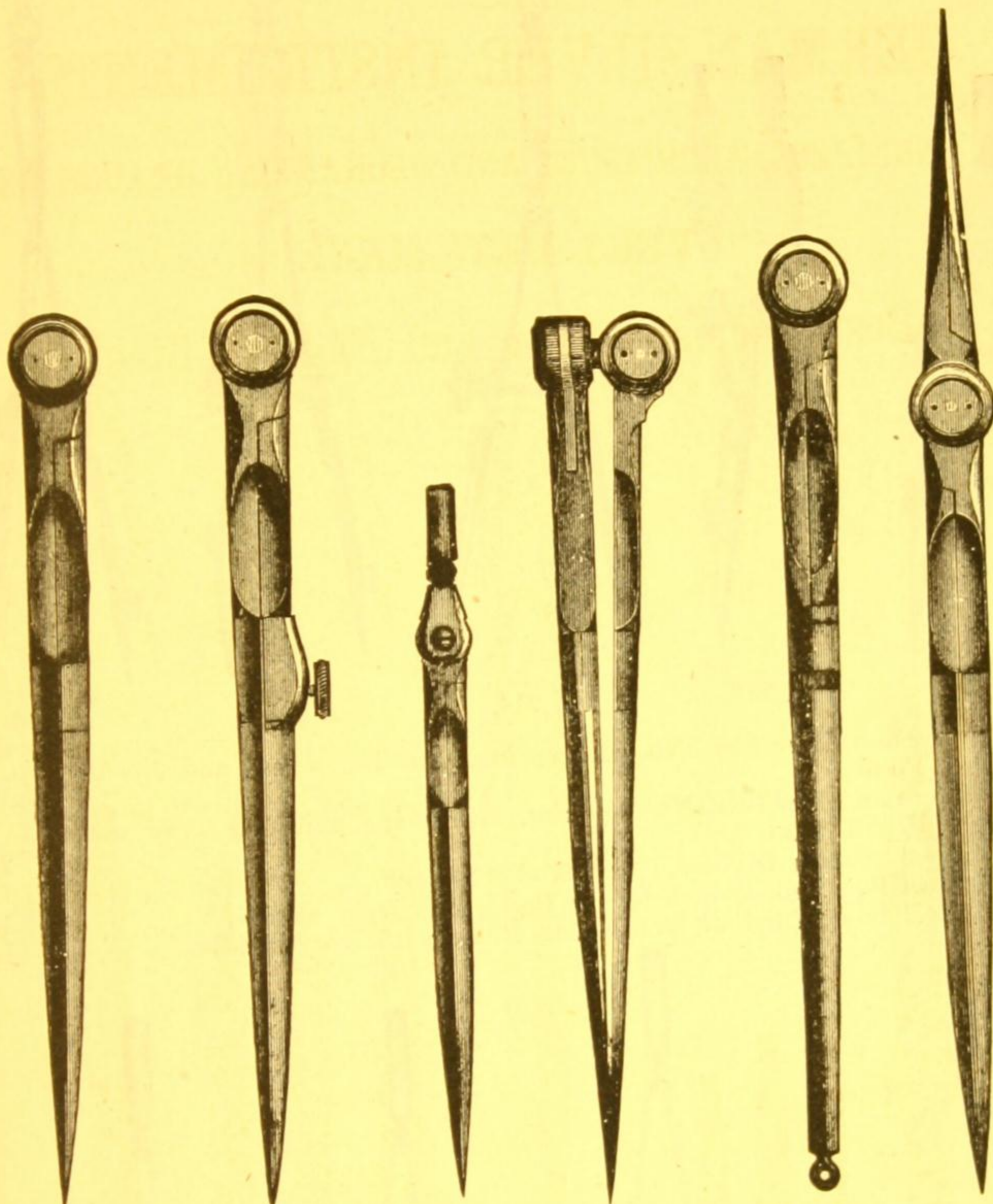


A 200.

A 201.

No.		PRICE
A 200.	Dividers $3\frac{1}{2}$ inches long; steel joints, with Pen, Pencil, and Needle Point,	\$2.75
A 201.	Dividers, 6 inches long; steel joints, with Pen, Pencil, Needle Point, and Lengthening Bar,	3.75

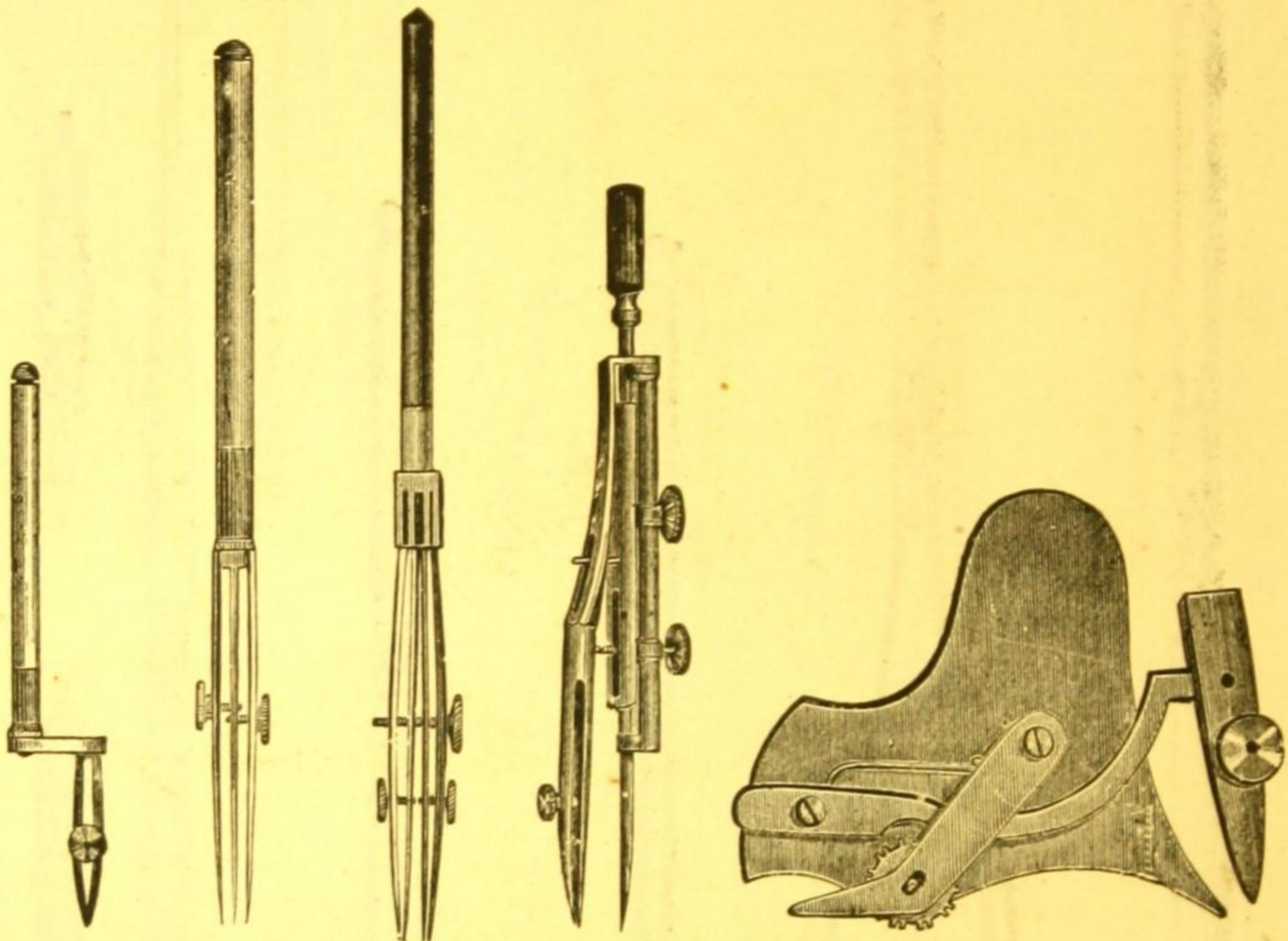
No.  
 A 202.  
 A 203.  
 A 204.  
 A 205.  
 A 206.  
 A 207.  
 A 208.  
 A 209.  
 A 210.  
 A 211.



A 202.-A 204. A 205.-A 207. A 208. A 210. A 209. A 211.

No.	Description	PRICE.
A 202.	Dividers, 4 inches long, steel joints,	\$0.70
A 203.	Do. 5 do. do.	.85
A 204.	Do. 6 do. do.	1.00
A 205.	Dividers, with hair spring, 4 inches long, steel joints,	1.25
A 206.	Do. do. 5 do. do.	1.75
A 207.	Do. do. 6 do. do.	2.00
A 208.	Dividers, plain, 3 inches long, with handle,	1.00
A 209.	Pocket Dividers, with sheath,	1.75
A 210.	Triangular Dividers,	3.75
A 211.	Bisecting or Whole and Half Dividers, 6½ inches,	2.75

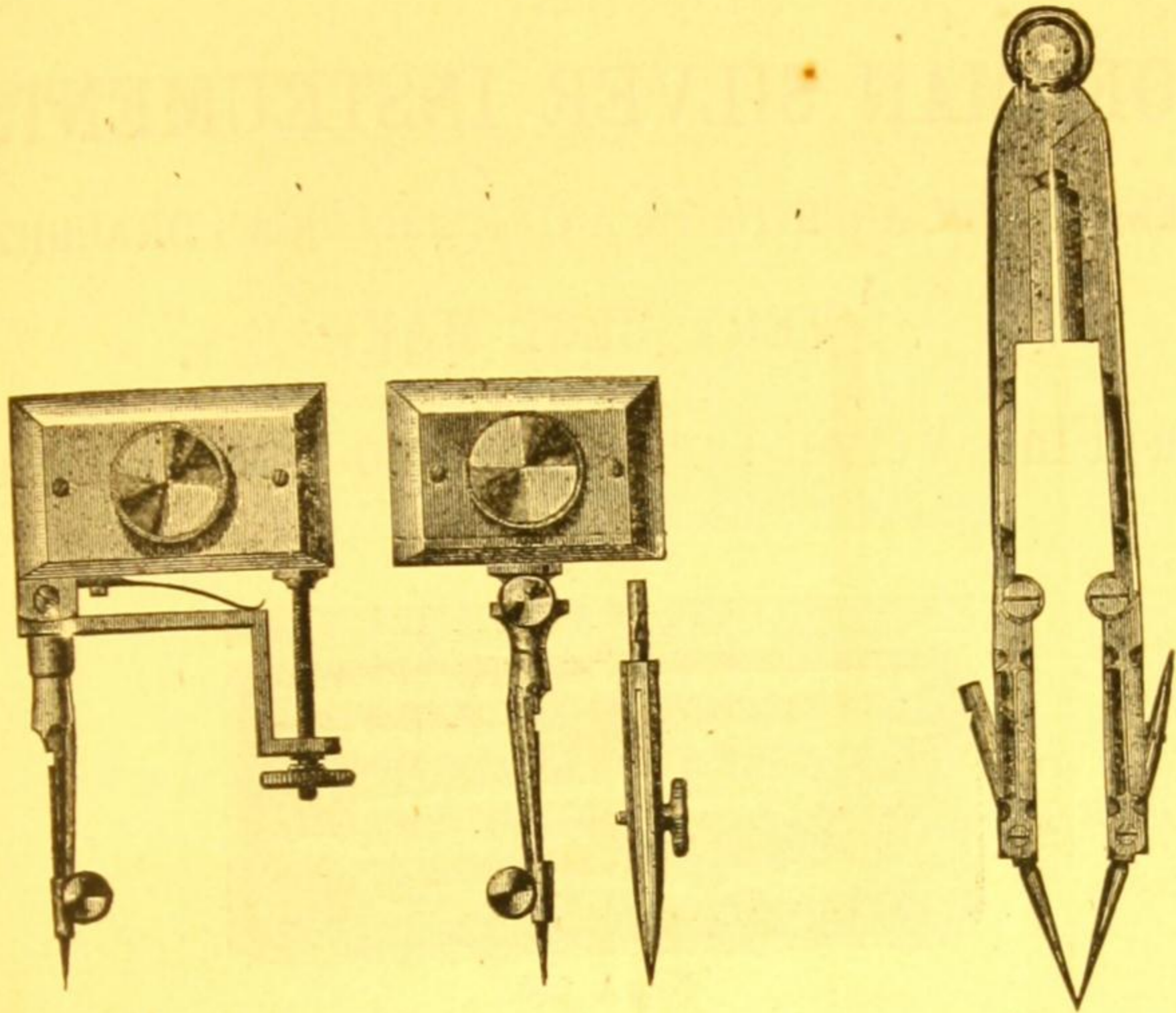
WTS.  
 UGHTSMEN  
 eel.  
 and Needle  
 Needle Point,



A 237.      A 238.      A 239.      A 240.      A 241.

No.	PRICE.
A 237. Drawing Pen for Curves, . . . . .	\$1.50
A 238. Drawing Pen for Heavy Border Lines, . . . . .	2.50
A 239. Patent Double Drawing Pen. Will draw with one stroke one broad or two parallel lines, . . . . .	3.75
A 240. Improved Bow Pen. The needle point in this pen being adjustable, it will draw extremely minute circles, . . . . .	3.00
A 241. Dotting Instrument, with 3 extra wheels, . . . . .	3.75

This instrument answers the purpose of making dotted lines better than any yet made. It consists of a small, conveniently shaped German silver plate, upon which is fastened a pen connected by a small bar, and a ratchet movement with a rolling wheel. The bar is kept in its place by a small spring. Extra wheels of different patterns accompany the instrument, which, being readily changed, allow the making of various forms of lines.



A 242.

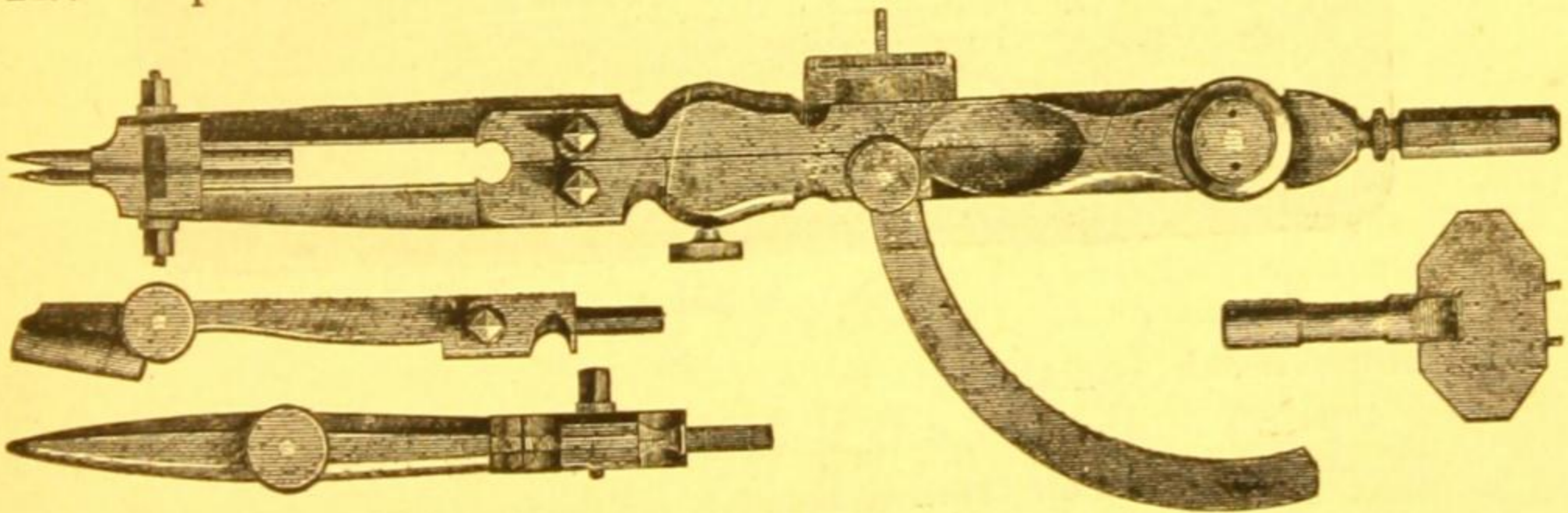
A 246.

No.	PRICE.
A 242. Beam Compasses to fit on straight edge, with 2 Points, Pencil, and Needle Point, . . . . .	\$9.00
A 243. Do. do. with wheel attachment to stand alone, . . . . .	11.00
A 244. Beam Compasses, McCord's pattern, with two Points, Pen, Pencil, and Needle Point, . . . . .	14.00
A 245. Do. do. with wheel attachment to stand alone, . . . . .	16.50
A 246. Pocket Compass with handles and folding points, . . . . .	5.00



A 247.

A 247. Proportional Dividers, 6½-inch, finely divided for lines and circles, . . . . .	7.00
--	------



A 248.

A 248. Lithographic Dividers, heavy, with arc set-screw, and micrometer adjustment 8-inch, with Pen, Pencil Point, Lengthening Bar, and Wrench Key, . . . . .	13.00
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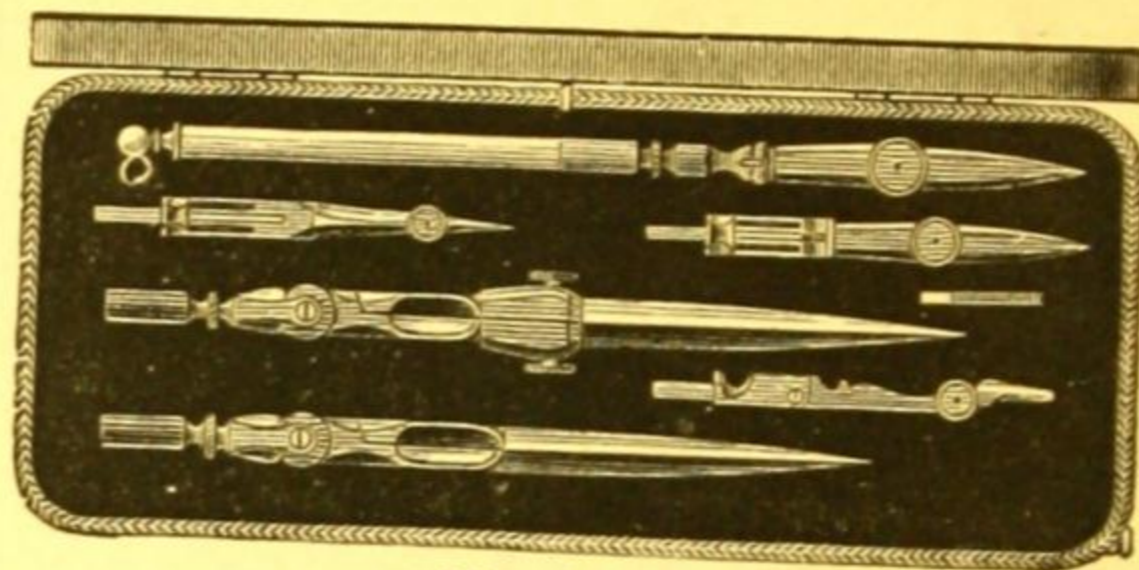
PRICE  
\$1.50  
2.50  
3.75  
3.00  
3.75

# GERMAN SILVER INSTRUMENTS.

FOR ENGINEERS, ARCHITECTS, AND MECHANICAL DRAUGHTSMEN.

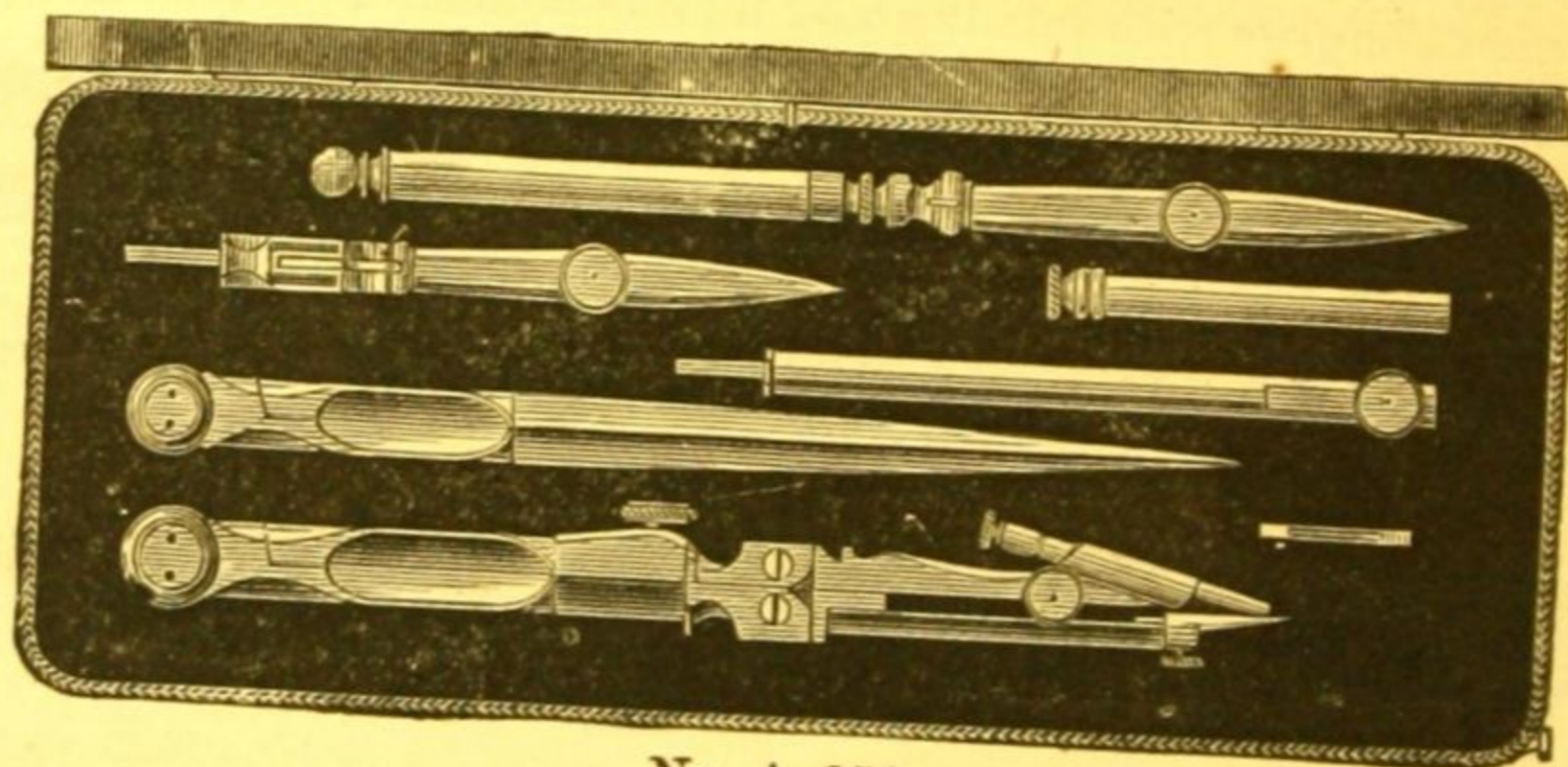
VERY BEST MAKE.

In Fine Velvet-Lined Morocco Pocket Cases.



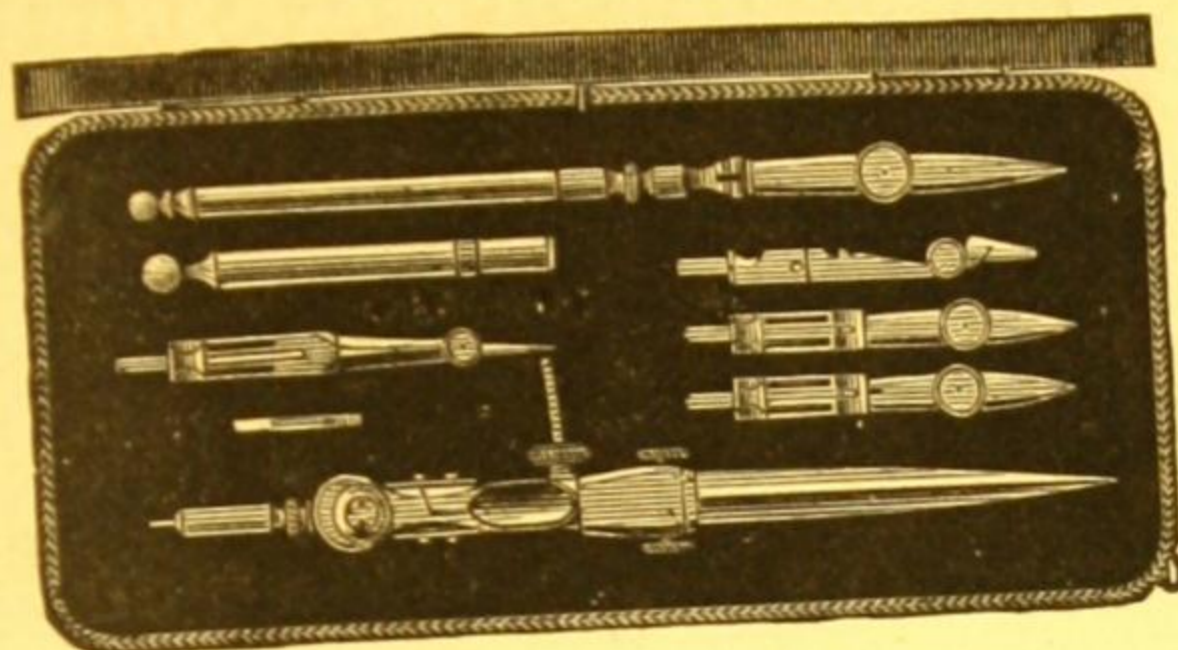
No. A 250.

- A 250. Morocco case, containing
- 1 pair 3½ in. Dividers, with Pen, Pencil, Needle Point, and Lengthening Bar, No. A 207.
  - 1 pair 3½ in. Plain Dividers.
  - 1 Drawing Pen, joint and pin, 4½ in. No. A 225.
  - 1 Box Leads. . . . . \$5 00



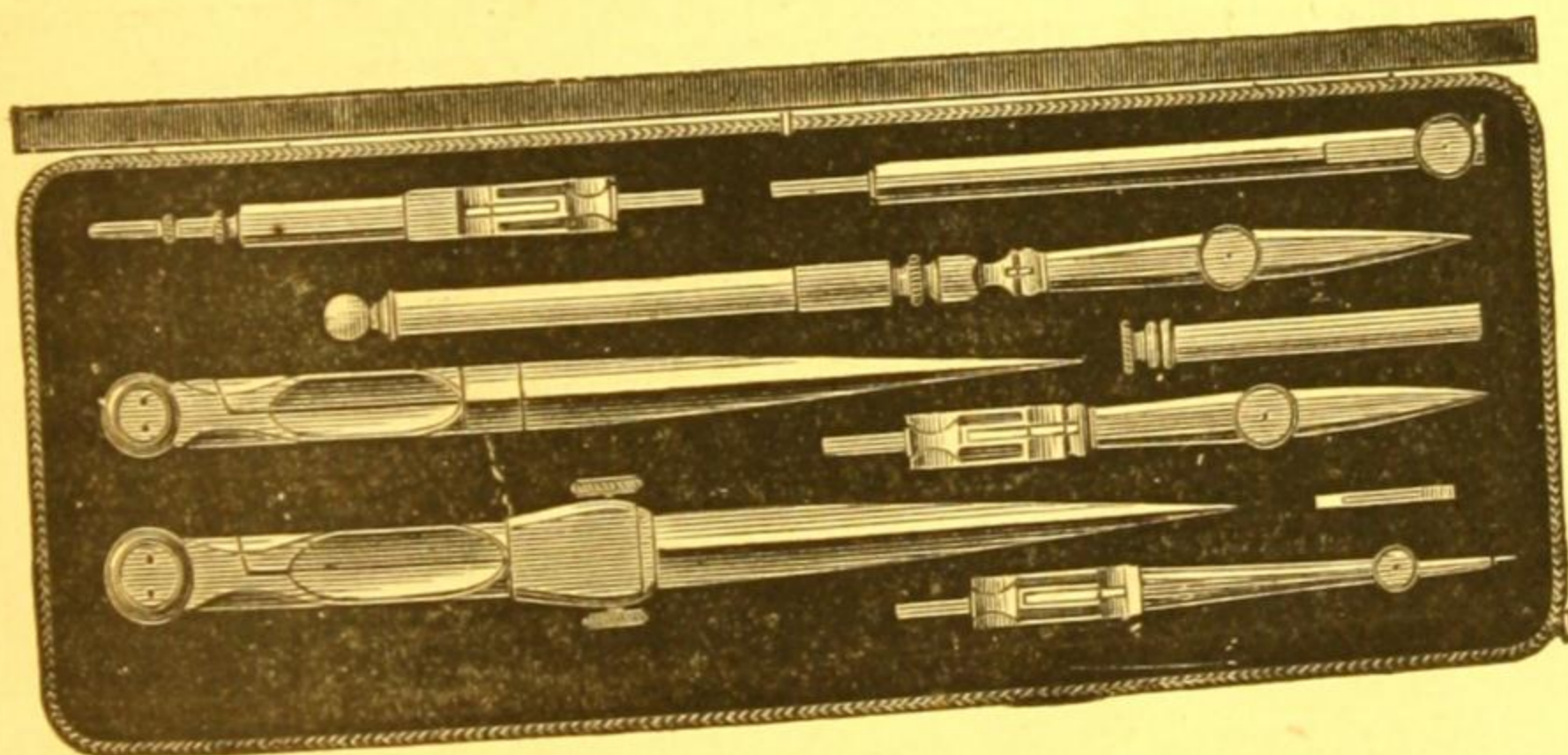
No. A 251.

- A 251. Morocco case, containing
- 1 pair 5 in. Dividers, with fixed Needle Point, Pen and Pencil Points, and Lengthening Bar.
  - 1 pair 5 in. Plain Dividers, No. A 201.
  - 1 Drawing Pen, joint and pin, 5½ in., No. A 226.
  - 1 Box Leads, . . . . . 4 50
- A 252. Same as above with addition of Nos. A 214, A 215, and A 216 . . . . . 9 00



No. A 253.

- A 253. Morocco case, containing
- 1 pair 3½ in. Spring Dividers, with Ivory Handle, with 2 Pens,  
Pencil, and Needle Point.
- 1 Drawing Pen, with joint and pin, A 225. \$6 00
- 1 Box Leads, . . . . .



No. A 254.

- A 254. Morocco case, containing
- 1 pair 6 in. Dividers, with Pen, Pencil, Needle Point, and  
Lengthening Bar, No. A 208.
- 1 pair Plain Dividers, 5 in. No. A 201.
- 1 Drawing Pen, with joint and pin, No. A 226. 8 00
- 1 Box Leads, . . . . .

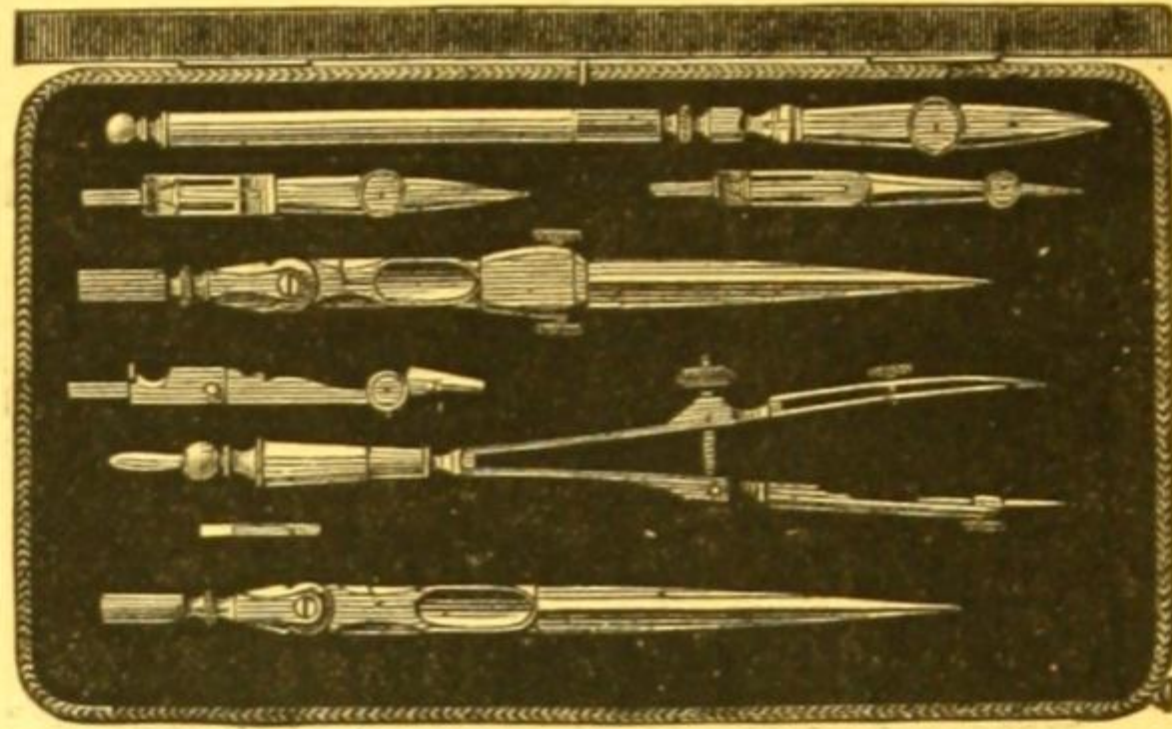
TS.  
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\$5 00

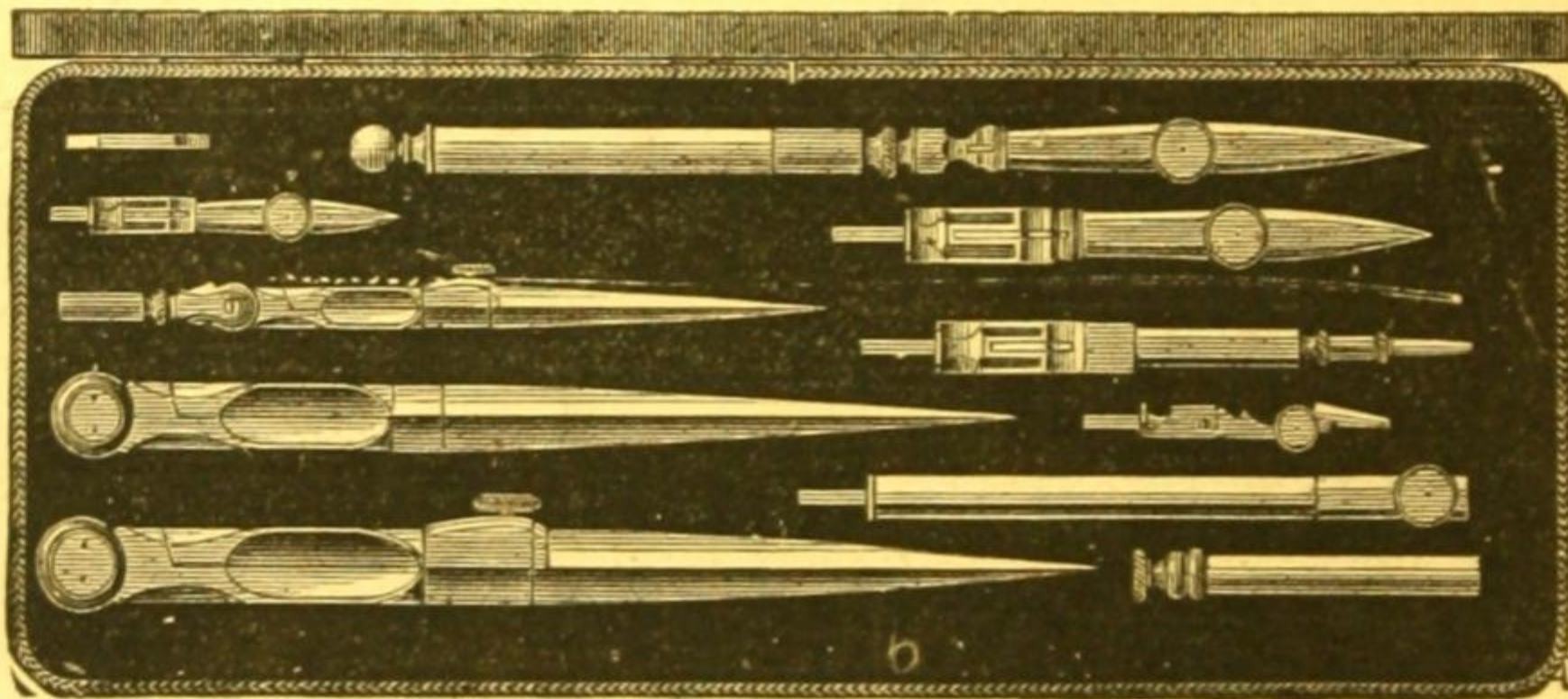
4 50

9 00



No. A 255.

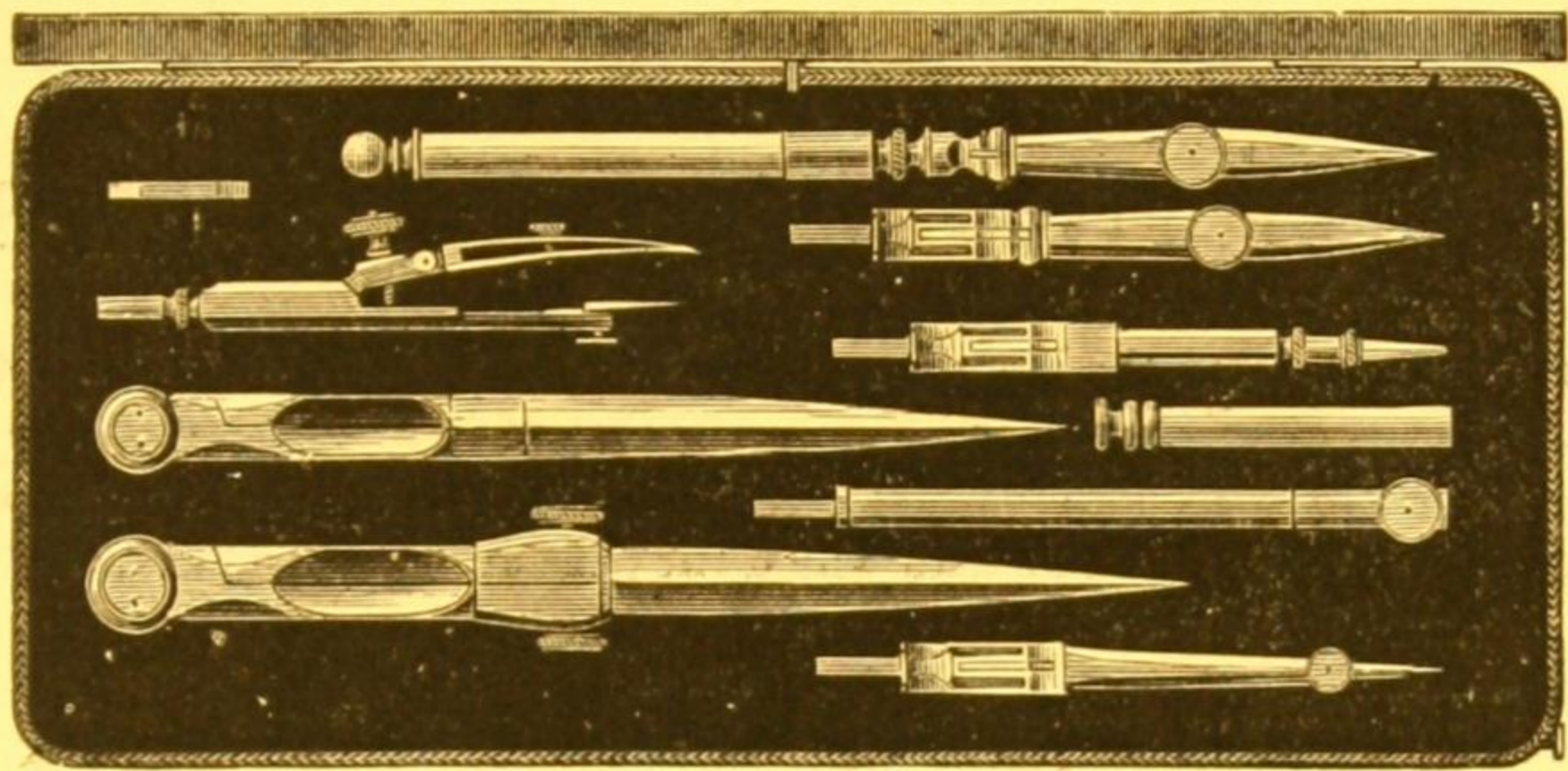
- A 255. Morocco case, containing
- 1 pair 3½ in. Dividers, with Pen, Pencil, Needle Point, and Lengthening Bar, No. A 207.
  - 1 pair 3½ in. Plain Dividers.
  - 1 Spring Bow Pen, with Needle Point, A 215.
  - 1 Drawing Pen, with joint and pin, 4½ in. No. A 225.
  - 1 Box Leads, . . . . . \$8 00



No. A 256.

- A 256. Morocco case, containing
- 1 pair 5½ in. Dividers, with Pen and Pencil Points and Lengthening Bar.
  - 1 pair 5 in. Plain Dividers, No. A 201.
  - 1 pair 3½ in. Dividers, with Pen and Pencil Points.
  - 1 Drawing Pen, joint and pin, No. A 226.
  - 1 German Silver Protractor.
  - 1 German Silver Square, . . . . . 7 50

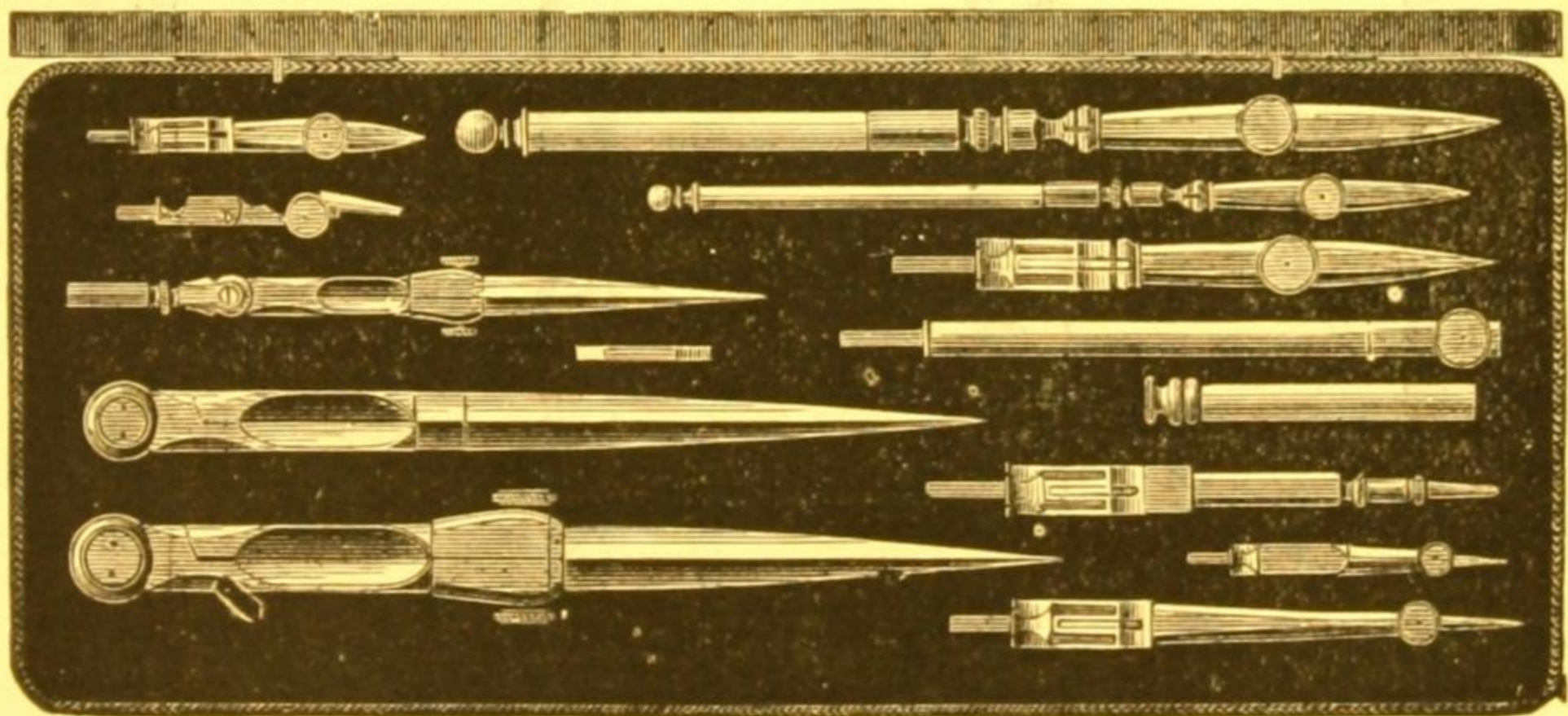




No. A 257.

**A 257.** Morocco case, containing

- 1 pair 5½ in. Dividers, with Pen, Pencil, Needle Point, and Lengthening Bar, No. A 208.
- 1 pair 5 in. Plain Dividers, A 201.
- 1 Spring Bow Pen, A 220.
- 1 Drawing Pen, joint and pin, A 226.
- 1 Box Leads, . . . . . \$7 50



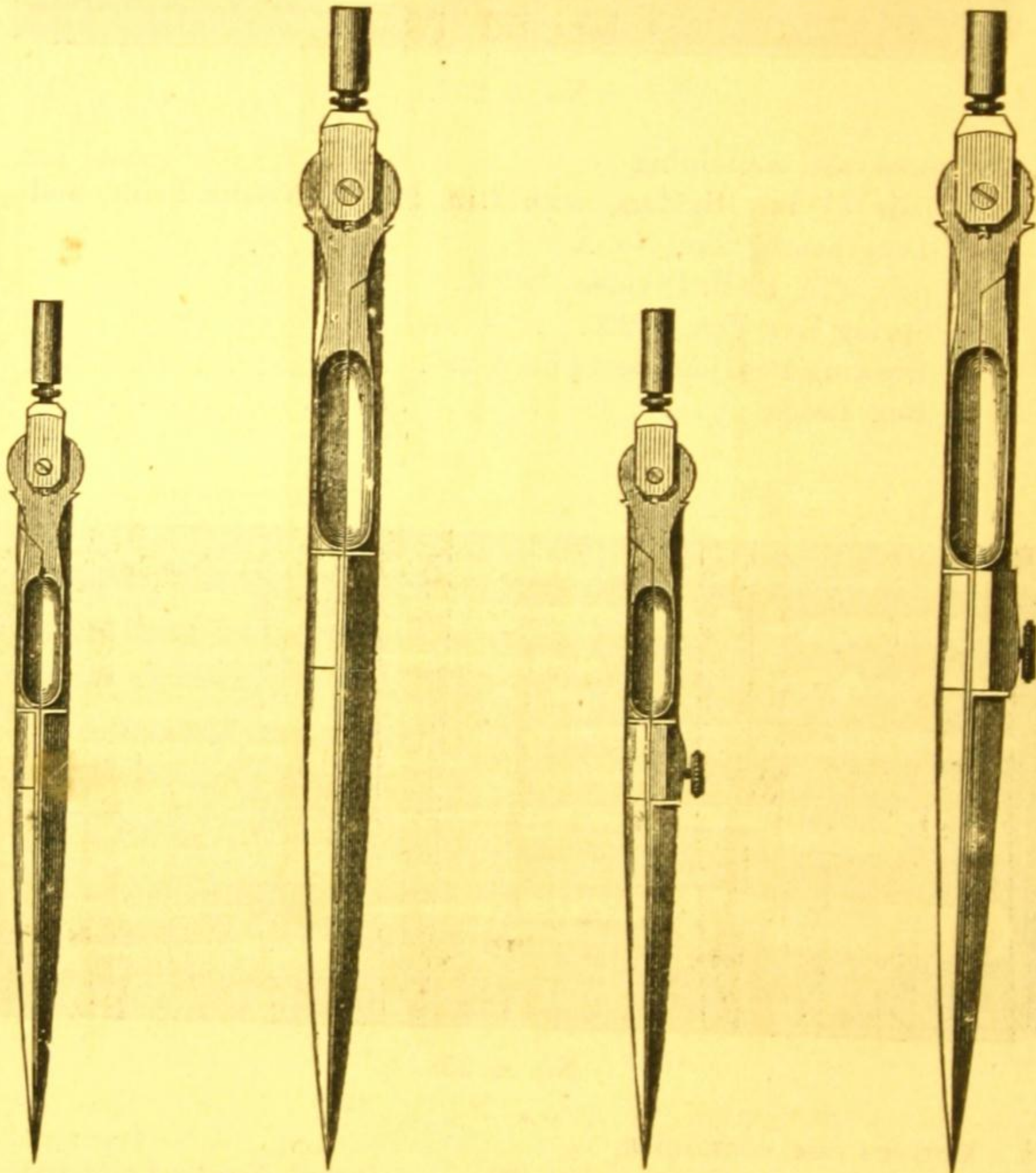
No. A 258.

**A 258.** Morocco case, containing

- 1 pair 5½ in. Dividers, with Pen and Pencil, Needle Point and Lengthening Bar, No. A 208.
- 1 pair Plain Dividers, 5 in., No. A 201.
- 1 pair 3½ in. Dividers, with Pen, Pencil, and Needle Point.
- 1 Drawing Pen, joint and pin, 4½ in. No. A 225.
- 1 " " " " 5½ in. No. A 226.
- 1 German Silver Protractor.
- 1 German Silver Square.
- 1 Box Leads, . . . . . 10 50

## PERFECT PIVOT JOINT INSTRUMENTS.

These instruments, of the best German Silver and English Steel, with Adjustable Pivot Joint, insuring smooth and regular motion of the legs, are of the highest quality, and are most accurately made. We can recommend them for general excellence of finish, and for the care with which the pens are made and pointed.



No. A 276.

No. A 278.

No. A 279.

No. A 281.

A 276.	Plain Dividers, 3½ in. long, each, . . . . .	\$1 50
A 277.	Plain Dividers, 5 in. long, each, . . . . .	1 75
A 278.	Plain Dividers, 6 in. long, each, . . . . .	2 25
A 279.	Hair Spring Dividers, 3½ in. long, each, . . . . .	2 25
A 280.	Hair Spring Dividers, 5 in. long, each, . . . . .	2 75
A 281.	Hair Spring Dividers, 6 in. long, each, . . . . .	3 25

UMENTS.

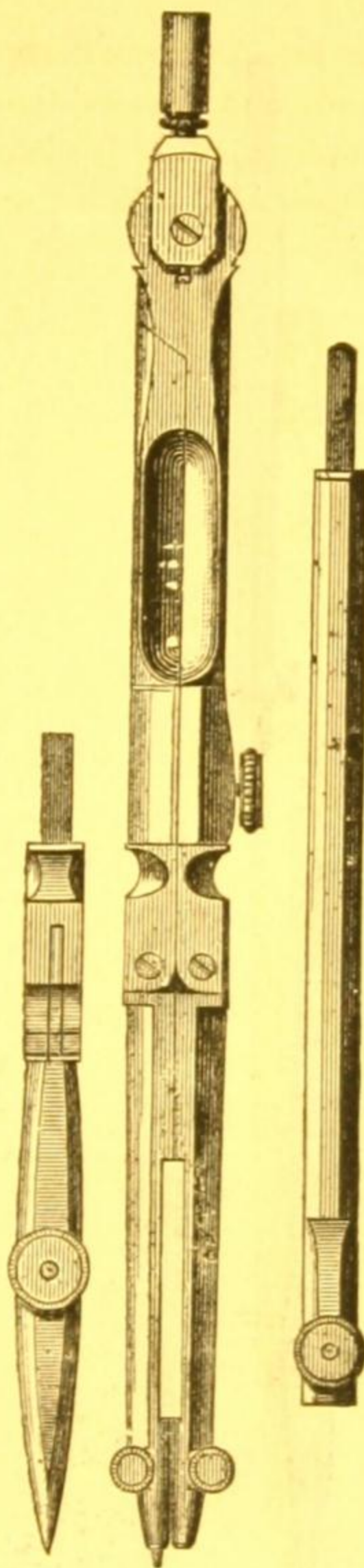
Steel, with Adjustable  
s, are of the highest  
em for general excel-  
and pointed.



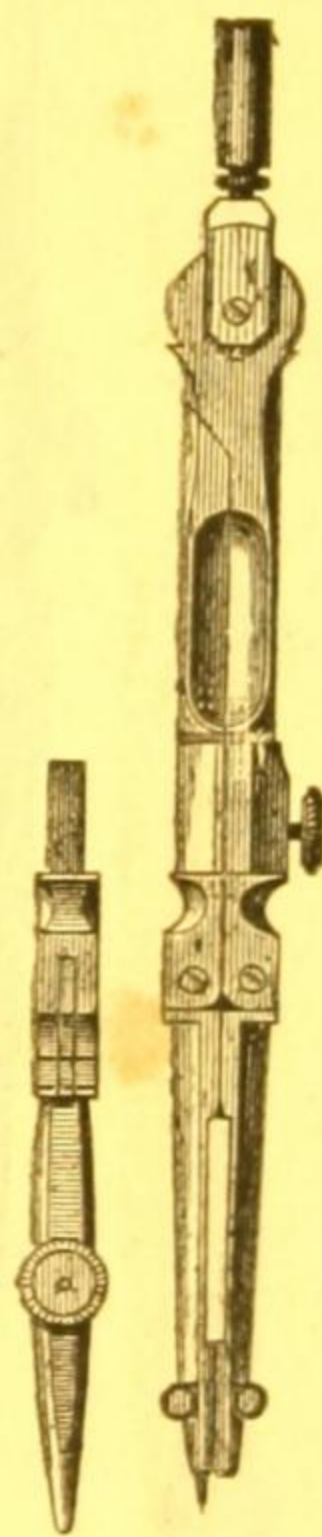
No. A 282.



No. A 283.



No. A 284.

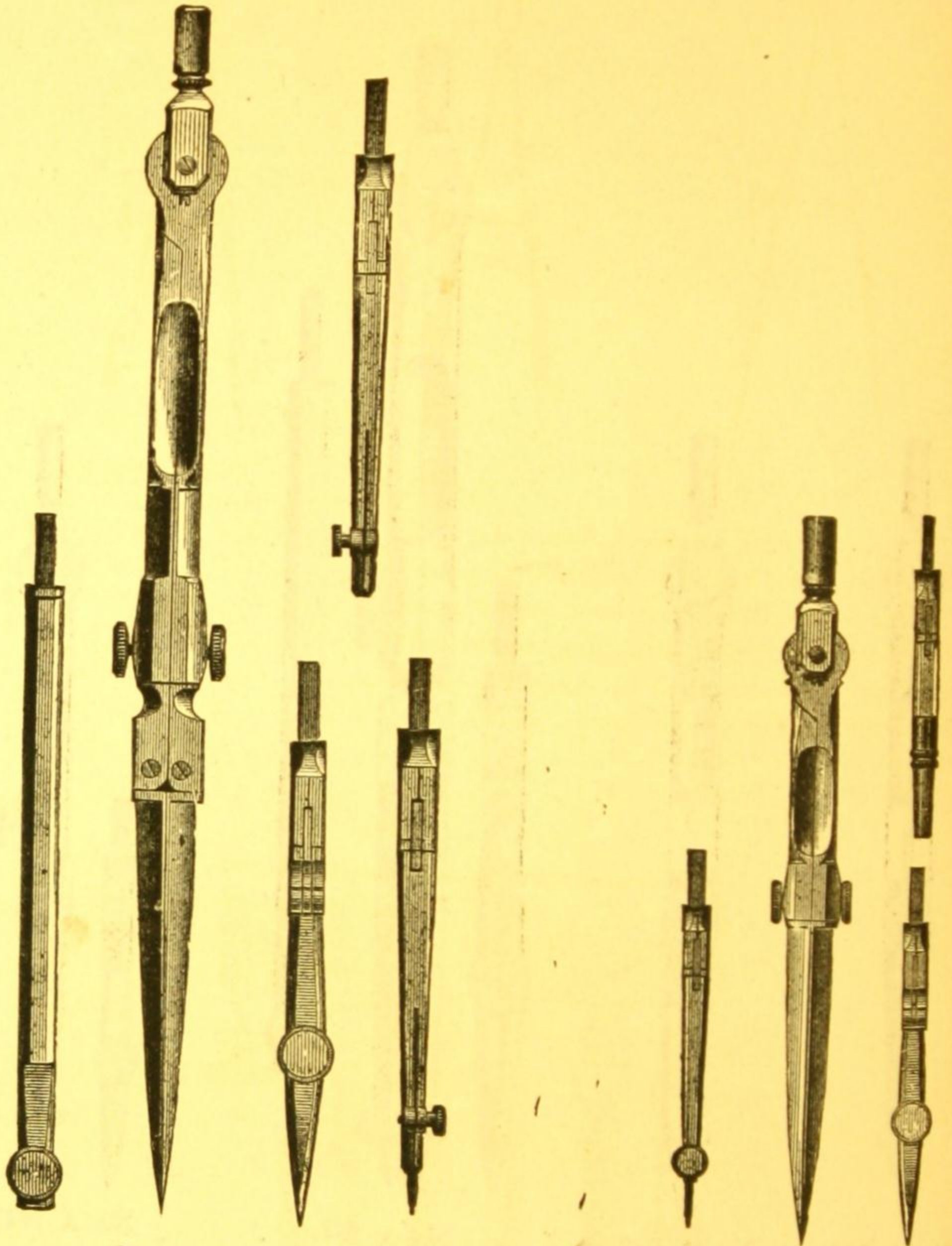


No. A 284 1/2.

281.

\$1 50  
1 75  
2 25  
2 25  
2 75  
3 25

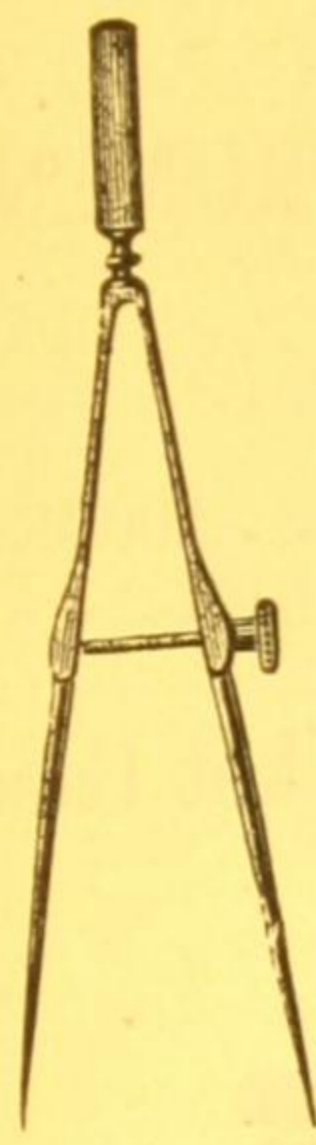
A 282.	Needle Point Dividers, 3 1/2 in. long, with Pencil Point, each, . . .	\$3 50
A 283.	Needle Point Dividers, 3 1/2 in. long, with Pen Point, each, . . .	3 50
A 284.	Needle Point Dividers, 6 in. long, Pen and Pencil Point and Lengthening Bar, . . . . .	5 50
A 284A.	Dividers, 6 1/2 in. long, with Pen, Pencil, Needle Points, and Lengthening Bar, . . . . .	6 50



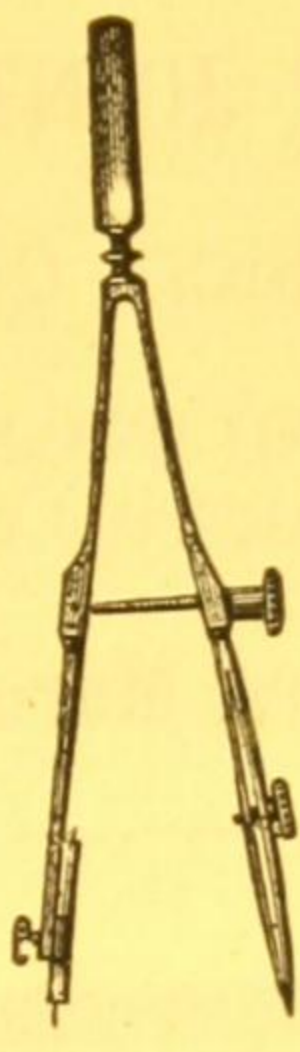
No. A 284 B.

No. A 284 C.

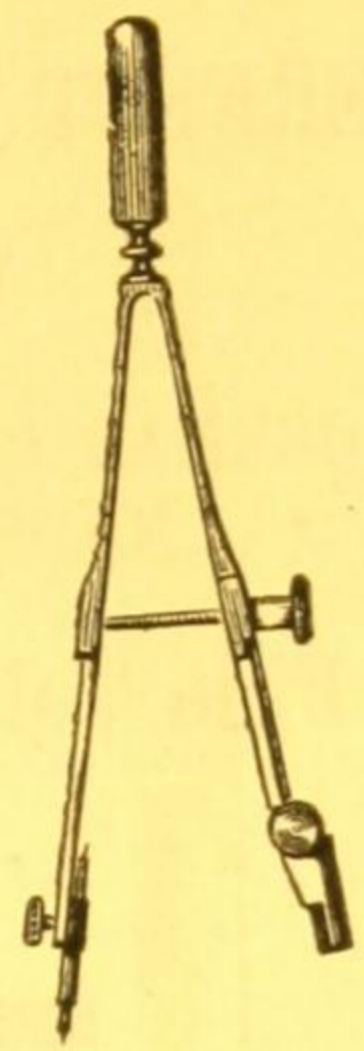
- |   |        |
|---|--------|
| A 284B. Dividers, 6½ in. long, joint in each leg, with Pen, Pencil, Needle Points, and Lengthening Bar, . . . . . | \$9 50 |
| A 284C. Dividers, 3½ in. long, with Pen, Pencil, and Needle Point, . . . . .                                      | 5 50   |
| A 284½. Dividers, 3½ in. long, with fixed Needle Point, and Pen and Pencil Point, . . . . .                       | 5 00   |



No. A 285.

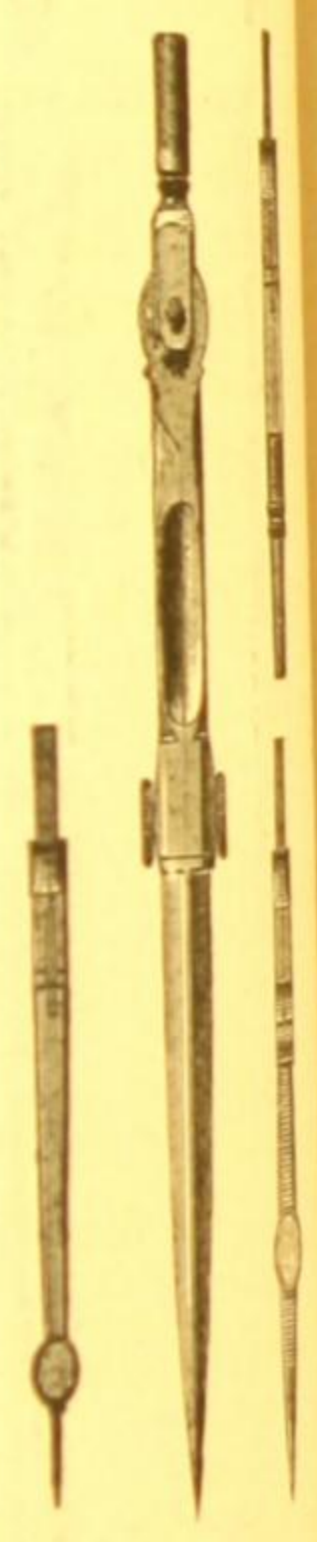


No. A 287.

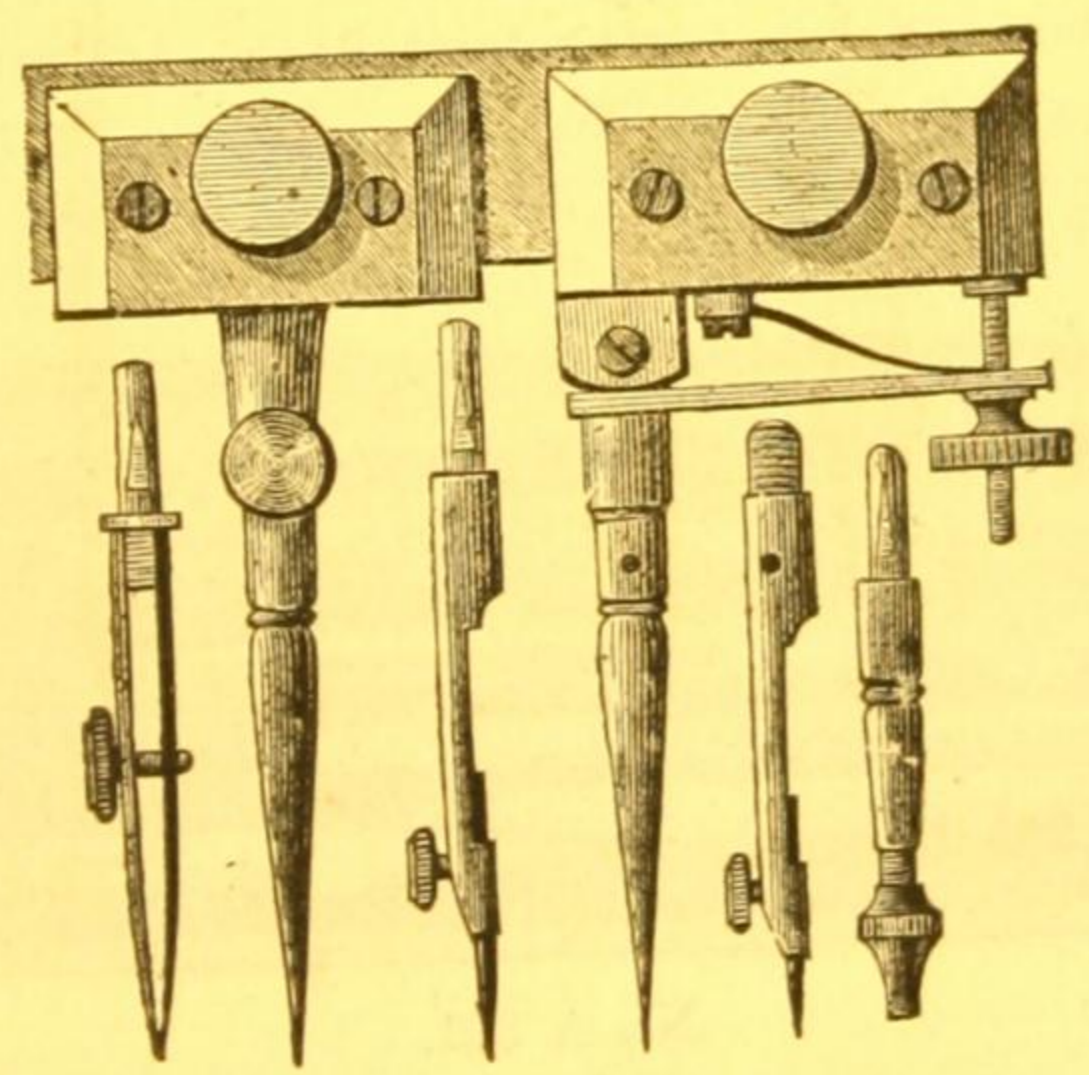


No. A 289.

A 285.	Steel Spacing Dividers, 3 in. long, . . . . .	\$1 25
A 286.	Steel Bow Pen, 3 in. long, round point, . . . . .	1 50
A 287.	Steel Bow Pen, 3 in. long, needle point, . . . . .	1 75
A 288.	Steel Bow Pencil, 3 in. long, round point, . . . . .	1 50
A 289.	Steel Bow Pencil, 3 in. long, needle point, . . . . .	1 75
A 290.	Drawing Pen, 4½ in. long. . . . .	1 00
A 291.	" " 5½ " " . . . . .	1 25
A 292.	" " 6 " " . . . . .	1 50



No. A 284 C.



No. A 293.

A 293.	Furniture for Straight-edge Beam Compasses, with Spring Adjustment, in morocco box, . . . . .	7 00
A 294.	Mahogany Bar, 30 inches long, for do., . . . . .	75
A 295.	Boxwood Bar, 24 inches long, graduated, . . . . .	50

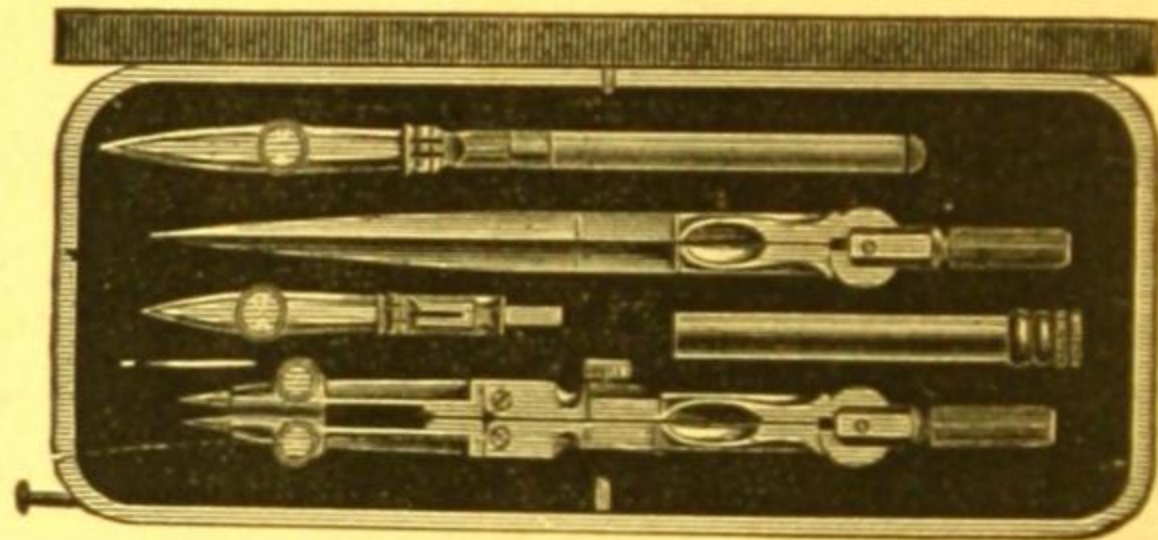
g, with Pen, Pencil, Needle  
 cil, and Needle Point,  
 le Point, and Pen and Pencil

PERFECT PIVOT JOINT INSTRUMENTS,

VERY BEST QUALITY

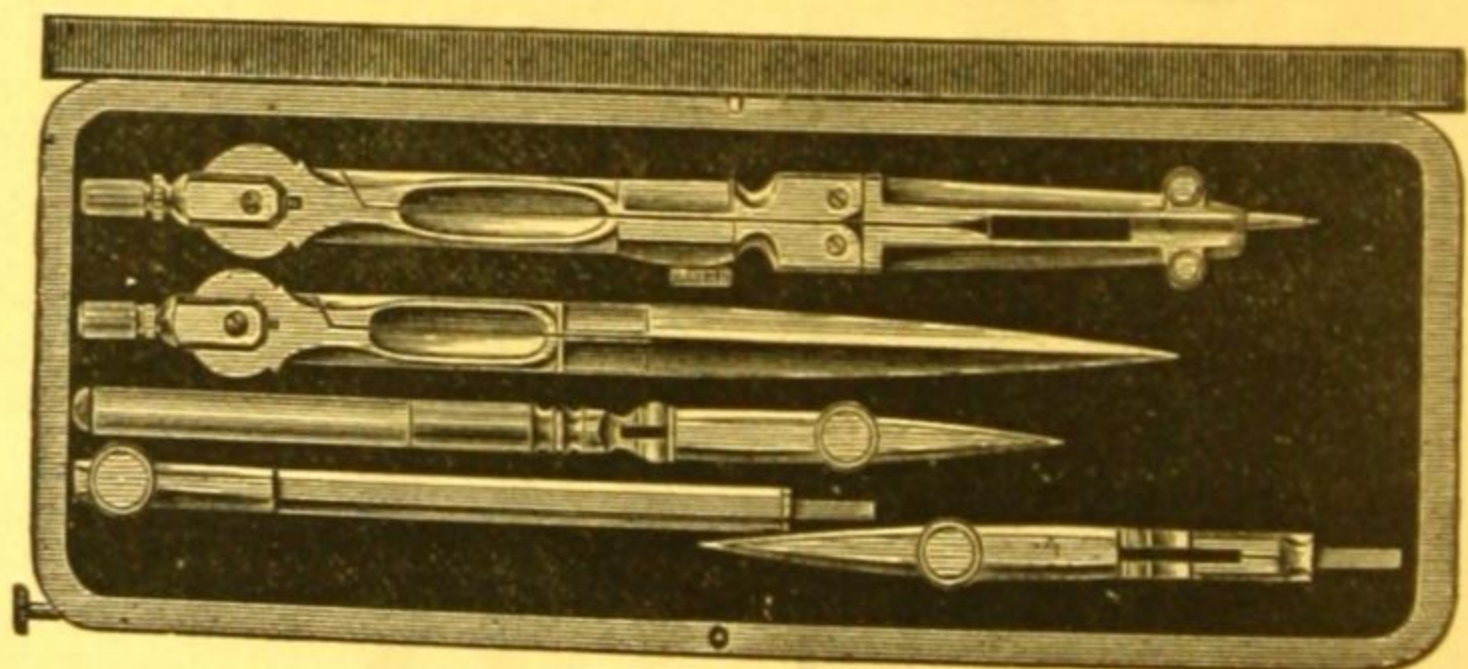
BEST GERMAN SILVER AND ENGLISH STEEL. ACCURATELY  
MADE AND CAREFULLY REFINISHED.

In Fine Velvet-Lined Morocco Pocket Cases.



No. A 300.

- ▲ 300. Morocco case, containing
  - 1 pair Perfect Joint Dividers, 3½ in. long, with fixed Needle Point, and Pen and Pencil Point, A 284½.
  - 1 pair Plain Dividers, Perfect Joint, 3½ in., A 276.
  - 1 Drawing Pen, 4½ in., A 290.
  - 1 Box Leads, . . . . . \$8 00



No. A 301.

- A 301. Morocco case, containing
  - 1 pair Perfect Joint Dividers, 6 in. long, with Pen, Pencil Point, and Lengthening Bar, A 284.
  - 1 pair Perfect Joint Plain Dividers, 5 in. long, A 277.
  - 1 Drawing Pen, 5½ in., A 291.
  - 1 Box Leads, . . . . . 9 50

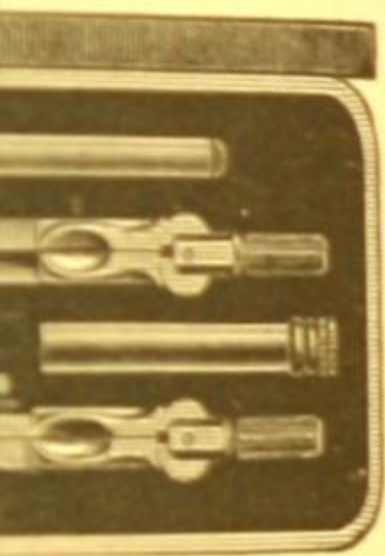
PHILADELPHIA.

NT INSTRUMENTS

QUALITY

GLISH STEEL. ACCURATELY  
LY REFINISHED.

Morocco Pocket Cases.



300.

in long, with fixed Needle Point,  
A 284.

oint, 3½ in., A 276.

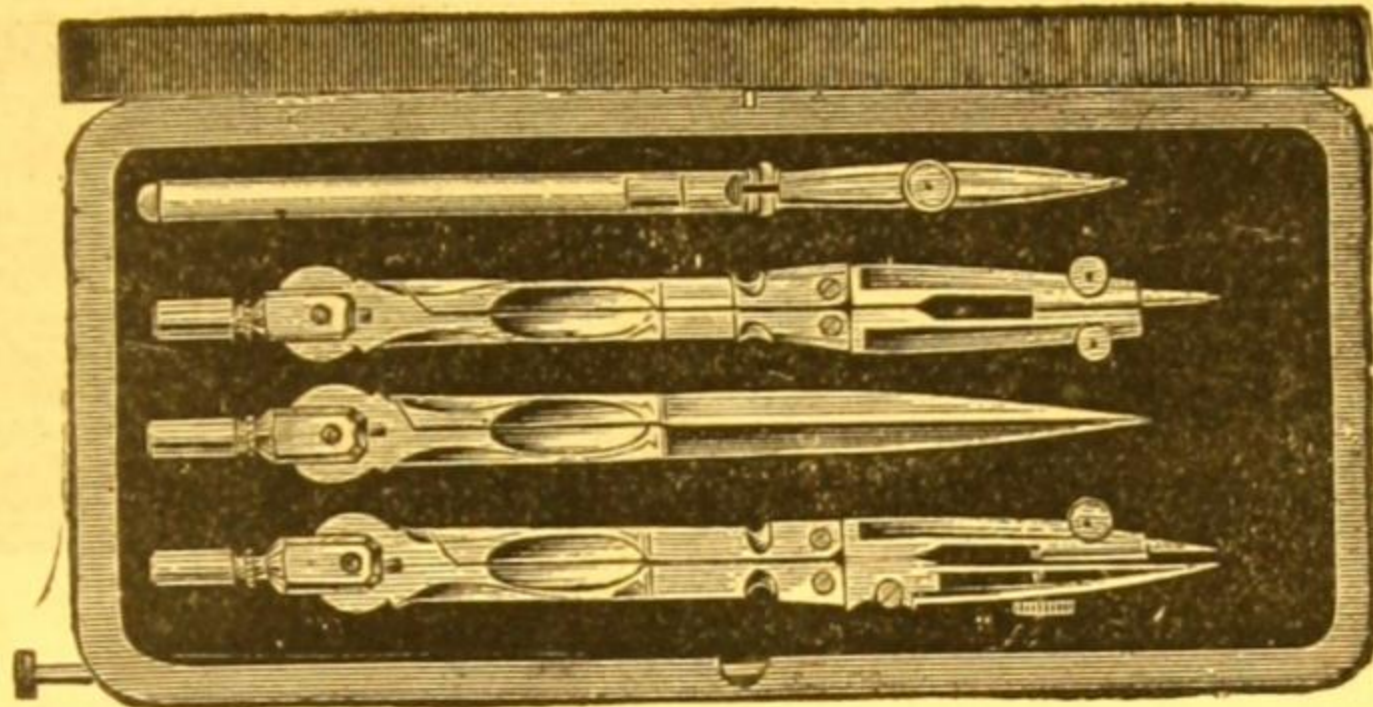


301.

in. long, with Pen, Pencil Point,

ders, 5 in. long, A 277.

JAMES W. QUEEN & CO., PHILADELPHIA.



No. A 302.

A 302. Morocco case, containing

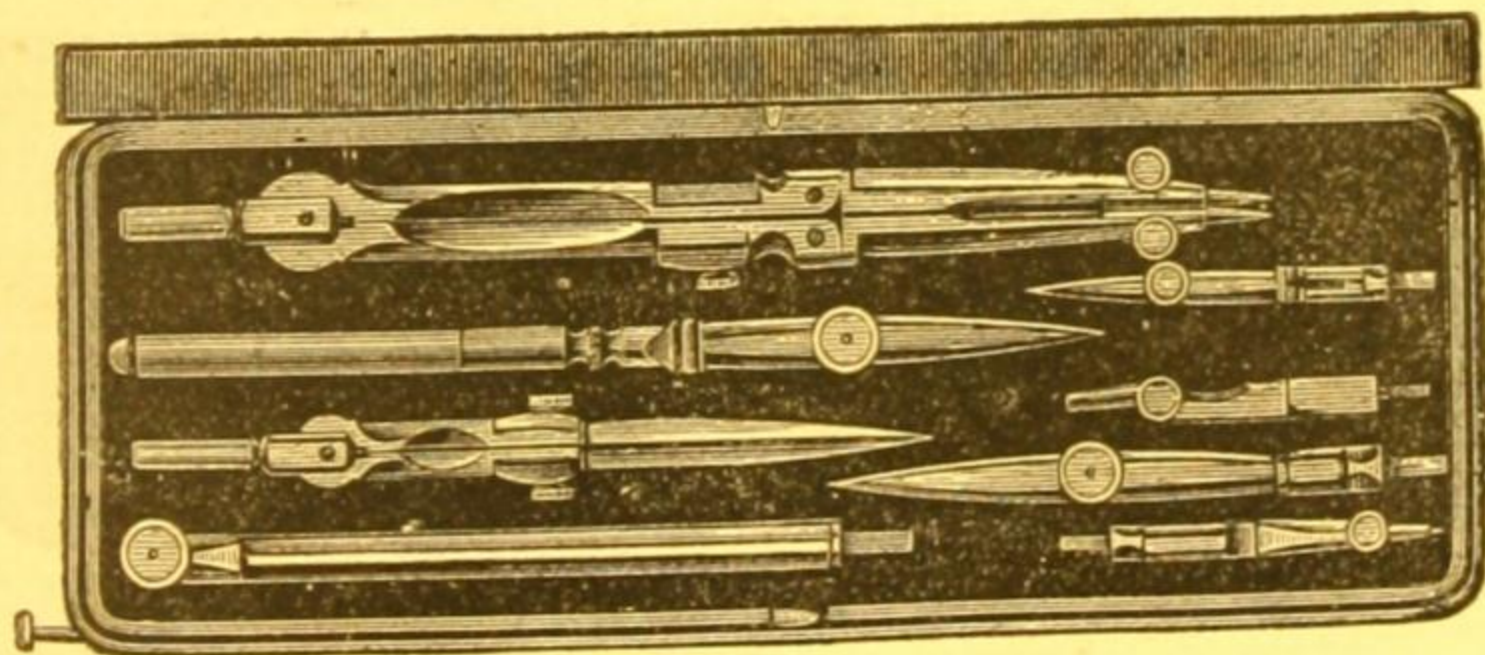
1 pair Perfect Joint Needle Point Dividers, 3½ in. long, with  
Pencil Point, A 282.

1 pair Perfect Joint Needle Point Dividers, 3½ in. long, with Pen  
Point, A 283.

1 pair Perfect Joint Plain Dividers, 3½ in., A 276.

1 Drawing Pen, A 290.

1 Box Leads, . . . . . \$10 50



No. A 303.

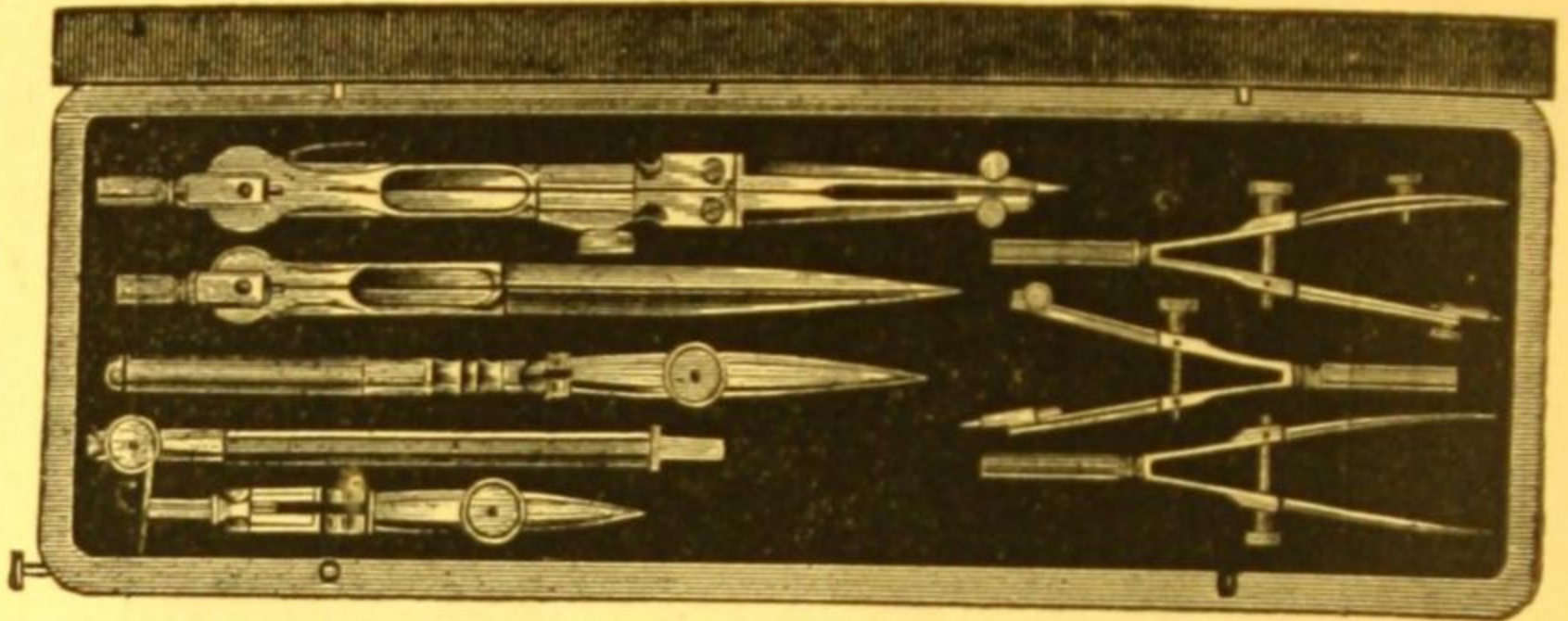
A 303. Morocco case, containing

1 pair Perfect Joint Dividers, 3½ in. long, with Pen, Pencil, and  
Needle Point, A 284 C.

1 pair Perfect Joint Dividers, 6 in. long, with Pen and Pencil  
Point and Lengthening Bar, A 284.

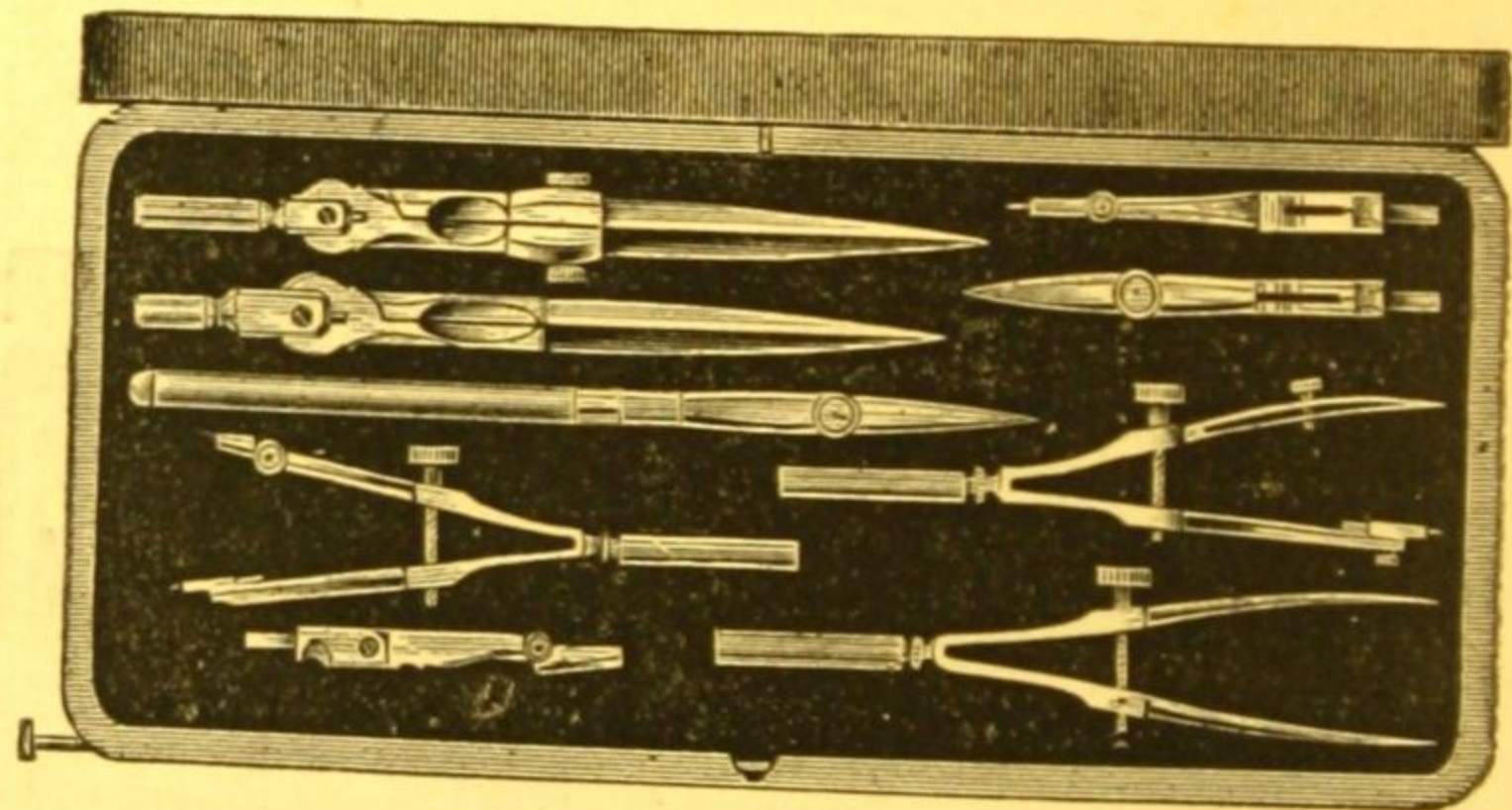
1 Drawing Pen, 5½ in., A 291.

1 Box Leads, . . . . . 13 00



No. A 304.

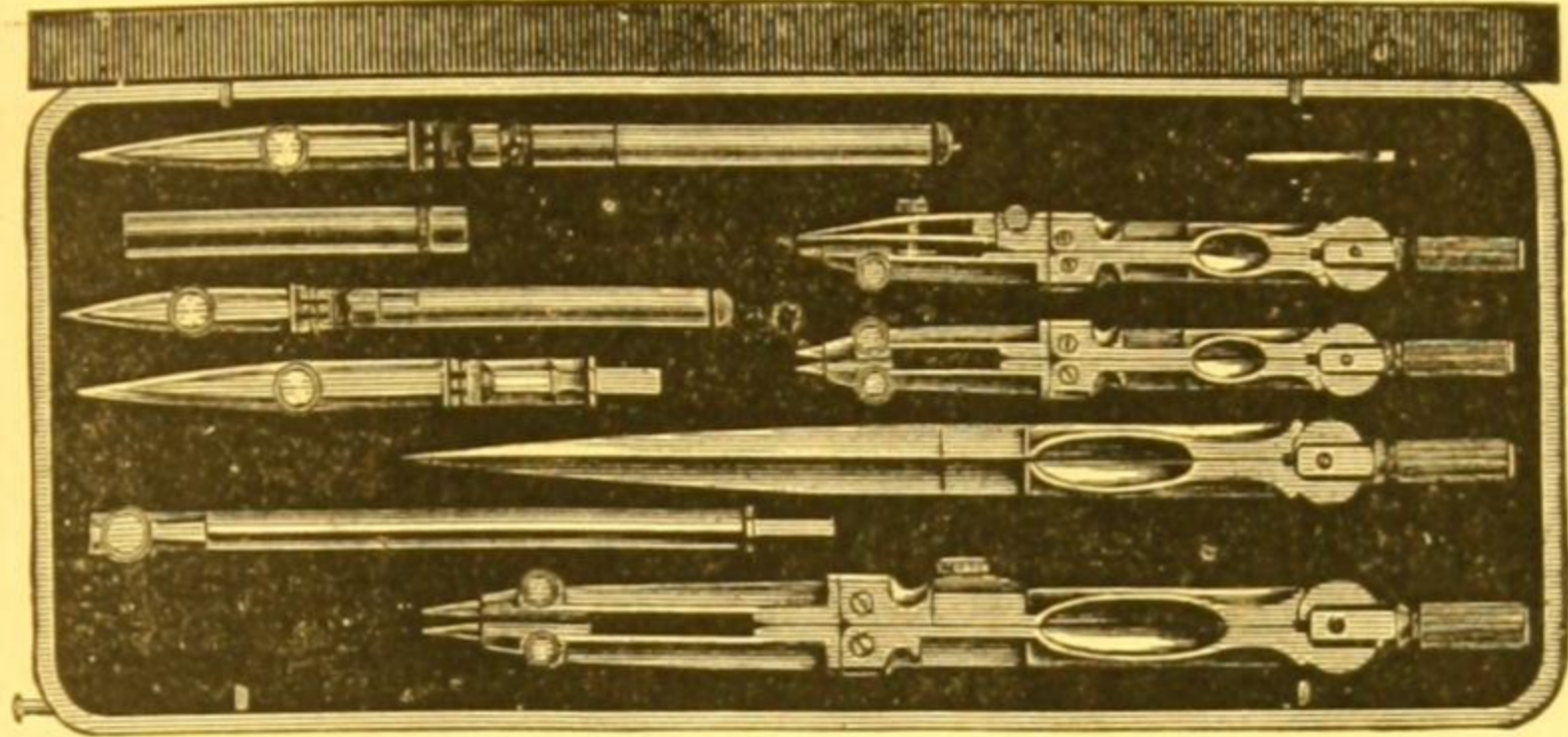
- A 304. Morocco case, containing
- 1 pair Perfect Joint Dividers,  $3\frac{1}{2}$  in. long, with fixed Needle Point, and Pen and Pencil Points, A 284 $\frac{1}{2}$ .
  - 1 pair Perfect Joint Plain Dividers,  $3\frac{1}{2}$  in., A 276.
  - 1 Steel Spacing Divider, A 285.
  - 1 Steel Bow Pen, needle point, A 287.
  - 1 Steel Bow Pencil, needle point, A 289.
  - 1 Drawing Pen,  $4\frac{1}{2}$  in., A 290.
  - 1 Box Leads, . . . . . \$12 50



No. A 305.

- A 305. Morocco case, containing
- 1 pair Perfect Joint Dividers,  $3\frac{1}{2}$  in. long, with Pen, Pencil, and Needle Points, A 284 C.
  - 1 pair Perfect Joint Plain Dividers,  $3\frac{1}{2}$  in. long. A 276.
  - 1 Steel Spacing Divider, A 285.
  - 1 Steel Bow Pen, needle point, A 287.
  - 1 Steel Bow Pencil, " " A 289.
  - 1 Drawing Pen,  $4\frac{1}{2}$  in., A 290.
  - 1 Box Leads, . . . . . 13 50

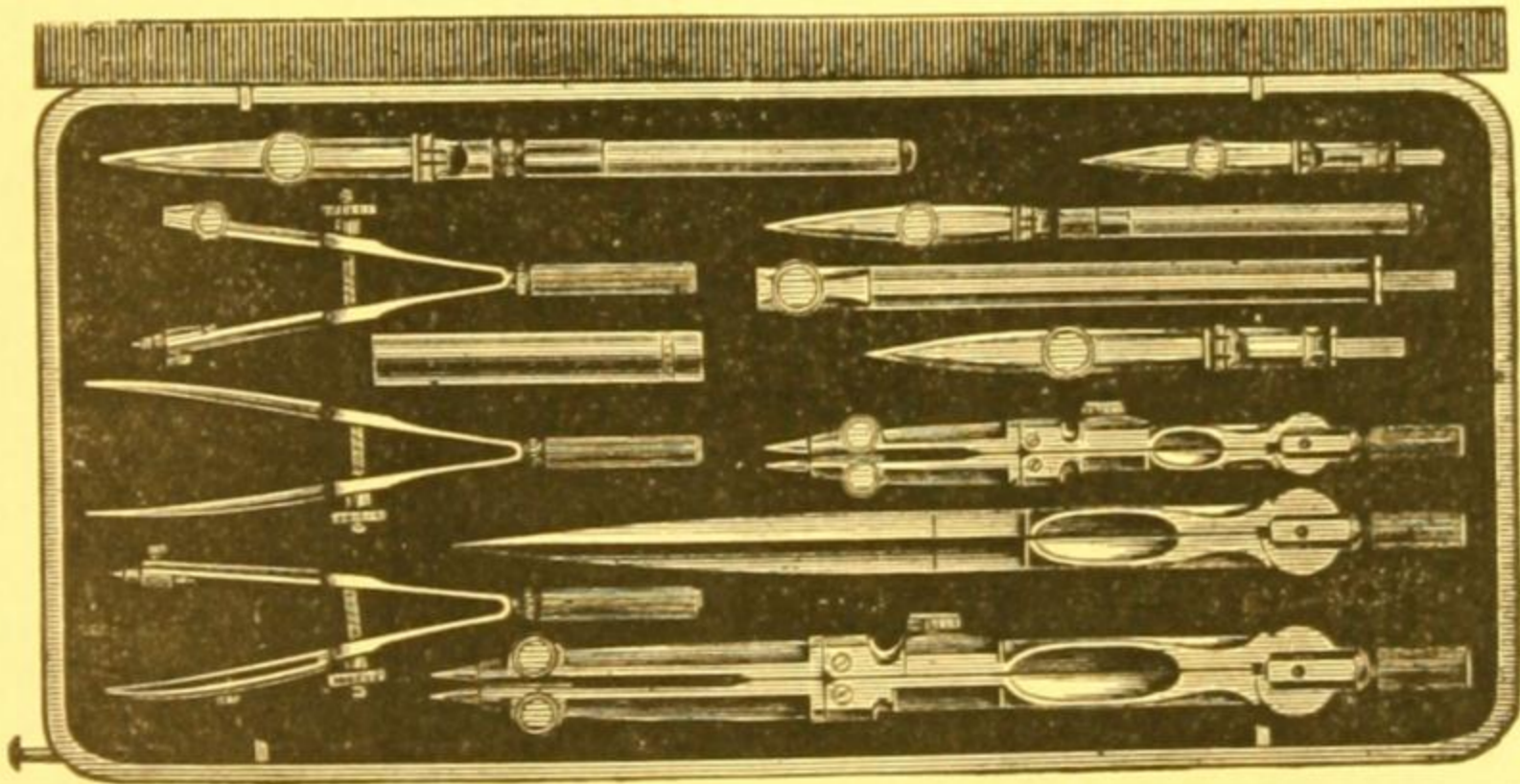




No. A 306.

**A 306.** Morocco case, containing

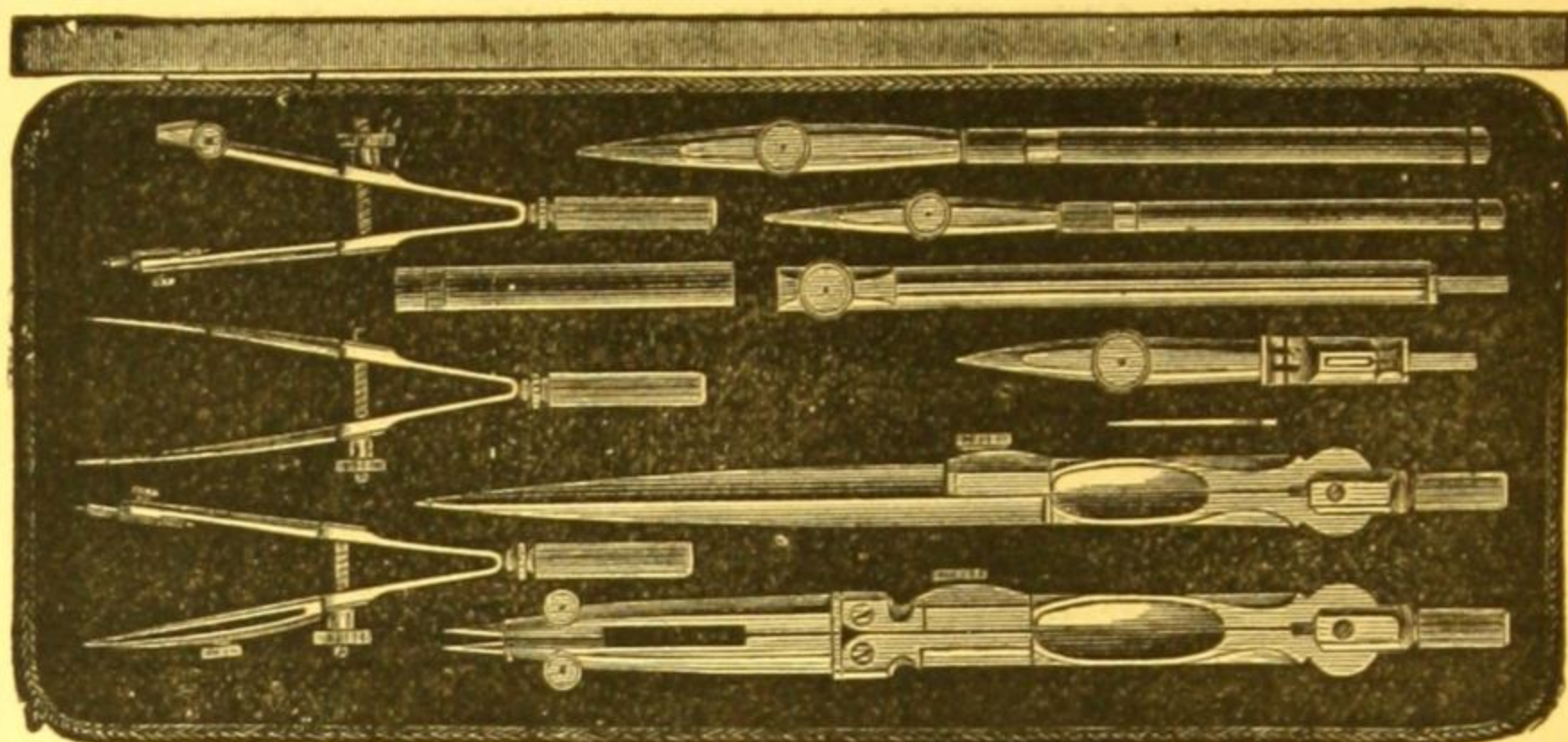
- 1 pair Perfect Joint Needle Point Dividers, 3½ in., with Pencil Point, A 282
- 1 pair Perfect Joint Needle Point Dividers, 3½ in., with Pen Point, A 283.
- 1 pair Perfect Joint Dividers 6 in. long, with Pen and Pencil Point and Lengthening Bar, A 284.
- 1 pair Perfect Joint Plain Dividers, 5 in., A 277.
- 1 Drawing Pen, 4½ in., A 290.
- 1 " " 5½ in., A 291.
- 1 Box Leads, . . . . . \$18 00



No. A 307.

**A 307.** Morocco case, containing

- 1 pair Perfect Joint Dividers, 6 in. long, and Pen and Pencil Points and Lengthening Bar, A 284.
- 1 pair Perfect Joint Dividers, 3½ in. long, with fixed Needle Point and Pen and Pencil Point, A 284½.
- 1 pair Perfect Joint Plain Dividers, 5 in. long, A 277.
- 1 Steel Spacing Dividers, 3 in., A. 285.
- 1 Steel Bow Pen, 3 in., A 287.
- 1 Steel Bow Pencil, 3 in. A 289.
- 1 Drawing Pen, 4½ in., A 290.
- 1 " " 5½ in., A 291.
- 1 Box Leads, . . . . . 18 50

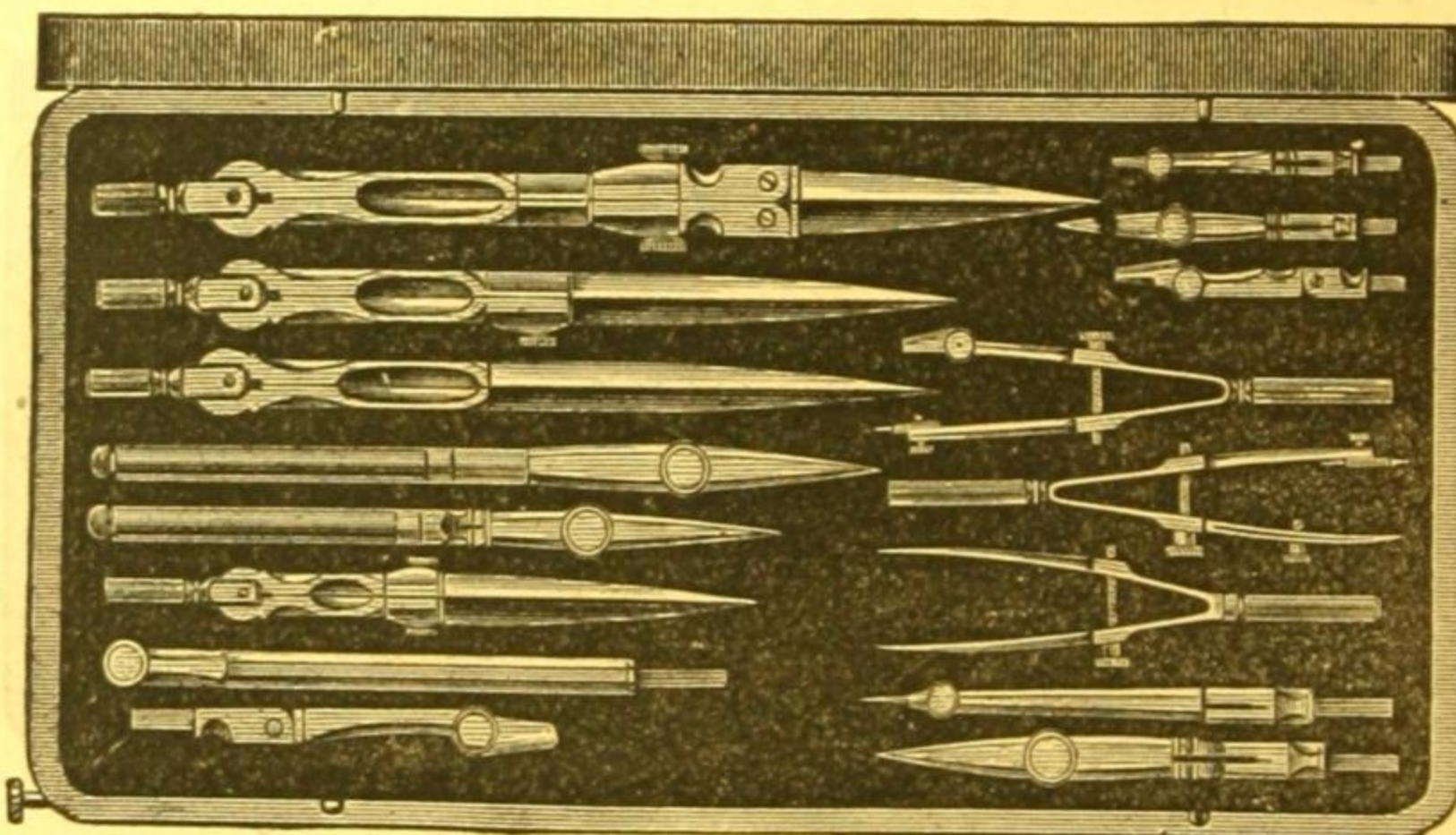


No. A 308.

**A 308.** Morocco case, containing

- 1 pair Perfect Joint Dividers, 6 in. long, with Pen and Pencil Point and Lengthening Bar, A 284.
- 1 pair Perfect Joint Hair Spring Dividers, 6 in. long, A 280.
- 1 Steel Spacing Divider, 3 in., A 285.
- 1 Steel Bow Pen, 3 in., needle point, A 287.
- 1 Steel Bow Pencil, 3 in., needle point, A 289.
- 1 Drawing Pen, 5½ in., A 291.
- 1 Box Leads, . . . . .

\$14 50



No. A 309.

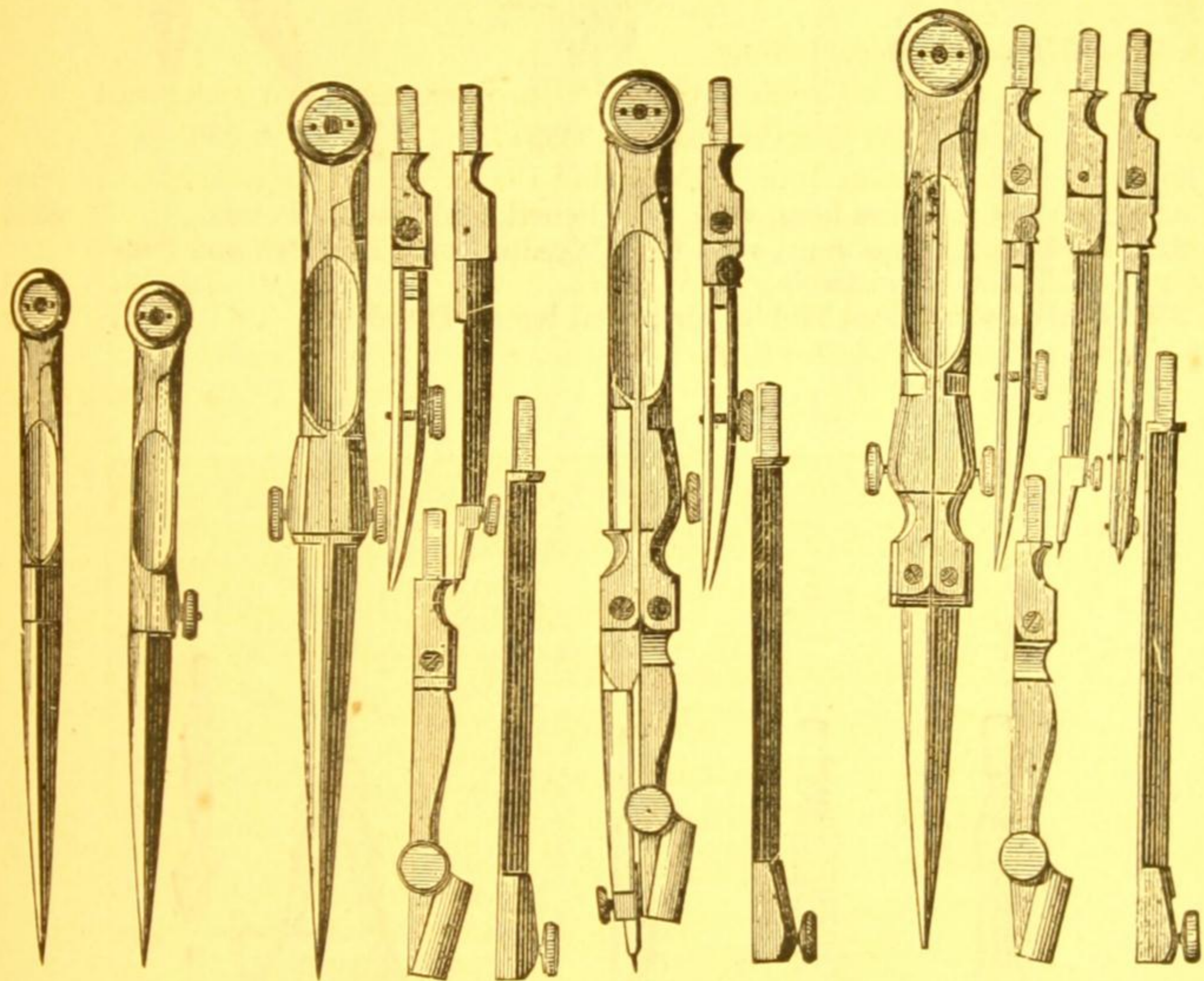
**A 309.** Morocco case, containing

- 1 pair Perfect Joint Dividers, 3½ in. long, with Pen, Pencil, and Needle Point, A 284 C.
- 1 pair Perfect Joint Hair Spring Dividers, 6 in. long, A 280.
- 1 pair Perfect Joint Plain Dividers, 5 in. long, A 277.
- 1 Steel Spacing Divider, 3 in., A 285.
- 1 Steel Bow Pen, 3 in., needle point, A 287.
- 1 Steel Bow Pencil, 3 in., needle point, A 289.
- 1 Drawing Pen, 4½ in., A 290.
- 1 " " 5½ in., A 291.
- 1 Box Leads, . . . . .

20 00

## SWISS DRAWING INSTRUMENTS.

Best German-Silver and English Steel.



A 320.

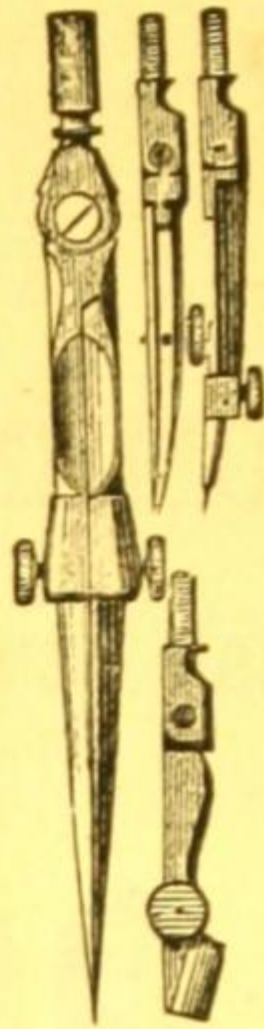
A 323.

A 325.

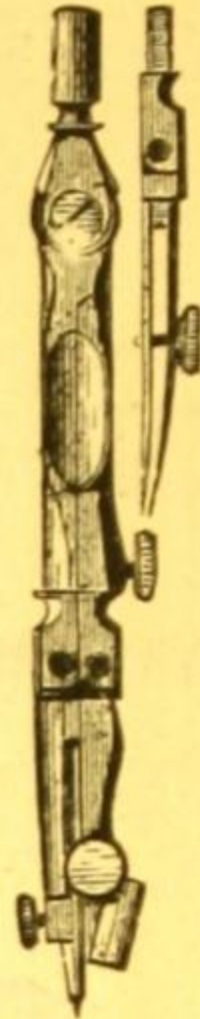
A 326.

A 327.

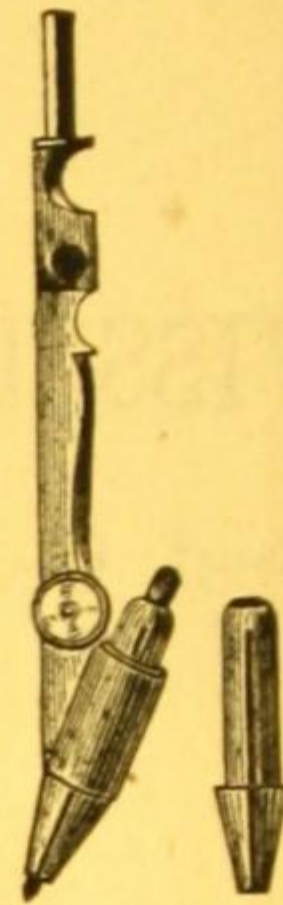
No.	DESCRIPTION	PRICE
A 320.	Plain Dividers, 4½ inches long, each,	\$1.50
A 321.	Plain Dividers, 5 inches long, each,	1.75
A 322.	Plain Dividers, 6 inches long, each,	2.50
A 323.	Hair Spring Dividers, 4½ inches long, each,	2.25
A 324.	Hair Spring Dividers, 5 to 6 inches long, each,	2.50
A 325.	Dividers, 6½ inches long, with Pen, Pencil, Needle Points, and Lengthening Bar,	6 50
A 326.	Dividers, 6½ inches long, with fixed Needle Point and Loose Pen, and Pen Points and Lengthening Bar,	6 00
A 327.	Dividers, 6½ inches long, joints in each leg, with Pen, Pencil, Needle Points, Dotting Pen, and Lengthening Bar,	9.00



A 328.



A 329.



A 330.

No.	PRICE
A 328. Dividers, 4 inches long, with Pen, Pencil, and Needle Points, . . . . .	\$5.00
A 329. Dividers, 4 inches long, with fixed Needle Point, and Pen and Pencil Points, changeable, . . . . .	4.50
A 330. Fox's Patent Lead Holder for pencil leg of Dividers. . . . .	.25



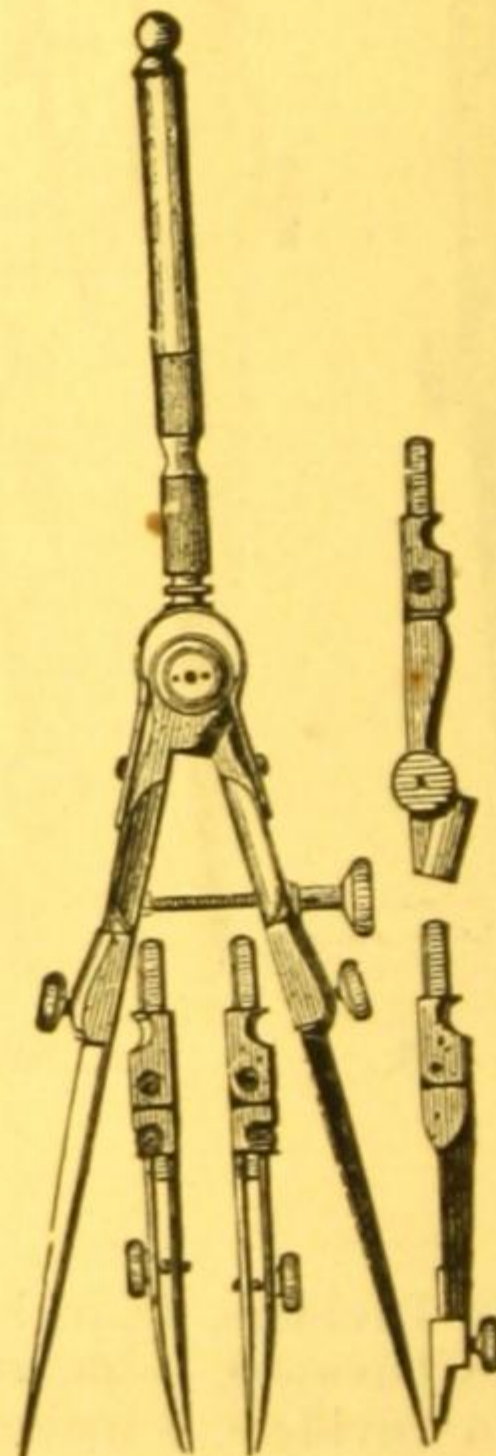
A 331.



A 332.

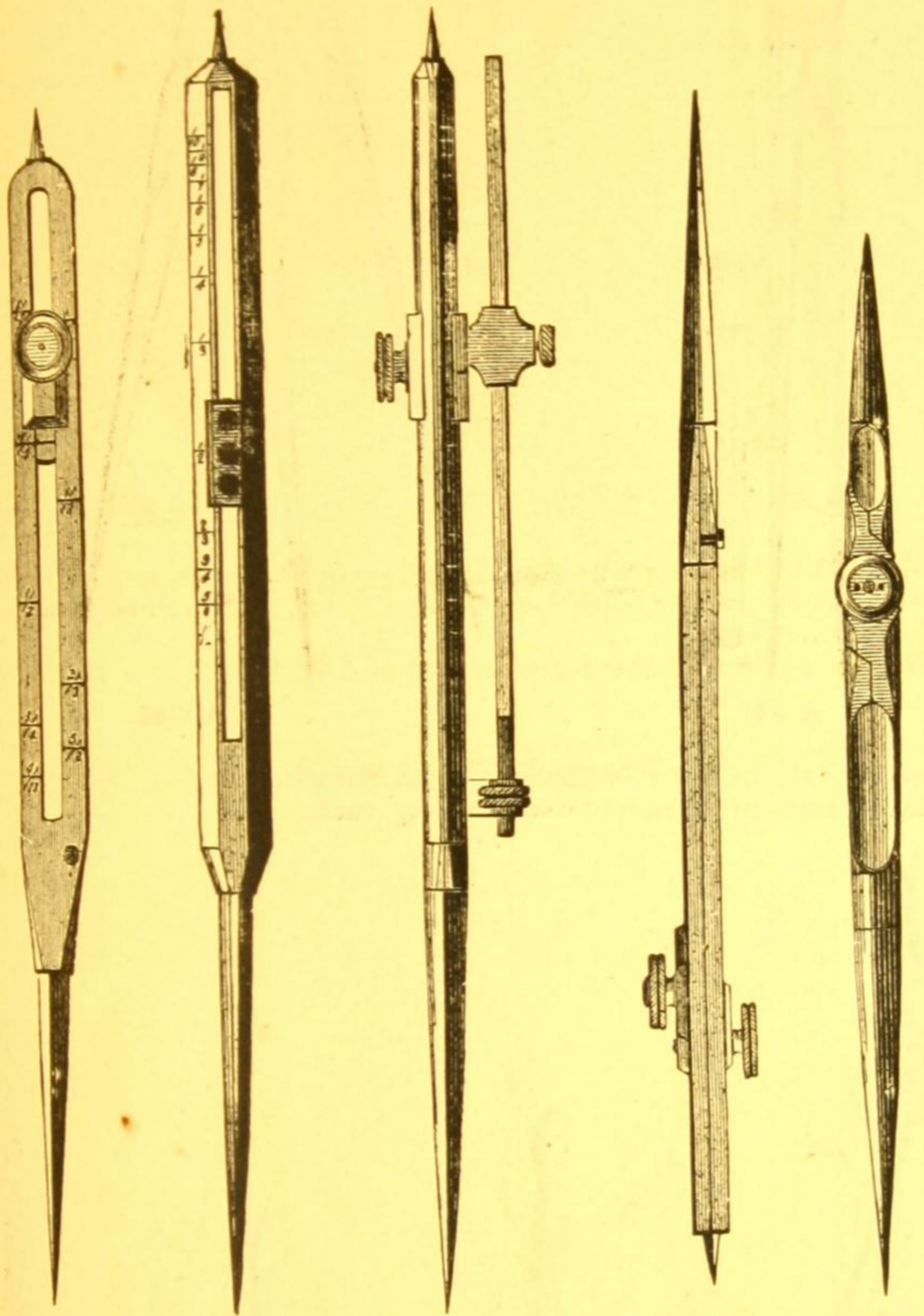


A 333.



A 334.

A 331. Dividers, 4 inches long, with two fixed Needle Points, . . . . .	3.00
A 332. Dividers, 4 inches long, with fixed Needle Point and Pen Point, . . . . .	3.00
A 333. Dividers, 4 inches long, with fixed Needle Point and Pencil Point, . . . . .	3.00
A 334. Dividers, 4 inches long, with Spring and Set Screw, Needle Point, Pencil Point, and two Pen Points, . . . . .	7.00



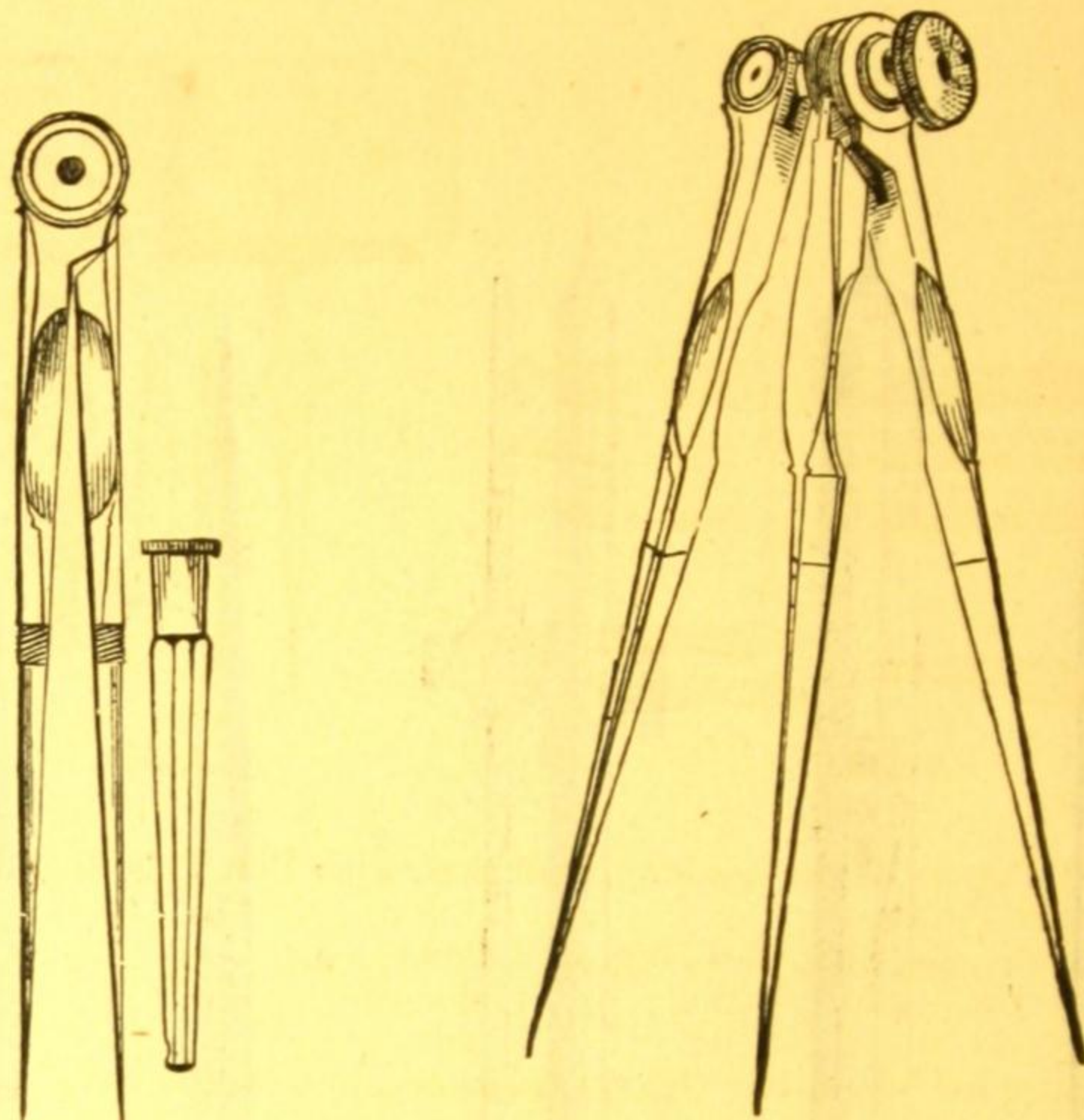
A 335.      A 337.      A 338.      A 339.      A 340.

No.	PRICE.
A 335. Proportional Dividers, 6½ inches long, finely graduated for lines,	\$8.00
A 336. Proportional Dividers, 6½ inches long, finely graduated for lines and polygons,	9.00
A 337. Proportional Dividers, 9 inches long, finely graduated for lines and polygons,	10.00
A 338. Proportional Dividers, 9 inches long, with micrometer adjustment, finely graduated for lines and polygons,	12.00
A 339. Proportional Dividers, 8 inches long, with rack adjustment, graduated for lines,	10.50
A 340. Bisecting Dividers, 7½ inches long, each,	4.25

PRICE  
\$5.00  
Pen- . 4.50  
. 25

3.00  
3.00  
3.00  
Point, .  
Point, 7.00

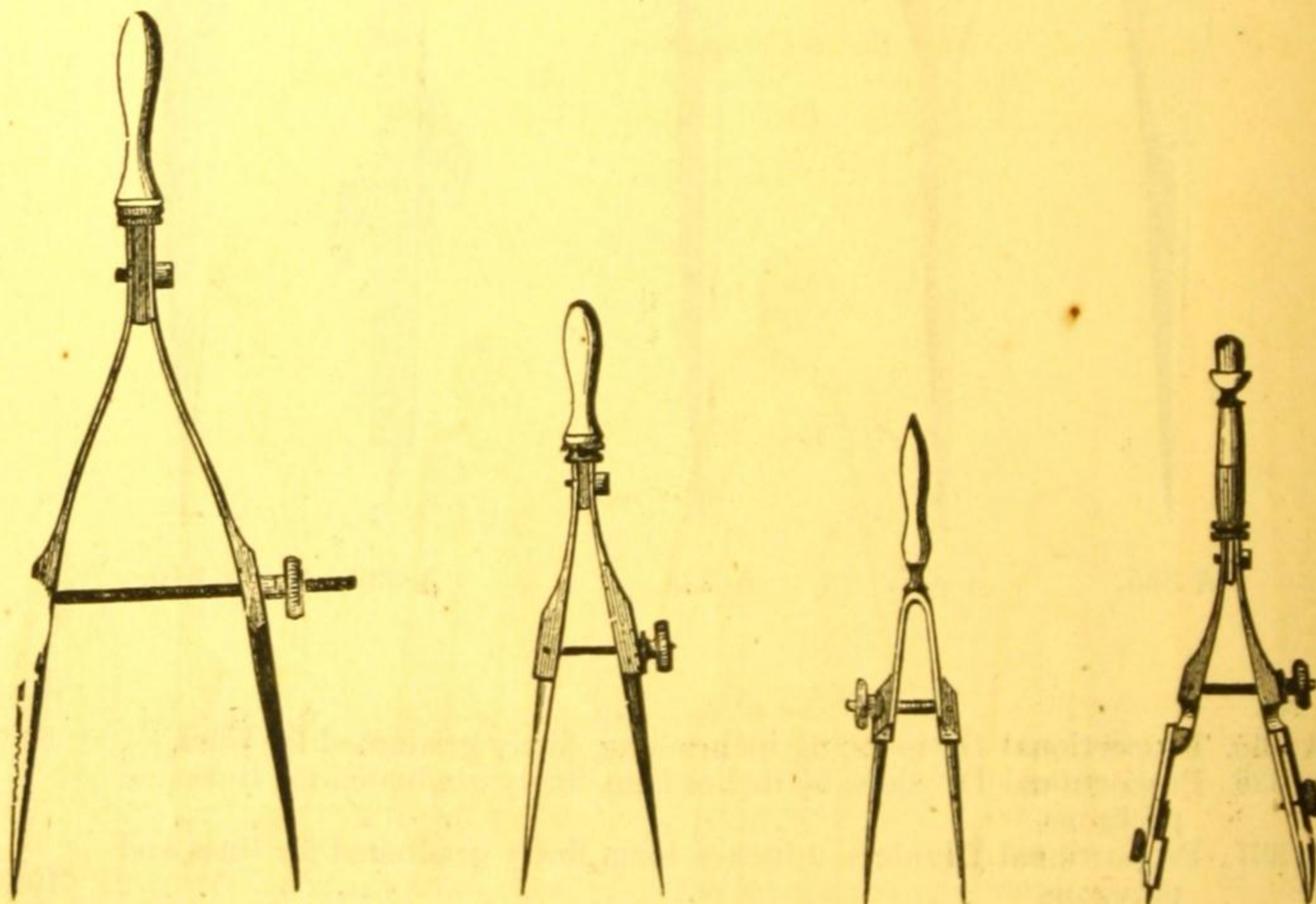
375.  
PRICE.  
3.75  
3.00  
2.00  
3.50  
3.75  
.40  
.60  
.60  
.60



A 341.

A 342.

No.	PRICE
A 341. Pocket Dividers, 5 to 6 inches long, with Sheath, each, . . . . .	\$2.40
A 342. Three-legged Dividers, 5 to 6 inches long, each, . . . . .	4.25



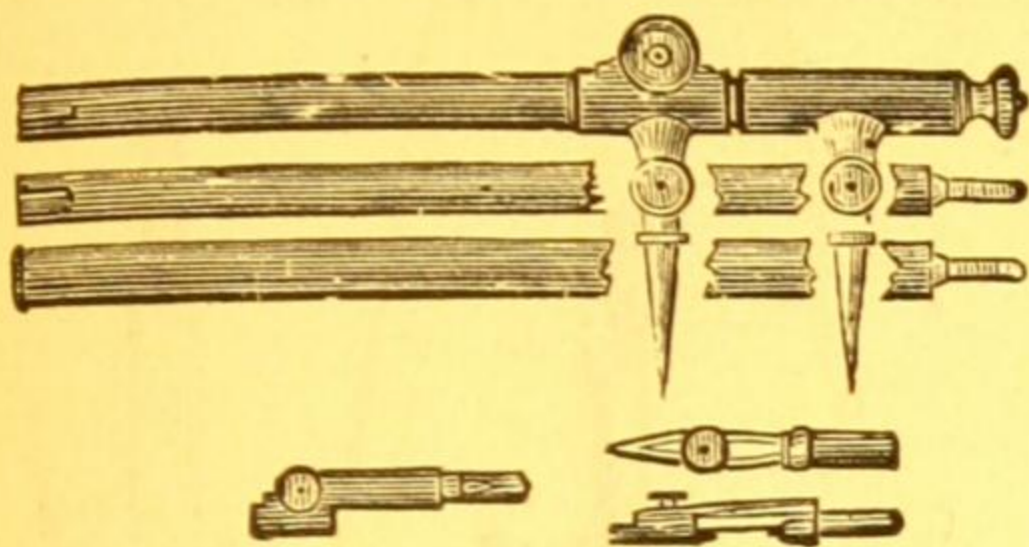
A 343.

A 344.

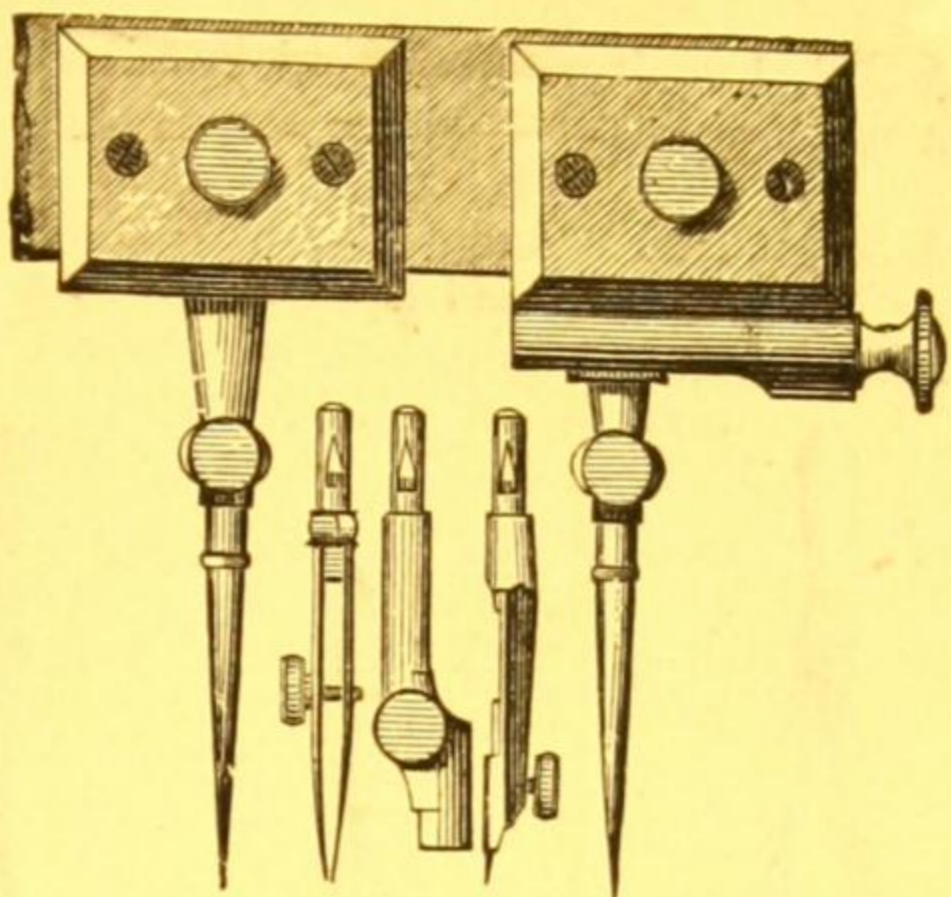
A 345.

A 346.

A 343. Steel-spacing Dividers, 5 inches long, with Ivory Handle, . . . . .	2.50
A 344. Steel-spacing Dividers, 3½ inches long, with Ivory or Metal Handle, . . . . .	1.50
A 345. Very delicate Steel-spacing Dividers, 2½ inches long, . . . . .	1.70
A 346. Steel-spacing Dividers, 3½ inches long, with Ivory Handle and Needle Points, . . . . .	2.50



A 348.



A 351.

No.							PRICE.
A 347.	Beam Compass,	20 inches long,	in 2 bars,	with Pen, Pencil,	and two		\$9.25
				Straight Points,			
A 348.	Beam Compass,	21 inches long,	in 3 bars,				10.50
A 349.	Do. do.	36	do.	4 do.			15.00
A 350.	Do. do.	54	do.	4 do.			21.00
A 351.	Furniture for Wood Bar Beam Compasses,						7.00

PRICE  
\$2.40  
4.25



A 352.

A 352. Hardwood Bars for Beam Compasses,	24	30	36	42	48	60	inch.
each,	.75	.85	\$1.00	1.25	1.35	1.50	

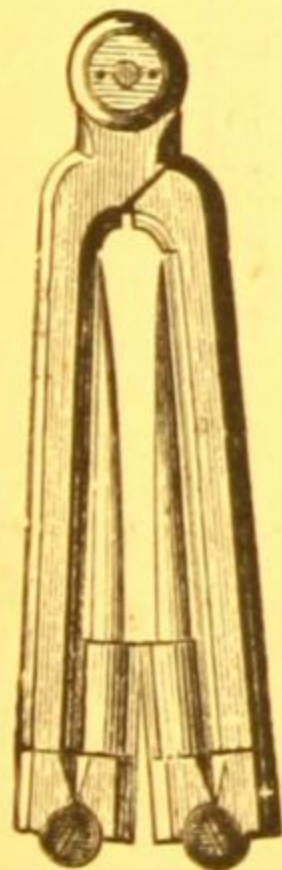


A 346.

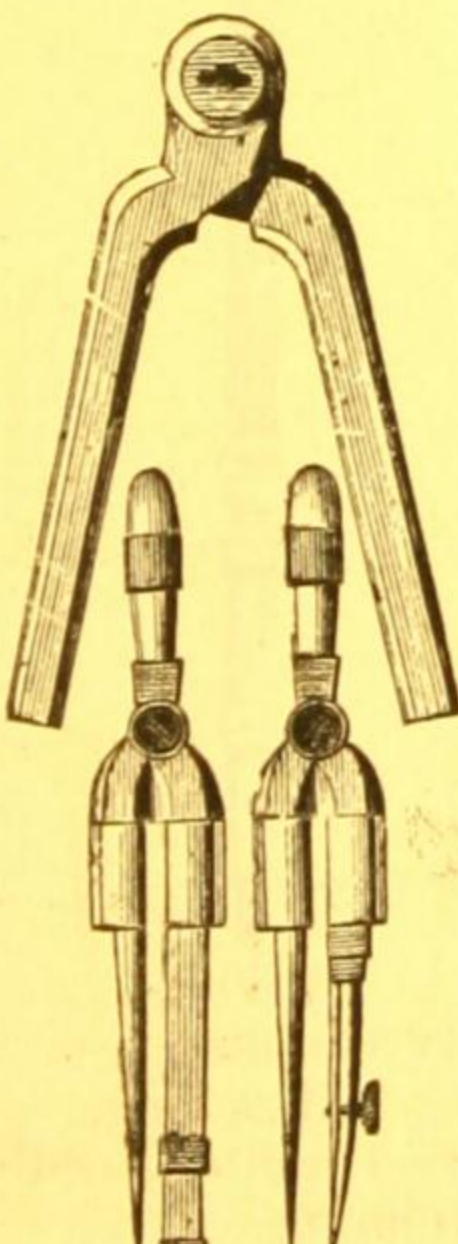
Handle, 2.50  
1.50  
1.70  
le and 2.50



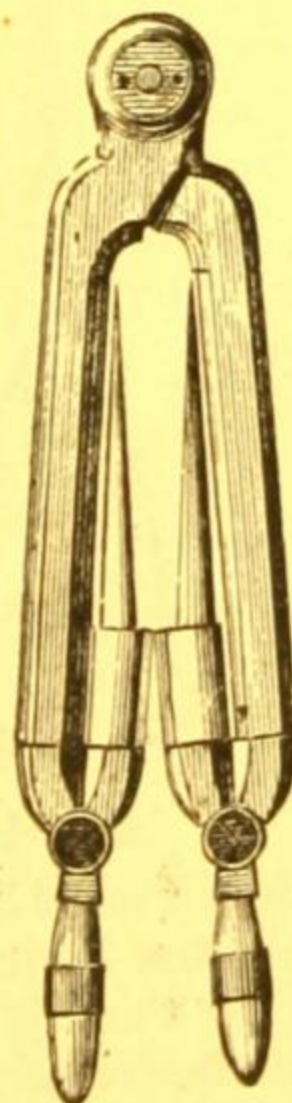
179.



180.

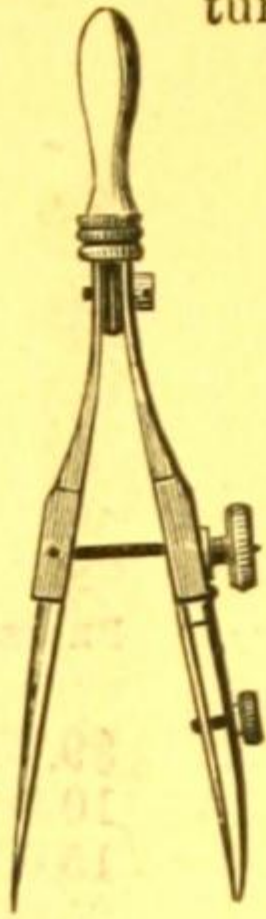


181.

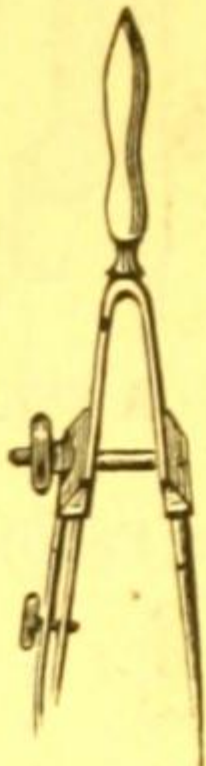


5.  
7.  
0.  
0.  
5.  
7.  
4.  
6.  
6.  
6.

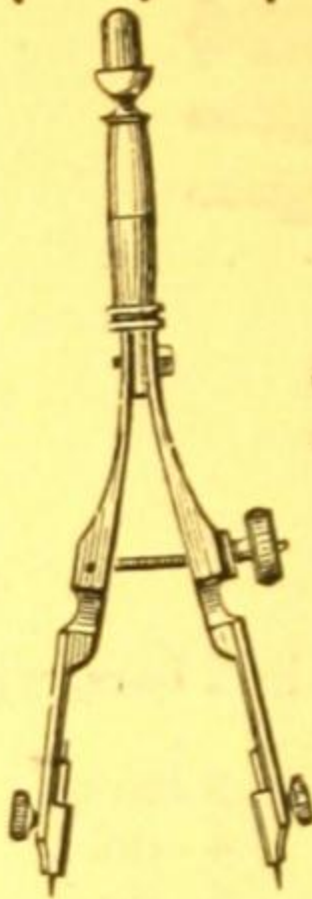
No.	PRICE.
A 353. Furniture for Wood Bar Beam Compasses, not in morocco box, . . .	\$6.75
A 354. Pillar Compasses, or Pocket Set of Instruments, with Points to change, . . . . .	7.50
A 355. Pillar Compasses, or Pocket Set of Instruments, with Points to change, and Handles to Bow Pen and Pencil, . . . . .	8.00
A 356. Pillar Compasses, or Pocket Set of Instruments, with Points to turn, . . . . .	7.50



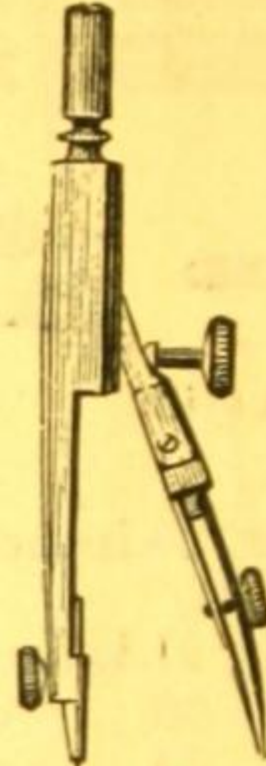
A 357.



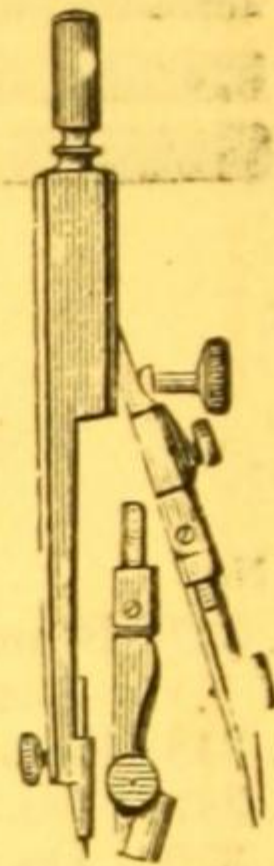
A 358.



A 359.

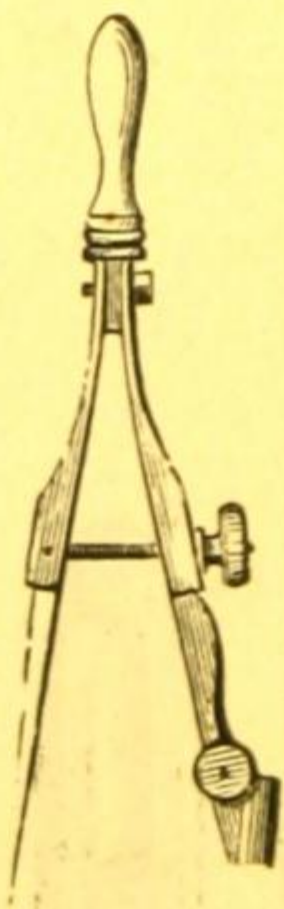


A 360.

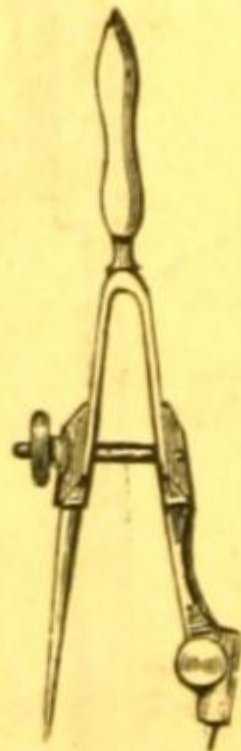


A 361.

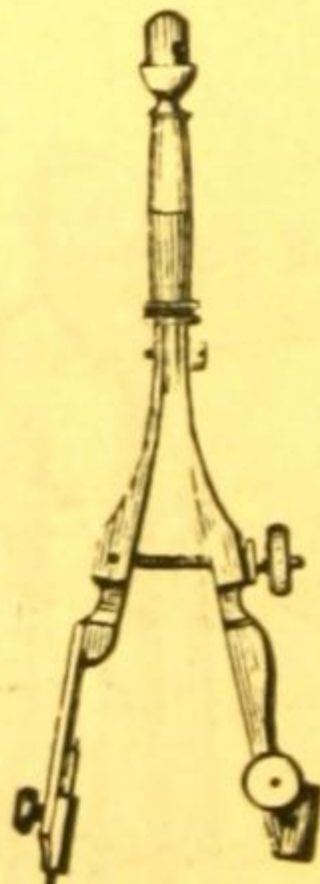
A 357. Spring Bow Pen, all steel, Ivory Handle, . . . . .	2.00
A 358. Very delicate Steel Bow Pen, 2½ inches long, . . . . .	2.25
A 359. Spring Bow Pen, with Needle Point, all steel, Ivory Handle, . . . . .	2.40
A 360. Do. do. German silver, . . . . .	2.00
A 361. Do. do. do. with Pencil Point, . . . . .	3.00



A 362.



A 363.



A 364.



A 365.



A 366.



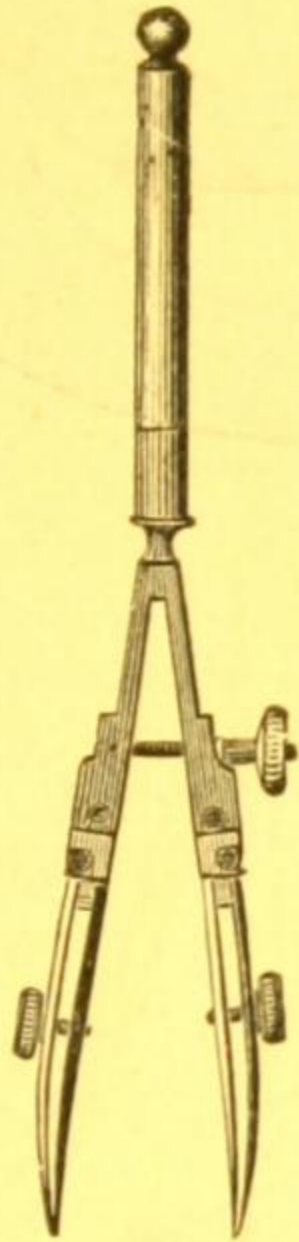
A 367.

A 362. All Steel Spring Bow Pencil, Ivory Handle, . . . . .	2.00
A 363. Very delicate Steel Bow Pencil, 2½ inches long, . . . . .	2.25
A 364. All Steel Spring Bow Pencil, Ivory Handle, Needle Point, . . . . .	2.40
A 365. Drawing Pen, 4½ inches long, with joints, . . . . .	1.25
A 366. Do. 5½ do. do. . . . .	1.40
A 367. Do. 6½ do. do. . . . .	1.60





A 368.



A 369.



A 370.

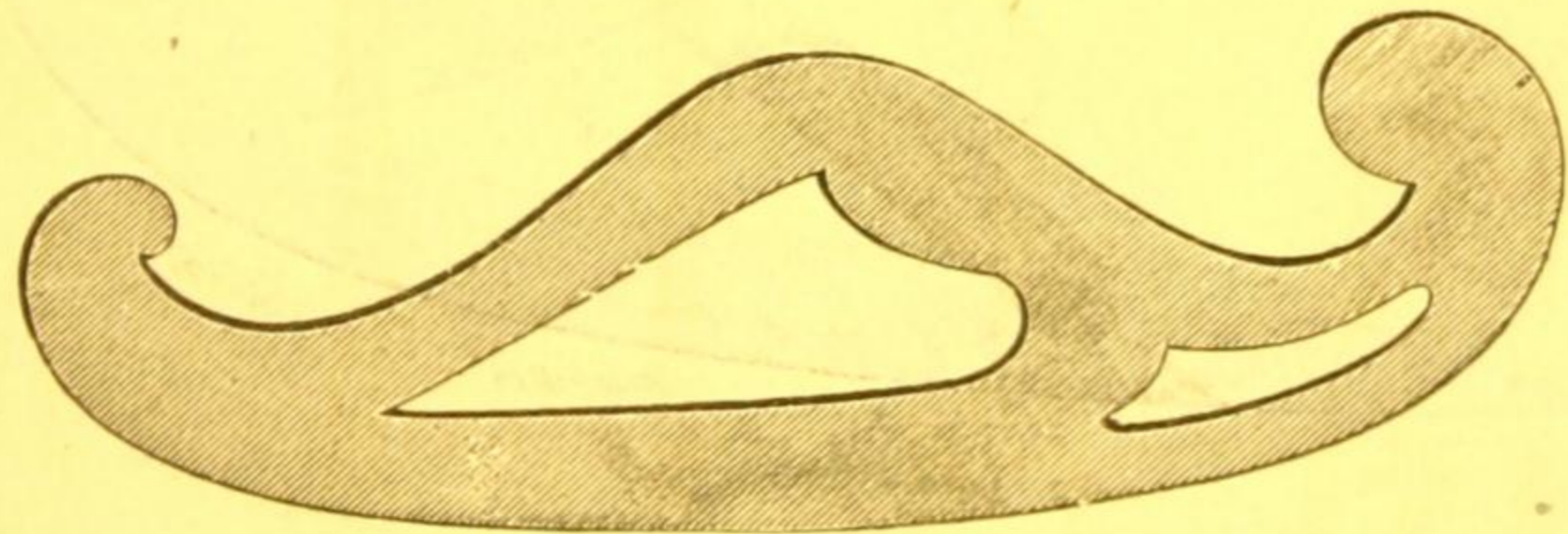


A 374.

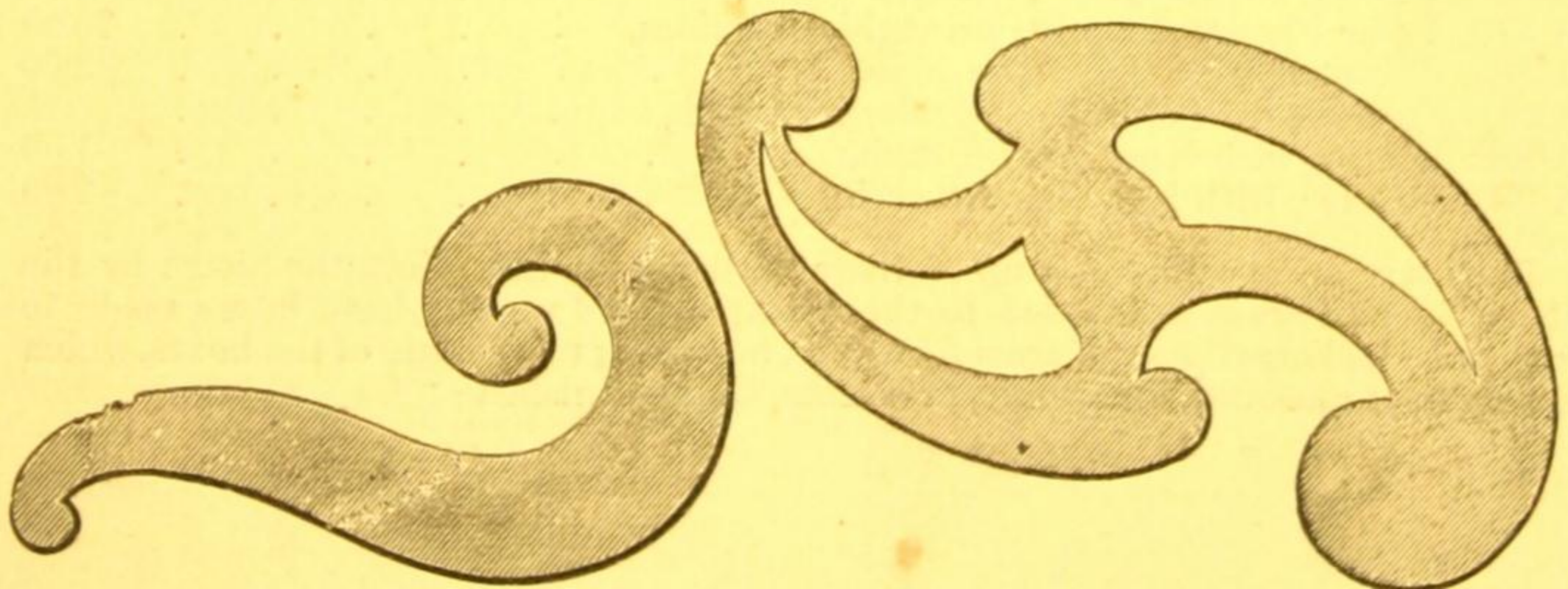


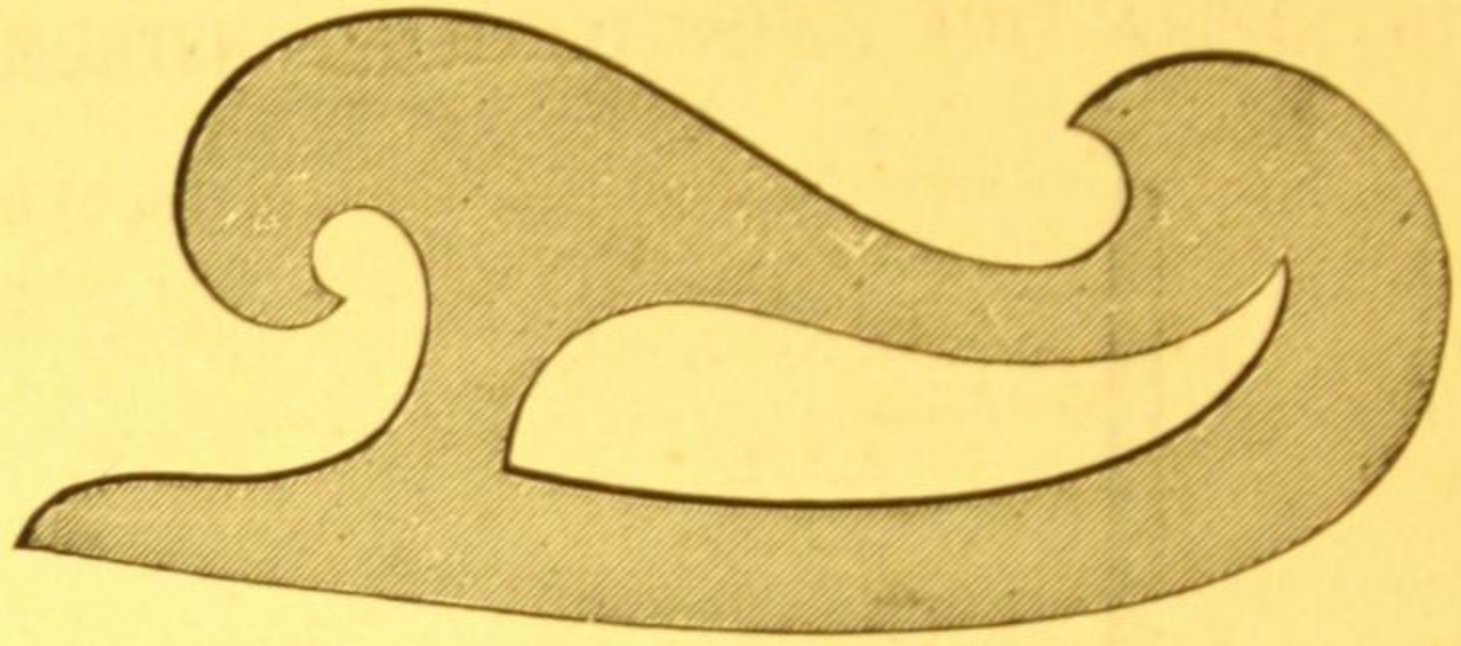
A 375.

No.	DESCRIPTION	PRICE.
A 368.	Road, or Double Drawing Pen, . . . . .	\$3.75
A 369.	Do. do. do. with joint in each side, . . . . .	3.00
A 370.	Dotting Pen, with one wheel, . . . . .	2.00
A 371.	Do. with six wheels, . . . . .	3.50
A 372.	Do. with three wheels, . . . . .	3.75
A 373.	Horn Centre, with German silver edges, . . . . .	.40
A 374.	German Silver Centre, with handle, . . . . .	.60
A 375.	Do. Fastening Tacks, per dozen, . . . . .	.60
A 376.	Steel Fastening Tacks, per dozen, . . . . .	.60

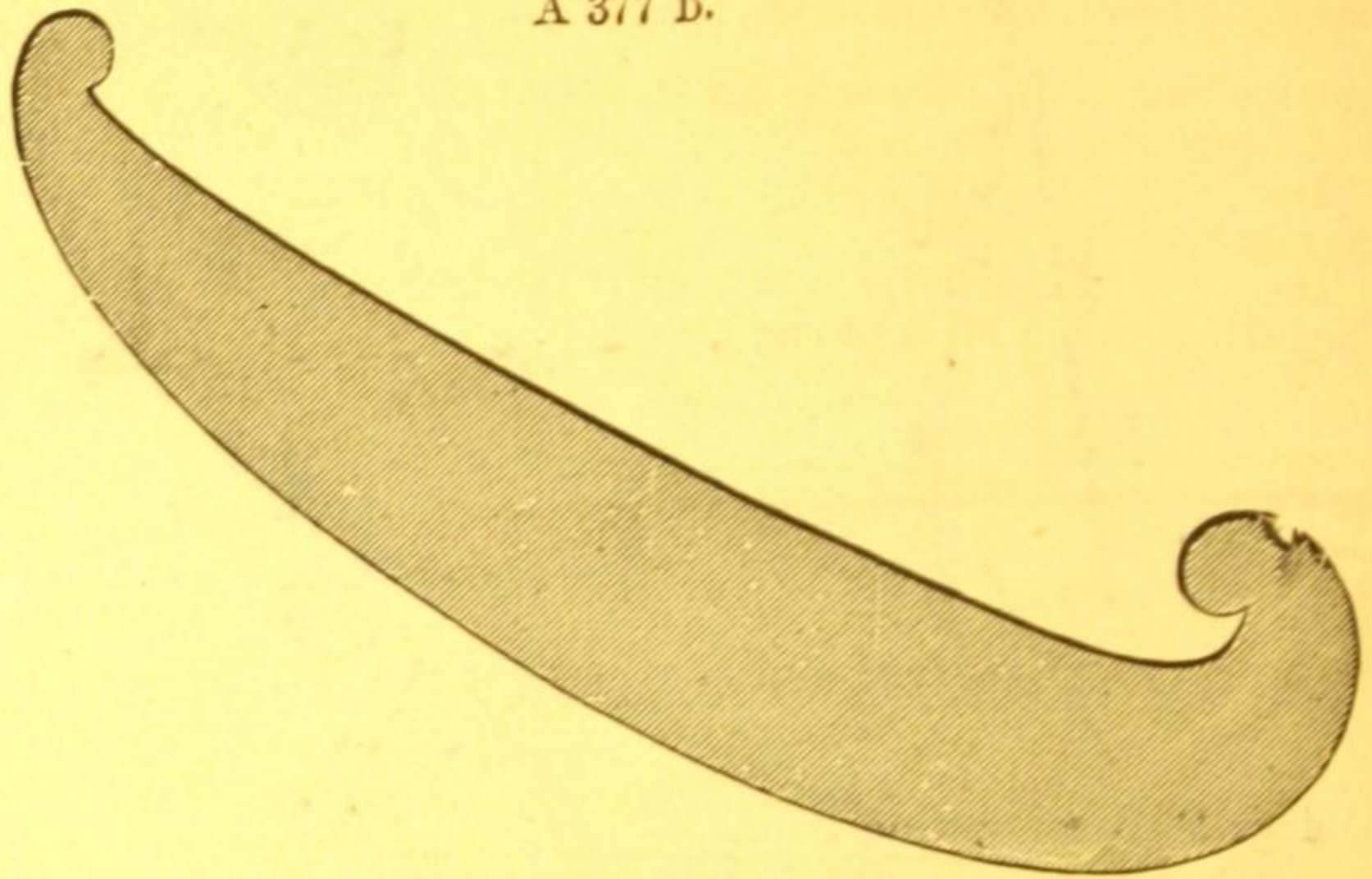


199A.

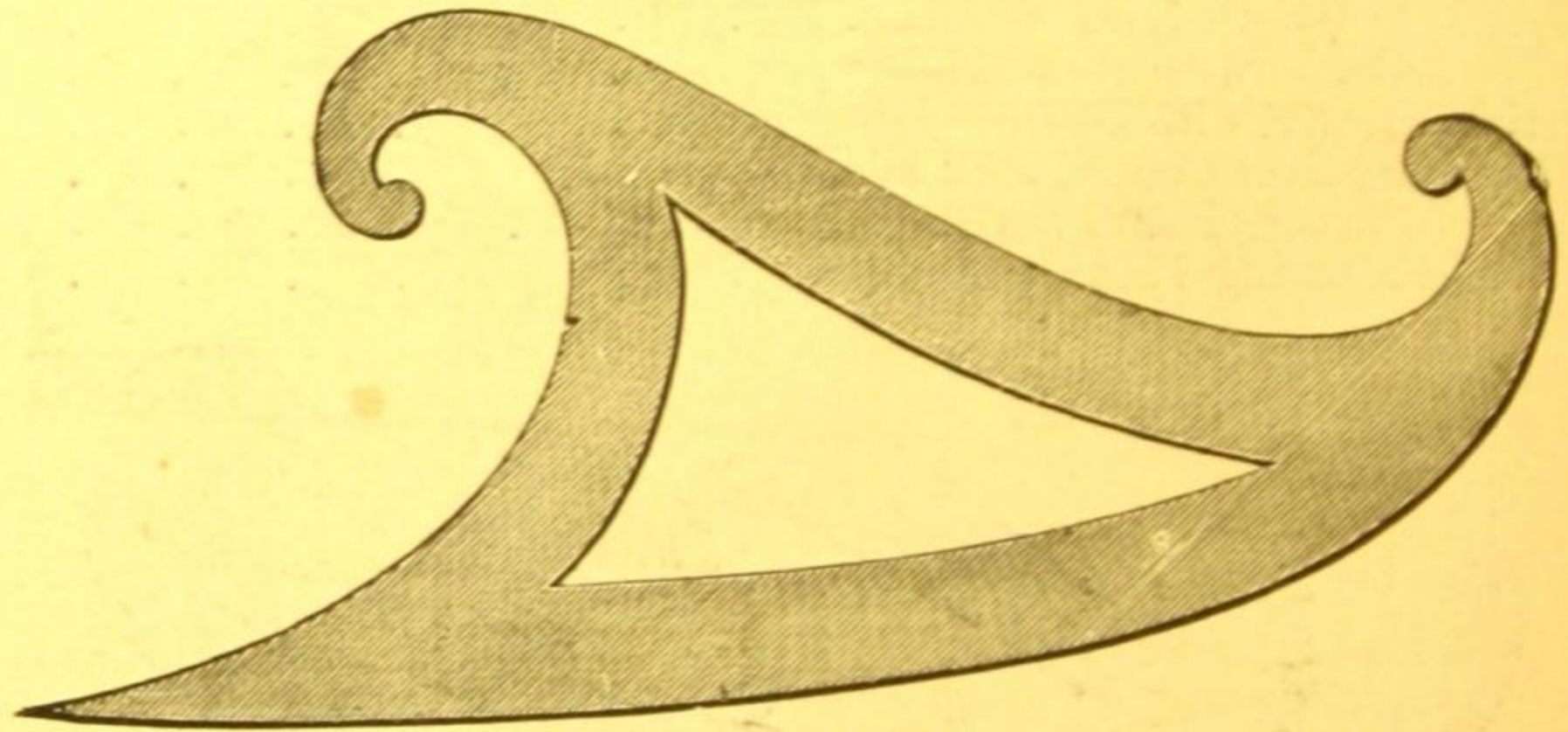




A 377 D.



A 377 E.



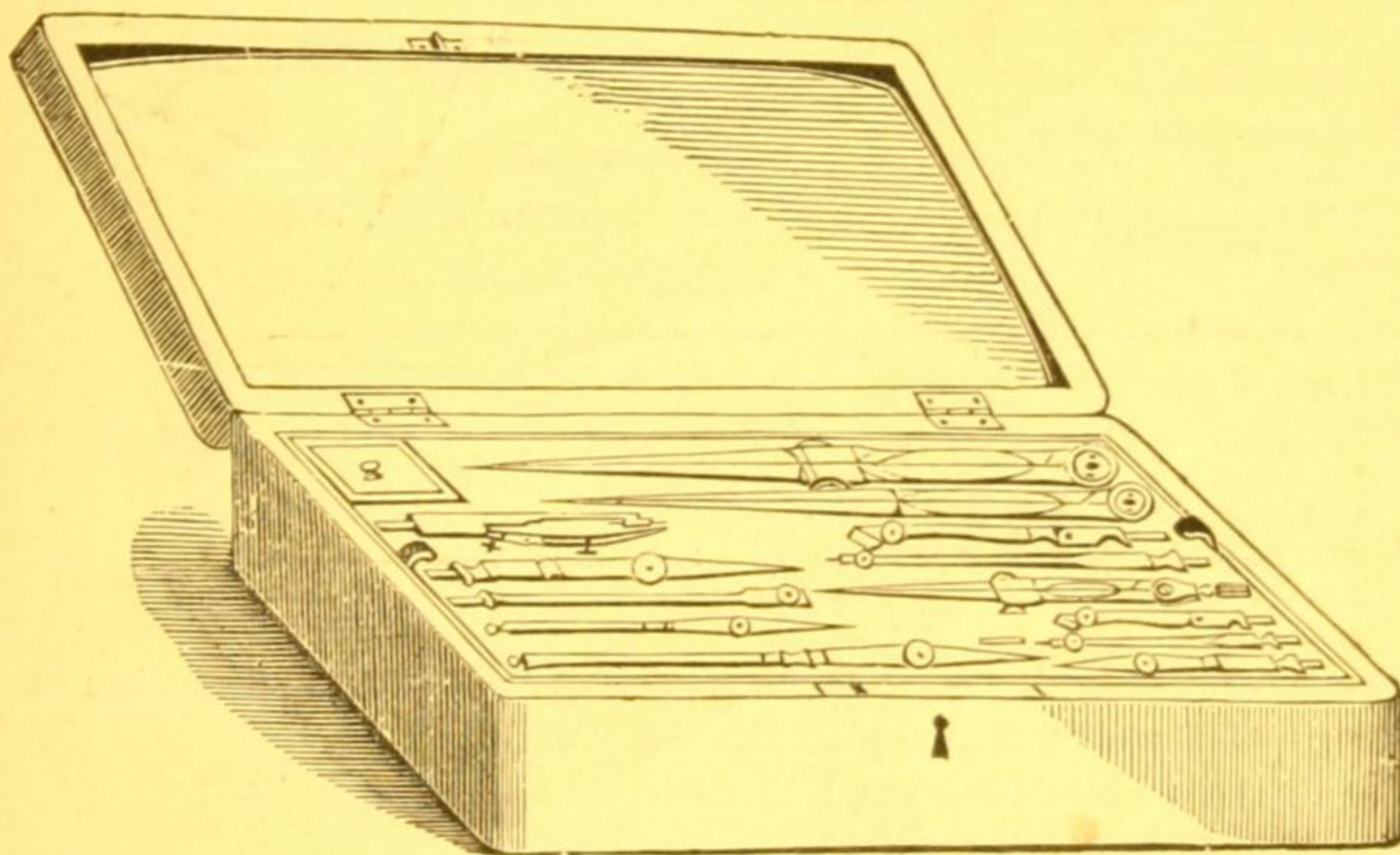
A 377 F.

No.	Price
A 377. Irregular Curves of Horn, each,	\$0.75
A 378. Rolling Parallel Rule, ebony,	3.00
A 379. Polar Planimeter, with printed instructions,	30.00
A 380. Eccentric Rule, 11 inches long,	2.00
A 381. Steel Needle Points for Divider legs, each,	.15
A 382. Tracer, with ivory handle, each,	1.50
A 383. Pricker, with ivory handle, each,	2.00

Parties wanting cases made up of these instruments can select the pieces by the above list that are best adapted to their purpose, and we will have boxes made to suit, at an additional cost of from \$7 to \$15, according to the sizes of the boxes, which are made of rosewood, mahogany, or walnut, highly finished.

SETS OF EXTRA FINE SWISS DRAWING INSTRUMENTS.

No.	PRICE.
The following sets have beautifully finished Walnut Boxes, 9½ inches long by 6 inches wide, with lock and key and tray :	
A 390. Contains pair plain Dividers, No. A 321, Set of Instruments, No. A 325, Steel Spacing Dividers, No. A 344, Steel Bow Pen, No. A 357, Steel Bow Pencil, No. A 362, Drawing Pen, No. A 366, Triangular Scale, 6 inches long, . . . . .	\$21.00
A 391. Contains pair plain Dividers, No. A 321, Set of Instruments, No. A 325, Do. No. A 328, Drawing Pen, No. A 365, Do. No. A 367, Triangular Scale, 6 inches long, . . . . .	22.00

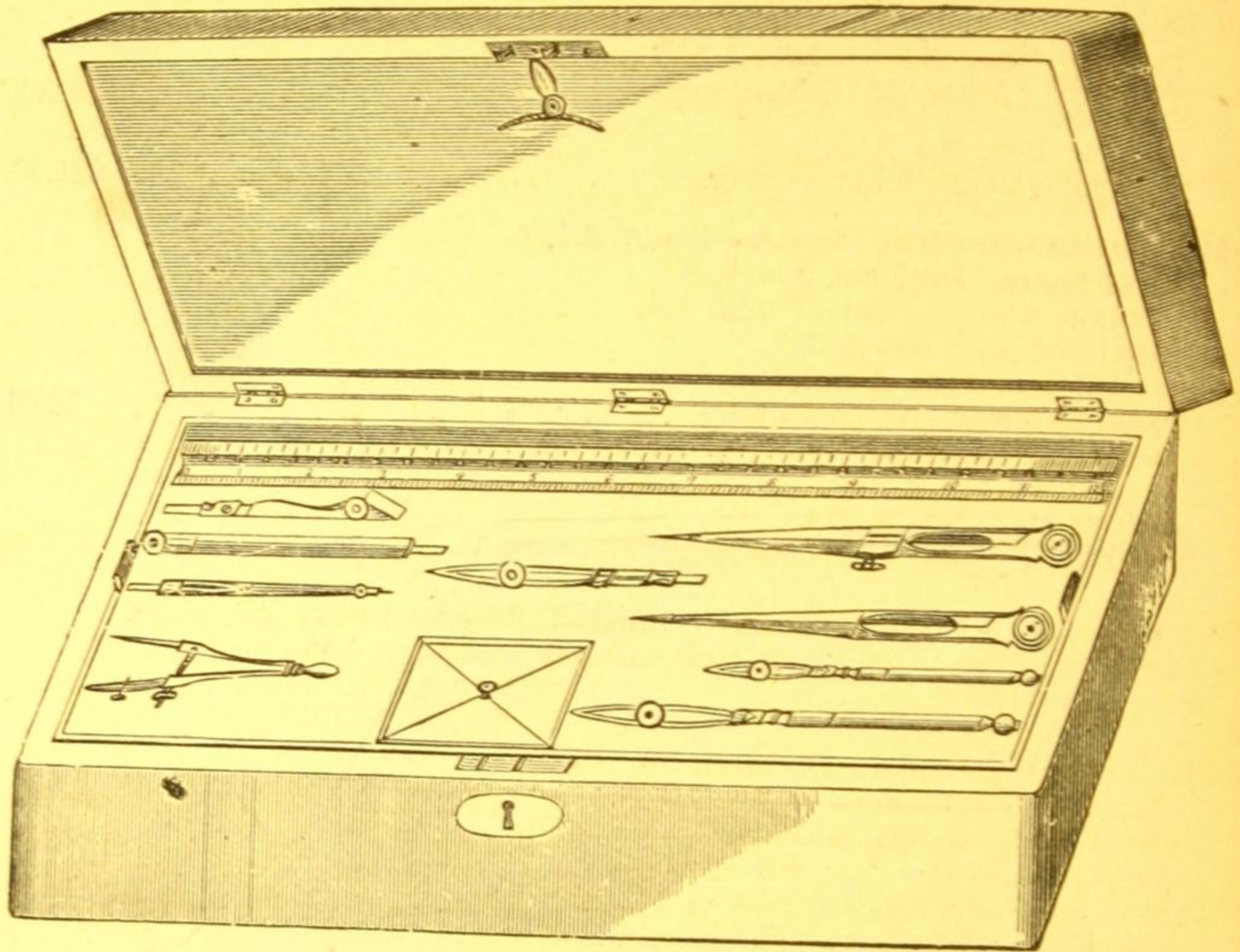


A 392.

A 392. Contains pair plain Dividers, No. A 321, Set of Instruments, No. A 325, Do. No. A 328, Bow Pen, No. A 360, Drawing Pen, No. A 365, Do. No. A 367, Triangular Scale, 6 inches long, . . . . .	24.00
A 393. Contains pair plain Dividers, No. A 321, Pair Hair Spring Dividers, No. A 324, Set of Instruments, No. A 325, Steel Spacing Dividers, No. A 344, Steel Bow Pen, No. A 357, Steel Bow Pencil, No. A 362, Drawing Pen, No. A 365, Do. No. A 366, Triangular Scale, 6 inches long, . . . . .	25.00

ments can select the pieces  
e, and we will have boxes  
ding to the sizes of the boxes  
ly finished.

- | No.   | PRICE   |
|---|---------|
| A 394. Contains plain pair Dividers, No. A 321,<br>Pair Hair Spring Dividers, No. A 324,<br>Set of Instruments, Nos. A 325 and A 328,<br>Bow Pen, No. A 360,<br>Drawing Pens, Nos. A 365 and A 367,<br>Triangular Scale, 6 inches long, . . . . . | \$28.00 |



A 395.

The following sets have beautifully finished Walnut Boxes, 13 inches long by 6 inches wide, with lock and key and tray:

- |   |       |
|---|-------|
| A 395. Contains pair plain Dividers, No. A 321,<br>Set of Instruments, No. A 325,<br>Steel Bow Pen, No. A 357,<br>Drawing Pens, Nos. A 365 and A 366,<br>Triangular Scale, 12 inches long, . . . . .  | 20.00 |
| A 396. Contains pair plain Dividers, No. A 321,<br>Set of Instruments, Nos. A 325 and A 328,<br>Steel Bow Pen, No. A 357,<br>Steel Bow Pencil, No. A 362,<br>Drawing Pens, Nos. A 365 and A 366,<br>Triangular Scale, 12 inches long, . . . . . | 26.50 |

The following sets have beautifully finished Rosewood Boxes, 13 inches long by 7½ inches wide, with lock and key and tray:

- |   |       |
|---|-------|
| A 397. Contains pair plain Dividers, No. A 321,<br>Pair Hair Spring Dividers, No. A 324,<br>Set of Instruments, Nos. A 325 and A 328,<br>Pair Steel Spacing Dividers, No. A 362,<br>Steel Bow Pen, No. A 357,<br>Steel Bow Pencil, No. A 362,<br>Drawing Pens, Nos. A 365, A 366, and A 367,<br>Triangular Scale, 12 inches long, . . . . . | 33.00 |
|---|-------|

No.	PRICE
<p><b>A 398.</b> Contains pair plain Dividers, No. A 321,                      Pair Hair Spring Dividers, No. A 324,                      Set of Instruments, Nos. A 325 and A 328,                      Proportional Dividers, No. A 335,                      Steel Spacing Dividers, No. A 344,                      Steel Bow Pen, No. A 357,                      Steel Bow Pencil, No. A 362,                      Drawing Pens, Nos. A 365, A 366, and A 367,                      Triangular Scale, 12 inches long, . . . . .</p>	\$40.00
<p><b>A 399.</b> Contains pair plain Dividers, No. A 321,                      Pair Hair Spring Dividers, No. A 324,                      Set of Instruments, Nos. A 325 and A 328,                      Proportional Dividers, No. A 366,                      Steel Spacing Dividers, No. A 344,                      Steel Bow Pen, No. A 357,                      Steel Bow Pencil, No. A 362,                      Beam Compass, No. A 348,                      Drawing Pens, Nos. A 365, A 366, and A 367,                      Road Pen, No. A 369,                      Dotting Pen, No. A 374,                      Triangular Scale, 12 inches long, . . . . .</p>	57.00

The following set has beautifully finished Rosewood Box, 15½ inches long by 10 inches wide, with lock and key and tray, and lined with finest silk velvet:

<p><b>A 400.</b> Contains pair plain Dividers, No. A 321,                      Pair Spring Dividers, No. A 324,                      Set of Instruments, No. A 327,                      Proportional Dividers, No. A 338,                      Steel Spacing Dividers, Nos. A 343 and A 344,                      Beam Compass, No. A 349,                      Steel Bow Pen, No. A 357,                      Set of Instruments, No. A 334,                      Steel Bow Pencil, No. A 362,                      Drawing Pens, Nos. A 365, A 366, A 367,                      Road Pen, No. A 369,                      Dotting Pen, with 6 wheels, No. A 371,                      Protractor,                      Triangular Scale, 12 inches long,                      Set of Color Cups, . . . . .</p>	95.00
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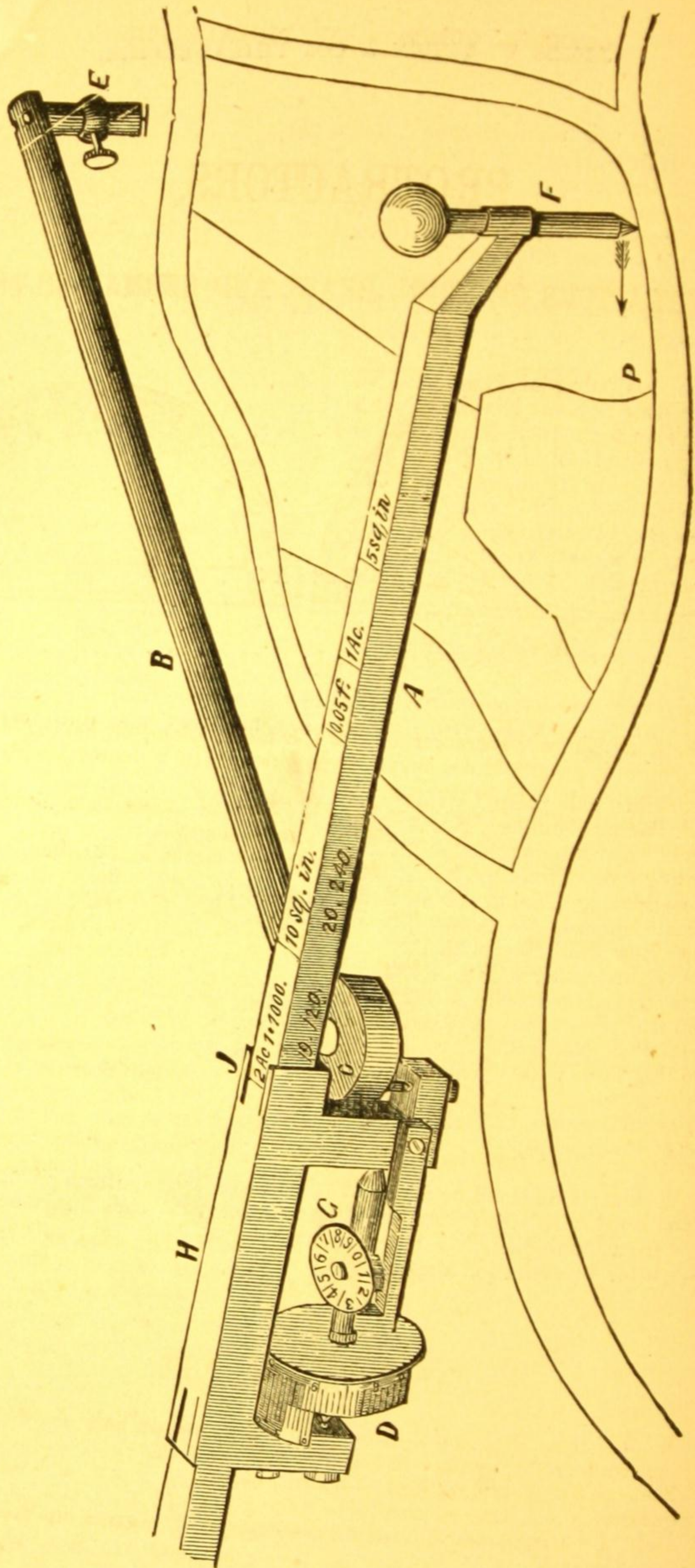
Finely Polished Rosewood or Black Walnut Cases, with German silver straps and corners, and lined with silk velvet, fitted up to order with such instruments as may be selected from Catalogue.

Extra Sets for presentation a specialty.



Walnut Boxes, 13 inches and tray:

Rosewood Boxes, 13 key and tray:



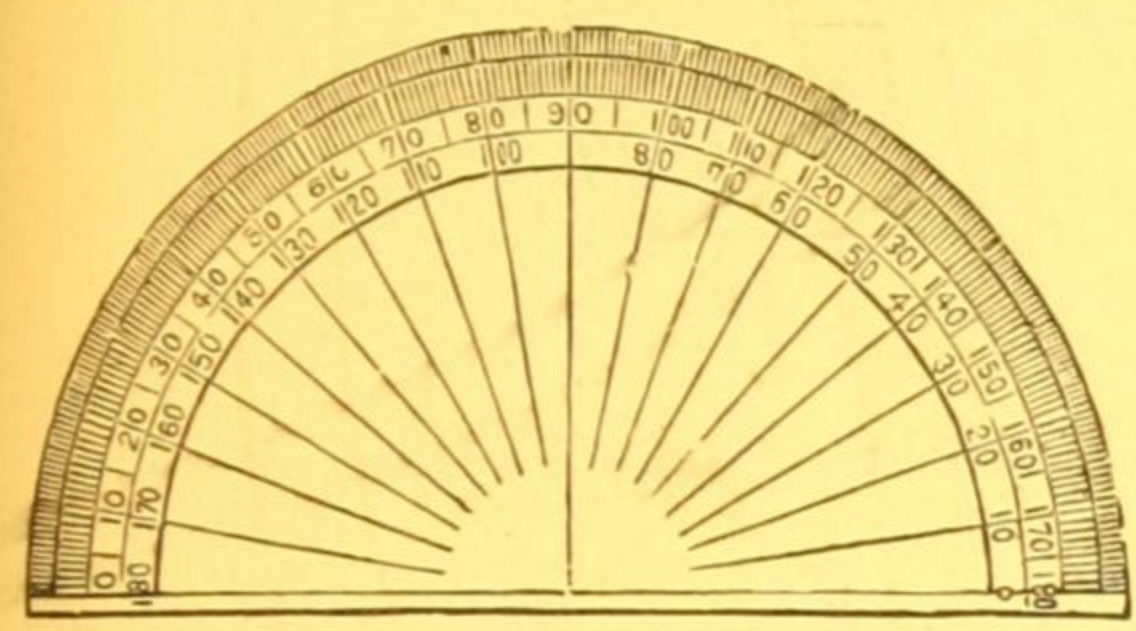
No  
 A 401. Amsler's Polar Planimeter,  
 A 402. Amsler's Polar Planimeter for Indicator Diagrams, . . . . .

PRICE.  
 \$30.00  
 32.50

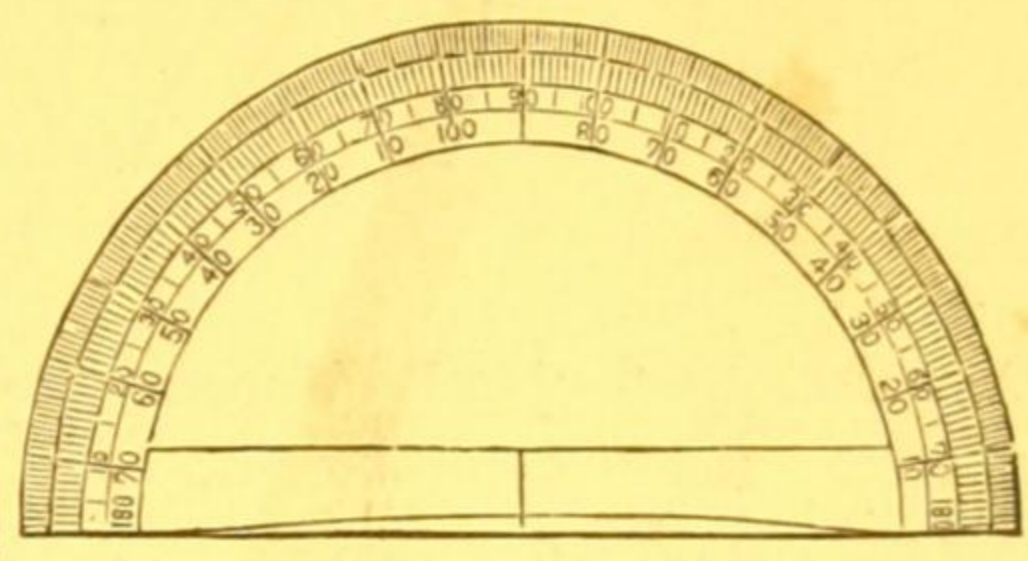
No.  
 A 405. F  
 A 406. F  
 A 407. F  
 A 408.  
 A 409.  
 A 410. F  
 A 411.  
 A 412.  
 A 413.  
 A 414.  
 A 415. B  
 A 416.  
 A 417.  
 A 418.  
 A 419. G  
 A 420.  
 A 421.  
 A 422.  
 A 423.  
 A 424.  
 A 425.  
 A 429. W  
 d  
 A 430. Sa  
 A 431. Sa  
 A 432. Ha  
 b

# PROTRACTORS.

## PROTRACTORS OF HORN, BRASS, AND GERMAN SILVER.



A 410.



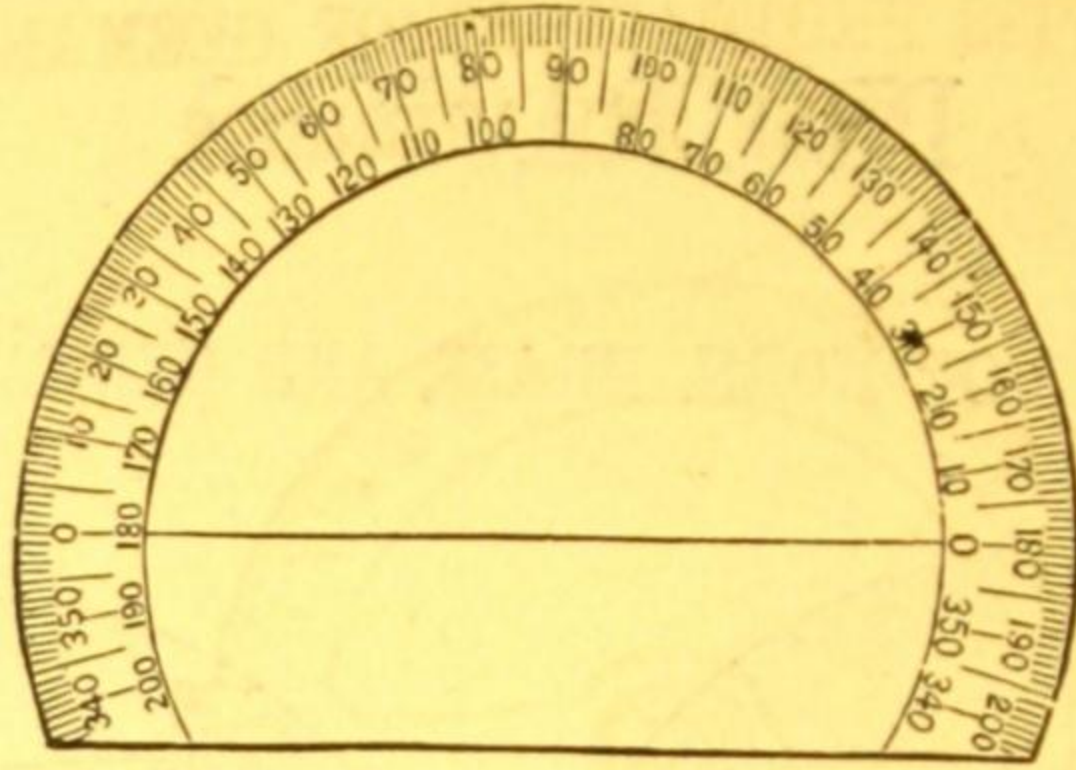
A 416.

No.					PRICE.
A 405.	Railroad Curve Protractor, of horn, 8 inches diameter, having laid off on it twenty-three curves from $\frac{1}{2}$ degree to 8 degrees, with a radius of 400 feet to the inch,				\$1.60
A 406.	Horn Rectangular Protractor, 6 inches long, $2\frac{7}{8}$ inches wide, divided around edge from 0 to 180 degrees, in — degrees,				.50
A 407.	Horn Protractors, 5 inches diameter, whole circle, half degrees,				1.00
A 408.	Do. 6 do. do. do.				1.25
A 409.	Do. 7 do. do. do.				1.50
A 410.	Horn Protractor, 4 do. half circle, whole degrees,				.15
A 411.	Do. 5 do. do. half degrees,				.25
A 412.	Do. 6 do. do. do.				.30
A 413.	Do. 7 do. do. do.				.50
A 414.	Do. 8 do. do. do.				.80
A 415.	Brass Protractor, 4 do. do. whole degrees,				.10
A 416.	Do. 4 do. do. half degrees,				.35
A 417.	Do. 5 do. do. do.				.55
A 418.	Do. 6 do. do. do.				.65
A 419.	German Silver Protractor, 4 in. diameter, half circle, whole degrees,				.50
A 420.	Do. do. 5 do. do. half degrees,				.85
A 421.	Do. do. 6 do. do. do.				1.00
A 422.	Do. do. 7 do. do. do.				1.15
A 423.	Do. do. 5 do. do. do. bev. edge, half degr.,				1.25
A 424.	Do. do. 6 do. do. do. do. do.				2.00
A 425.	Do. do. 7 do. do. do. do. do.				2.65

## PAPER PROTRACTORS.

A 429.	Whole Circle Protractors, 8 or 13 inches diameter, half degrees, on drawing paper, printed in red or black, each,	.30
A 430.	Same as No. A 429, on Bristol-boards, each,	.40
A 431.	Same as No. A 429, on vegetable tracing paper,	.25
A 432.	Half Circle Protractor, 5 inches diameter, half degrees, on Bristol-boards, each,	.25

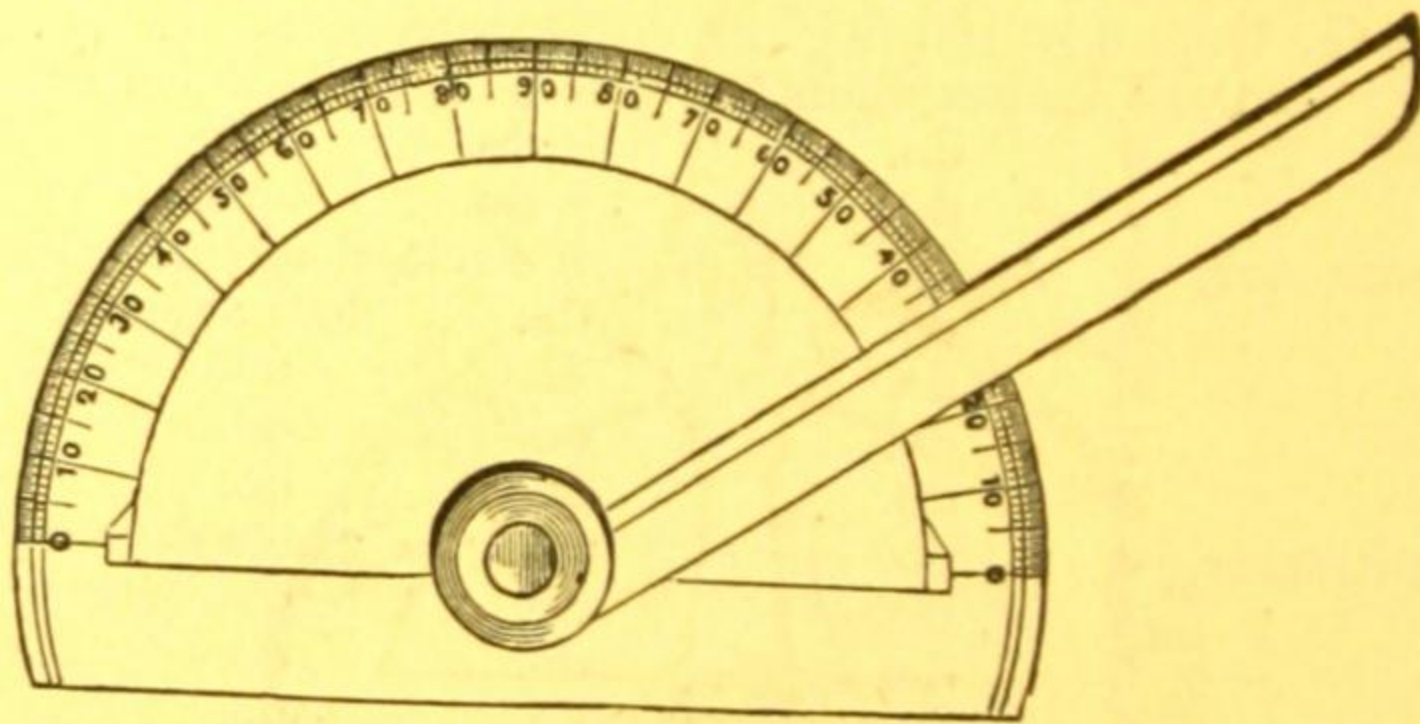
EXTRA FINE SWISS PROTRACTORS.



A 443.

No.									PRICE.
A 439.	Protractor,	4 inches	diameter,	$\frac{1}{2}$ circle,	whole	degrees,	centre on	outer edge,	\$1.50
A 440.	Do.	5	do.	$\frac{1}{2}$	do.	$\frac{1}{2}$	do.	do.	2.00
A 441.	Do.	6	do.	$\frac{1}{2}$	do.	$\frac{1}{2}$	do.	do.	3.00
A 442.	Do.	6	do.	$\frac{1}{2}$	do.	$\frac{1}{4}$	do.	do.	3.25
A 443.	Do.	5	do.	$\frac{1}{2}$	do.	$\frac{1}{2}$	do.	do.	2.50
A 444.	Do.	6	do.	$\frac{1}{2}$	do.	$\frac{1}{2}$	do.	inner edge,	3.00
A 445.	Do.	6	do.	$\frac{1}{2}$	do.	$\frac{1}{4}$	do.	do.	4.00

EXTRA FINE SWISS PROTRACTORS, OF GERMAN SILVER, WITH ARMS.

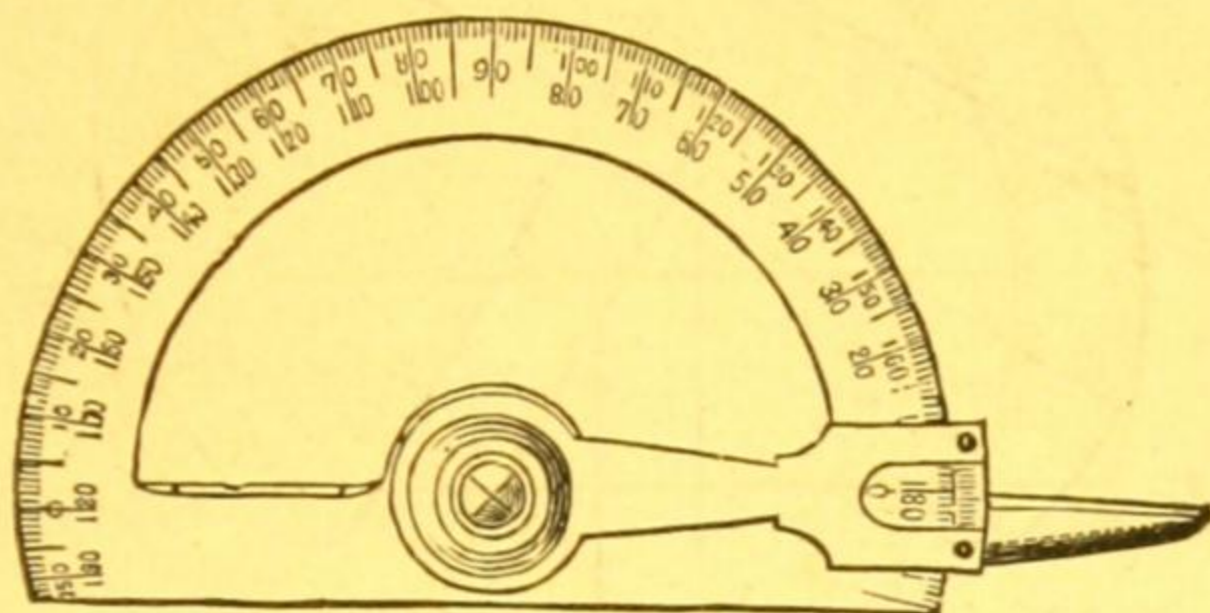


A 459.

A 459.	German Silver Protractor,	5 inches	diameter,	half circle,	with arm,	and divided in half degrees,	7.50
A 460.	German Silver Protractor,	6 inches	diameter,	half circle,	with arm,	and divided in half degrees,	8.50
A 461.	German Silver Protractor,	7 inches	diameter,	half circle,	with arm,	and divided in half degrees,	9.00
A 463.	German Silver Protractor,	8 inches	diameter,	half circle,	with arm,	and divided in half degrees,	9.50
A 469.	German Silver Protractor,	5 inches	diameter,	whole circle,	with arm,	and divided in half degrees,	9.00
A 470.	German Silver Protractor,	6 inches	diameter,	whole circle,	with arm,	and divided in half degrees,	10.00
A 471.	German Silver Protractor,	7 inches	diameter,	whole circle,	with arm,	and divided in half degrees,	11.00
A 472.	German Silver Protractor,	8 inches	diameter,	whole circle,	with arm,	and divided in half degrees,	12.00

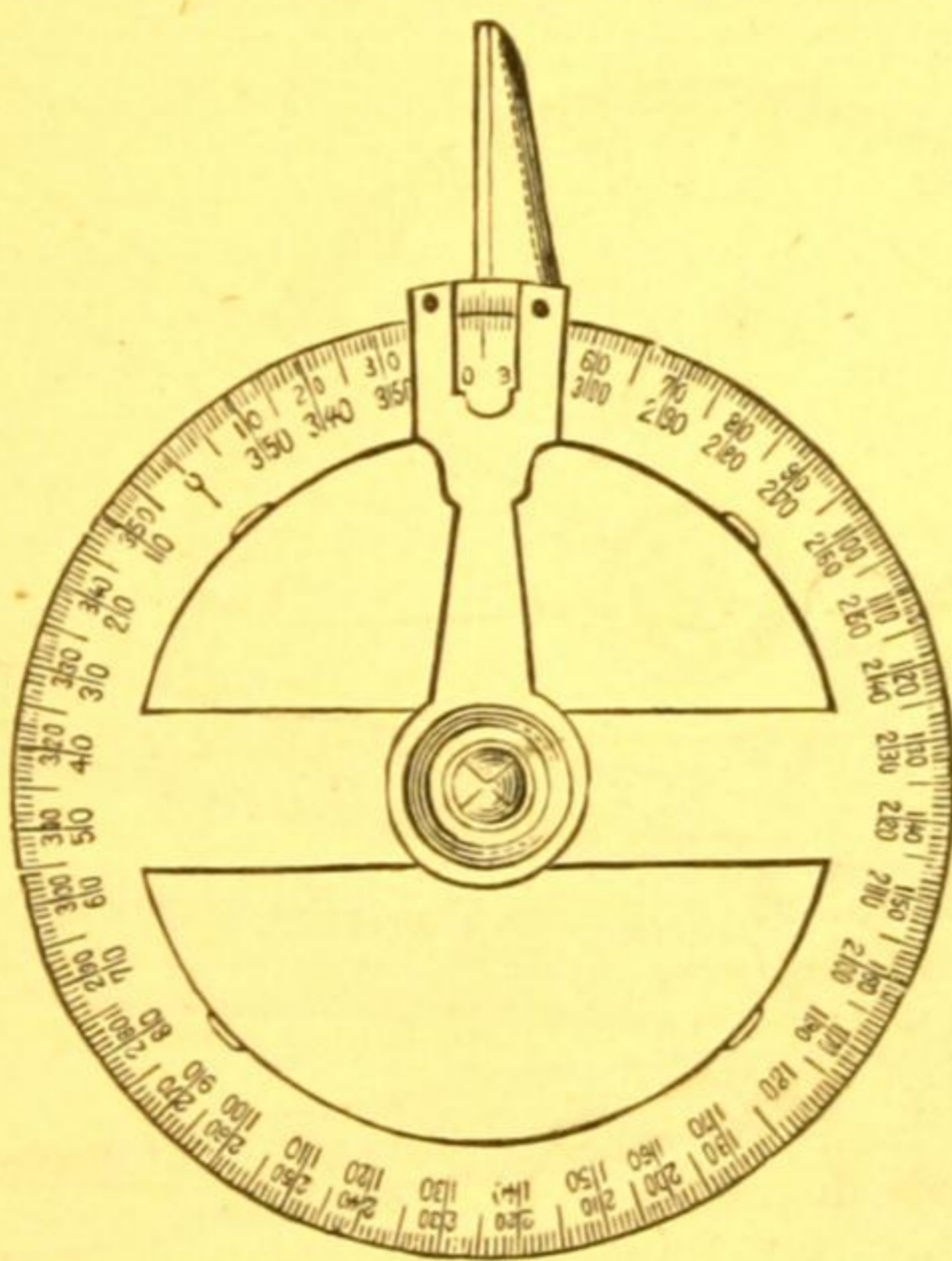


EXTRA FINE SWISS PROTRACTORS OF GERMAN SILVER, WITH ARMS AND VERNIERS.



A 479.

No.	PRICE.
A 479. Protractor, 5½ inches diameter, half circle, half degrees, with vernier reading to three minutes,	\$11.00
A 480. Protractor, 8 inches diameter, half circle, quarter degrees, with vernier reading to one minute,	14.00
A 481. Protractor, 10 inches diameter, half circle, quarter degrees, with vernier reading to one minute,	18.00



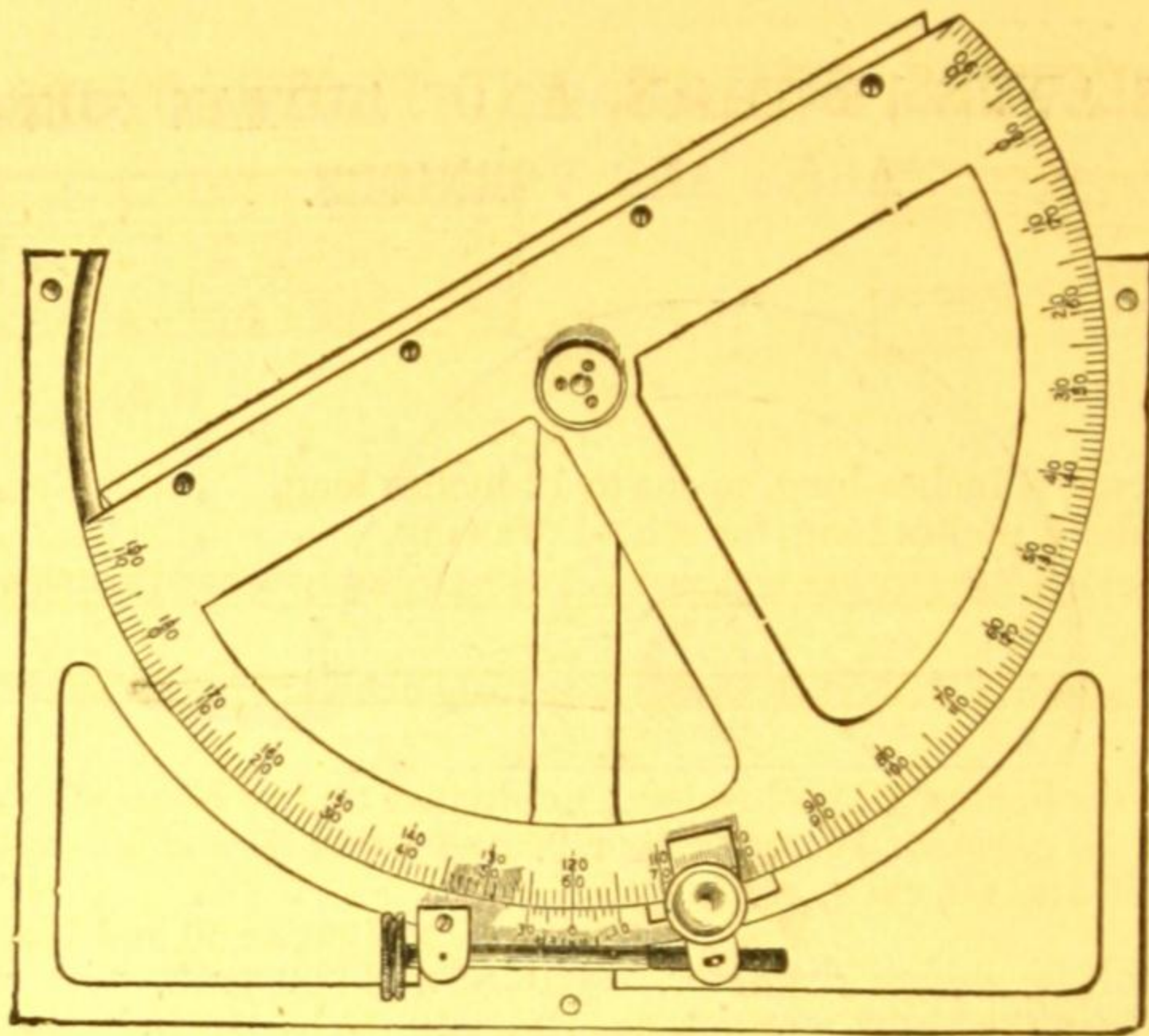
A 482.

A 482. Protractor, 5½ inches diameter, whole circle, half degrees, with vernier reading to three minutes,	14.50
A 483. Protractor, 8 inches diameter, whole circle, quarter degrees, with vernier, reading to one minute,	16.00
A 484. Protractor, 10 inches diameter, whole circle, quarter degrees, with vernier reading to one minute,	20.00

es, centre on outer edge, \$1.50  
do. do. 2.00  
do. do. 2.50  
do. inner edge, 2.50  
do. do. 3.00  
do. do. 4.00

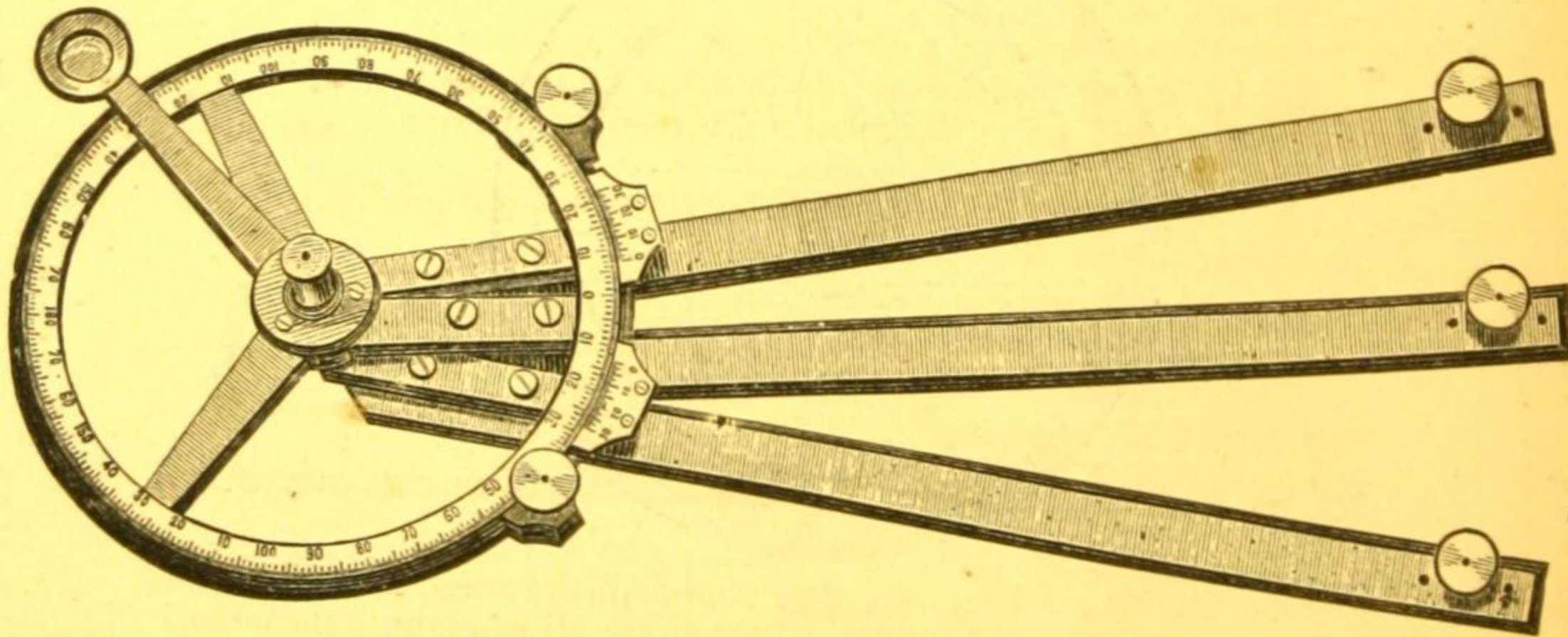
GERMAN SILVER, WITH

circle, with arm, 7.50  
circle, with arm, 8.50  
circle, with arm, 9.00  
circle, with arm, 9.50  
circle, with arm, 9.00  
circle, with arm, 10.00  
circle, with arm, 11.00  
circle, with arm, 12.00



A 490.

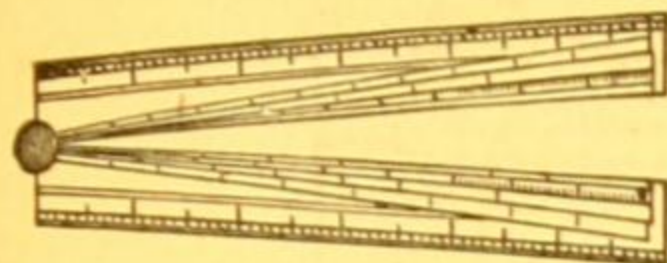
No.	PRICE
A 490. CROZET PROTRACTOR, 8-inch $\frac{1}{4}$ reading to 1 minute, . . . . .	\$45.00
An extremely useful and practical instrument, which may be used along a straight edge, and angles set off without the necessity of bringing the centre of the protractor over the starting point.	



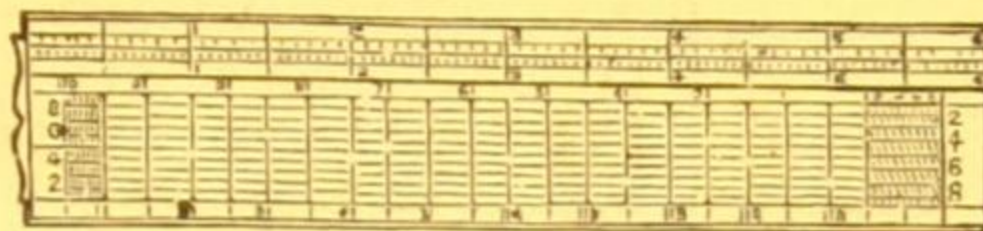
A 492.

A 492. STATION POINTER, or THREE-ARM PROTRACTOR, $6\frac{1}{2}$ -inch diameter, arms 9 inches long, to lengthen to $17\frac{1}{2}$ -inch. Divided to $\frac{1}{2}$ degrees, with verniers reading to 1 minute; with magnifying lens; packed in polished mahogany case, . . . . .	80.00
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SECTORS, SCALES, AND PROTRACTORS.

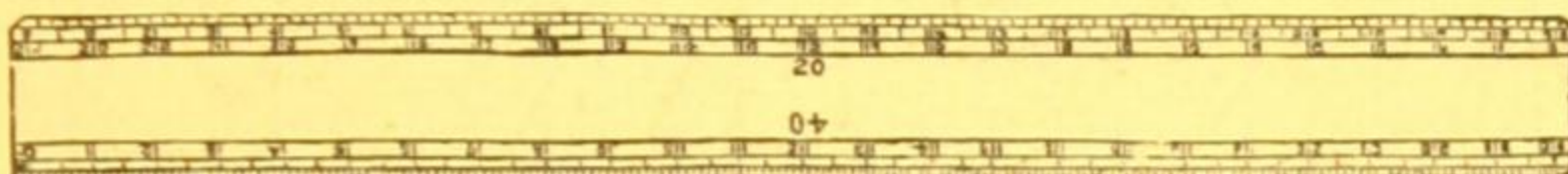


A 509.



A 510.

No.				PRICE.
A 509.	Ivory Sector,	6 inches long,	opens to 12 inches long,	\$2.25
A 510.	Ivory Scale,	6 inches long,	for school drawing,	.75



A 511.

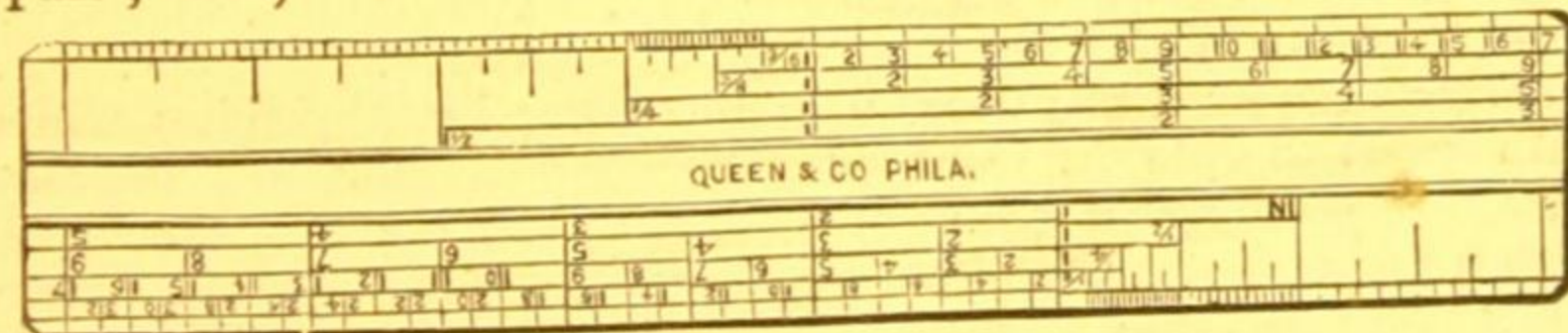
A 511.	Ivory Chain Scales,	12 inches long,	graduated on two edges with either 10 and 10 parts, or 10 and 20, or 20 and 40, or 30 and 50, or 40 and 60, or 50 and 60, each,	3.00	
A 512.	Do.	do.	do.	with 40 and 80, or 50 and 100, each,	5.25
A 513.	Do.	do.	do.	with 80 and 100, each,	5.75
A 514.	Ivory Off-set Scales,	2 inches long,	10 by 10, 10 by 20, 20 by 40, 30 by 50, 40 by 60, each,	.65	

ARCHITECTS' IVORY SCALES.



A 515.

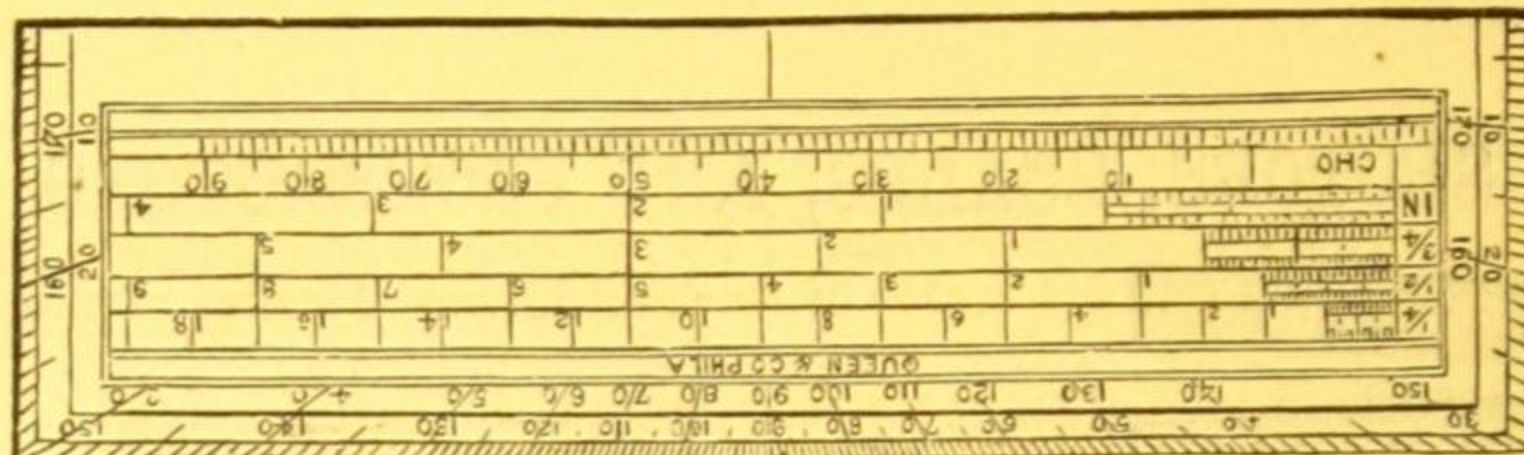
A 515.	Ivory Scale,	12 inches long,	with 16 scales, as follows: $\frac{1}{8}$ , $\frac{3}{16}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , 1, $1\frac{1}{4}$ , $1\frac{1}{2}$ , $1\frac{3}{4}$ , 2, $2\frac{1}{4}$ , $2\frac{1}{2}$ , and 3 inches to the foot, the first division of each scale subdivided in 12 parts, each,	3.00
A 516.	Same as No. 406,	but with the first division of each scale subdivided into 10 parts, each,		3.00
A 517.	Ivory Scale,	12 inches long,	with 12 scales, as follows: $\frac{1}{8}$ , $\frac{3}{16}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{5}{8}$ , $\frac{7}{8}$ , 1, $1\frac{1}{4}$ , $1\frac{1}{2}$ , $1\frac{3}{4}$ , 2, and 3 inches to the foot, the first division of each scale subdivided into 12 parts, diagonal scale reading to $\frac{1}{100}$ and $\frac{1}{200}$ of an inch, each,	3.00
A 518.	Same as No. 408,	but has the first division of each scale subdivided into 10 parts, each,		3.00



A 519.

A 519.	Ivory Scale,	12 inches long,	one side rounded, the other flat, with the following scales, the graduations of which are all brought to the edge: $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{3}{16}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , 1, $1\frac{1}{4}$ , $1\frac{1}{2}$ , $1\frac{3}{4}$ , 2, $2\frac{1}{4}$ , and 3 inches to the foot, the first division of each scale is subdivided into 12 parts, each,	3.00
A 520.	Same as No. 410,	but the first division of each scale subdivided into 10 parts, each,		3.00
A 521.	Flat Ivory Scale,	6 inch, div.	$\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , 1 inch to the foot, each,	2.00
A 522.	Do.	do.	12 do. $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , 1 do. do.	3.25
A 523.	Do.	do.	12 do. $\frac{3}{8}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ , 3 do. do.	3.25

IVORY PROTRACTORS.



A 534. FRONT SIDE.



A 534. REVERSE SIDE.

- | No.    | Description  | PRICE  |
|--------|--|--------|
| A 534. | Ivory Rectangular Protractor, 6 inches long, $1\frac{3}{4}$ inches wide, with scales as follows: front sides divided around edge from 0 to 180 degrees in single degrees, scales of $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , and 1 inch to the foot, and scale of chords. Reverse side scales of 30, 35, 40, 45, 50, and 60 parts to the inch, scale of chords and diagonal scale of inches and $\frac{1}{100}$ ths.  | \$1.50 |
| A 535. | Ivory Rectangular Protractor, 6 inches long by $1\frac{3}{4}$ inches wide, with scales as follows: front side, the edge divided in single degrees from 0 to 180 degrees, scales of $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , and 1 inch to the foot, and scale of chords. On the reverse side, scales of 30, 35, 40, 45, 50, and 60 parts to the inch, scale of chords and diagonal scale of $\frac{1}{100}$ ths.  | 2.25   |
| A 536. | Ivory Rectangular Protractor, 6 inches long by 2 inches wide, with scales as follows: front side, the edge divided in single degrees from 0 to 180 degrees, scales of $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , 1, $1\frac{1}{8}$ , $1\frac{1}{4}$ , inches to the foot, scale of chords, and line of 40 parts on lower edge. On the reverse side, scales of 20, 25, 30, 35, 40, 45, 50, and 60 parts to the inch, diagonal scale of $\frac{1}{100}$ ths.  | 3.25   |
| A 537. | Ivory Rectangular Protractor, same as No. A 536, but has the Protractor divided in $\frac{1}{2}$ degrees.  | 4.00   |
| A 538. | Ivory Rectangular Protractor, 6 inches long by $2\frac{1}{4}$ inches wide, with scales as follows: front side, the edge divided in $\frac{1}{2}$ degrees from 0 to 180 degrees, scales of $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , 1, $1\frac{1}{8}$ , $1\frac{1}{4}$ , $1\frac{3}{8}$ , $1\frac{1}{2}$ inches to the foot, scale of chords, and scale of 40 parts on lower edge. Reverse side, scales of 10, 15, 20, 25, 30, 35, 40, 45, 50, 60 parts to the inch, and diagonal scale of $\frac{1}{100}$ ths.  | 4.50   |
| A 539. | Ivory Rectangular Protractor, 6 inches long by $2\frac{1}{2}$ inches wide, with scales as follows: front side, the edge divided in $\frac{1}{2}$ degrees from 0 to 180 degrees, scales of $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , 1, $1\frac{1}{8}$ , $1\frac{1}{4}$ , $1\frac{3}{8}$ , $1\frac{1}{2}$ inches to the foot, scale of chords, and scale of 40 parts on lower edge. Reverse side, scales of 20, 25, 30, 35, 40, 45, 50, and 60 parts to the inch, 2 scales of chords, scales of latitudes, sines, tangents, hours, longitudes, secants, rhombs. | 6.00   |
| A 540. | Ivory Rectangular Protractor, 8 inches long by 2 inches wide, with scales as follows: front side, the edge divided in $\frac{1}{2}$ degrees from 0 to 180 degrees, scales of $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , 1 inch to the foot, scale of chords and scale of 40 parts on lower edge. Reverse side, scales of 30, 35, 40, 45, 50, and 60 parts to the inch, scale of chords and diagonal scale of $\frac{1}{100}$ ths.   | 5.00   |
| A 541. | Ivory Rectangular Protractor, 12 inches long by $2\frac{1}{2}$ inches wide, with scales as follows: the edge divided in $\frac{1}{2}$ degrees from 0 to 180 degrees, scales of $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , 1, $1\frac{1}{8}$ , $1\frac{1}{4}$ , $1\frac{3}{8}$ , $1\frac{1}{2}$ scale of chords and scale of 40 parts on lower edge. Reverse side, scales of 10, 15, 20, 25, 30, 35, 40, 45, 50, and 60 parts to the inch, scale of chords and diagonal scale of $\frac{1}{100}$ ths.  | 11.50  |

Wood Protractor, 6 inches  
scales of equal parts, 4  
and diagonal scale,  
Wood Scale, 6 inches lon

Wood Chain Scale, 12 in  
and 10 parts, or with 10  
and 50 parts, or with  
Wood Off-set Scales, 2 in  
by 4, 30 by 50, 40 by 60

Wood Scale, 12 inches  
1, 1, 1, 1, 1, 1, 2,  
one of each scale subdivi  
as No. 454, but wit  
into ten parts, each.

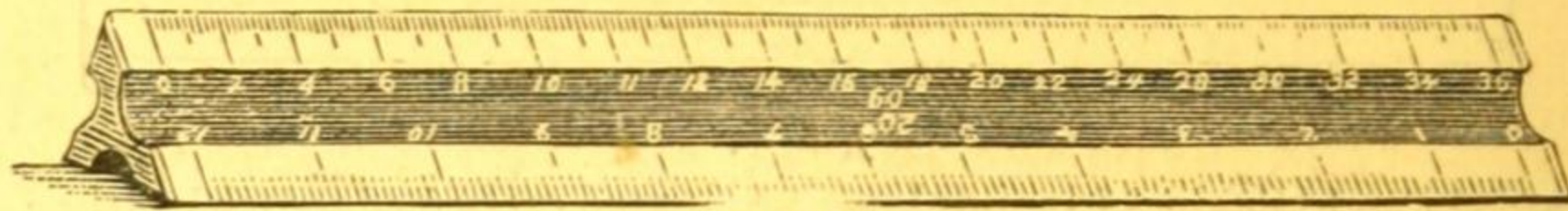
Wood Scale, 12 inches  
1, 1, 1, 1, 1, 2, and 3  
one subdivided into 12  
and  $\frac{1}{100}$ ths of an inch, e  
as No. 456, but has  
10 parts, each.

Wood Scale, 12 inch  
the following scales,  
edge:  $\frac{1}{10}$ ,  $\frac{1}{20}$ ,  $\frac{1}{40}$ ,  $\frac{1}{80}$ ,  
but, the first division  
as No. 458, but h  
10 parts, each.

Flat Boxwood Scale  
Do. do.  
Do. do.  
Flat Scale, 12 inch  
1, 1, 3 inches to



No.		PRICE
A 573.	Metallic Triangular Scale, 12 inches long, graduated $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , and 1 inch to the foot, of brass tubing, with the ends closed, nickled, with a dull finish, and weighing less than $3\frac{1}{2}$ ounces. The size and shape are the same as the ordinary Boxwood Triangular Scale,	\$3.00
A 574.	Metallic Triangular Scale, 12 inches long, graduated 10, 20, 30, 40, 50, and 60 to the inch,	3.00



A 575.

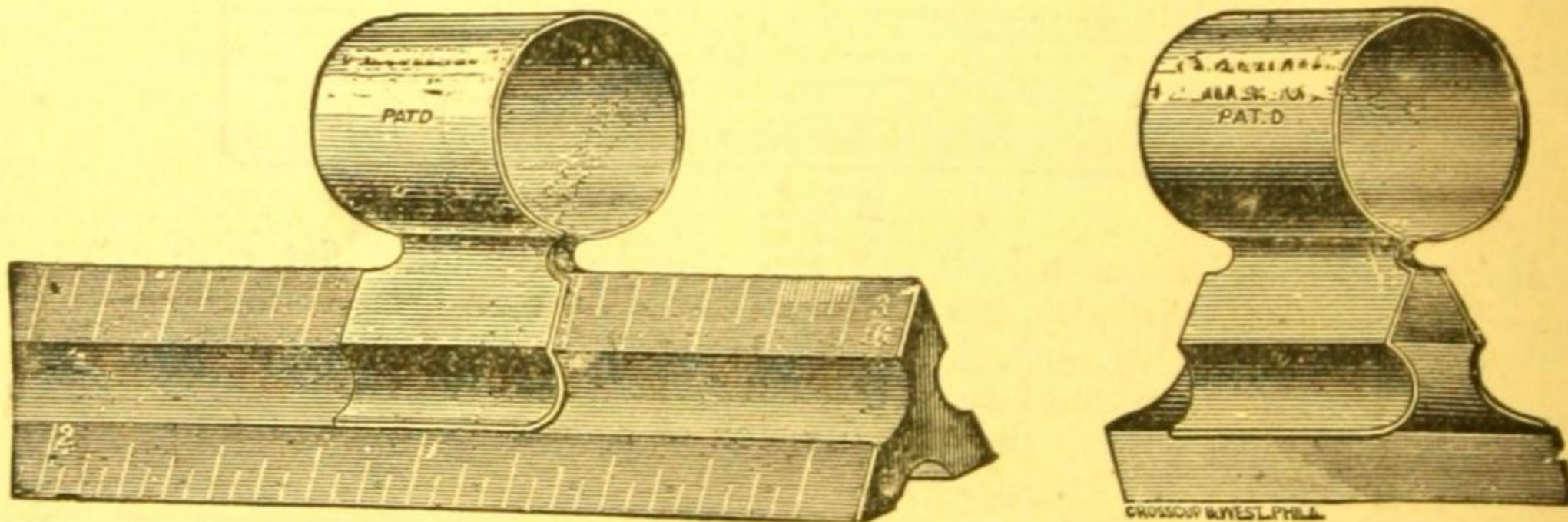
A 575.	Triangular Scale of Boxwood, 24 inches long, graduated 10, 20, 30, 40, 50, and 60 to the inch; or, 20, 30, 40, 50, 60, and 80 to the inch,	5.00
A 576.	Do. do. do. do. 12 inches,	2.00
A 577.	Do. do. 12 inches long, graduated 100, 200, 300, 400, 500, 600 to the foot, each,	2.00
A 578.	Do. do. 6 inches, graduated same as No. A 575,	1.50
A 579	Triangular Scales of Boxwood for Off-sets, 2 inches long, 10, 20, 30, 40, 50, and 60 parts,	.75



A 580.

A 580.	Triangular Scale of Boxwood, 24 inches long, graduated $\frac{3}{32}$ , $\frac{3}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , 1, $1\frac{1}{2}$ , 6 inches and 16ths to the foot,	5.00
A 581.	Do. do. do. 12 inches long,	2.00
A 582.	Do. do. do. 6 do.	1.50

*Boxwood Triangular Scales, 6 and 12 inches, put in strong paper boxes, and mailed to any address at an additional cost per scale of 25 cents.*



A 585.

A 585.	Triangular Scale Guards, each,	.25
A very useful attachment to the Triangular Scale, to obviate the liability to error, and the loss of time caused by the necessity of a careful examination of the scale each time it is used.		
A 586.	Gunter Scales, 12 inches, each,	.75
A 587.	Do. 24 do.	1.25
A 588.	Boxwood School Rule, 12 inches, $\frac{1}{8}$ and $\frac{1}{16}$ inch,	.15
A 589.	Do. do. 12 do. $\frac{1}{8}$ beveled brass edge,	.35
A 590.	Do. do. 18 do. do. do.,	50

Bevered Steel Scales, fully  
to the foot, each,  
divided to  $\frac{1}{8}$ ,  $\frac{1}{4}$ ,  $1\frac{1}{2}$ , and 3 in  
as above, but divided o  
1 inch to the foot, each,  
and 1 inch to the foot, ea  
and  $\frac{1}{2}$  inch to the foot, ea  
and 3 inches to the foot,  
as above, but beveled on  
and  $\frac{1}{8}$ ,  $1\frac{1}{2}$ , and 3 inches to

wood, fully divided.  
10 20  
\$0.60 \$0.90  
2.25 4.00  
Boxwood, 20  
\$1.50  
Boxwood, 1 meter, 6-fol  
Boxwood, 1 meter, 4-fol  
Ivory, but in ivory,  
Ivory, but in ivory,  $\frac{1}{2}$  m. in  
Metric Rule, 4 foot, 8-fol

Scale, printed on card  
graduations on one edge in  
10ths.  
Scale, same as A 595,  
40.  
Scales, same as A 596  
1/2 inches and 48ths,  
Scale, printed on card  
and engineers, in sets of 6  
Series A contains 6 scales,  
inches to the foot.  
Series B contains 6 scales,  
1/2 inch to the foot.  
Series C contains 6 scales  
and 60 parts to the inch.  
Single Scale of any of the s  
Paper Scales, same as A 59  
to the foot, each,  
Advantages of these scales a  
Paper, do not soil the wor  
dividers.  
Manufacture to order Scales to

STEEL DRAUGHTING SCALES.

No.		PRICE.
A 591.	Flat, Beveled Steel Scales, fully divided on four edges to $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , and 1 inch to the foot, each, . . . . .	\$1.75
	Or divided to $\frac{3}{8}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ , and 3 inches to the foot, . . . . .	1.75
A 592.	Same as above, but divided only on two edges, with scales of $\frac{1}{8}$ and $\frac{1}{4}$ inch to the foot, each, . . . . .	1.50
	Or $\frac{1}{2}$ and 1 inch to the foot, each, . . . . .	1.50
	Or $\frac{3}{8}$ and $\frac{3}{4}$ inch to the foot, each, . . . . .	1.50
	Or $1\frac{1}{2}$ and 3 inches to the foot, each, . . . . .	1.50
A 593.	Same as above, but beveled on both sides, graduated $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , and 1, and $\frac{3}{8}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ , and 3 inches to the foot, each, . . . . .	2.00

METRIC SCALES AND RULES.

Flat Boxwood, fully divided.				50 cm. long.
	10	20	30	\$1.75 each.
	\$0.60	\$0.90	\$1.25	
Ivory Flat,	2.25	4.00	5.00 each.	
Triangular Boxwood, 20			30 cm. long.	
	\$1.50	\$2.00		
Metric Rule, boxwood, 1 meter, 6-fold, with springs at each joint, . . . . .				.75
Metric Rule, boxwood, 1 meter, 4-fold, divided inches and meter, each, . . . . .				.60
Same as above, but in ivory, . . . . .				1.75
Same as above, but in ivory, $\frac{1}{2}$ m. in length, . . . . .				1.00
Engineer's Metric Rule, 4 foot, 8-fold, divided to inches and meters, each, . . . . .				.75

PAPER SCALES.

A 595.	Paper Scale, printed on card-paper, $1\frac{1}{2}$ inch wide, 12 inches long, graduations on one edge inches and 10ths, and the other feet and 100ths, . . . . .	.10
A 596.	Paper Scale, same as A 595, one edge 20 parts to the inch, the other edge 40, . . . . .	.10
A 597.	Paper Scales, same as A 596, one edge inches and 16ths, the other edge inches and 48ths, . . . . .	.10
A 598.	Paper Scale, printed on card-paper, 19 inches long, for architects and engineers, in sets of 6 scales, per set, . . . . .	1.00
	Series A contains 6 scales, one each, divided to $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , 1, $1\frac{1}{2}$ , and 3 inches to the foot.	
	Series B contains 6 scales, one each, divided to $\frac{3}{32}$ , $\frac{1}{8}$ , $\frac{1}{16}$ , $\frac{5}{16}$ , $\frac{3}{8}$ , and $\frac{7}{8}$ inch to the foot.	
	Series C contains 6 scales, one each, divided to 10, 20, 30, 40, 50, and 60 parts to the inch. . . . .	.20
A 599.	Single Scale of any of the above series, A, B, C—each scale, . . . . .	.20
A 600.	Paper Scales, same as A 598, divided either to $\frac{5}{8}$ , $1\frac{1}{8}$ , $1\frac{1}{4}$ , or $1\frac{3}{8}$ inches to the foot, each, . . . . .	.20

The advantages of these scales are, they expand and contract nearly the same as drawing-paper, do not soil the work, and distances can be set off from them without the use of dividers.

We manufacture to order Scales to any divisions, in ivory, boxwood, whitewood, or rubber.

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7.00

3.00  
.50

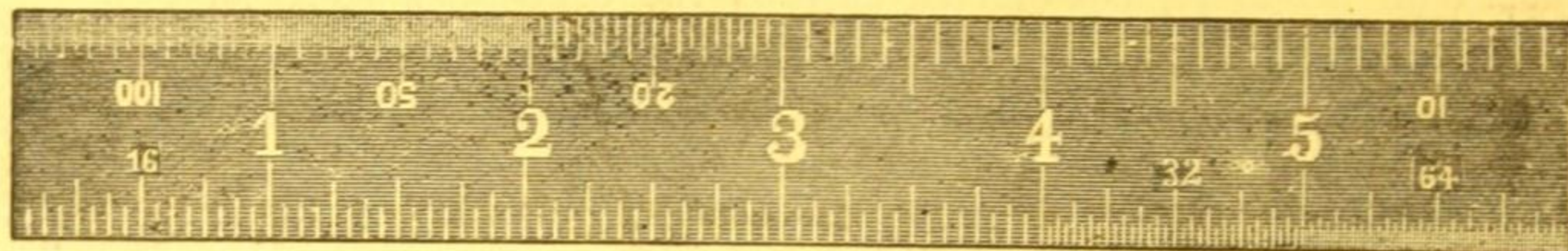
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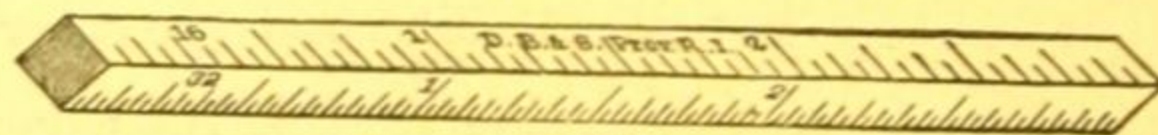
.75

## SQUARES, CALIPERS FOR MACHINISTS, STRAIGHT EDGES.



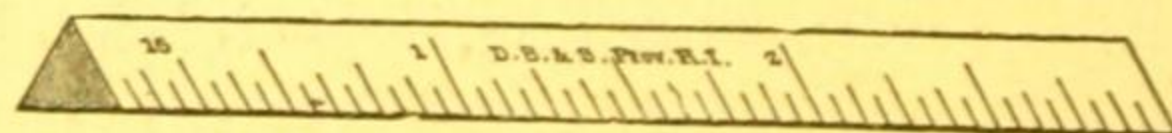
A 615.

No		PRICE
A 615.	24-inch Steel Rule, graduated to inches, 8ths, 10ths, 12ths, 16ths, 20ths, 24ths, 32ds, 48ths, 50ths, 64ths, and 100ths of an inch,	\$4.00
A 616.	12 inches, do. do. do. do.	2.00
A 617.	9 do. do. do. do.	1.50
A 618.	6 do. do. do. do.	1.00
A 619.	4 do. do. do. do.	.75
A 620.	3 do. do. do. do.	.50
A 621.	Steel Rule and Scale, 12 inches long, divided in inches and 16ths on one side, and inches and 12ths or 10ths on the other,	.75
A 622.	Same as A 621, but divided in inches and 16ths on one side, and inches, 8ths, 32ds, and 64ths on the other,	1.00
A 623.	Same as A 621, but divided in inches and 16ths on one side, and centimeters and millimeters on other side,	1.25
A 624.	Steel Shrink Rule, 24 $\frac{1}{2}$ inches long, graduated as A 615,	4.50
A 625.	Boxwood Shrink Rule, 24 $\frac{1}{2}$ inches long, graduated as A 615,	3.00
A 626.	Steel Standard Yard Measure, graduated to inches and 8ths on one side, and on the other side to $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , and $\frac{7}{8}$ of a yard,	3.00
A 627.	Steel Standard French Measures subdivided to centimeters and millimeters; $\frac{1}{5}$ meter long, \$1.75; $\frac{3}{16}$ do., \$2.50; $\frac{1}{2}$ do., \$4.00; 1 do.,	10.00



A 628.


A 628.	Square Steel Rules, divided to 8ths, 16ths, 32ds, 64ths, and 100 parts to the inch; 3 inches long, 50 cts.; 4 ins., 75 cts.; 6 ins.,	1.00
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A 629.

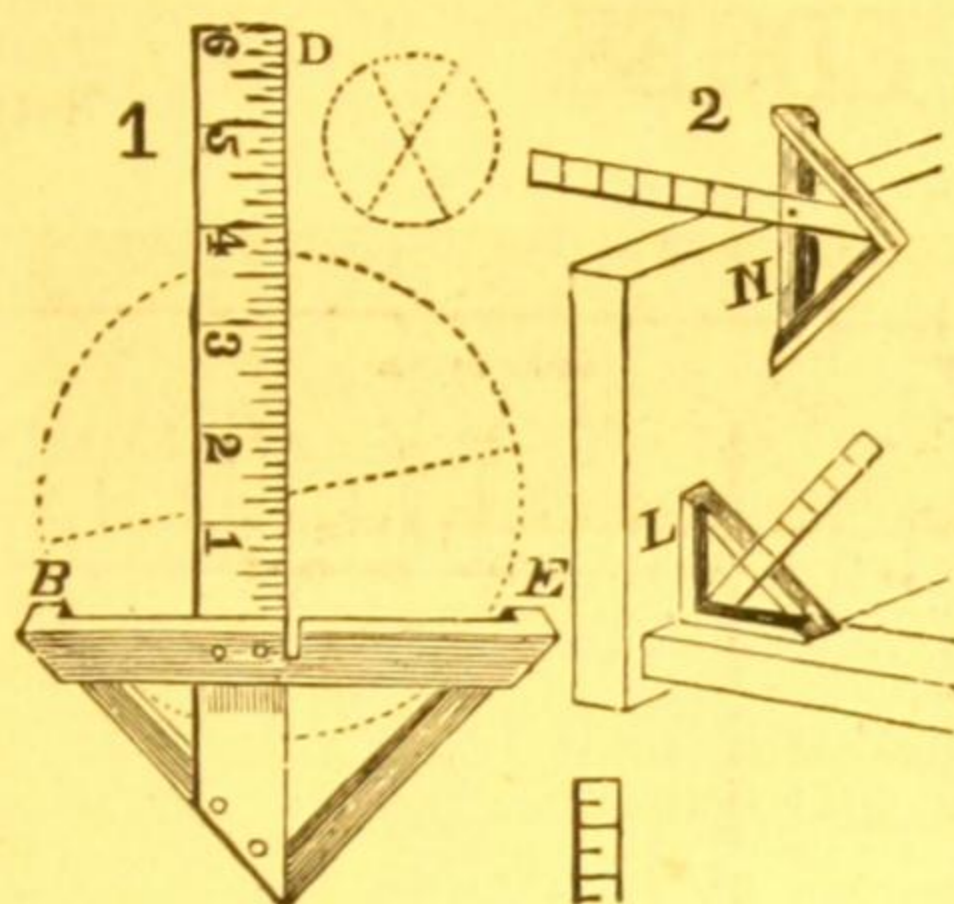
A 629.	Triangular Steel Rules, 3 inches long, divided to 12, 16, 20, 24, 32, 48, 50, 64, and 100 parts to the inch,	.60
	4 inch, 80 cts; 6 inch, \$1.20; 12 inch,	3.00
A 630.	Centre Gauge, and Gauge for Grinding and Setting Screw Tools,	.50

The angles used in this Gauge are 60 degrees. The four divisions upon the Gauge of 14, 20, 24, and 32 parts to the inch, are very useful in measuring the number of threads to the inch of taps and screws. The following parts to the inch can be determined by them, viz.: 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16, 20, 24, and 32.

 Any of the above Scales nickel-plated for five cents per running inch.



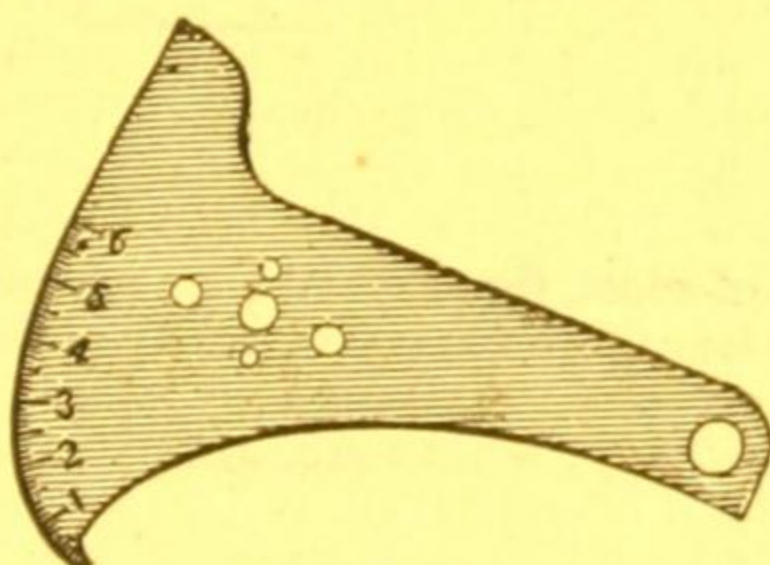
AMES' PATENT UNIVERSAL SQUARE.



This square combines, in a most convenient form, five different instruments, viz.: The TRY-SQUARE, the MITER, the T-SQUARE, the GRADUATED RULE, and (what is entirely new) the CENTRE SQUARE, for finding the centre of a circle.

Fig. 1 explains its application as a CENTRE-SQUARE. Put the instrument over the circle, as the end of the bolt or shaft, with the arms B A, A E resting against the circumference, in which position one edge of the rule A D will cross the centre. Mark a straight line in this position; apply the instrument again to another part of the circumference, and mark another line crossing the first. The point where the two lines cross each other will be the centre of the circle. The whole is the work of a moment. Fig. 2 explains the application of the instrument as a carpenter's TRY-SQUARE, N, and an OUTSIDE SQUARE.

No.						PRICE.
A 631.	Ames' Patent Universal Square,	blade 6 inches long,	.	.	.	\$3.00
A 632.	Do.	do. 8 do.	.	.	.	4.00
A 633.	Do.	do. 10 do.	.	.	.	5.50
A 634.	Do.	do. 12 do.	.	.	.	7.00



A 635.

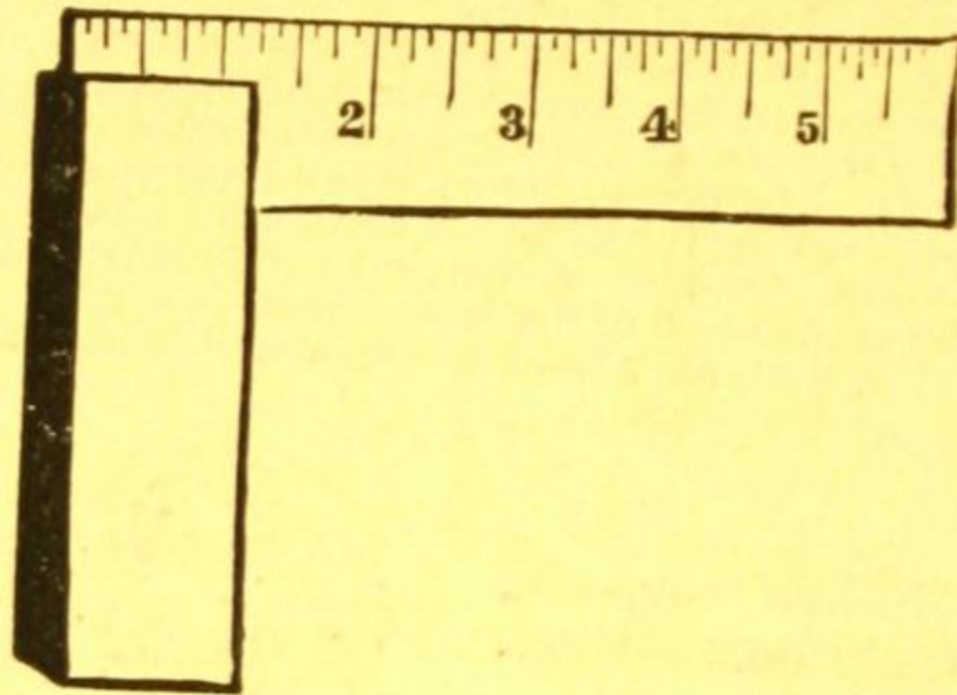
A 635.	Robinson's New Templet Odontograph is a ready-made Scribe Templet of universal application for describing Teeth of Gear Wheels. Price, in morocco case, with Rules and Tables,	.	.	.	3.00
	Treatise on the above Odontograph, by Prof. S. W. Robinson,	.	.	.	.50

WILLIS' ODONTOGRAPH.

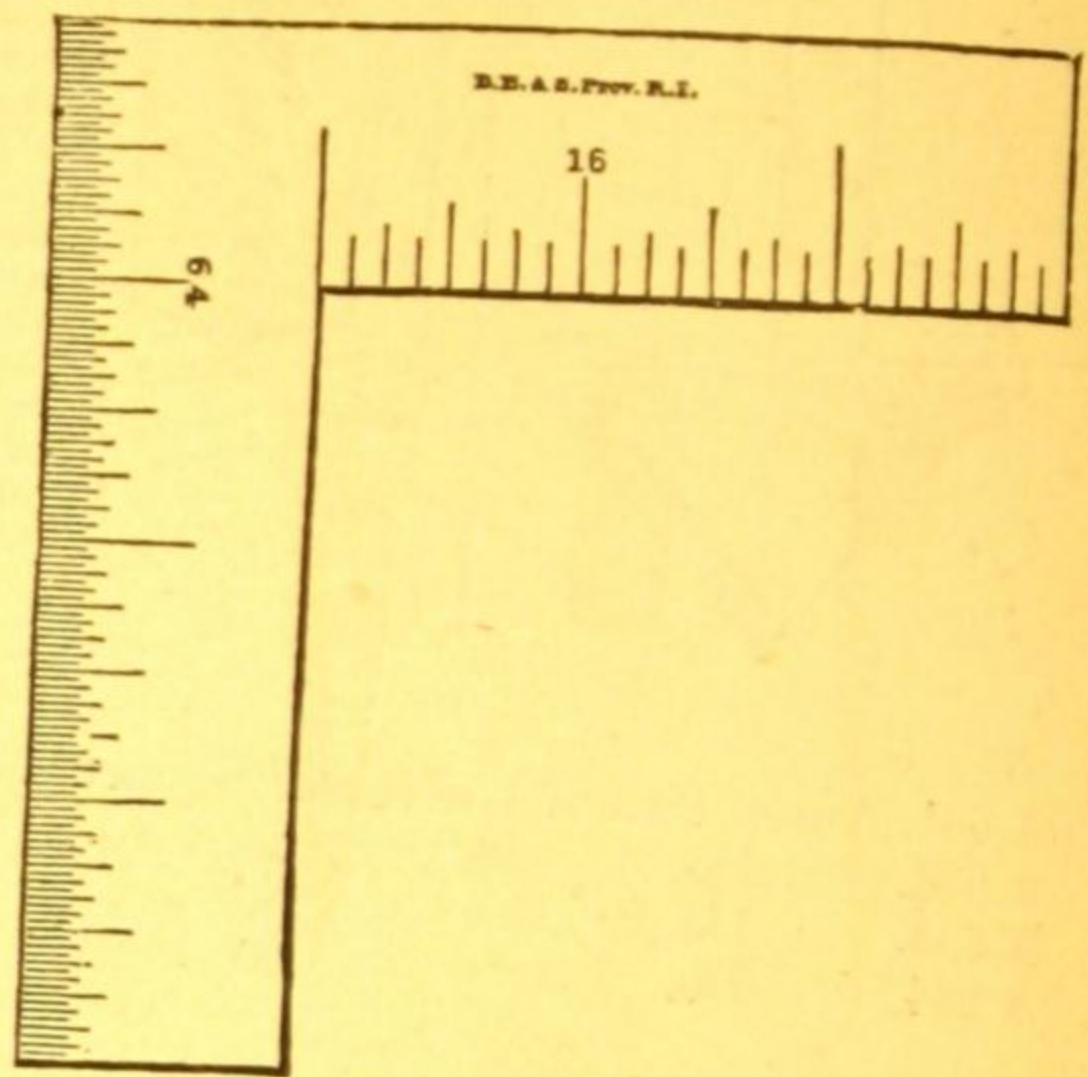
This is an instrument recently invented by Prof. R. Willis, of Cambridge University, England, for describing the correct form of the teeth of wheels, and the templets and cutters used in making them. All wheels of the same pitch, but of different sizes, having their teeth drawn with this instrument, will run together correctly.

A 636.	Willis' Odontograph, for drawing the teeth of small wheels by diametrical pitch, when only a single arc is required, with drawing and direction for use,	.	.	.	2.50
A 637.	Willis' Odontograph, for drawing the teeth of larger wheels by circular pitch, where it is necessary to have separate arcs for flanks and faces, with drawing and direction for use,	.	.	.	4.00
A 638.	Willis' Odontograph, on Bristol-board, revised by Prof. W. D. Marks, University of Pennsylvania, giving additional tables, explanation, and formula, making it of universal application,	.	.	.	.75

No.						PRICE.
A 639.	Heavy-headed Square, made of hardened steel, for machinists, graduated to inches and 32ds of an inch, blade 3 inches long,					
A 640.	Do.	do.	do.	4	do.	\$2.50
A 641.	Do.	do.	do.	6	do.	3.00
A 642.	D	do.	do.	9	do.	4.00
A 643.	Do.	do.	do.	12	do.	7.00
						8.00



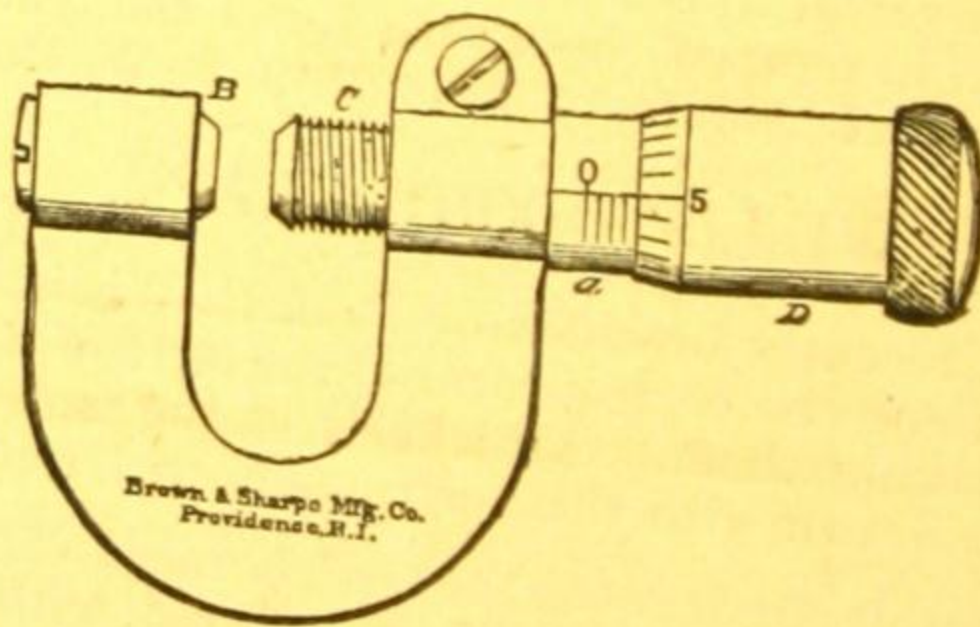
A 639.



A 644.

A 644.	Light Square, made of steel, for machinists, graduated on one side to inches, 16ths, and 64ths of an inch, and on the other side to inches, 32ds, and 64ths of an inch, sides 3 inches long,					2.50
A 646.	Same as No. A 644, sides 4 inches long, graduated on both sides to inches 16ths, and 32ds of an inch,					3.00
A 647.	Same as No. A 644, sides 6 inches long,					4.00

Any of the above Squares nickel-plated for five cents per inch of blade.



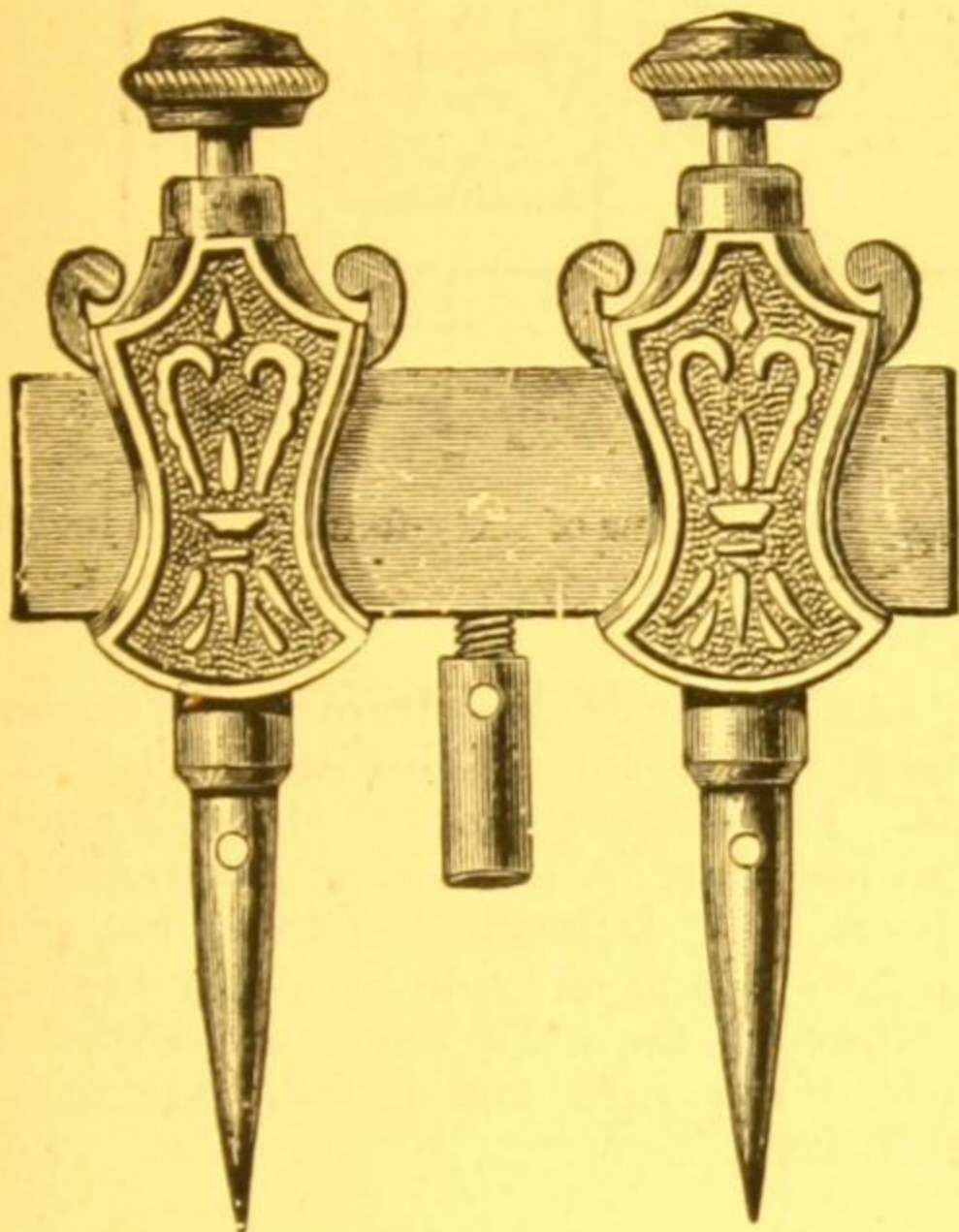
A 648.

A 648.	Micrometer Caliper for machinists' use, in morocco case,					6.50
A 648.	Do.	do.	do.	without case,		6.00

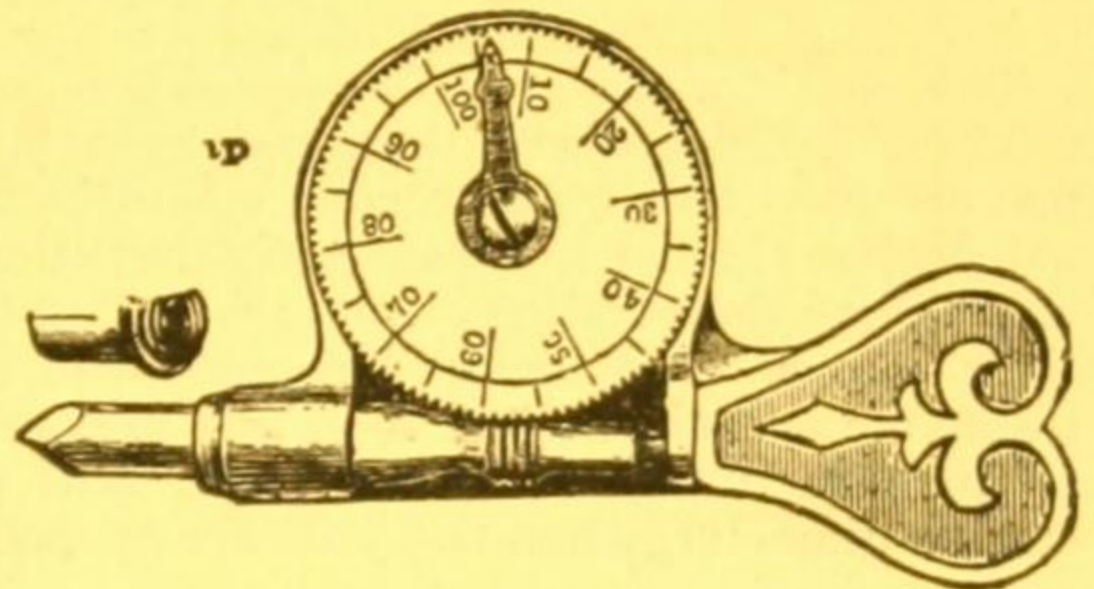
This is the most convenient form of Pocket Vernier Caliper; it can be used for all diameters less than one inch, and with the vernier reads to 1000ths of an inch.

PHILADELPHIA.  
 for machinists, gradu-  
 inches long,  
 do.  
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IMPROVED TRAMMEL POINTS.



A 650.

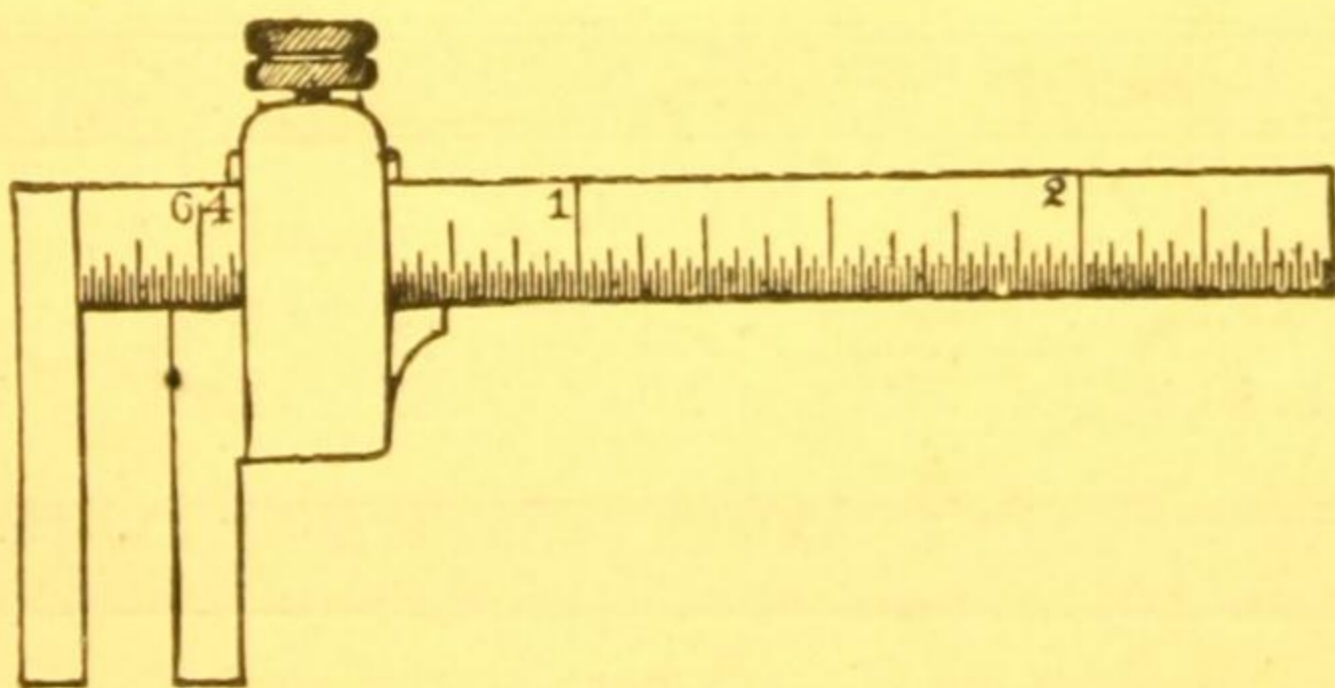


A 652.

These tools are used by all machinists and mechanics who have occasion to strike arcs or circles larger than can be done by compass dividers. They may be used on a straight wooden bar of any length, and when secured in position by the thumb-screws, all circular work can be readily laid out. They are made of bronze, and have steel points, either of which can be renewed, and replaced by pencil socket, which accompanies each pair

No	PRICE.
A 649. Small (No. 1), per pair, . . . . .	\$1.50
A 650. Medium (No. 2), per pair, . . . . .	2.00
A 651. Large (No. 3) per pair, . . . . .	2.75
A 652. Speed Indicator, . . . . .	2.00

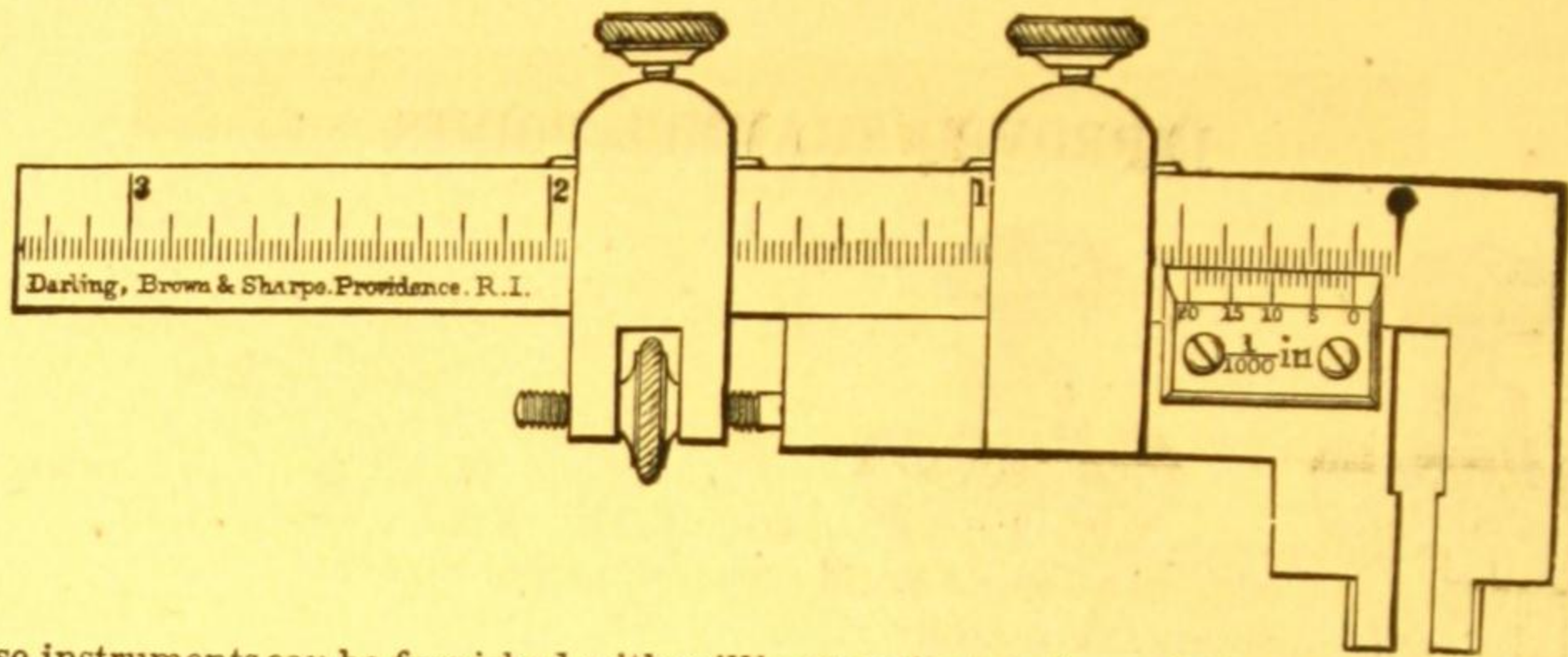
STEEL CALIPERS.



A 653.

A 653. Plain Steel Caliper, 2 inches long, graduated to 64ths of an inch, .	4.00
A 654. Do. do. 3 do. divided to 64ths of an inch, .	5.00

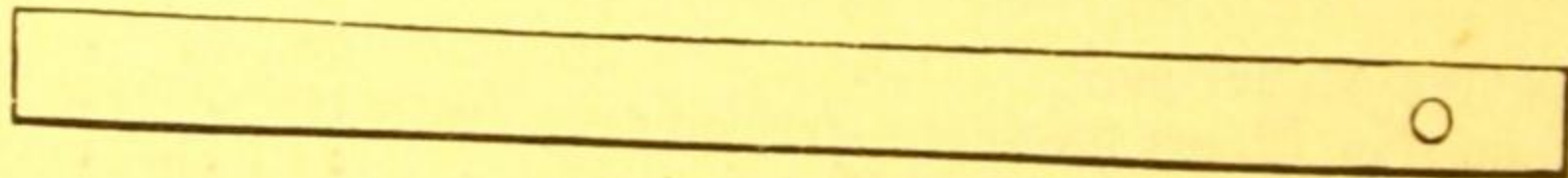
A 644.  
 ed on one side to  
 er side to inches,  
 on both sides to  
 . . . . .  
 . . . . .  
 er inch of blade.  
 . . . . .  
 . . . . .  
 it can be used for all  
 ths of an inch.



These instruments can be furnished with millimeters (in the place of sixty-fourths of an inch), and provided with a vernier to read to one-fiftieth of a millimeter.

The cut is a fac-simile of one side of our hardened cast-steel Improved Vernier Caliper, a light, convenient, and valuable instrument for machinists' and tool-makers' use in obtaining correct measurements. The side represented above is graduated upon the bar to inches and fiftieths of an inch, and by the aid of a vernier is read to one thousandths of an inch. The opposite side is graduated to inches and sixty-fourths of an inch. The outside of the jaws are of suitable form for taking inside measurements, and when the jaws are closed measure 250 one-thousandths of an inch in diameter. This Caliper will measure one inch and eleven-sixteenths, outside diameter, when the jaws are opened full size.

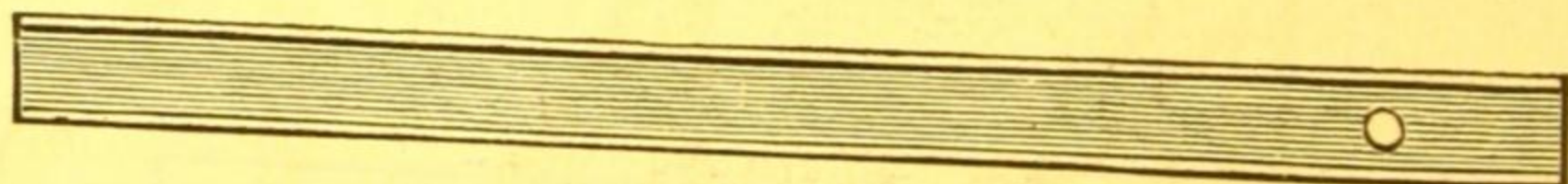
No.		PRICE.
A 655.	Vernier Steel Caliper, as shown above, in morocco case, . . . . .	\$12.50
A 657.	Pearwood Ovals, 2 to 6 inches long, 10 in a set, per set, . . . . .	2.00
A 658.	Do. $1\frac{1}{2}$ to $4\frac{1}{2}$ do. 6 do. do. . . . .	1.50
A 659.	Do. $\frac{3}{4}$ to 7 do. 43 do. do. . . . .	5.00
A 660.	Pearwood Hyperbolas, 2 to 5 inches long, 8 in a set, . . . . .	1.40
A 661.	Do. Parabolas, 12 do. . . . .	3.00
A 662.	Do. do. $1\frac{1}{2}$ to 6 inches long, 8 do. . . . .	1.40



A 663.

A 663. Whitewood, beveled edge, thick:

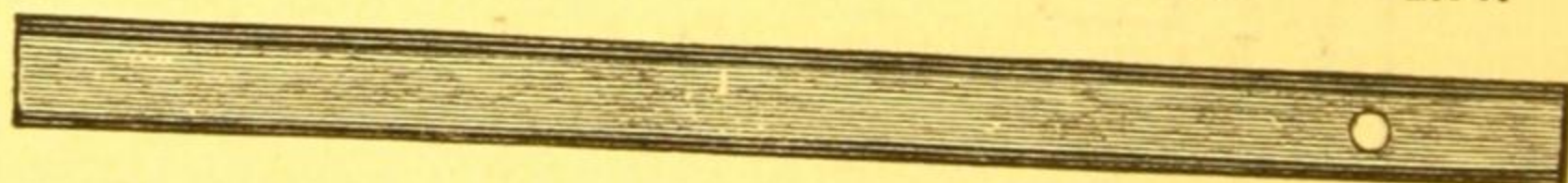
	12	18	24	30	36	42 inch.
each, \$0.15		.20	.25	.30	.40	.50.



A 664.

A 664. Hardwood lined, square edges, thin:

	24	30	36	42	48	54 inch.
each, \$0.40		.50	.70	.85	1.15	1.50.



A 665.

A 665. Mahogany, ebony lined, square edges, thin:

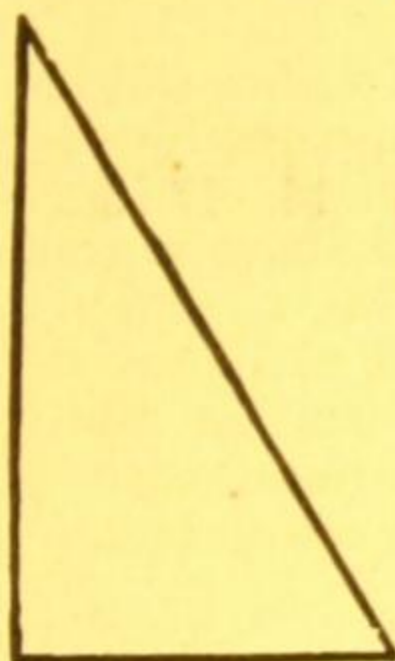
	24	30	36	42	48	54 inch.
each, \$0.55		.70	1.00	1.25	1.60	2.00.



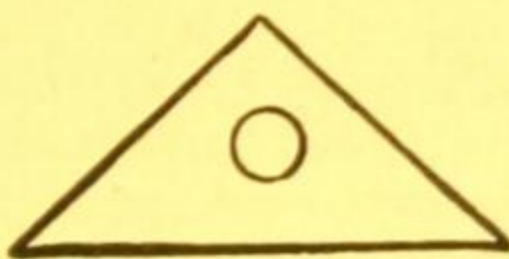
A 666.

No.								
A 666. Hard Rubber Rulers.	12	18	24	30	36	42 inch.		
	each, \$0.50	.70	1.00	1.50	2.00	2.50		
A 667. Steel, with one edge beveled, the other square.	18	24	30	36	42	48	60	72 inches long.
	each, \$1.50	2.75	3.50	4.50	5.25	6.00	9.00	11.50
A 668. Steel, one edge beveled, the other square, nickel-plated.	18	24	30	36	42	48	60	72 inches long.
	each, \$1.75	3.00	4.00	5.00	6.00	8.00	10.50	14.00

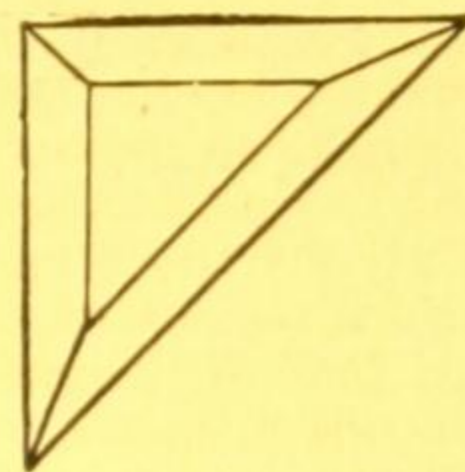
TRIANGLES.



A 678.



A 679.



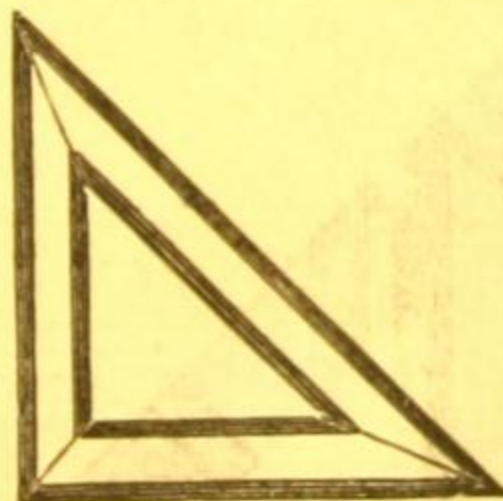
A 680.

A 681.

A 678. Pearwood Triangles, 30°x60°x90°.	5 or 6½	8 or 9½	11 or 12 inches long.				
	10 cents.	15 cents.	20 cents.				
A 679. Pearwood Triangles, 45°x45°x90°.	4, 5, or 6 inch,	7 or 8 inches long.					
	15 cents.	20 cents.					
A 680. Pearwood or Cherry Triangles, framed open centre, 30°x60°x90°.	5	7	9	12	14	16	19 inches long.
	\$0.20	.25	.25	.30	.40	.75	1.00
A 681. Pearwood or Cherry Triangles, framed open centre, 45°x45°x90°.	5	6½	8	10	12	14 inches long.	
	\$0.20	.25	.30	.40	.60	.75	



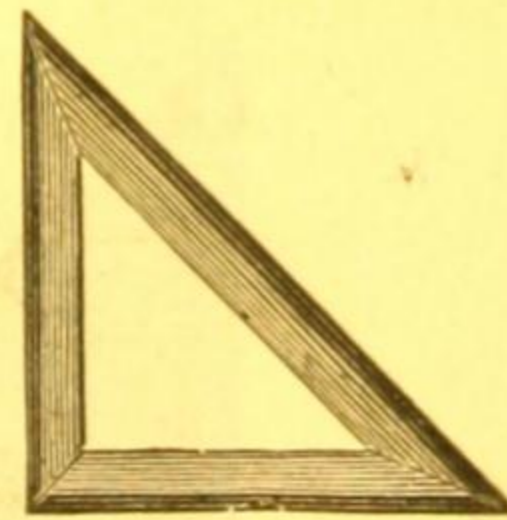
A 682.



A 683.

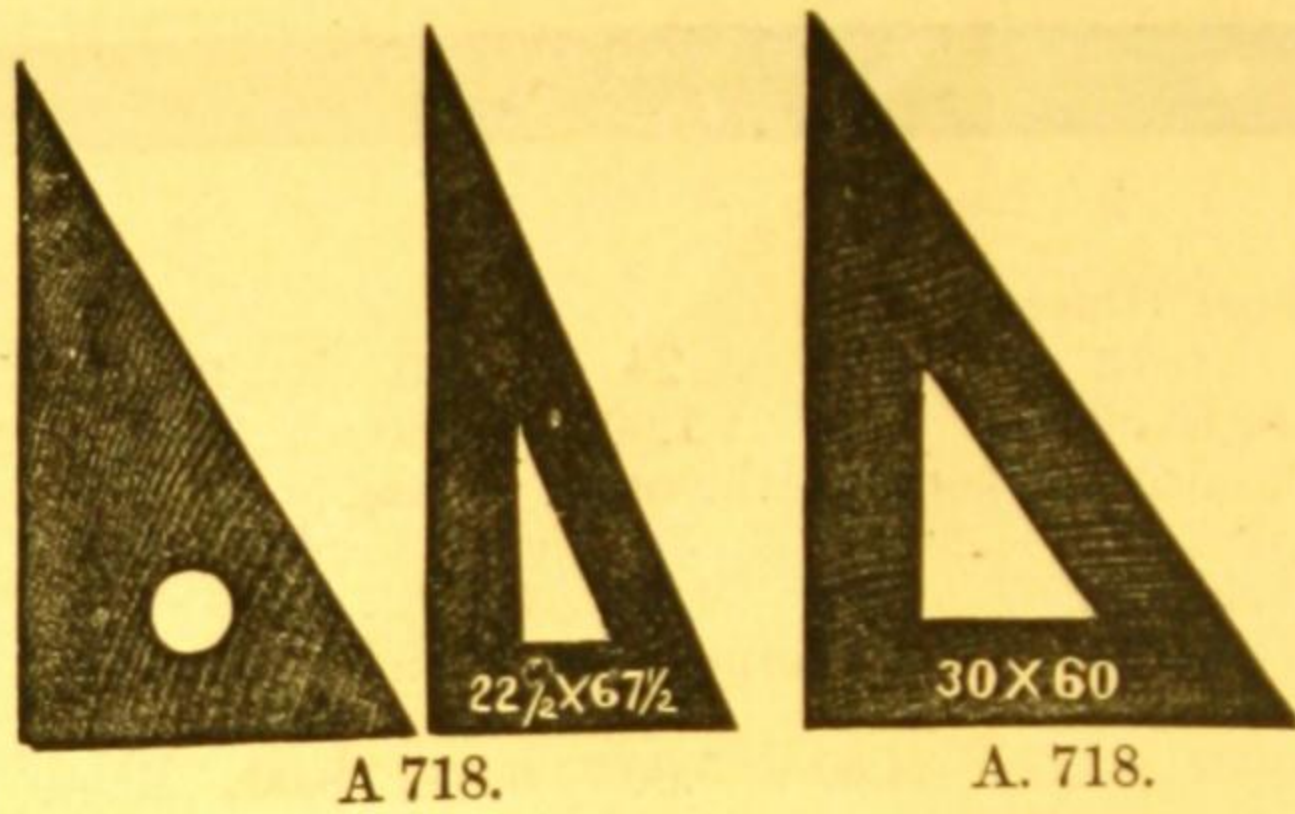


A 682.



A 683.

A 682. Mahogany or Walnut Triangles, ebony or maple lined, framed open centre, 30°x60°x90°.	5	6	7	9	11	13	15	18 inches long.
	\$0.50	.60	.70	.80	1.00	1.25	1.75	
A 683. Mahogany or Walnut Triangles, ebony or maple lined, framed open centre, 45°x45°x90°.	5	6	7½	9	11	13	15 inches long.	
	\$0.50	.60	.70	.80	1.00	1.25	1.75	



No.

A 718. Hard Rubber Triangles, angles 30x60x90, or 22½x67½ degrees, either solid or with open centre.

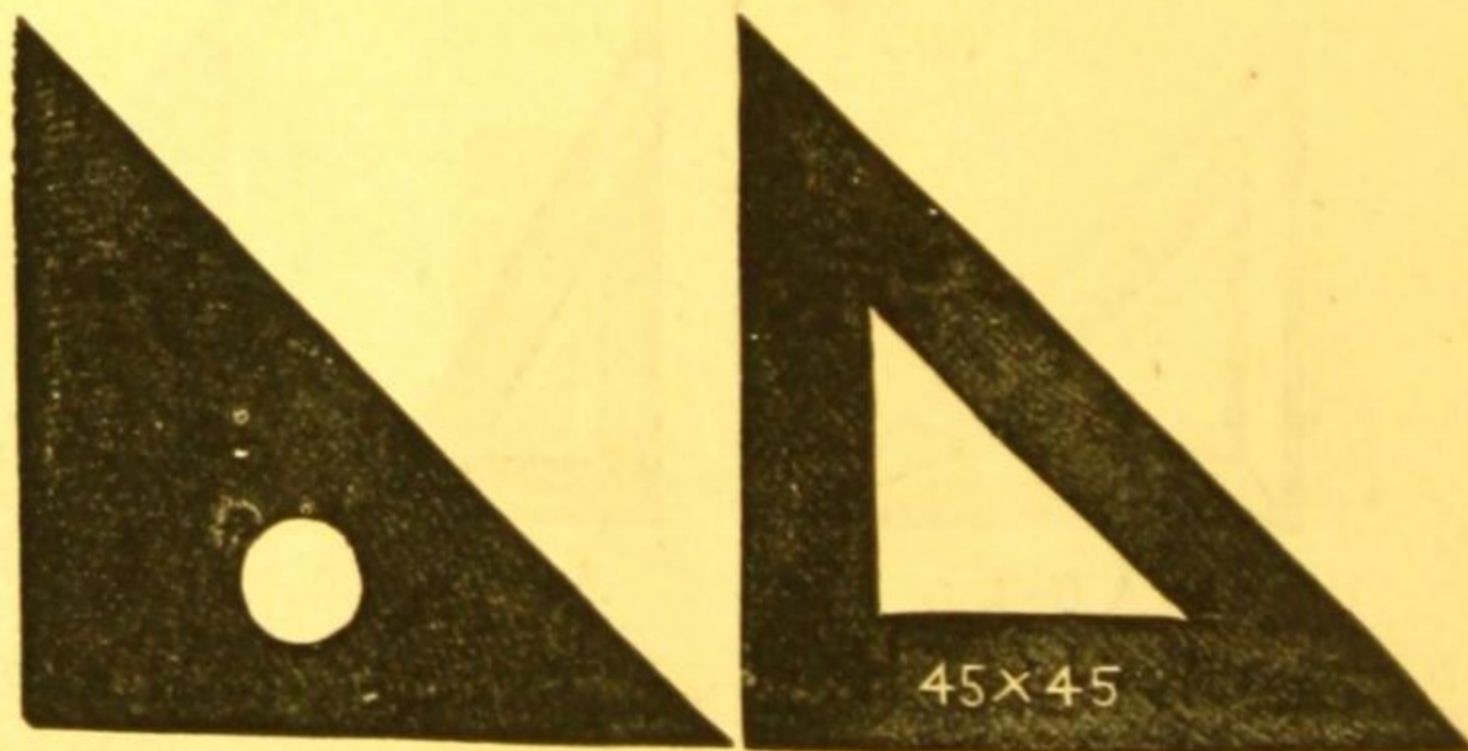
Perpendiculars,	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	ins.
	\$0.25	.25	.30	.35	.40	.55	.60	.65	.75	.95	1.10	1.25	1.50	1.75	2.00	each.



A. 719.

A 719. Hard Rubber Triangles, angles 30x60x90 degrees, extra heavy, open centre.

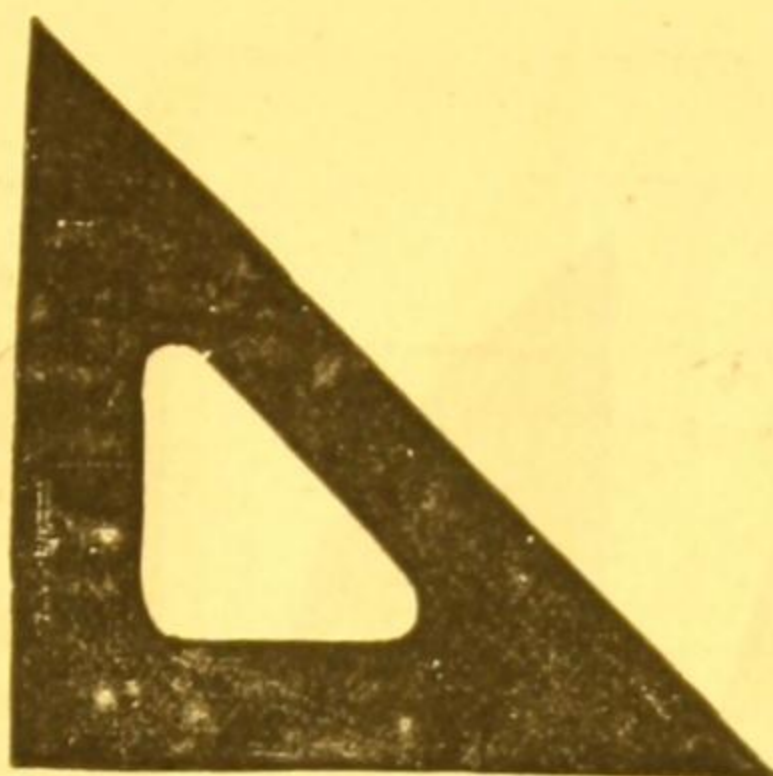
Isoscles sides	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	ins.
	\$0.35	.40	.45	.50	.60	.70	.80	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	each.



A 721.

A 721. Hard Rubber Triangles, angles 45x45x90 degrees, either solid or with open centres.

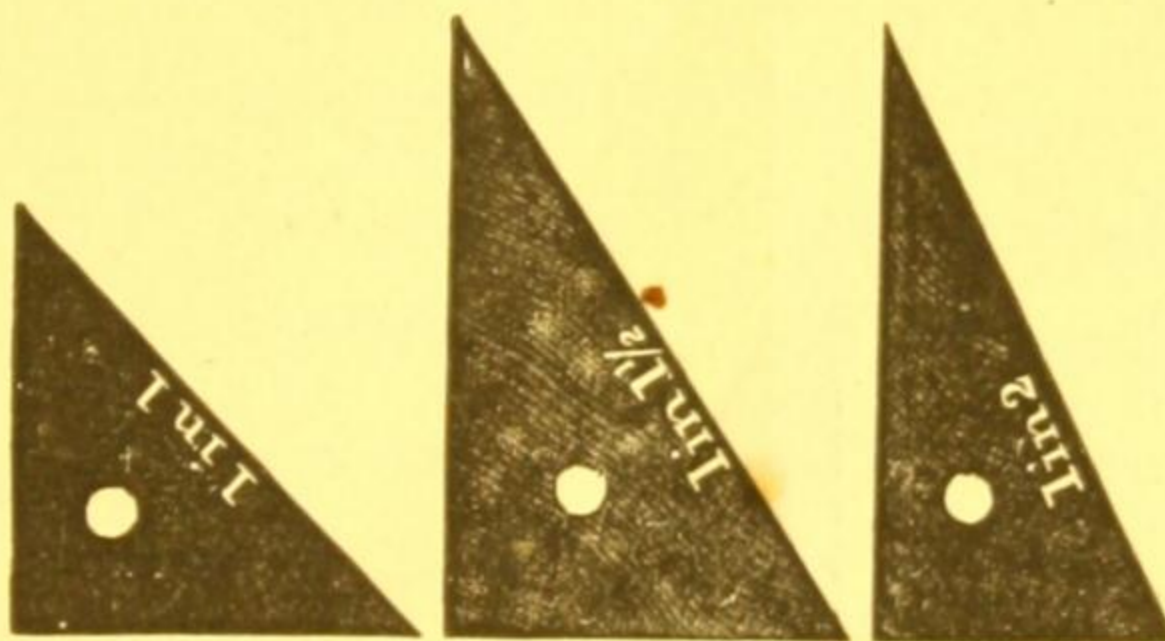
Isoscles sides,	3	4	5	6	7	8	9	10	11	12	13	14	inches.
	\$0.30	.30	.40	.50	.60	.70	.85	1.10	1.25	1.35	1.50	1.65	each.



A 722.

No. PRICE.  
**A 722.** Hard Rubber Triangles, angles 45x45x90 degrees, extra heavy, open centre.  
 Isosceles sides, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 ins.  
 \$0.50 .60 .70 .80 1.00 1.25 1.50 1.75 2.00 2.25 2.50 2.75 3.50 3.75 each.

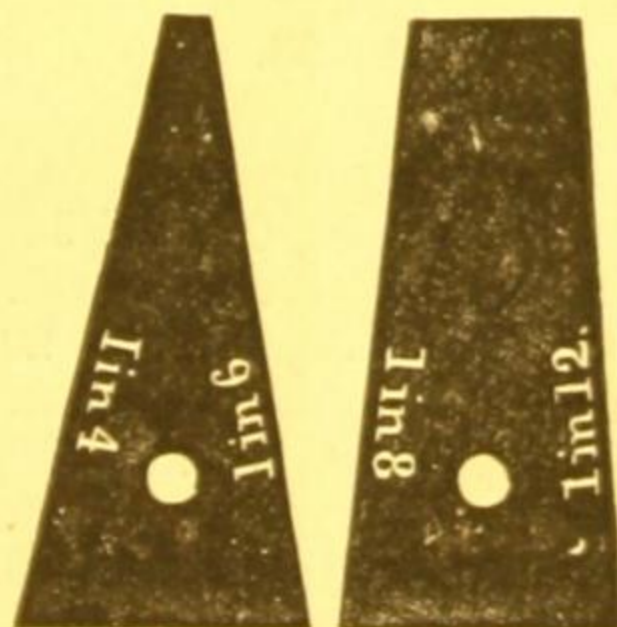
**CROSS SECTION TRIANGLES.**



A 724.

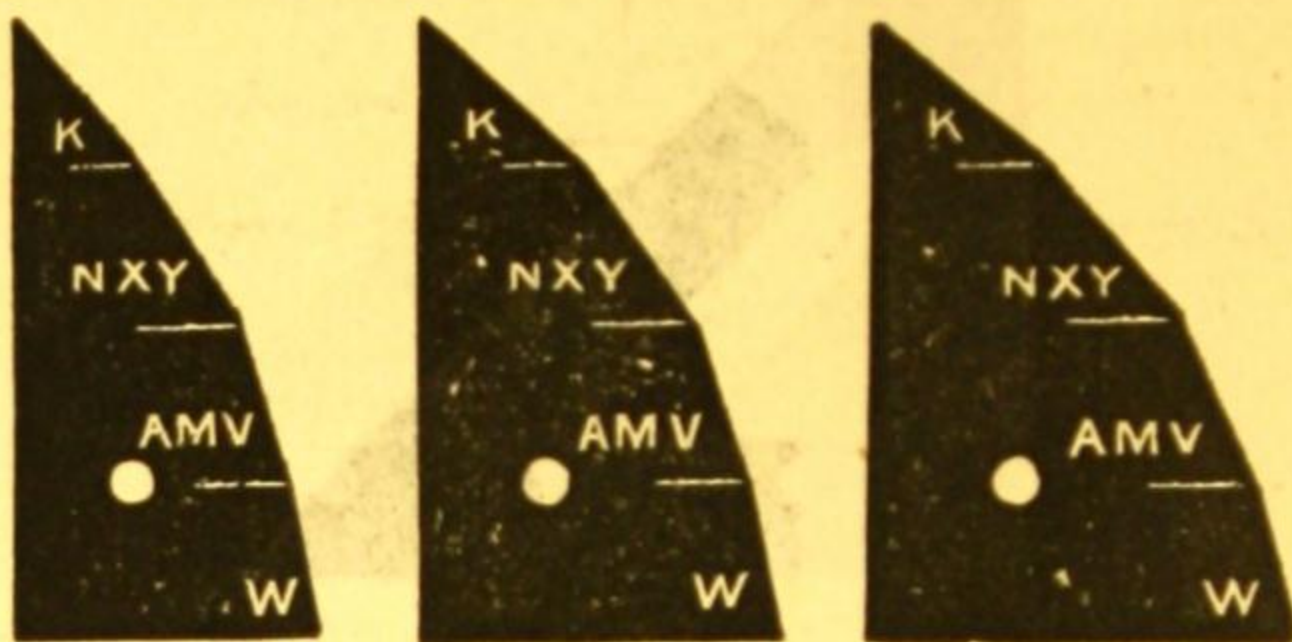
**A 724.** Cross Section Triangles, set of seven Cross Section Triangles, made of hard rubber, as follows:  $\frac{1}{4}$  to 1,  $\frac{1}{2}$  to 1,  $\frac{3}{4}$  to 1, 1 to 1,  $1\frac{1}{4}$  to 1,  $1\frac{1}{2}$  to 1, 2 to 1, per set, . . . . . \$4.25  
 Single Triangles, each, . . . . . .75

**BATTER SLOPES.**



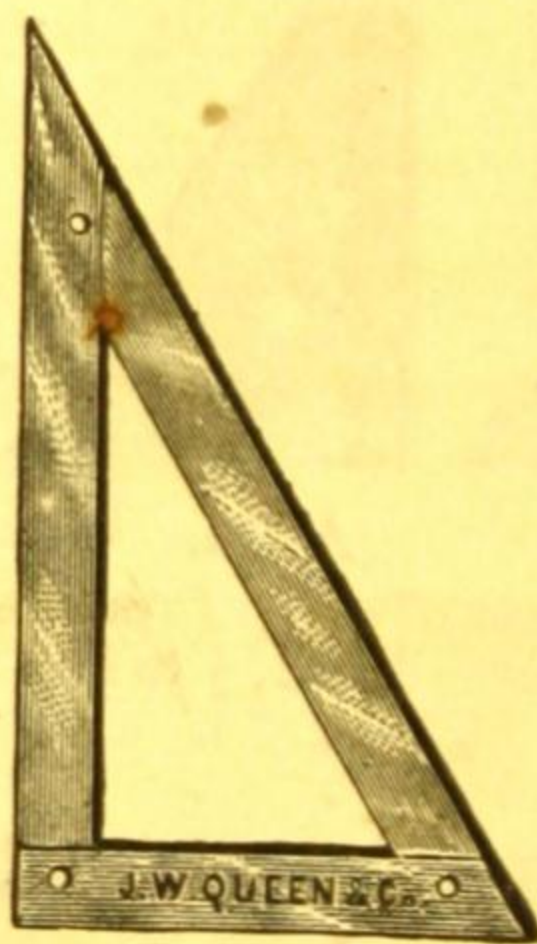
A 725.

**A 725.** Set of three forms of hard rubber for Batters of walls and rock, giving the following slopes, 1 in 4, 1 in 5, 1 in 6, 1 in 8, 1 in 10, 1 in 12, per set, . . . . . 2.00  
 Single Triangles, each, . . . . . .75



A 727.

No.	PRICE.
A 727. Hard Rubber Lettering Triangles, three in set, 3½ inches, per set, .	\$1.25
Single templets, . . . . .	.50

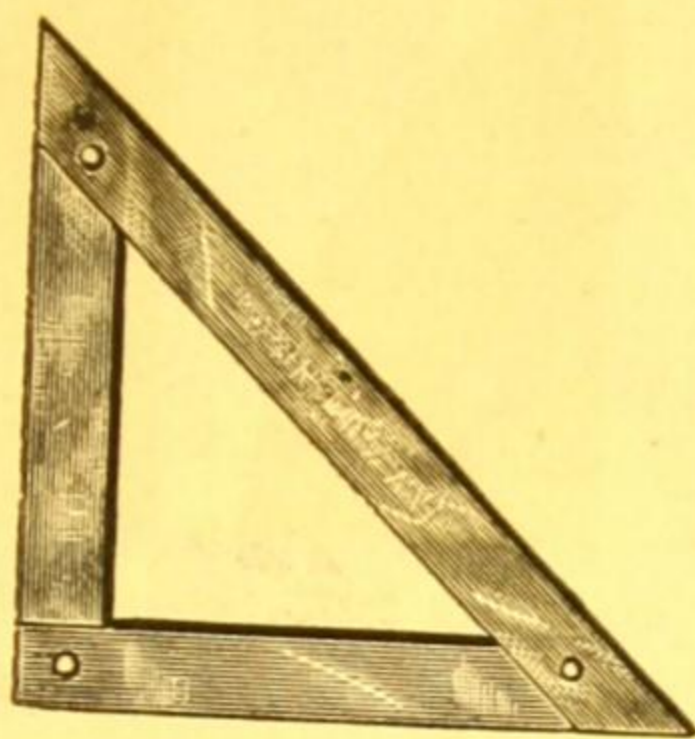


A 728.

A 728. German Silver Triangle, angles 30, 60, and 90 degrees, perpendicular, 6 inches long, each,	2.50
A 729. German Silver Triangle, angles 30, 60, and 90 degrees, perpendicular, 7 inches long, each,	2.75
A 730. German Silver Triangle, angles 30, 60, and 90 degrees, perpendicular, 8 inches long, each,	3.00
A 731. German Silver Triangle, angles 30, 60, and 90 degrees, perpendicular, 9 inches long, each,	3.50
A 732. German Silver Triangle, angles 30, 60, and 90 degrees, perpendicular, 10 inches long, each,	4.00
A 733. German Silver Triangle, angles 30, 60, and 90 degrees, perpendicular, 11 inches long, each,	5.00
A 734. German Silver Triangle, angles 30, 60, and 90 degrees, perpendicular, 12 inches long, each,	5.50



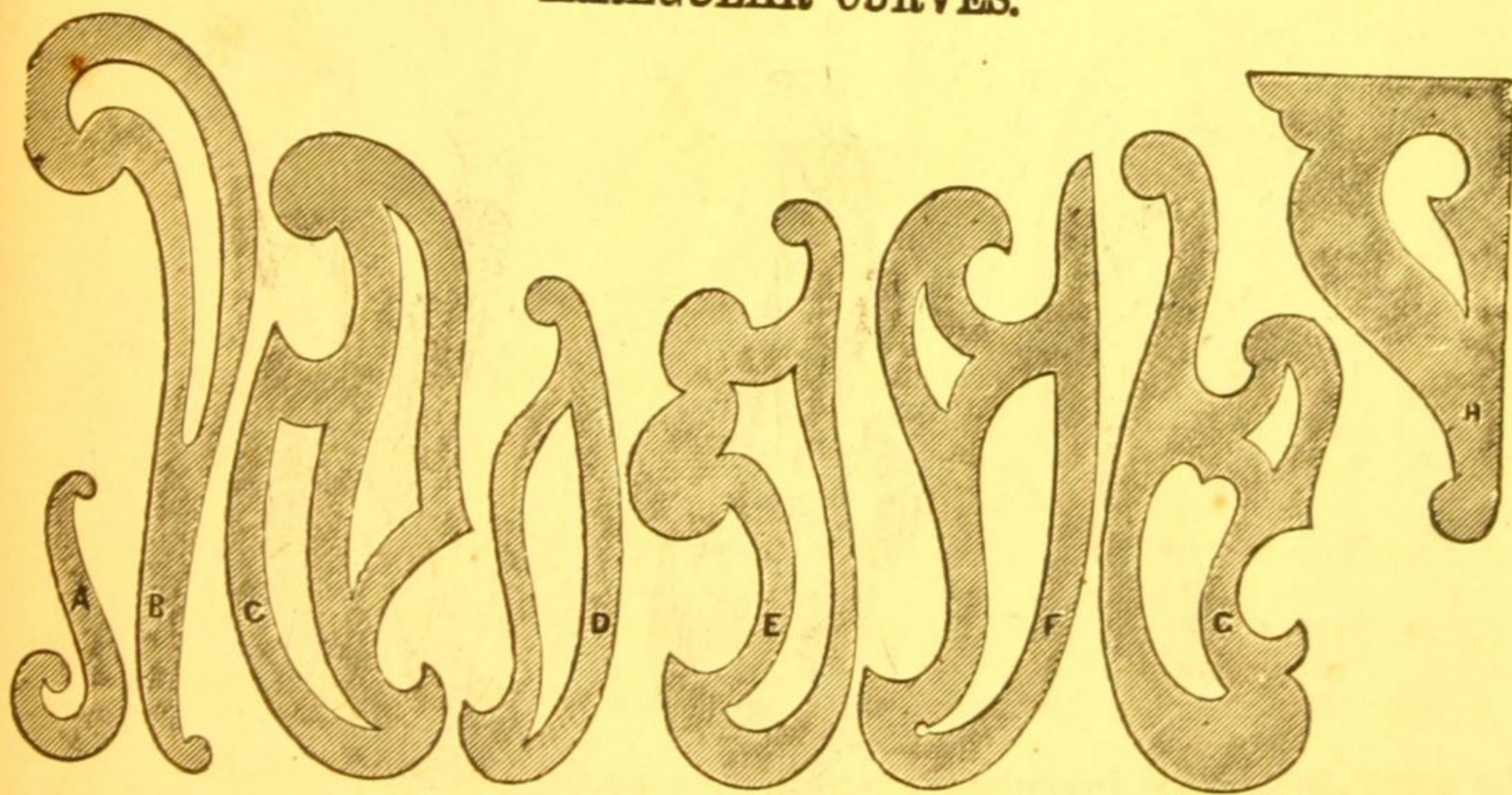
No.	PRICE.
A 735. German Silver Triangle, angles 30, 60, and 90 degrees, perpendicular, 14 inches long, each,	\$6.00
A 736. German Silver Triangle, angles 30, 60, and 90 degrees, perpendicular, 15 inches long, each,	6.50



A 737.

A 737. German Silver Triangle, angles 45, 45, and 90 degrees, isosceles sides, 4 inches long,	2.00
A 738. German Silver Triangle, angles 45, 45, and 90 degrees, isosceles sides, 5 inches long,	2.25
A 739. German Silver Triangle, angles 45, 45, and 90 degrees, isosceles sides, 6 inches long,	2.75
A 740. German Silver Triangle, angles 45, 45, and 90 degrees, isosceles sides, 7 inches long,	3.50
A 741. German Silver Triangle, angles 45, 45, and 90 degrees, isosceles sides, 8 inches long,	4.00
A 742. German Silver Triangle, angles 45, 45, and 90 degrees, isosceles sides, 9 inches long,	4.50
A 743. German Silver Triangle, angles 45, 45, and 90 degrees, isosceles sides, 10 inches long,	5.00

IRREGULAR CURVES.



A 767.

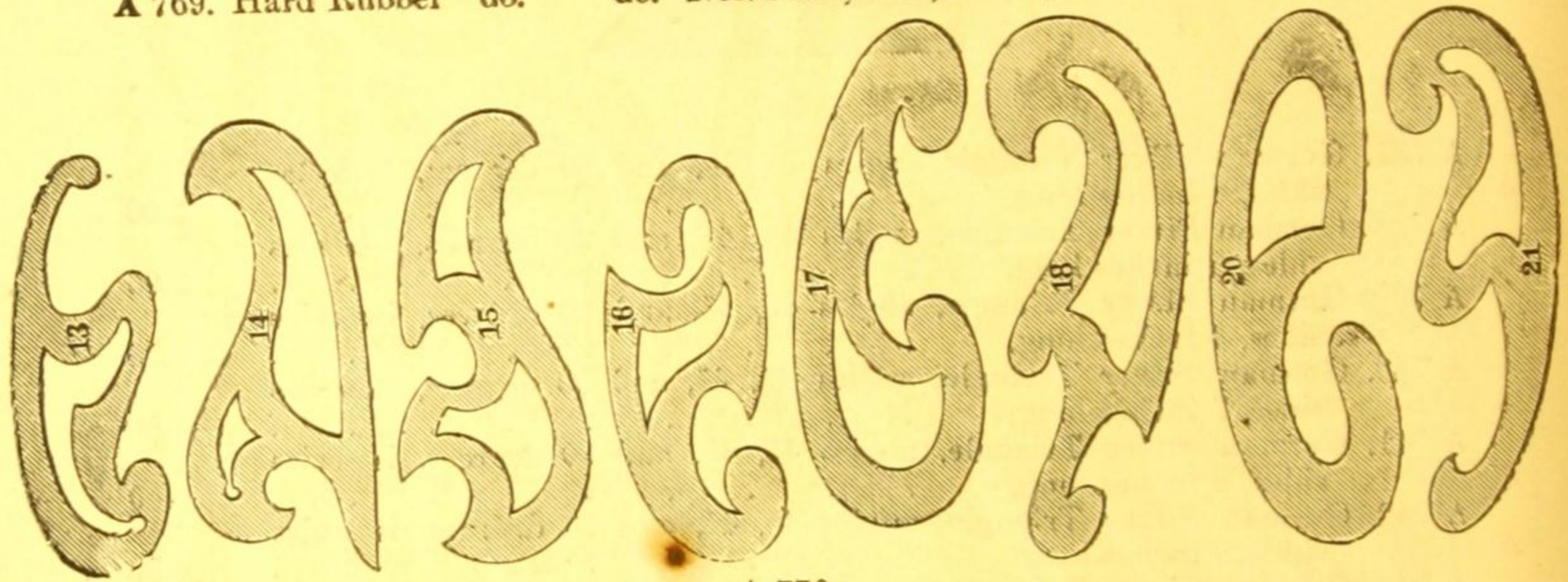
A 767. Whitewood Irregular Curves, 5 to 15 inches long, various patterns, each,	.20
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rees, perpendic- 2.50  
 rees, perpendic- 2.75  
 rees, perpendic- 3.00  
 rees, perpendic- 3.50  
 rees, perpendic- 4.00  
 rees, perpendic- 5.00  
 rees, perpendic- 6.50



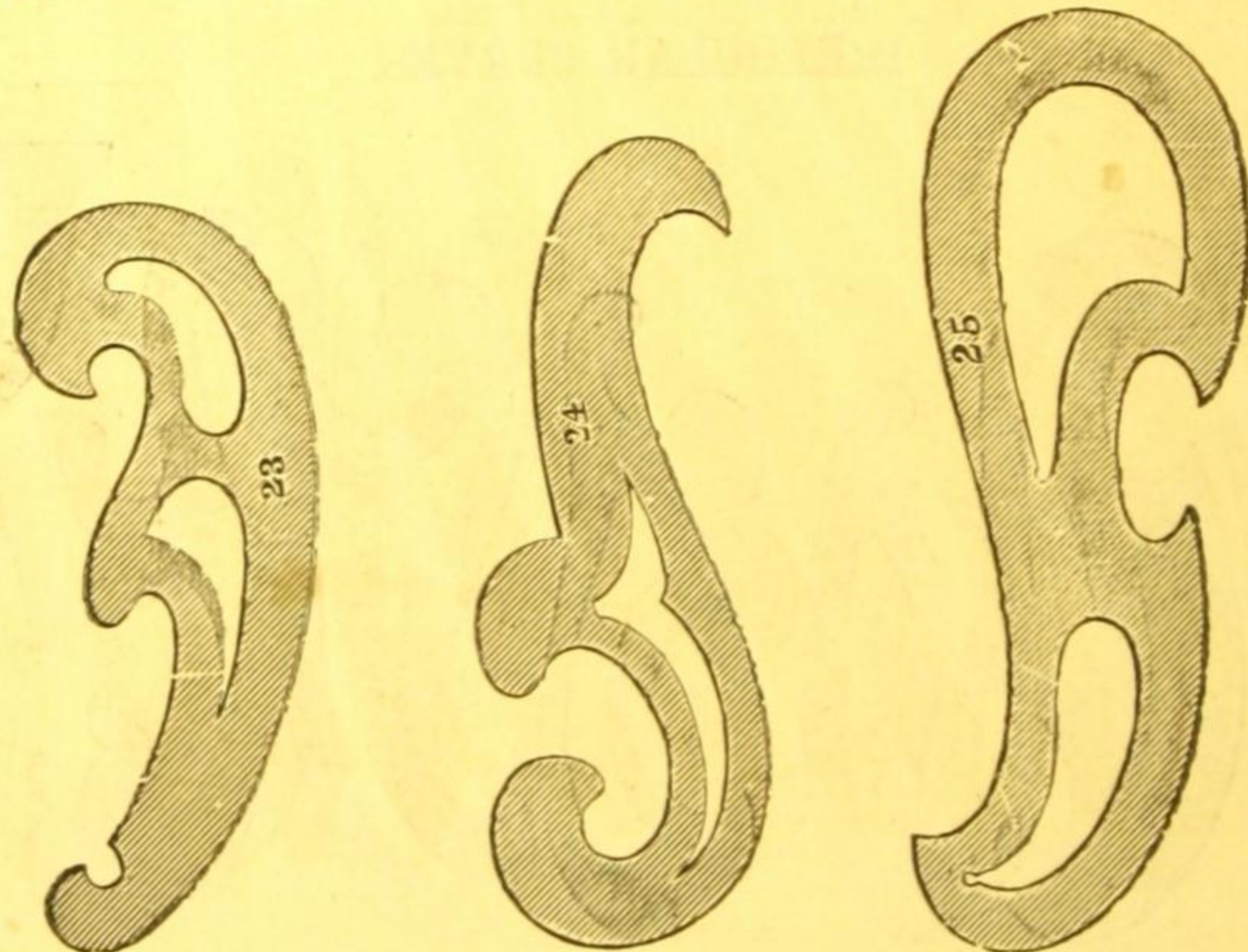
A 768.

No		PRICE.
A 768.	Whitewood Irregular Curves, of superior quality, Nos. 1 to 6, each,	\$0.15
A 769.	Hard Rubber do. do. Nos. 1 to 6, each, 35 cts.; Nos. 8 to 10 each,	.50



A 770.

▲ 770.	Whitewood Irregular Curves, of superior quality, Nos. 13 to 21, each,	.25
▲ 771.	Hard Rubber do. do. Nos. 13 to 21, each,	.75



A 772.

▲ 772.	Whitewood Irregular Curves, of superior quality, Nos. 23 to 25, each,	.55
▲ 773.	Hard Rubber do. do. Nos. 23 and 24, each, \$1; No. 25, each,	1.00



A 774.

No. A 774. Hard Rubber and Irregular Ship Curves, 4 to 26 inches long, as used in the United States Navy Yards, complete set in wooden box, PRICE \$38.50

A 775. Single Curves of set No. A 774:

No. 1, 25 cents each; 2, 3, 45 cents; 4, 5, 6, 50 cents; 7, 8, 9, 10, 60 cents; 11, 12, 13, 14, 65 cents; 15, 75 cents; 16, 17, 18, 90 cents; 19, \$1.10; 20, 21, 22, 23, \$1.00; 24, 25, 35 cents; 26, 27, 28, 29, 30, 45 cents; 31, 32, 70 cents; 33, 34, 60 cents; 35, 36, 37, 70 cents; 38, 39, 40, 41, 42, 90 cents; 43, 44, 45, 46, 47, 48, 49, 50, 51, \$1.10.



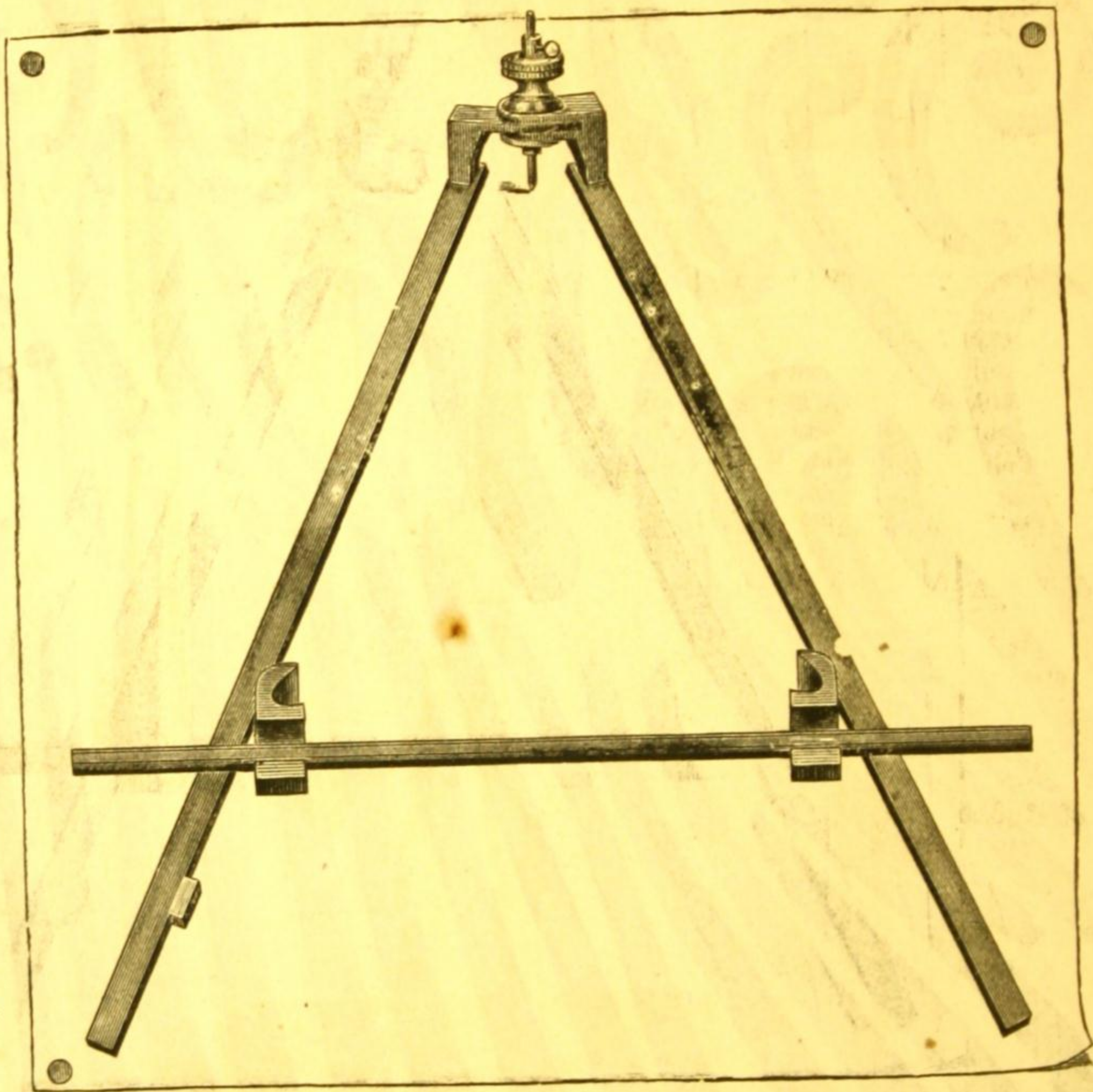
PRICE  
each, \$0.15  
do each, 50



each, .25  
do, .75

each, .55  
do, 1.00

## MARICHAL'S CURVOGRAPH



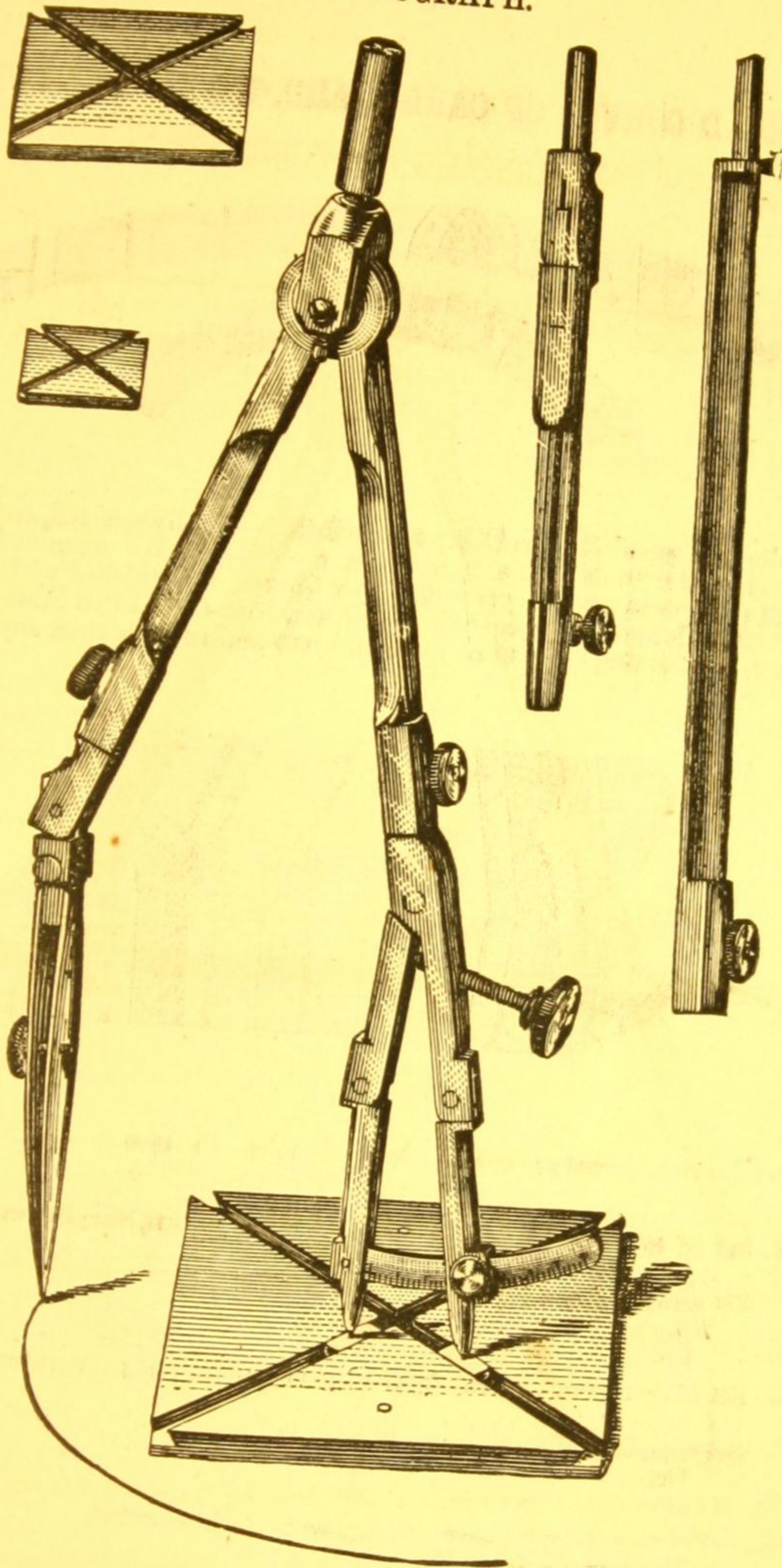
A 776, A 776,

No.	PRICE
A 776. MARICHAL'S CURVOGRAPH for drawing railroad curves of any radius,	\$12.00

This instrument is a mechanical application of the well-known property of the circle that all angles inscribed in the same segment are equal. In drawing large railroad curves particularly it will be found extremely useful, as with this instrument it is as easy to draw one curve as another between the whole range of values of radius—zero and infinity

177. ELLIPSO  
points,  
desired  
178. Ellipse A

ELLIPSOGRAPH.

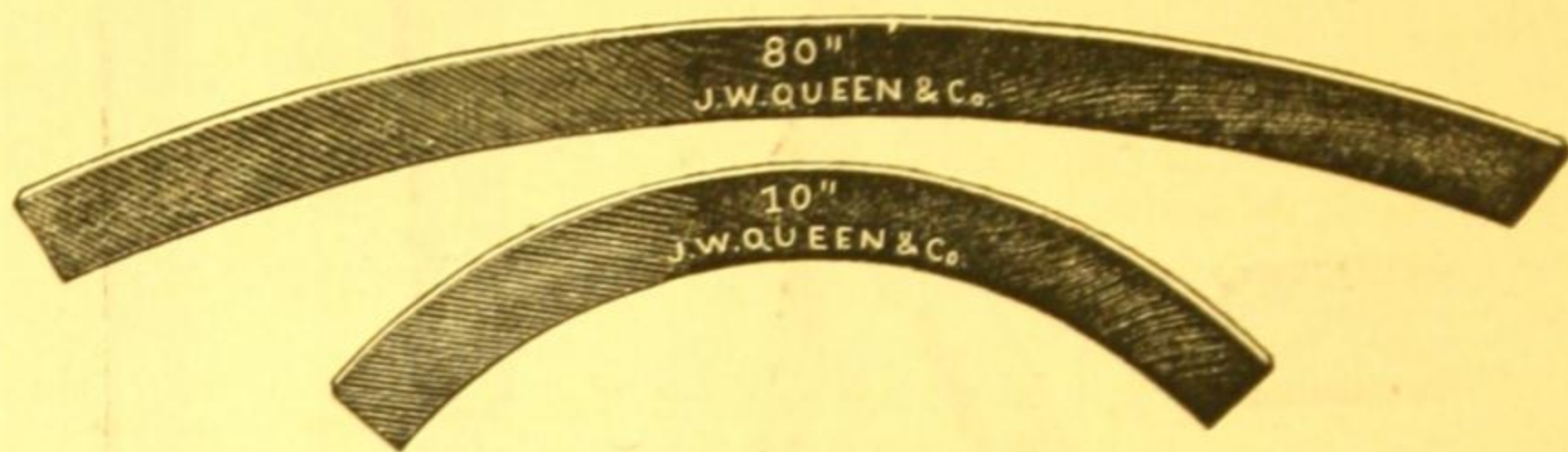


A 777.

No.	PRICE
A 777. ELLIPSOGRAPH, consisting of 5½-inch dividers, pens and pencil points, lengthening bar with ellipse plates, by which ellipses of any desired diameter may be drawn,	\$14.00
A 778. Ellipse Attachment, to fit any pair of dividers,	7.50

PRICE  
\$12.00  
of the  
large  
instru  
dues of

RAILROAD CURVES OF CARD-BOARD, WOOD, AND RUBBER.



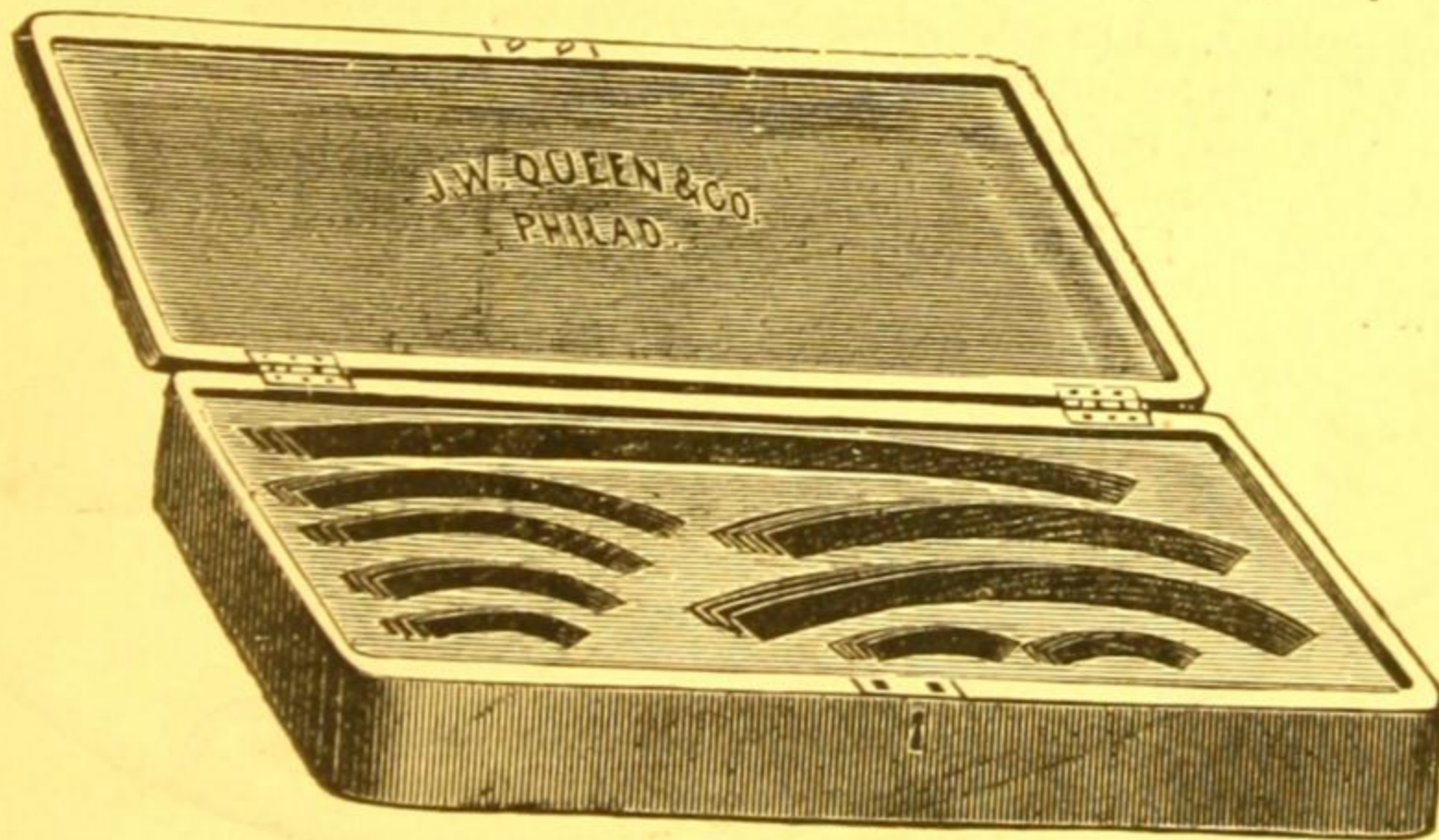
The following sets of Railroad Curves have been carefully selected, and, we believe, will answer all the wants of the engineering profession. We manufacture to order additional sets, cut to any desired scale. Our Curves are finished with the greatest care, and their large and increasing sale throughout the United States and Canada warrants us in claiming them to be more accurate and reliable than any others in the market.



The following curves are cut to a scale of inches, the outside of arcs only finished.

No.		PRICE.
A 781.	Set of ten Curves, from 12 to 120 inches radius, varying every 12 inches:	
	Set complete, of card-board, in box, . . . . .	\$3.00
	Do. wood, do. . . . .	4.50
	Do. rubber, do. . . . .	7.00
A 782.	Set of seventeen Curves, from 12 to 60 inches radius, varying every 3 inches:	
	Set complete, of card-board, in box, . . . . .	5.00
	Do. wood, do. . . . .	7.50
	Do. rubber, do. . . . .	12.00
A 783.	Set of twenty-four Curves, from 2 to 24 inches radius, Varying $\frac{1}{2}$ " from 2" to 10", Do. 2" from 10" to 24"	
	Set complete, of card-board, in box, . . . . .	7.50
	Do. wood, do. . . . .	10.00
	Do. rubber, do. . . . .	17.00

No.	PRICE,
A 784. Set of forty-three Curves, from $3\frac{1}{2}$ to 200 inches radius, Varying every $\frac{1}{2}$ " to 10".	
Do. do. 2" to 24".	
Do. do. 3" to 42".	
Do. do. 6" to 90".	
Do. do. 10" to 140".	
Do. do. 20" to 200".	
Set complete, of wood, in box, . . . . .	\$19.00
Do. rubber, do. . . . .	30.00
A 785. Set of one hundred Curves, from 2 to 100 inches radius, varying every inch, with inside and outside of arcs finished:	
Set, complete, of wood, in box, . . . . .	45.00
Do. rubber, do. . . . .	69.00
A 786. Set of one hundred and two Curves, from 3 to 200 inches radius, with 3 inches of tangent to each curve. Length of Curves, with tangent, from 7 to 21 inches:	
Set, complete, of rubber, in box, . . . . .	122.00
The following Curves are cut to a scale of 50 feet to the inch, and have both inside and outside of arcs finished:	
A 787. Set of fifteen Curves, rising every 30" to 3°, then single degrees to 12°:	
Set, complete, of wood, in box, . . . . .	9.00
Do. rubber, do. . . . .	13.50
A 788. Set of twenty Curves, rising every 30" to 10°:	
Set, complete, of wood, in box, . . . . .	12.00
Do. rubber, do. . . . .	18.00
A 789. Set of fifty Curves, from 25" to 3° by every 5", and from 3° to 5° by every 15", 5° to 10° by every 30":	
Set, complete, of wood, in box, . . . . .	30.00
Do. rubber, do. . . . .	45.00



A 790.

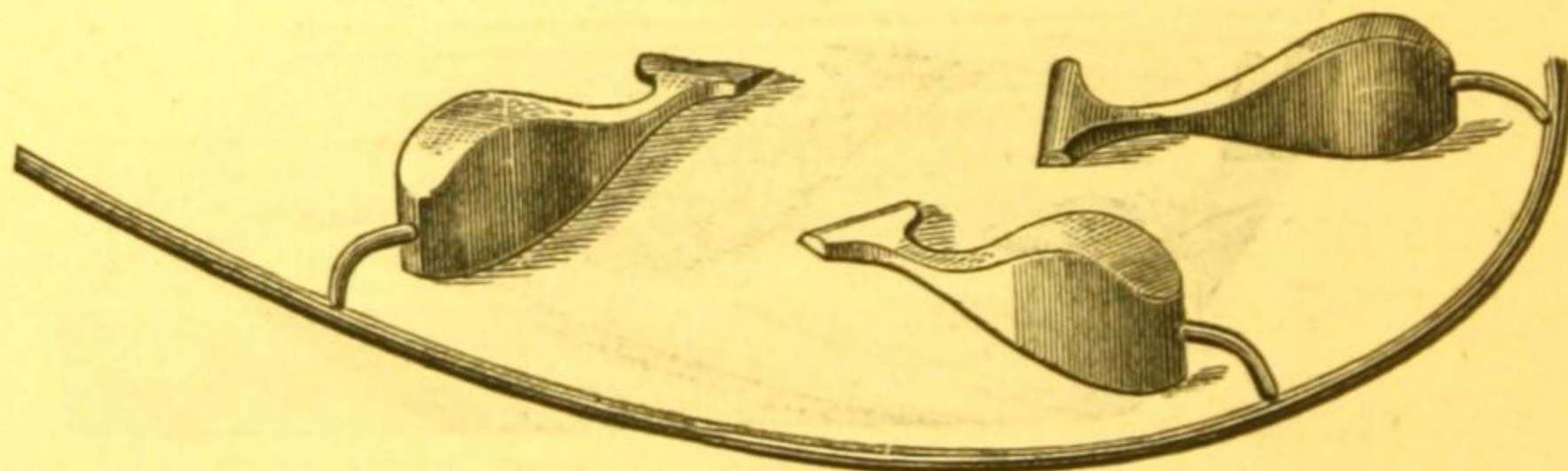
A 790. Same as No. A 789, but with 3 inches of tangent to each Curve:	
Set, complete, of rubber, in box, . . . . .	60.00
Sets Nos. A 791 and A 792 are cut to a scale of 100 feet to the inch, and have both inside and outside of arcs finished.	
A 791. Set of twenty-four Curves, from 30" to 12° by 30":	
Set, complete, of wood, in case, . . . . .	13.25
Do. rubber, do. . . . .	19.75

No.	PRICE.
A 792. Set of seventy-eight Curves, from 15'' to 4° by every 5'', 4° to 12° by every 15'':	
Set, complete, of wood, in case, . . . . .	\$42.00
Do. rubber, do. . . . .	64.00
Sets Nos. A 793 and A 794 are cut to a scale of 400 feet to the inch, and are finished only on outside of arc.	
A 793. Set of twenty Curves, from 30'' to 10° by every 30'':	
Set, complete, of wood, in case, . . . . .	9.50
Do. rubber, do. . . . .	14.00
A 794. Set of seventy Curves, from 15'' to 4° by every 5'', and from 4° to 10° by every 15'':	
Set, complete, of wood, in case, . . . . .	33.50
Do. rubber, do. . . . .	49.00
A 799. Railroad Curve Protractor, of horn, 8 inches diameter, having laid off on it 33 curves, from ½° to 8°, with a radius of 400 feet to the inch, each, . . . . .	2.00

## SHIP CURVES

A 800. Ship Curves, of pearwood, set of 10 curves, per set, . . . . .	5.50
A 801. Hard Rubber, 28 in set, being Nos. 23 to 51, inclusive, as described in A 775; set complete in box, . . . . .	20.00
A 802. Same as above, but in wood, . . . . .	11.00

These Curves were made by us from drawings furnished by the chief draughtsman in the Navy Yard at League Island, and are the standard patterns as used in the United States.

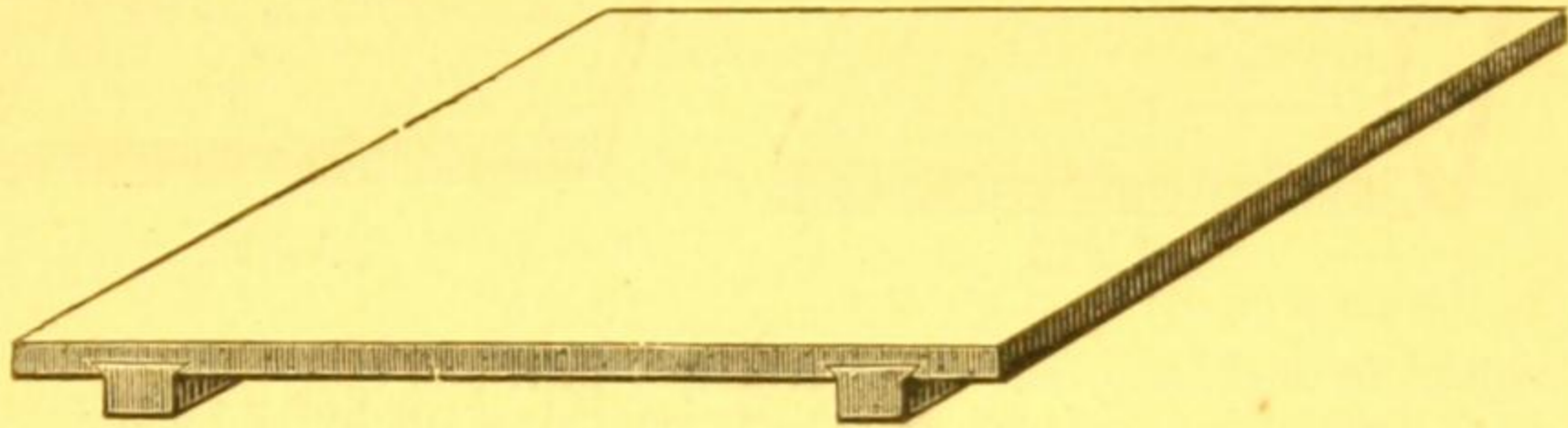


A 805.

A 803. Hard Rubber Splines.						
	12	18	24	30	36	42 inch.
each, \$0.25	.30	.35	.40	.45	.50	
A 804. Pearwood Splines, 12 to 36 inches long, from . . . . .						.15 to .30
A 805. Lead Weights for Splines, each, . . . . .						1.50
A 806. Lead Paper Weights, covered with leather, each, . . . . .						1.00
A 807. Iron Paper Weights, round with knob, small, each, . . . . .						.60
A 808. Do. do. square with knob, large, each, . . . . .						1.00

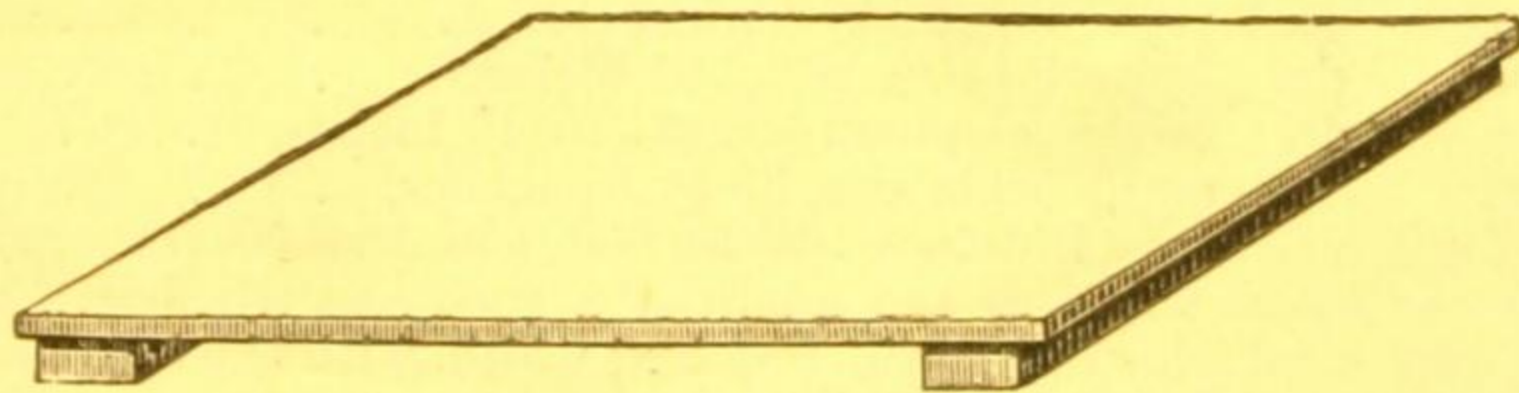


## DRAWING BOARDS.



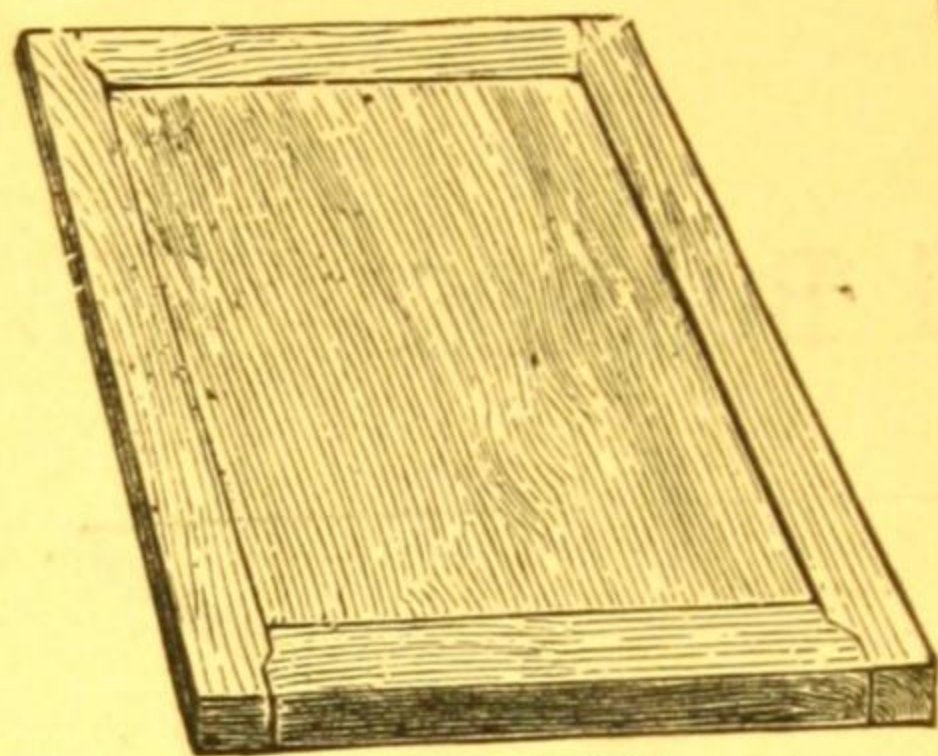
A 810.

No.		PRICE.
<b>A 810.</b>	Drawing Board, of pinewood, well seasoned, dove-tailed, hardwood batten,	
Do.	do. cap size, 12 by 17 inches, each, . . . .	\$0.75
Do.	do. demy size, 16 by 21 inches, each, . . . .	1.15
Do.	do. superroyal size, 20 by 28 inches, each, . . . .	1.50
Do.	do. imperial size, 23 by 31 inches, each, . . . .	2.50
Do.	do. atlas size, 27 by 34 inches, each, . . . .	2.50
Do.	do. double elephant size, 28 by 42 inches, each, . . . .	2.75
Do.	do. antiquarian size, 33 by 54 inches, . . . .	5.00

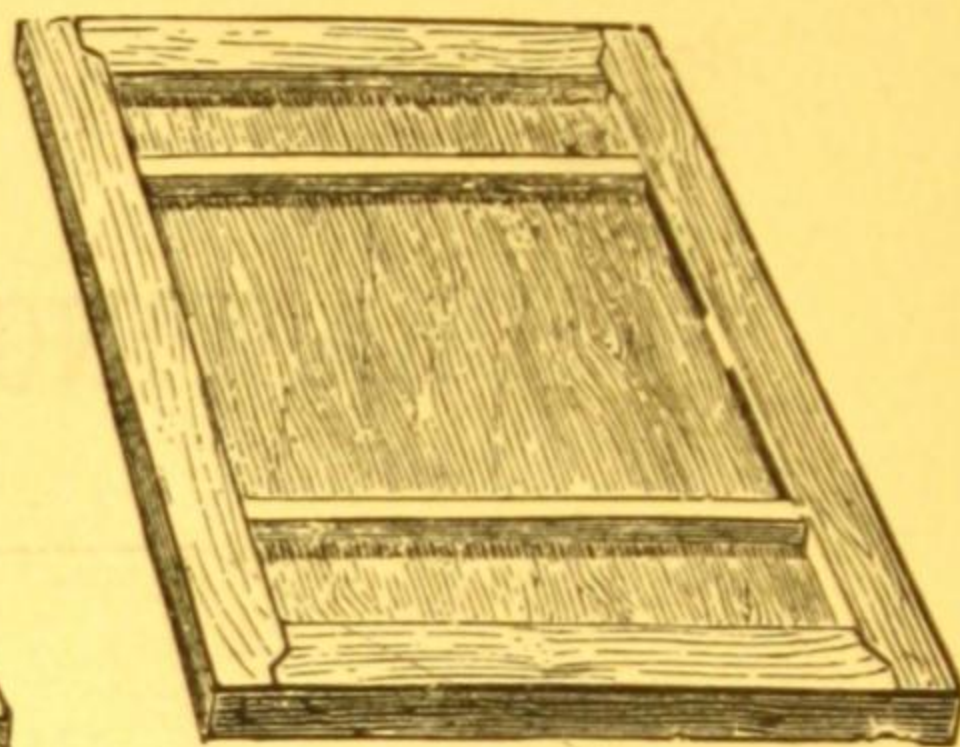


A 811.

<b>A 811.</b>	Drawing Board, pinewood, hardwood battens screwed to the back. The screws run in slots, to allow free contraction or expansion.	
Do.	do. demy size, 16 by 21 inches, each, . . . .	1.50
Do.	do. royal size, 20 by 26 inches, each, . . . .	2.25
Do.	do. imperial size, 23 by 31 inches, each, . . . .	3.50
Do.	do. double elephant, 28 by 42 inches, each, . . . .	5.50

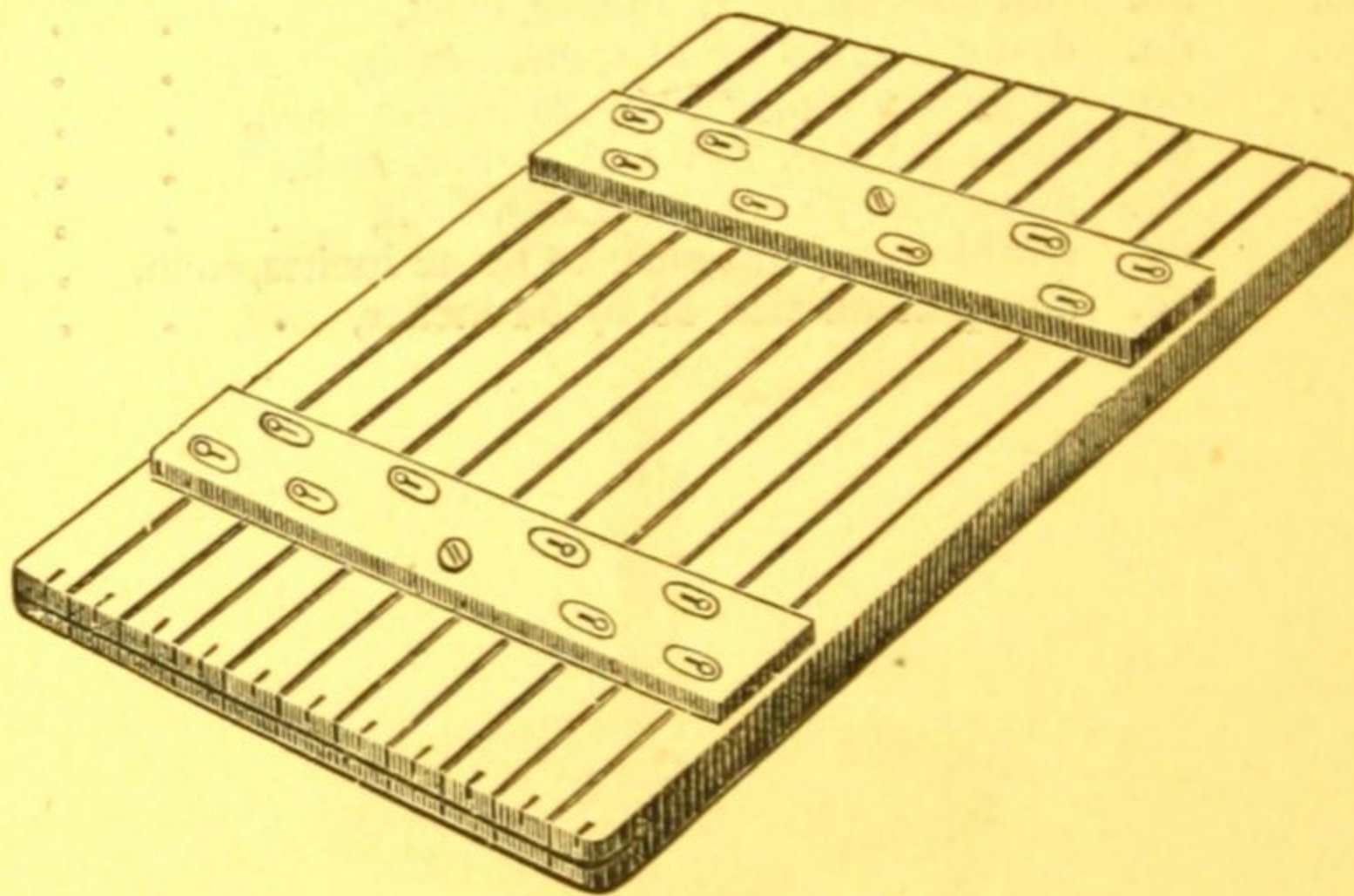


A 812.



A 812.

No.		centre of pine and removable.	PRICE.
A 812.	Walnut-framed Drawing Board,	half royal size, 10½ by 17 inches,	\$2.00
Do.	do.	half imperial size, 14 by 19 inches,	2.50
Do.	do.	royal size, 17 by 22 inches,	3.50
Do.	do.	imperial size, 19 by 28 inches,	4.50
Do.	do.	double elephant size, 24 by 38 inches,	7.00



A 813.

A 813.	Drawing Board,	pinewood, hardwood battens.	
Do.	do.	demy size, 15 by 21 inches,	3.00
Do.	do.	royal size, 20 by 26 inches,	4.50
Do.	do.	imperial size, 23 by 31 inches,	6.00
Do.	do.	double elephant size, 31 by 42 inches,	8.50
Do.	do.	antiquarian size, 33 by 55 inches,	12.00

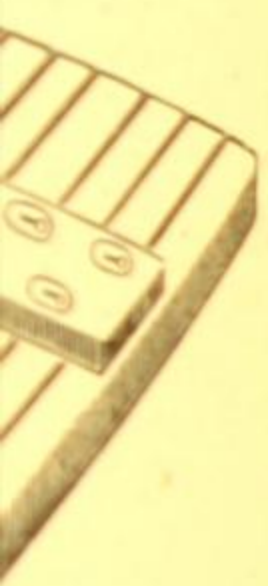
The Drawing Board above illustrated is the best, and deserves recommendation, as it is the only one which possesses the qualities a good and true board should have. It is made of pinewood, glued up to the required width, with the heart side of each piece of wood to the surface. A pair of hardwood battens are screwed to the back, the screws pass through the ledges in oblong slots, bushed with brass, which fits closely under the heads, and yet allows the screws to move freely when drawn by the contraction of the board. To give the battens power to resist the tendency of the surface to warp, a series of grooves are 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 battens, leaving at the same time the longitudinal strength of the wood nearly unimpaired.

To make the two working edges perfectly smooth, allowing an easy movement with the square, a slip of hardwood is let into the end of the board. The slip is afterward sawn apart at about every inch to admit contraction.



A 812.

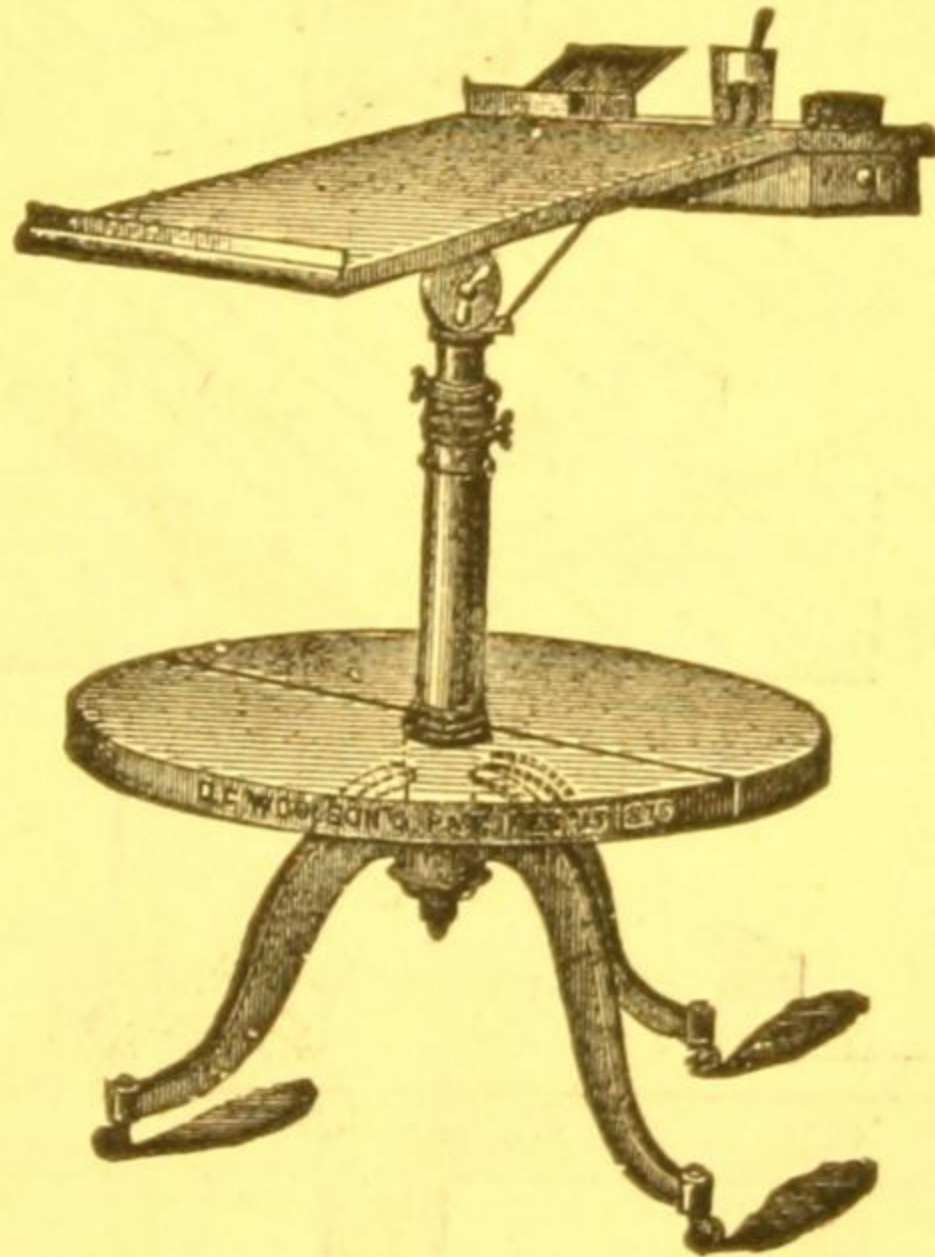
removable,	
10 1/2 by 17 inches,	\$2.00
14 by 19 inches,	2.50
22 inches,	3.50
by 28 inches,	4.50
size, 24 by 38 inches,	7.00



ches,	3.00
	4.50
	6.00
	8.50
	12.00

reserves recommendation, and true board should have with the heart side of end as are screwed to the back with brass, which is freely when drawn by the resist the tendency of the thickness of the board one length out of the wood to allow the longitudinal strength giving an easy movement with board. The slip is after

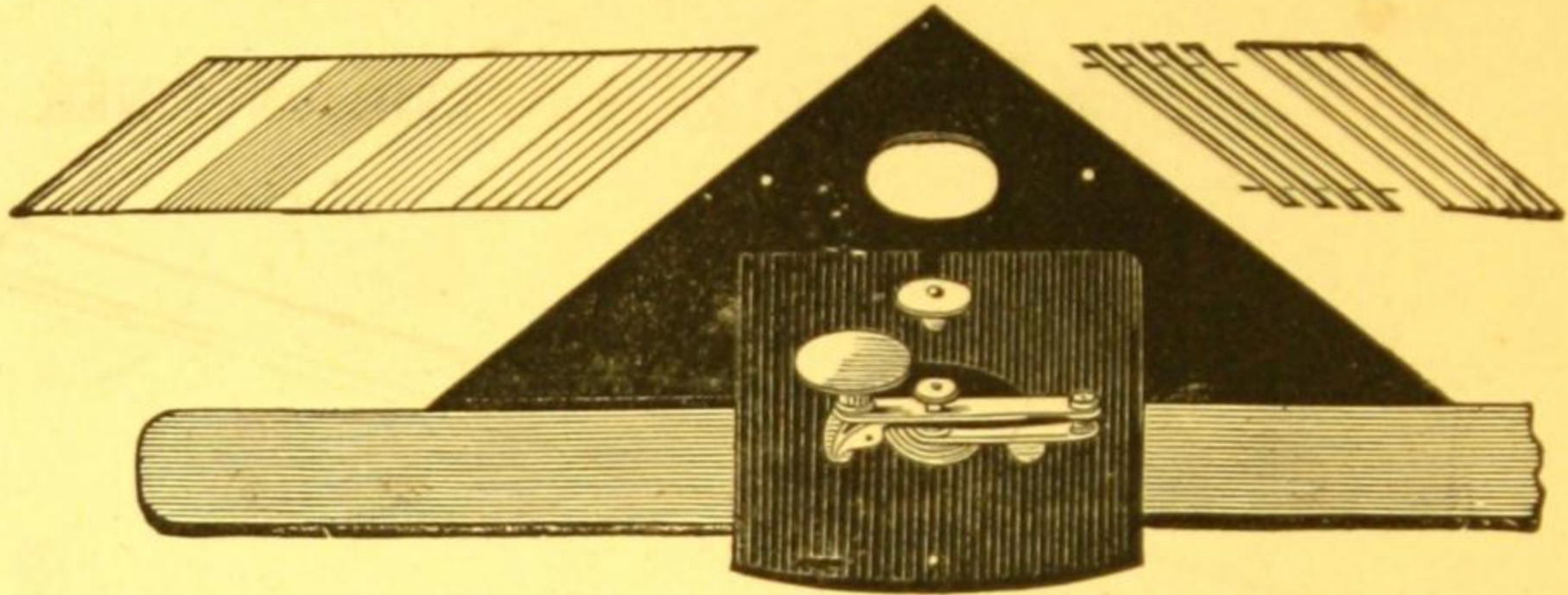
### DRAWING TABLES.



A 814.

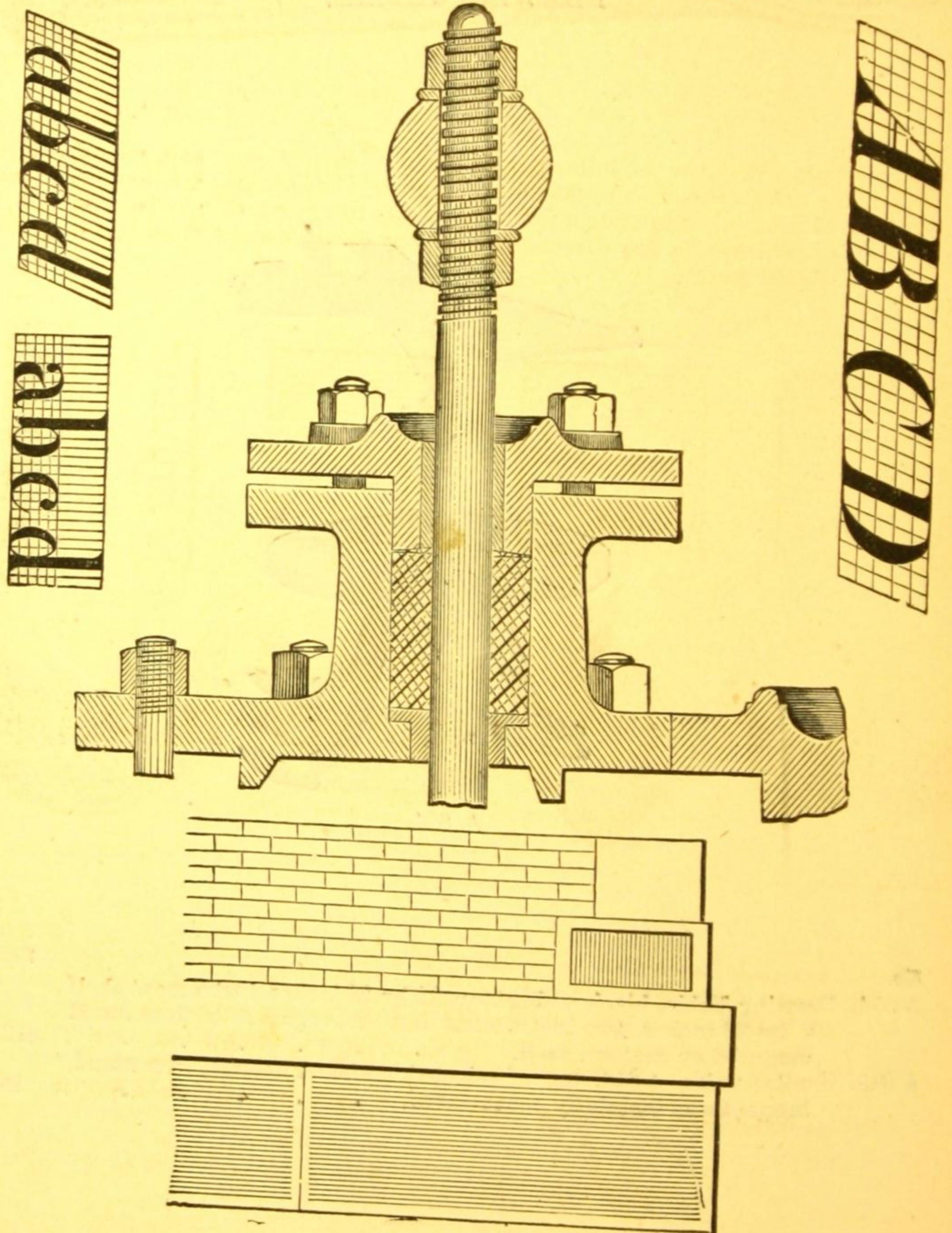
- | No.    | Description  | Price.  |
|--------|--|---------|
| A 814. | Drawing Table, black walnut top, 22 by 26 inches, instrument shelf 7 by 26 inches, two instrument drawers, ornamented iron stand mounted on casters, each. | \$12.50 |
| A 815. | Similar to No. A 814, top of selected polished walnut, iron stand, bronzed and tastefully ornamented,  | 15.50   |

BERGNER'S PATENT SECTION LINER.

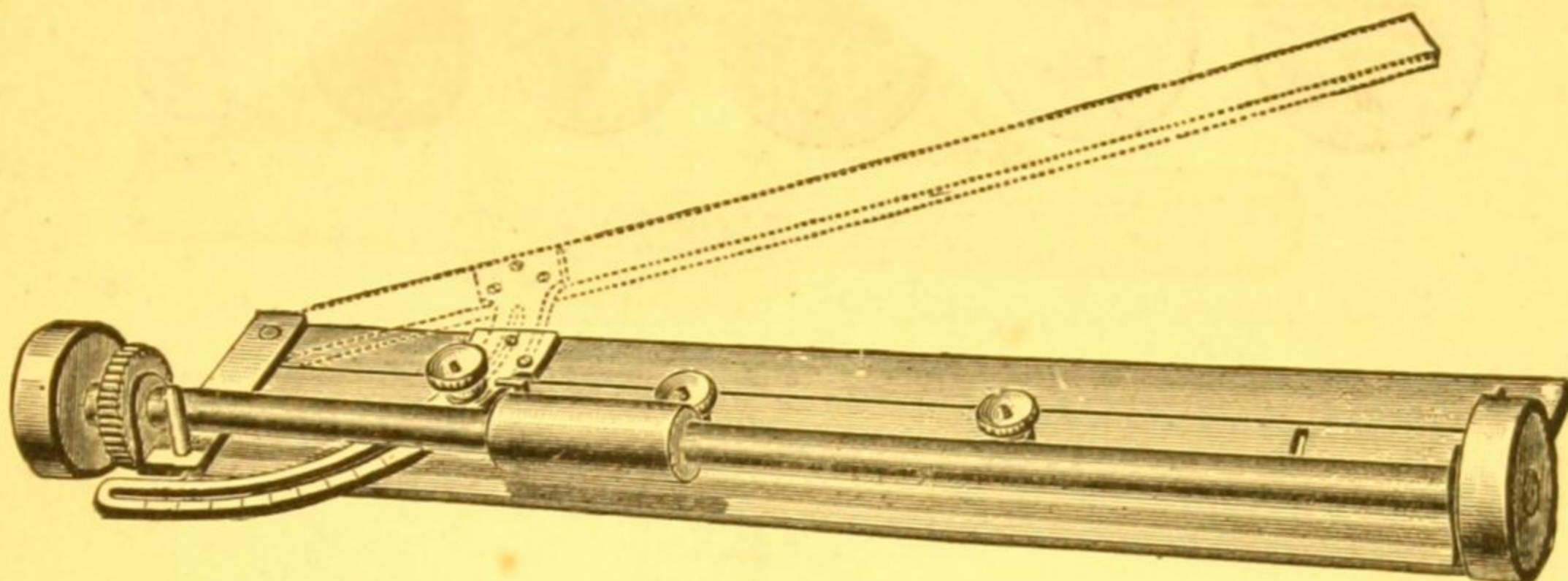


A 831.

A 831. Bergner's Patent Section Liner, in morocco case, . . . . . \$7.50  
 SAMPLES OF WORK DONE WITH BERGNER'S PATENT SECTION LINER.

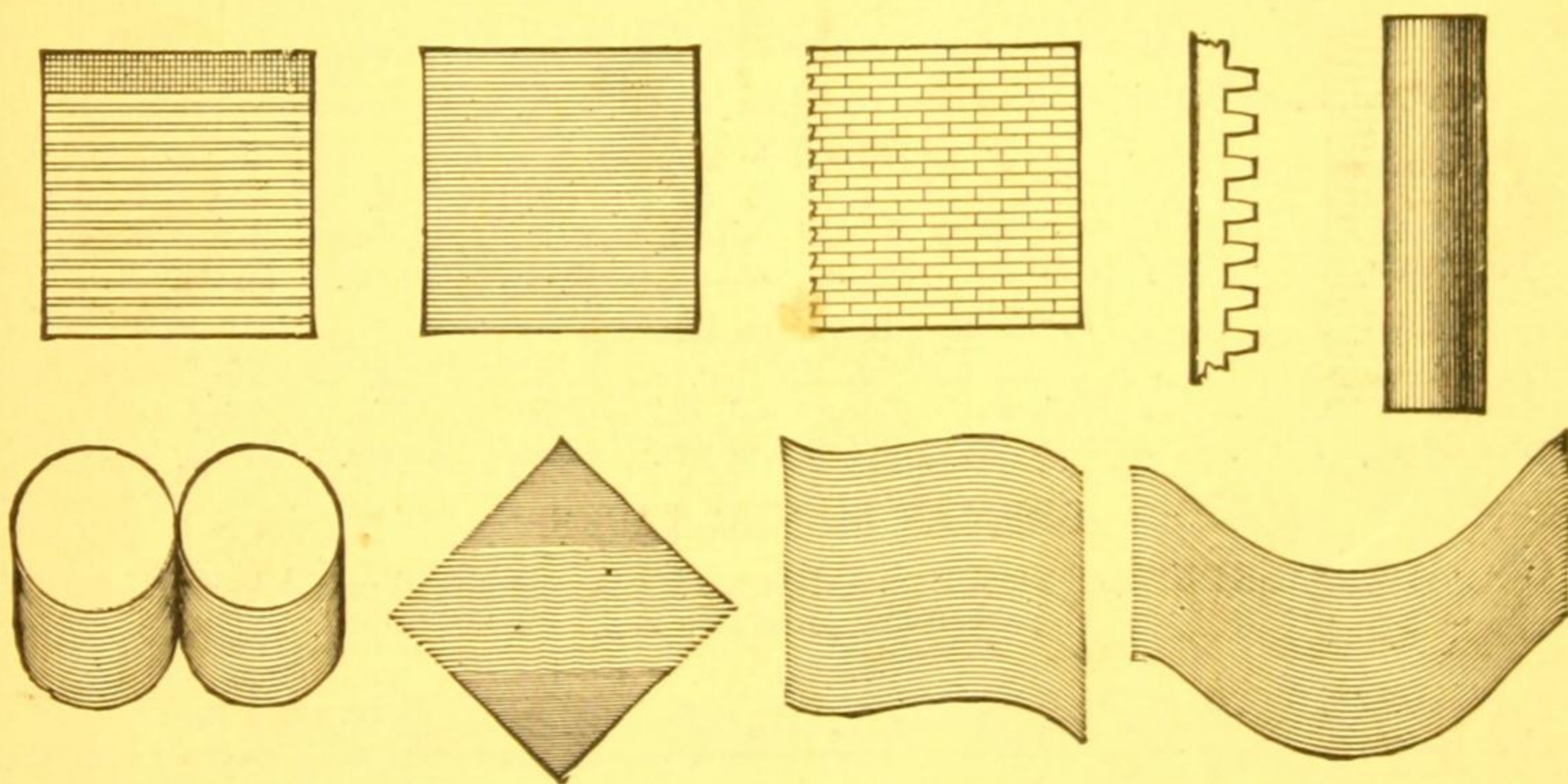


THE "UNIVERSAL" RULER AND SECTION LINER.



A 832.

This Ruler combines the following advantages: *it is accurate, neat, simple, and durable*, being made of steel and brass, nickel-plated. The cuts which follow were drawn with this Ruler, and illustrate a few of the many things which may be done with it. Lines may be drawn in any direction and at any distance apart, from  $\frac{1}{100}$  of an inch to any distance desired.

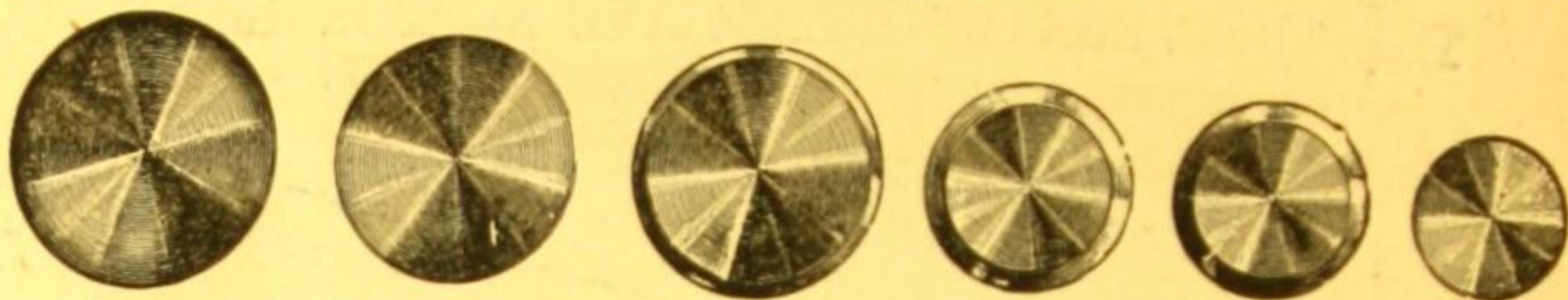


No.	PRICE.
A 832. Six-inch Ruler, without Centre Point, . . . . .	\$4.50
A 833. Eight and one-half inch Ruler, with Centre Point, . . . . .	5.00
A Velvet Lined Case will be supplied for . . . . .	.50

Larger sizes will be supplied to order.

A 834. A Nickel-plated Straight Edge of any length desired up to 3 feet, .	1.00
--	------

# THUMB TACKS.



## BRASS TACKS.

Riveted, Steel Points, Milled Edge, packed loose, one gross in a box.

A 840.		A.	B.	C.	D.
Diameter, . . . . .		$\frac{5}{16}$ in.	$\frac{3}{8}$ in.	$\frac{7}{16}$ in.	$\frac{1}{2}$ in.
Per dozen, . . . . .		10 cts.	20 cts.	25 cts.	30 cts.

## BRASS TACKS.

Riveted, Steel Points, ROUND HEADS, packed loose, one gross in a box.

A 841.		A.	B.	C.	D.	E.	F.
Diameter, . . . . .		$\frac{5}{16}$ in.	$\frac{3}{8}$ in.	$\frac{7}{16}$ in.	$\frac{1}{2}$ in.	$\frac{9}{16}$ in.	$\frac{5}{8}$ in.
Per dozen, . . . . .		15 cts.	25 cts.	25 cts.	30 cts.	35 cts.	40 cts.

Same. BEVELED HEADS.

A 842.		A.	B.	C.	D.	E.	F.
Diameter, . . . . .		$\frac{5}{16}$ in.	$\frac{3}{8}$ in.	$\frac{7}{16}$ in.	$\frac{1}{2}$ in.	$\frac{9}{16}$ in.	$\frac{5}{8}$ in.
Per dozen, . . . . .		15 cts.	20 cts.	25 cts.	30 cts.	35 cts.	40 cts.

## GERMAN SILVER TACKS.

Riveted, Steel Points, ROUND HEADS, Mounted on Cork, and packed one gross in a box.

A 843.		A.	B.	C.	D.	E.	F.
Diameter, . . . . .		$\frac{5}{16}$ in.	$\frac{3}{8}$ in.	$\frac{7}{16}$ in.	$\frac{1}{2}$ in.	$\frac{9}{16}$ in.	$\frac{5}{8}$ in.
Per dozen, . . . . .		30 cts.	35 cts.	40 cts.	45 cts.	50 cts.	55 cts.

Same. BEVELED HEADS.

A 844.		A.	B.	C.	D.	E.	F.
Diameter, . . . . .		$\frac{5}{16}$ in.	$\frac{3}{8}$ in.	$\frac{7}{16}$ in.	$\frac{1}{2}$ in.	$\frac{9}{16}$ in.	$\frac{5}{8}$ in.
Per dozen, . . . . .		30 cts.	35 cts.	40 cts.	45 cts.	50 cts.	55 cts.

## GERMAN SILVER TACKS.

Screwed in and Riveted Steel Points, ROUND HEADS, Mounted on Cork, and packed one gross in a box.

A 845.		A.	B.	C.	D.	E.	F.
Diameter, . . . . .		$\frac{5}{16}$ in.	$\frac{3}{8}$ in.	$\frac{7}{16}$ in.	$\frac{1}{2}$ in.	$\frac{9}{16}$ in.	$\frac{5}{8}$ in.
Per dozen, . . . . .		50 cts.	60 cts.	65 cts.	75 cts.	80 cts.	90 cts.

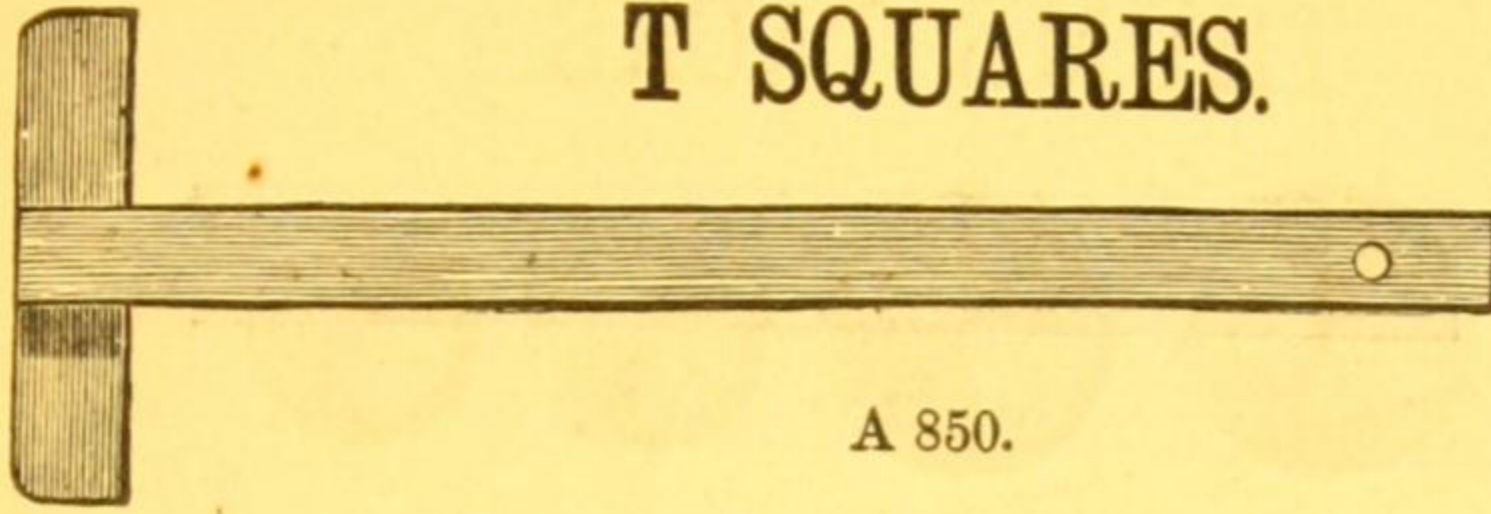
Same. BEVELED HEADS.

A 846.		A.	B.	C.	D.	E.	F.
Diameter, . . . . .		$\frac{5}{16}$ in.	$\frac{3}{8}$ in.	$\frac{7}{16}$ in.	$\frac{1}{2}$ in.	$\frac{9}{16}$ in.	$\frac{5}{8}$ in.
Per dozen, . . . . .		50 cts.	60 cts.	65 cts.	75 cts.	80 cts.	90 cts.

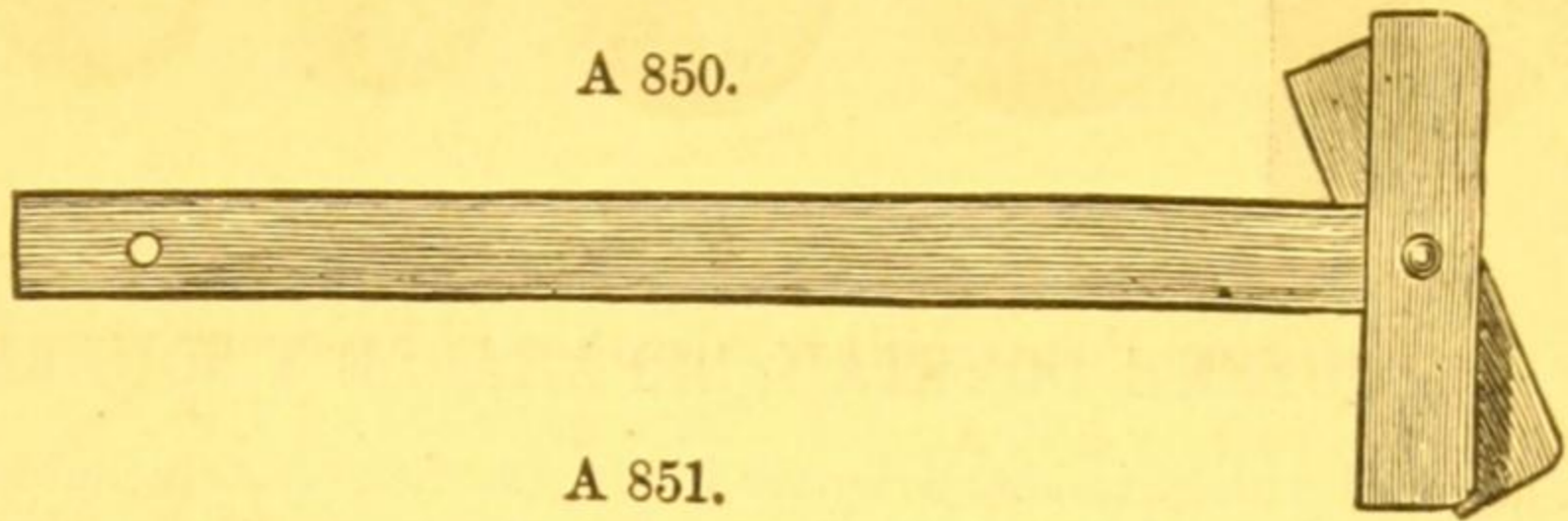
Order by Number and Letter only.

A 847. Horn Centre, each.							
A 848. Do. with German silver rim.							\$0.15
A 849. Thumb-Tack Extractor and Impressor, for pressing in and taking out thumb-tacks, nickel-plated.							.35
							.25

# T SQUARES.

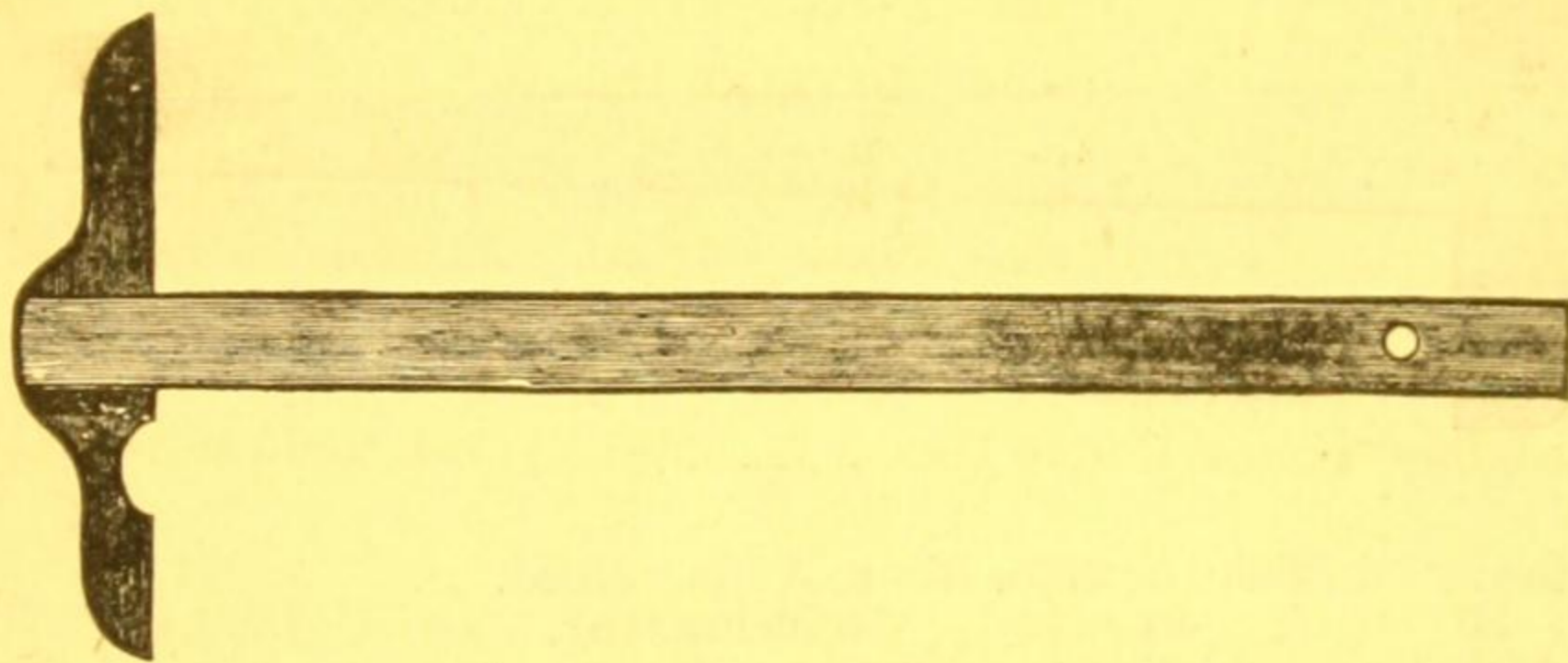


A 850.



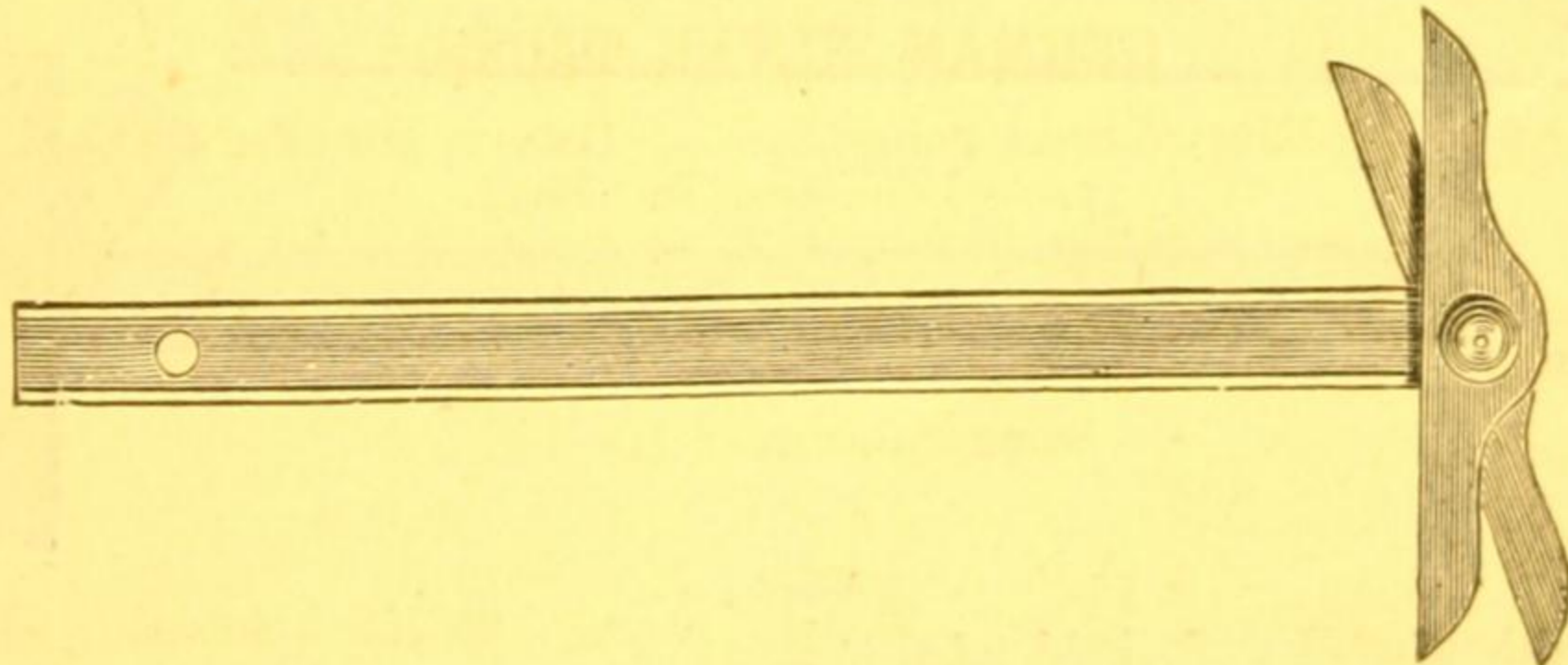
A 851.

No.	A 850. Pearwood T Square, fixed head.								
	15	20	25	30	35	40	45	50	70 inches long
	\$.30	.45	.45	.50	.65	.85	1.00	1.25	2.00
No.	A 851. Pearwood T Square, shifting head.								
	20	25	30	35	40	50	70 inches long		
	\$1.00	1.00	1.10	1.20	1.50	1.75	2.50		



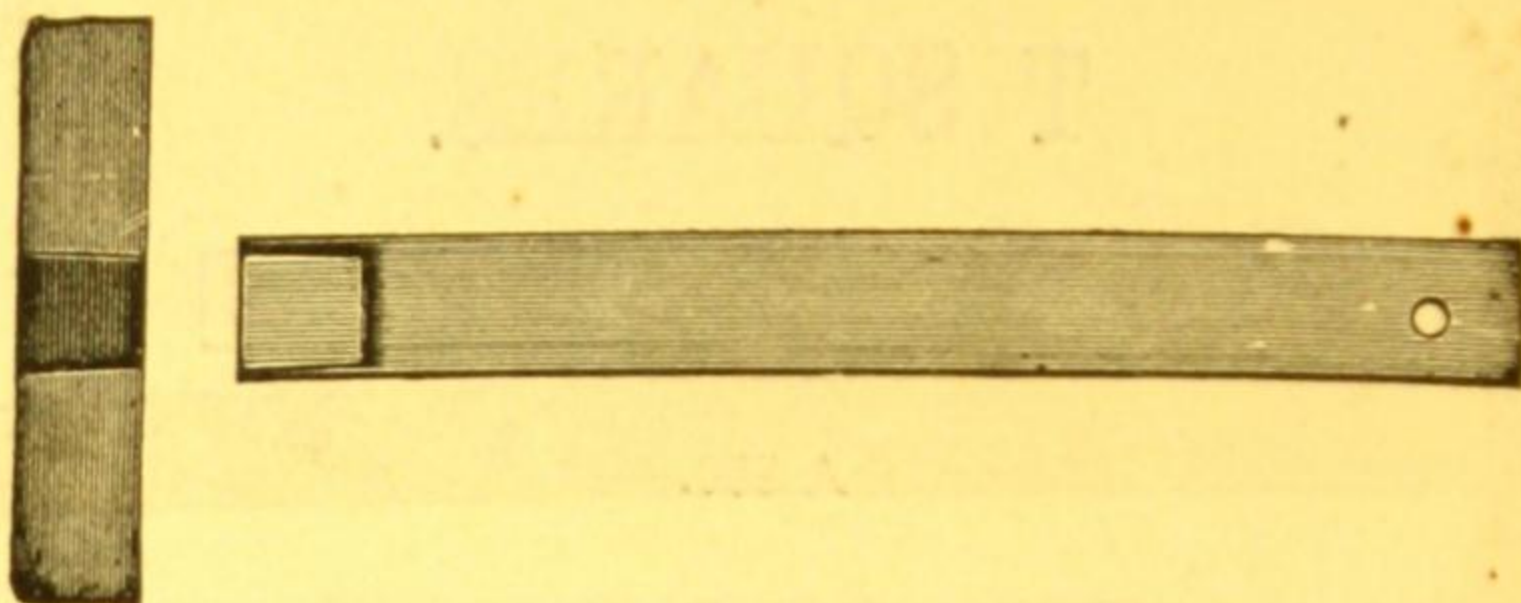
A 852.

A 852. Maple Blade, Black Walnut Head, fixed.						
	20	25	30	35	50	60 inches long
	\$.65	.75	.85	1.00	1.25	1.60



A 853.

A 853. Maple Blade, Black Walnut Head, shifting.					
	30	25	30	40	55 inches long
	\$1.10	1.25	1.40	1.60	2.00



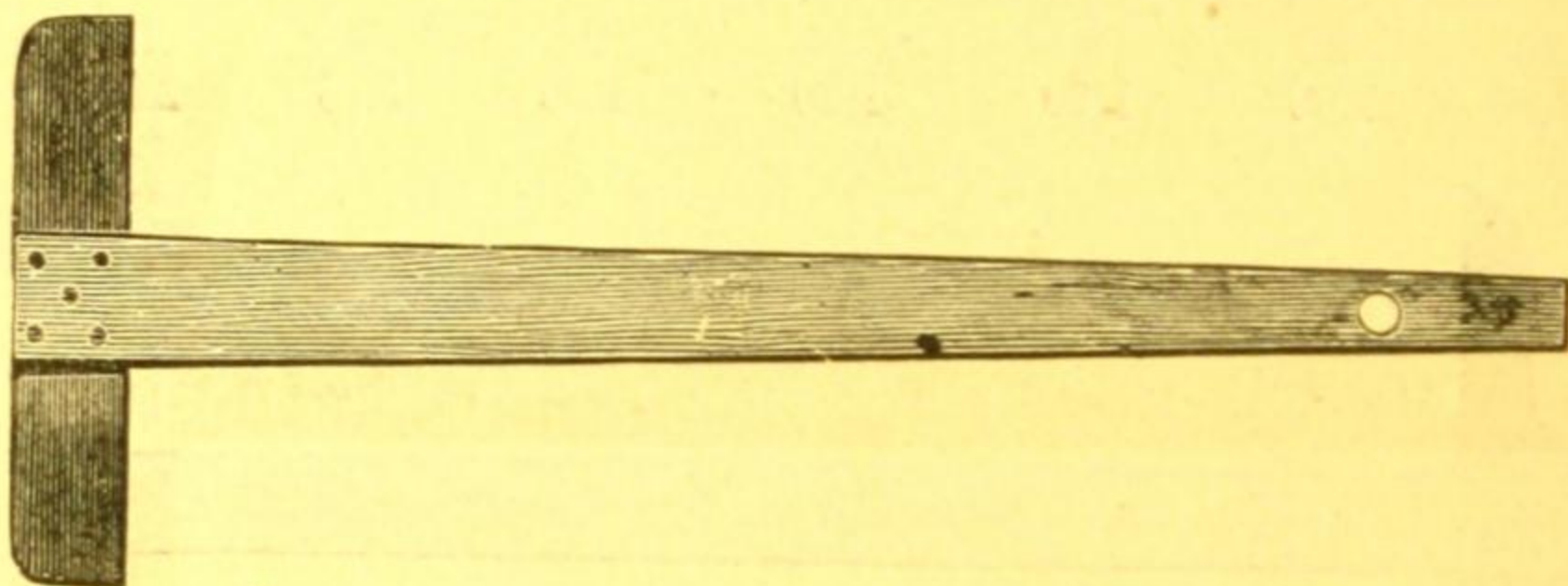
A 854.

QUEEN'S DOVETAIL SEPARABLE T SQUARES.

The great advantage in above Square is that the head is detachable from the blade, which, without impairing its strength and firmness when fixed, makes it much more convenient for carrying.

No.

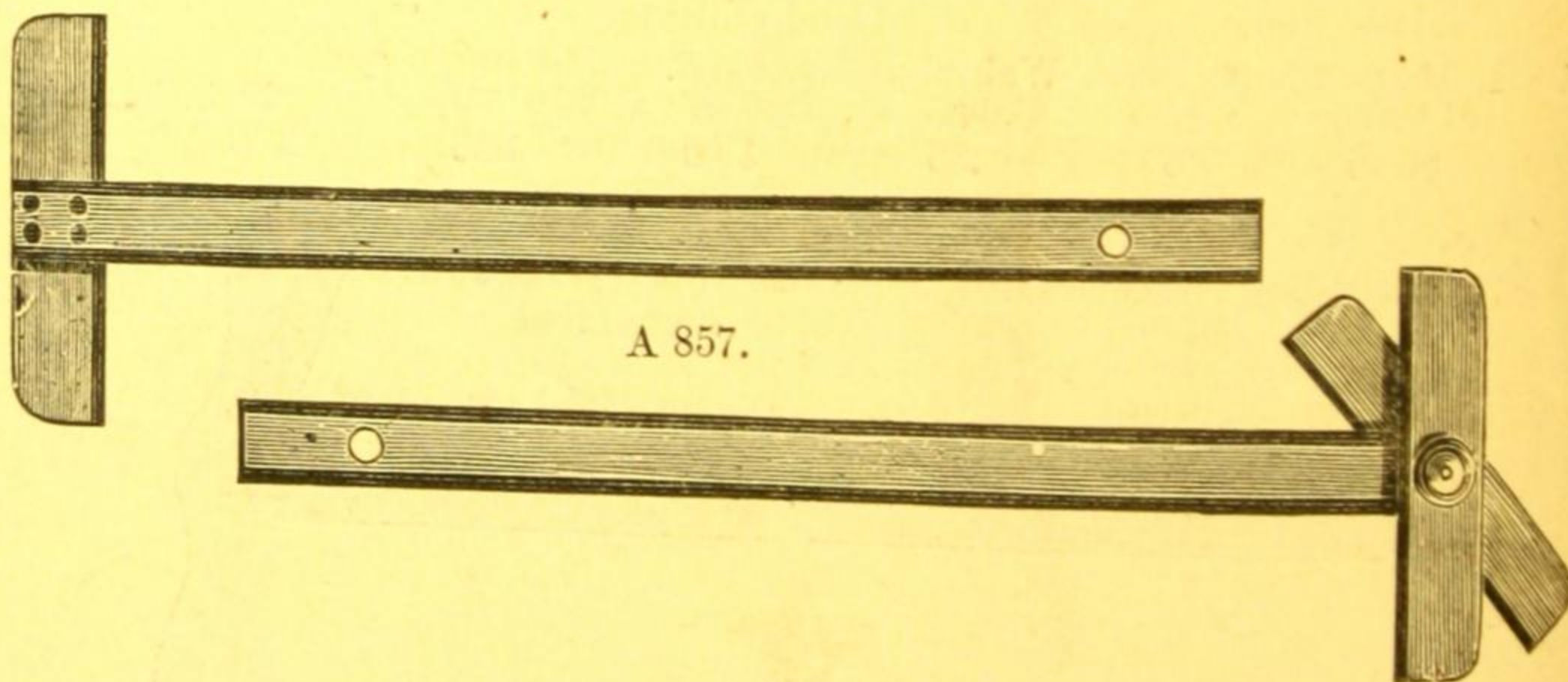
A 854. Price, 25-inch Blade, 60 cents; 30-inch Blade, 75 cents; 35-inch Blade, 90 cents



A 855.

A 855. Hardwood Blade, tapered, Black Walnut Head.

30	40	50 inches long.
\$1.25	1.75	2.00

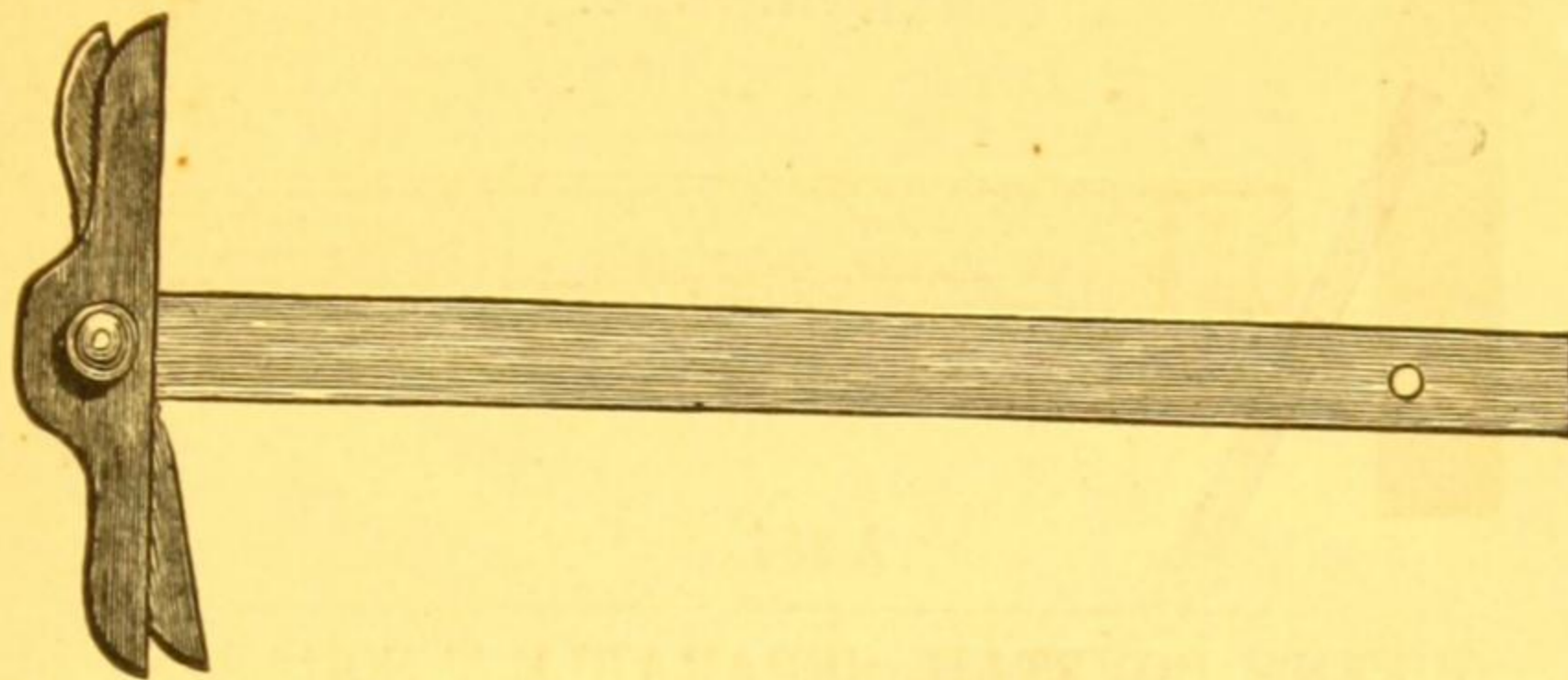


A 857.

A 858.

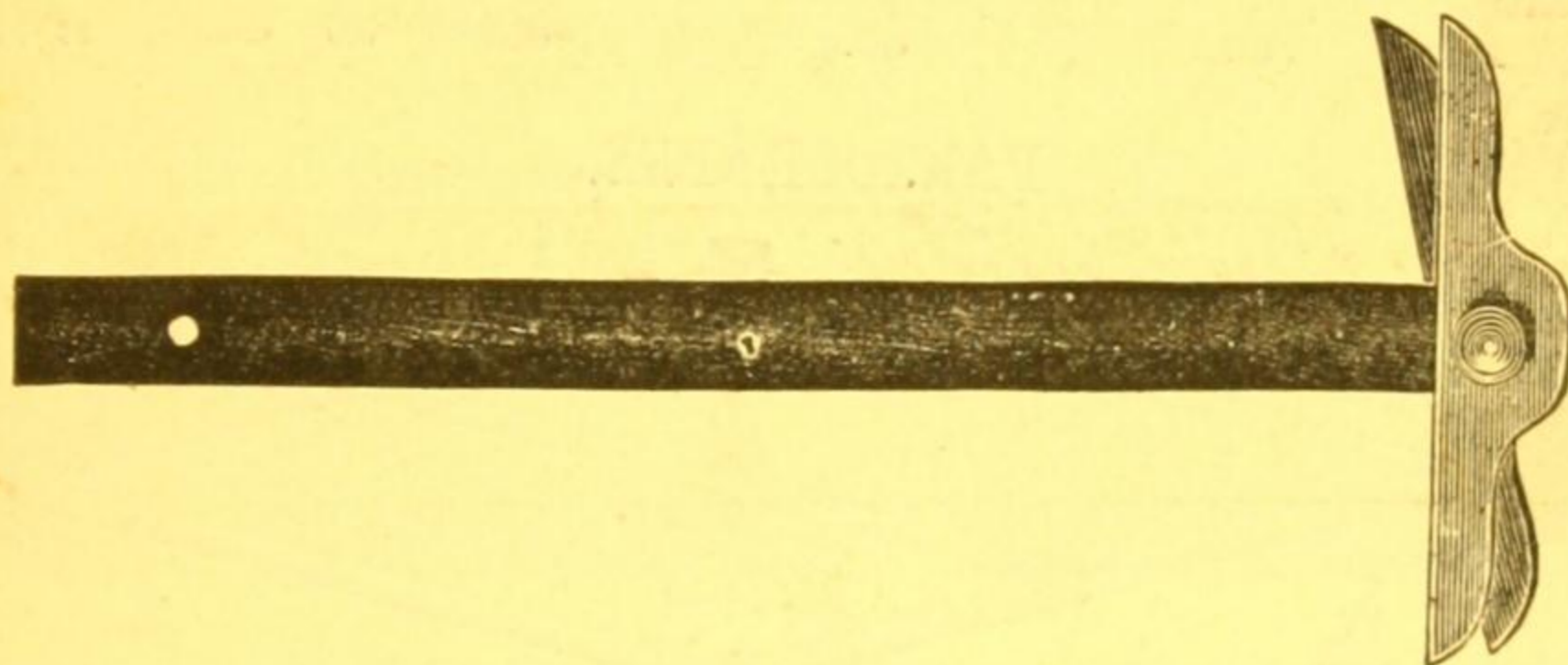
A 857. Mahogany, Ebony lined, fixed heads.					
25	30	35	42	50	60 inches long.
\$1.25	1.50	1.75	2.00	2.50	4.00
A 858. Mahogany, Ebony lined, shifting head.					
25	30	35	42	50	60 inches long.
\$1.25	2.50	2.75	3.25	3.50	5.00





A 860.

No.						PRICE
A 860.	Rubber Blades, Black Walnut Head, fixed.					
	12	15	20	25	30	36 inches long.
	\$0.60	.65	.80	1.00	1.25	1.75



A 861.

A 861.	Rubber Blades, Black Walnut Head, shifting.					
	15	20	25	30	35 inches long.	
	\$1.50	1.75	2.00	2.50	2.75	
A 862.	Steel Blades, Nickel-Plated, Japanned Iron Heads.					
	18	24	30	35 inches long.		
	\$3.25	4.50	5.50	6.50		
A 863.	Steel Blades, Nickel-Plated, Japanned Iron Heads, shifting head.					
	18	24	30	35 inches long.		
	\$4.75	6.00	7.00	8.00		
A 864.	Bronze Heads, Steel Blade, with Protractor Head, graduated to half degrees, blade 36 inches long,					\$16.00



A 865.

A 865.	Brass Swivel for T Square, with nut and washer,					.60
A 866.	Same as No. A 865, but of German silver,					.85

ADJUSTABLE T SQUARES

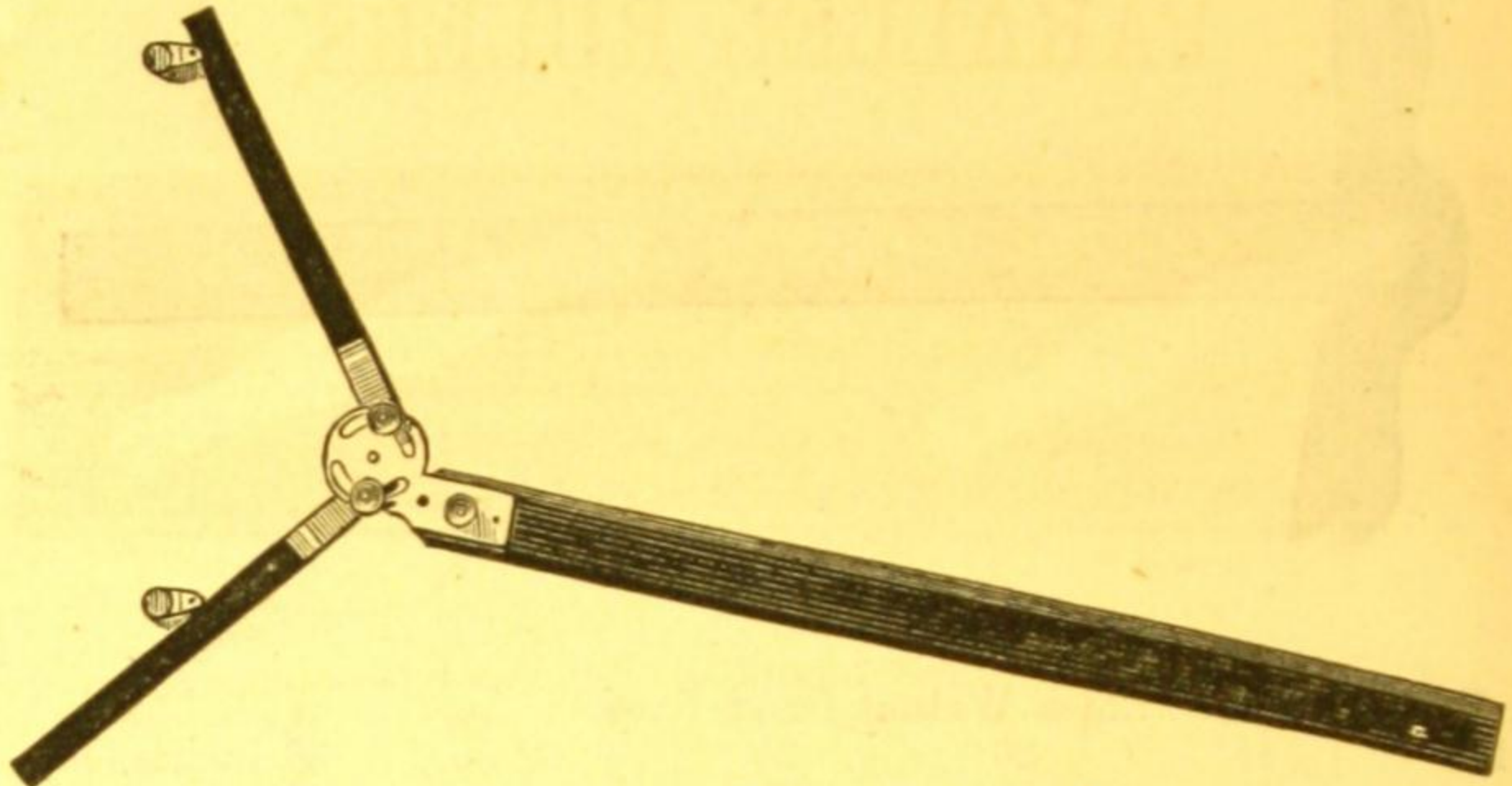
the head is detachable from the blade when fixed, makes it much more

Blade, 75 cents; 35-inch Blade, 90 cents

Head. long.

50	60 inches long
2.50	4.00
50	60 inches long
3.50	5.00

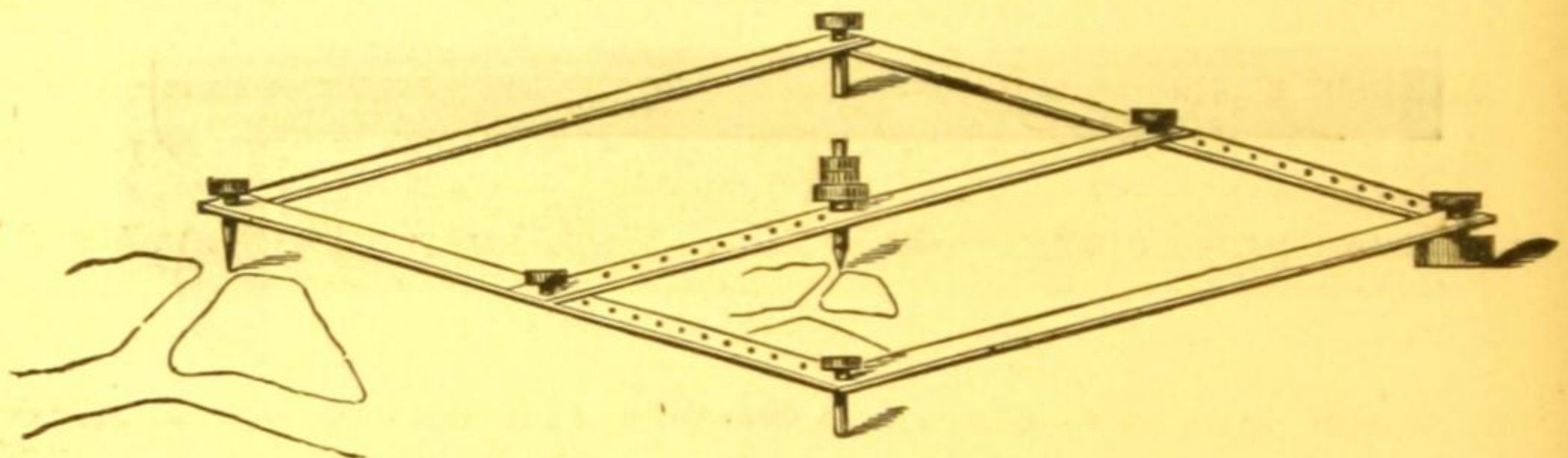
CENTROLINEAD.



A 870.

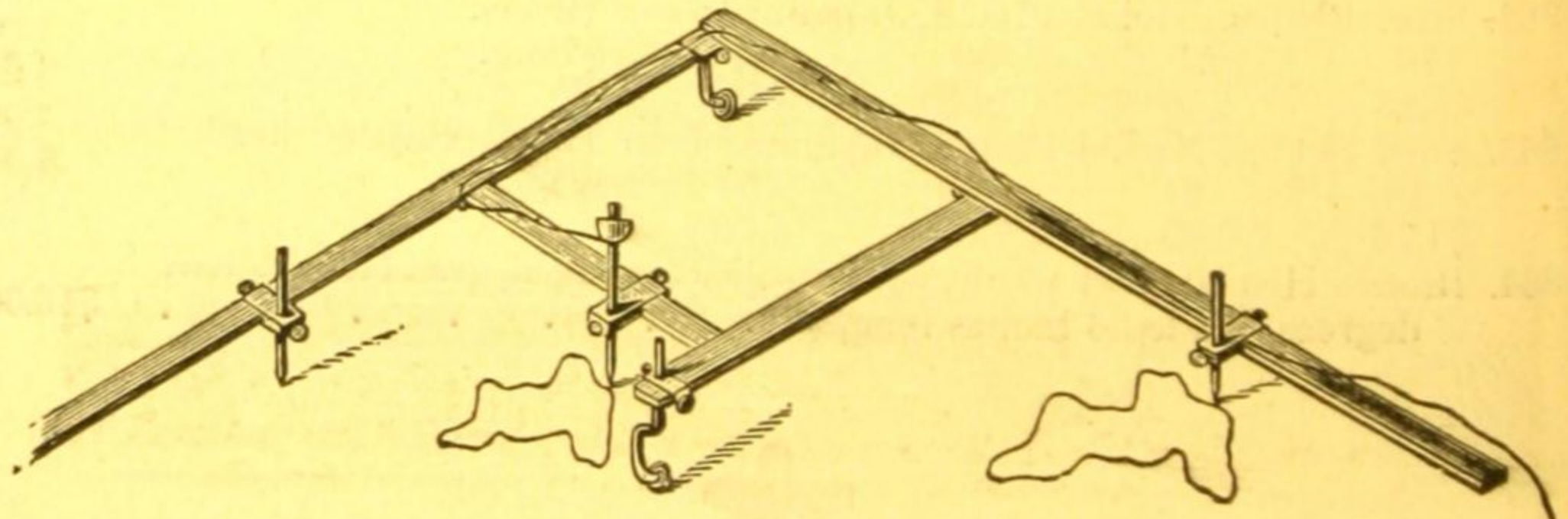
No.						PRICE.
A 870.	Centrolinead,	of wood,	for perspective drawing,	arms 24 inches,	.	\$5.00
A 871.	Do.	do.	do.	do. 36 do.	.	6.50

PANTOGRAPHS.



A 872.

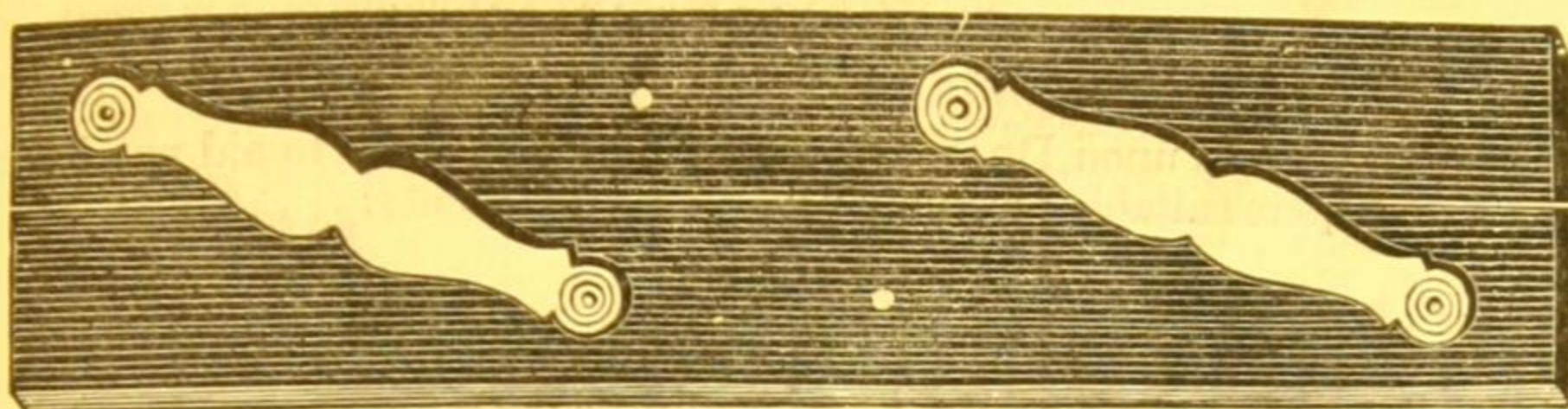
A 872.	Pantograph,	of hardwood arms,	.	.	.	.	3.00
A 873.	Do.	pearwood,	arms 22 inches long,	.	.	.	5.50



A 874.

A 874.	Pantograph,	of black wood,	with Brass Joints and Mountings, Iron and Lead Weights and complete Fittings, of good construction,	for fine work,	arms 20 inches long,	in case, each,	.	.	.	18.00
A 875.	Pantograph,	of ebony,	in box,	arms 24 inches long,	.	.	.	.	.	25.00
A 876.	Do.	brass,	do.	24	do.	.	.	.	.	60.00
A 877.	Do.	do.	do.	30	do.	.	.	.	.	70.00

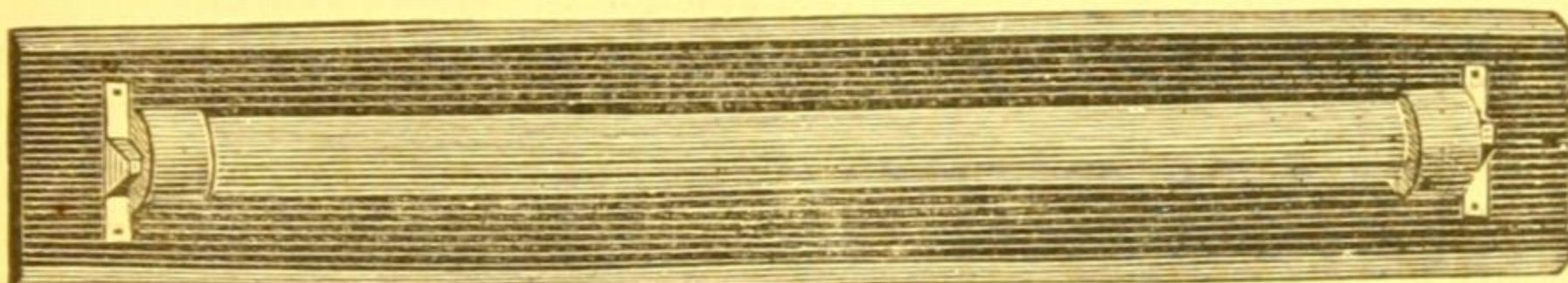
# PARALLEL RULERS.



A 880.

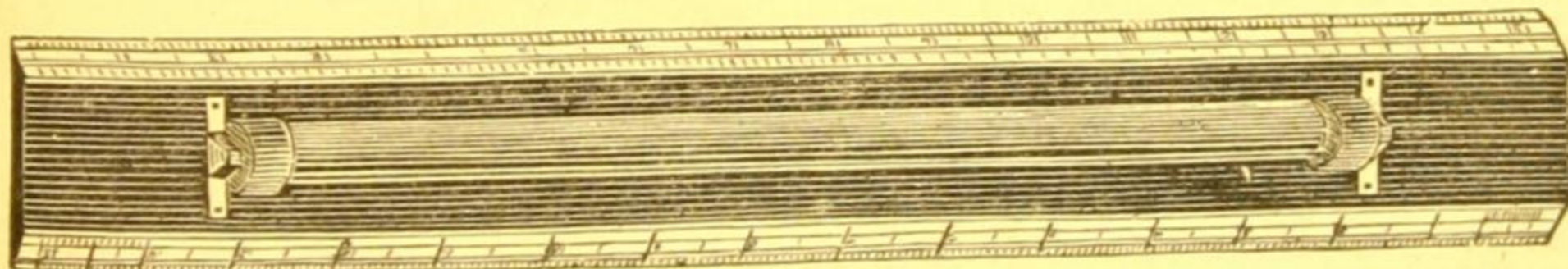
No.							PRICE.
A 880.	Parallel Rulers,	ebony,	brass mounted,	6 inches long,	each,	.	\$0.25
A 881.	Do.	do.	do.	9 do.	do.	.	.50
A 882.	Do.	do.	do.	12 do.	do.	.	.75
A 883.	Do.	do.	do.	15 do.	do.	.	1.00
A 884.	Do.	do.	do.	18 do.	do.	.	1.25
A 885.	Do.	do.	do.	24 do.	do.	.	2.00
A 886.	Do.	German silver mounted, 12 inches long, each,				.	1.25

# ROLLING PARALLEL RULERS.



A 889.

A 889.	Parallel Ruler,	all German silver,	on rollers,	12 inches long,	.	.	10.00
A 890.	Do.	do.	do.	15 do.	.	.	12.00
A 891.	Do.	do.	do.	18 do.	.	.	15.00
A 892.	Do.	all brass,	on rollers,	9 inches long,	.	.	6.50
A 893.	Do.	do.	do.	12 do.	.	.	8.00
A 894.	Do.	do.	do.	15 do.	.	.	10.00
A 894½.	Do.	do.	do.	18 do.	.	.	12.00
A 895.	Do.	ebony,	do.	12 do.	.	.	3.25
A 896.	Do.	do.	do.	15 do.	.	.	4.00
A 897.	Do.	do.	do.	18 do.	.	.	5.00



A 898.

A 898.	Parallel Ruler,	ebony,	ivory graduated edges,	on rollers,	12 inches long,	.	5 00
A 899.	Parallel Ruler,	ebony,	ivory graduated edges,	on rollers,	15 inches long,	.	6.40
A 899½.	Parallel Ruler,	ebony,	ivory graduated edges,	on rollers,	18 inches long,	.	7.50

## DRAWING PAPERS.

The following remarks upon DRAWING PAPERS are intended to aid purchasers in the selection of papers suitable for their various requirements:

WHATMAN'S PAPERS, hand-made, in sheets, are imported by us only in their best grades. The "H. P.," or hot-pressed, has a smooth surface, suitable for pencil and fine line drawings. The "Not," or not hot-pressed, has a finely grained surface, and is used for water-color drawing and for general purposes.

The ACADEMIA PAPERS are of good quality, with a surface well adapted for ordinary school drawing.

The GERMANIA PAPERS are of high grade stock, well made, with a medium surface, suitable for general use.

The CONSTANTIA, in continuous rolls, is a fine white paper, of the best stock, medium in weight, with a slight grain.

The "I. X. L.," a white paper of the finest stock, has a smooth surface on one side, with the reverse slightly roughened. The smooth side is especially suitable for drawings intended to be photographed, the rough for fine office drawings.

The ACME PAPERS, manufactured exclusively for us, have been for a number of years steadily increasing in reputation among the professions in which draughting papers are used, and they have stood every test to which they have been subjected, proving unsurpassed for general work. The color is white, the surface is regularly pebbled, and is equally adapted to general drawing in lines, wash, or in water-colors. They are extremely strong, tearing with difficulty, and standing erasing perfectly.

The LEONINE is an extra stout, slightly tinted paper, suitable for shop-drawings requiring much handling.

The PAPIER POURTOUT, of which we take the entire product of the mill manufacturing it, is comparatively new in the American market, but is rapidly gaining a reputation as a desirable addition to the list of good drawing papers. It is white, of pure tone, excellent fibre, and superb erasing quality, with a surface well adapted to general drawing.

Every yard is water-marked "Papier Pourtout," and none is genuine without the water mark.

The "BON ACCORD" PAPER, which we also control, is a Detail paper, excellently adapted for general purposes. It is of an agreeable cream buff color, and in all the qualities of surface, toughness, hardness, and uniformity of finish it is greatly superior to the American Manilla papers and to the high priced foreign papers heretofore imported, whilst in price it is but little higher than the ordinary Manilla. For workshop use it is unequalled.

The "DOPPELT" PAPER is a fine Detail paper of lighter color and high grade of stock, having a surface of fine grain and standing erasing perfectly. It is peculiarly adapted to fine architectural work.

YS.

## DRAWING PAPERS IN SHEETS.

Whatman's Papers, hot-pressed, have smooth surfaces; cold-pressed have fine grain surfaces. In ordering, customers will please state which surface they desire. We import and sell only the best quality of Whatman's hand-made papers.

No.					PRICE.
A 900.	WHATMAN'S HOT AND COLD-PRESSED DRAWING PAPERS, selected:				
	Demy,	20x15 inches,	per quire, \$1.00,	per sheet,	\$0.06
	Medium,	22x17 do.	do.	1.50, do.	.08
	Royal,	24x19 do.	do.	1.85, do.	.10
	Superroyal,	27x19 do.	do.	2.40, do.	.12
	Imperial,	30x21 do.	do.	3.50, do.	.20
	Atlas,	33x26 do.	do.	4.50, do.	.25
	Double Elephant,	40x26 do.	do.	5.50, do.	.30
	Antiquarian,	52x31 do.	do.	30.00, do.	1.50
A 901.	WHATMAN'S DRAWING PAPER, extra weight:				
	Imperial,	per quire, \$9.00,	per sheet,		.45
	Double Elephant,	do.	14.00, do.		.75
A 902.	ACADEMIA PAPERS, for pencil drawings:				
	Demy,	per quire,			.60
	Medium,	do.			.75
	Royal,	do.			1.00
	Superroyal,	do.			1.25
	Imperial,	do.			1.50
	Double Elephant,	do.			2.50
A 903.	GERMANIA PAPERS, white, with medium surface:				
	Demy,	15x20 inches,	per quire,		.70
	Medium,	17x22 do.	do.		1.00
	Royal,	19x24 do.	do.		1.25
	Superroyal,	19x27 do.	do.		1.60
	Imperial,	22x30 do.	do.		2.00
	Double Elephant,	do.	do.		3.25

PRICE.

\$10.75  
8.00  
13.50  
10.50  
30.00  
18.00  
3.75  
4.50  
6.50

## DRAWING PAPERS CONTINUOUS.

IN ROLLS OF THIRTY OR FORTY POUNDS.

No.		Per lb.	Per Roll of 10 Yards.	Per Yard.
A 904.	PAPIER POURTOUT, 36 inches wide, . . .	\$0.35	\$1.80	\$0.20
A 904.	Do. do. 42 do. . . .	.35	2.35	.25
A 904.	Do. do. 54 do. . . .	.35	3.00	.35
A 905.	CONSTANTIA, 36 inches wide, . . .	.45	2.25	.25
A 906.	I. X. L., 42 inches wide, medium, . . .	.45	3.00	.35
A 906.	Do. 58 do. do. . . .	.45	5.00	.60
A 907.	ACME, 36 inches wide, medium, . . .	.45	2.25	.25
A 907.	Do. 42 do. do. . . .	.45	3.00	.35
A 907.	Do. 58 do. do. . . .	.45	4.00	.45
A 907.	Do. 58 do. heavy, . . .	.45	5.00	.60
A 908.	LEONINE, 62 inches wide, medium, . . .	.45	3.75	.40
A 908.	Do. 62 do. heavy, . . .	.45	4.50	.50

## DETAIL PAPERS.

No.		Per lb.	Per Roll of 10 Yards.	Per Yard.
A 915.	"BON ACCORD," 36 inches wide, thin, . . .	\$0.18	\$0.75	\$0.12
A 915.	Do. 42 do. do. . . .	.18	1.00	.15
A 915.	Do. 36 do. medium, . . .	.18	1.00	.15
A 915.	Do. 42 do. do. . . .	.18	1.25	.18
A 915.	Do. 54 do. do. . . .	.18	1.50	.20
A 915.	Do. 36 do. heavy, . . .	.18	1.25	.18
A 915.	Do. 42 do. do. . . .	.18	1.50	.20
A 915.	Do. 54 do. do. . . .	.18	2.00	.25
A 916.	DOPPELT DETAIL PAPER, 36 inches wide, . . .	.25	1.50	.18
A 916.	Do. do. 42 do. . . .	.25	1.80	.20
A 916.	Do. do. 54 do. . . .	.25	2.50	.30

*The pound price applies only to full rolls.*

# MOUNTED DRAWING PAPERS.

## WHITE, CONTINUOUS IN ROLLS.

### MOUNTED ON MUSLIN.

Our papers are carefully and smoothly mounted on muslin of the best quality for the purpose.

No.						Per roll of 10 yds.	PRICE. Per yd.
A 920.	MOUNTED PAPIER POURTOUT,	36 inches wide,				\$7.50	\$0.85
	Do. do. do.	42 do.				.85	.95
	Do. do. do.	54 do.				10.75	1.20
A 921.	MOUNTED CONSTANTIA,	36 inches medium,				8.50	.90
A 922.	MOUNTED ACME,	36 do.				8.50	.90
	Do. do.	42 do.				9.00	1.10
	Do. do.	54 do.				12.00	1.35
	Do. do.	54 inches heavy,				12.50	1.40
	Do. do.	58 do. medium,				12.50	1.40
	Do. do.	58 do. heavy,				13.50	1.60
A 923.	MOUNTED I. X. L.,	42 inches smooth,				9.00	1.10
	Do. do.	42 do. rough,				9.00	1.10
	Do. do.	54 do. smooth,				12.50	1.35
	Do. do.	54 do. rough,				12.50	1.35
	Do. do.	58 do. smooth,				13.50	1.60
	Do. do.	58 do. rough,				13.50	1.60
A 924.	MOUNTED LEONINE,	62 inches wide, thin,				13.00	1.55
	Do. do.	62 do. heavy,				13.50	1.60

## MOUNTED PAPER IN SHEETS.

A 925. MOUNTED WHATMAN'S PAPERS.							
Royal,	selected,	18x24 inches,	per sheet,				.40
Imperial,	do.	22x30 do.	do.				.50
Double Elephant,	do.	27x40 do.	do.				.75
Antiquarian,	do.	31x33 do.	do.				1.80

Large sheets of Paper for Maps mounted to order.

## HELIOGRAPHIC OR BLUE PROCESS PAPERS.

---

Our ACME HELIO PAPERS are now absolutely unrivaled for Blue Printing. The prints obtained with them are clear, bright, and strong, the whites being unclouded and pure. The paper is of good weight, excellent surface, and tough texture, bearing washing without injury.

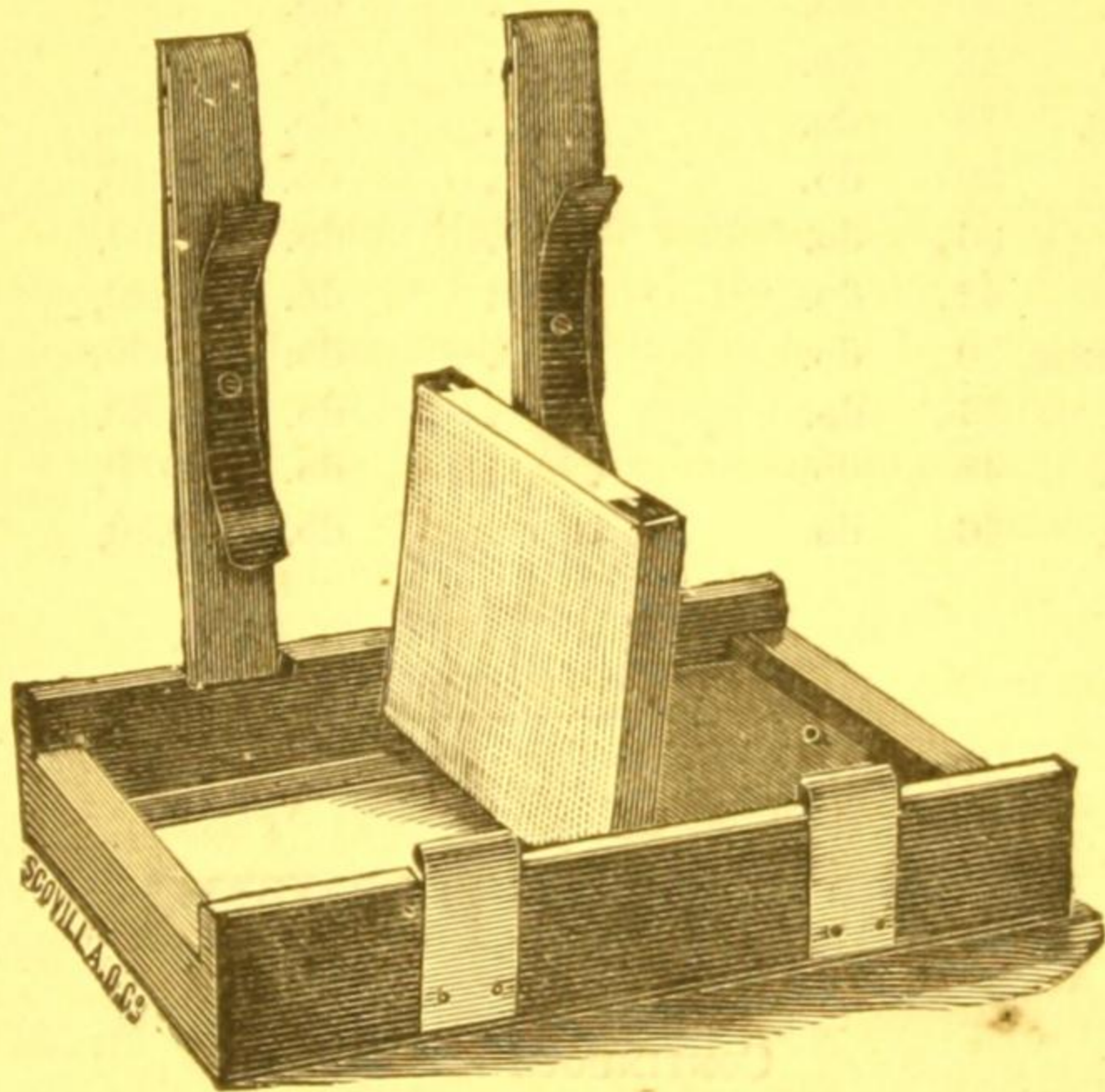
The ACME HELIO is manufactured solely for us, and every yard is watermarked. None other is genuine.

No.	PRICE.
<b>A 930. ACME HELIO No. 1, UNPREPARED.</b>	
27 inches wide, in rolls of 50 yards, . . . . .	\$5.50
30 do. do. do. . . . .	6.00
36 do. do. do. . . . .	6.50
42 do. do. do. . . . .	8.50
54 do. do. do. . . . .	10.50
<b>A 933. PREPARED ACME HELIO No. 1. IN ROLLS OF 10 YARDS.</b>	
27 inches wide, per roll, . . . . .	2.20
30 do. do. . . . .	2.50
36 do. do. . . . .	3.25
42 do. do. . . . .	4.50
<b>A 935. PREPARED SHEET PAPER.</b>	
16x21 inches, per dozen, . . . . .	.75
18x22 do. do. . . . .	1.00
20x24 do. do. . . . .	1.10
23x36 do. do. . . . .	2.10
27x40 do. do. . . . .	3.00

These papers are carefully prepared by a NEW PROCESS, by which we are enabled to produce a sensitized paper free from streakiness and with a smooth and uniform surface. By this process prints are made that are far superior to anything heretofore attainable in Blue Prints.



PRINTING FRAMES AND BATH TRAYS.



No.		PRICE.
A 937.	PRINTING FRAME, complete, with cushion and plate-glass, 20x24 inches each, . . . . .	\$10.75
A 938.	PRINTING FRAME, with double thick glass, . . . . .	8.00
A 939.	Do. plate-glass, 24x30 inches, . . . . .	13.50
A 940.	Do. double thick glass, . . . . .	10.50
A 941.	Do. plate-glass, 35x46, . . . . .	30.00
A 942.	Do. double thick glass, . . . . .	18.00
A 943.	Zinc Tray, for washing prints, 20x24 inches, each, . . . . .	3.75
A 944.	Do. do. 24x30 do. . . . .	4.50
A 945.	Do. do. 35x46 do. . . . .	6.50

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PRICE.  
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 4.50

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## TRACING OR VELLUM CLOTH.

BOTH SIDES GLAZED OR ONE SIDE GLAZED AND BACK DULL. IN ROLLS OF  
24 YARDS.

No.				PRICE.
A 950.	IMPERIAL, 18 inches wide,	.	per roll, \$4.00,	per yard, \$0.25
	Do. 30 do.	.	do. 6.90,	do. .40
	Do. 36 do.	.	do. 7.50,	do. .45
	Do. 42 do.	.	do. 10.50,	do. .60
A 951	SAGARS, 18 do.	.	do. 4.25,	do. .25
	Do. 30 do.	.	do. 7.40,	do. .40
	Do. 36 do.	.	do. 8.00,	do. .45
	Do. 42 do.	.	do. 11.00,	do. .60
A 952.	RELIANCE, 30 do.	.	do. 6.00,	do. .35
	Do. 36 do.	.	do. 6.80,	do. .40
	Do. 40 do.	.	do. 8.00,	do. .50
	Do. 43 do.	.	do. 9.50,	do. .55

## TRACING PAPERS.

CONTINUOUS IN ROLLS.

A 955.	FRANCAIS, 40 inches wide, in rolls of 11 yards, per roll, . . . . .	\$1.50
A 956.	FRANCAIS, do. do. 22 do. do. . . . .	2.50
A 957.	ORINOCO, very thin and transparent, 30 inches, in rolls of 33 yards, . . . . .	2.50
A 958.	VEGETABLE, 54 inches wide, in rolls of 22 yards, per roll, . . . . .	3.75
A 959.	DEVONIA, 40 inches wide, in rolls of 20 yards, . . . . .	3.50
A 960.	KÖLNER, No. 1, thin, tough, and transparent, 43 inches wide, in rolls of 22 yards, per roll, . . . . .	4.50
A 961.	KÖLNER, No. 2, thin, tough, and transparent, in rolls of 33 yards, 58 inches wide, per roll, . . . . .	7.50
A 962.	EHRENSTEIN, unprepared, 54 inches wide, in rolls of 33 yards, per roll, . . . . .	5.00
A 963.	PARCHMENT, very tough and transparent and does not discolor from age, 39 inches wide, in rolls of 33 yards, per roll, . . . . .	8.00
A 964.	PARCHMENT, heavy, tough, and transparent, 39 inches wide, in rolls of 33 yards, per roll, . . . . .	9.00

LLUM CLOTH

ED AND BACK DULL. Is B...

per roll, \$4.00, per yard  
do. 6.90, do.  
do. 7.50, do.  
do. 10.50, do.  
do. 4.25, do.  
do. 7.40, do.  
do. 8.00, do.  
do. 11.00, do.  
do. 6.00, do.  
do. 6.80, do.  
do. 8.00, do.  
do. 9.50, do.

PAPERS.

ROLLS.  
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do. do. . . .  
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# TRACING PAPERS.

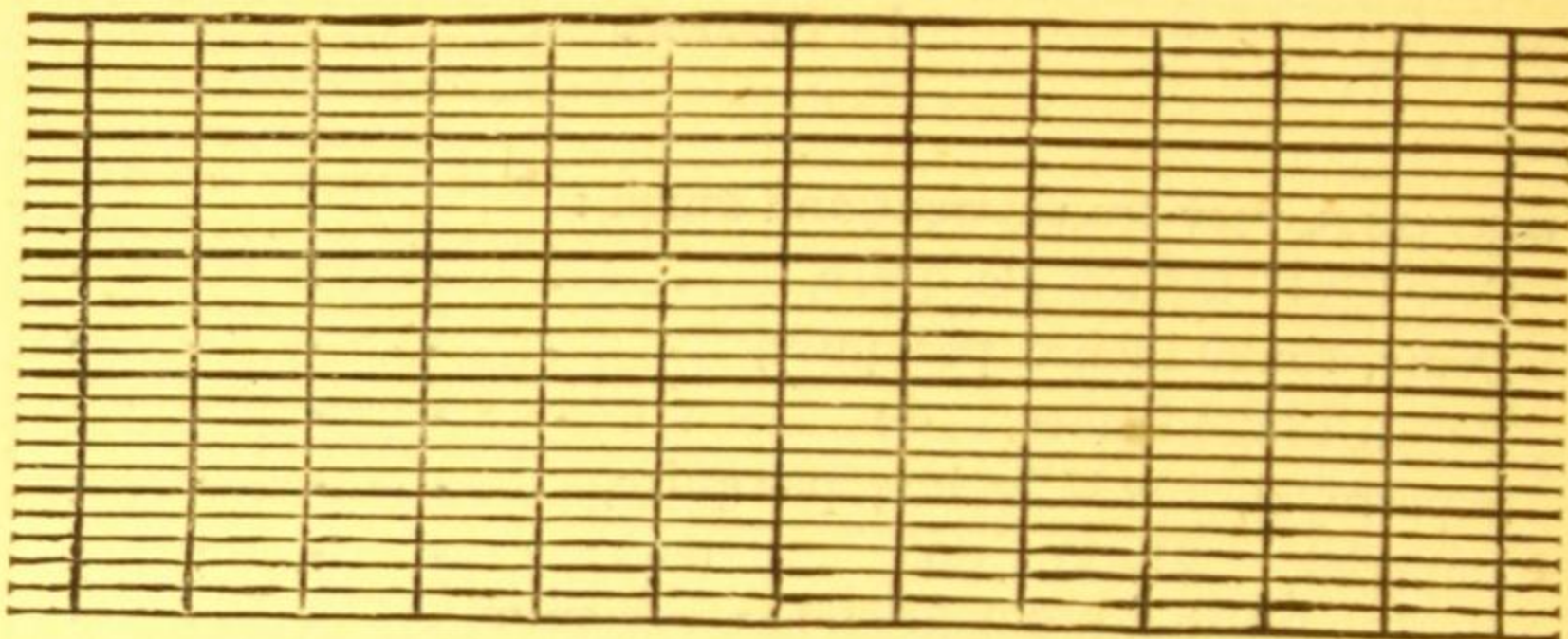
IN SHEETS.

No.		PRICE.
<b>A 965.</b>	<b>VEGETABLE, very transparent and tough :</b>	
	Cap, 13x17 inches, per quire, . . . . .	\$0.90
	Demy, 15x20 inches, per quire, . . . . .	1.25
	Royal, 18x24 inches, do. . . . .	2.00
	Superroyal, 19x37 inches, per quire, . . . . .	2.25
	Imperial, 21x30 do. do. . . . .	2.50
	Double Elephant, 28x40 inches, per quire, . . . . .	8.50
<b>A 966.</b>	<b>FRANCAIS :</b>	
	Imperial, 20x30 inches, per quire, . . . . .	1.00
	Double Elephant, 30x40 inches, per quire, . . . . .	2.00
<b>A 967.</b>	<b>PROVENÇAL :</b>	
	Royal, 19x25 inches, per quire, . . . . .	1.00
	Superroyal, 21x26 inches, per quire, . . . . .	1.50
	Double Elephant, 28x40 inches, per quire, . . . . .	2.50
<b>A 968.</b>	<b>ARCHITECT : 20x30 inches, per quire, . . . . .</b>	<b>1.50</b>
	Do. 30x40 do. do. . . . .	3.00
<b>A 969.</b>	<b>LONDON ACADEMY, very fine and transparent, 20x30 inches, . . . . .</b>	<b>2.50</b>
	Do. do. do. 30x40 do. . . . .	5.00
<b>A 970.</b>	<b>REYNOLDS' WHITE BRISTOL-BOARD :</b>	
	Cap, 12 $\frac{3}{4}$ x16 $\frac{1}{2}$ in., per dozen, . . . . .	2 Sheets. \$0.60 3 Sheets. \$0.90 4 Sheets. \$1.20
	Demy, 14 $\frac{1}{2}$ x18 $\frac{1}{2}$ in. do. . . . .	.90 1.35 1.60
	Medium, 16 $\frac{1}{2}$ x20 $\frac{3}{4}$ in. do. . . . .	1.20 1.60 2.25
	Royal, 18x22 $\frac{1}{2}$ in. do. . . . .	1.60 2.35 3.15
<b>A 971.</b>	<b>FRENCH WHITE BRISTOL-BOARD :</b>	
	Cap, 12 $\frac{1}{2}$ x16 $\frac{1}{2}$ in., per dozen, . . . . .	2 Sheets. \$0.60 3 Sheets. \$0.70 4 Sheets. \$0.90
	Demy, 15 $\frac{1}{4}$ x19 $\frac{1}{2}$ in., do. . . . .	.90 1.15 1.50
	Medium, 16 $\frac{3}{4}$ x20 $\frac{3}{4}$ in., do. . . . .	1.10 1.35 1.70
	Royal, 19x24 $\frac{3}{4}$ in., do. . . . .	1.35 1.80 2.25
	Imperial, 21 $\frac{1}{2}$ x28 in., do. . . . .	1.60 2.00 2.50
<b>A 972.</b>	<b>TINTED BRISTOL-BOARD, thin, in a variety of tints :</b>	
	Royal, 19x24 $\frac{1}{2}$ inches, per dozen, . . . . .	1.10
<b>A 973.</b>	<b>TINTED BRISTOL BOARD, thick, in a variety of tints ;</b>	
	Royal, 19x24 $\frac{1}{2}$ inches, per dozen, . . . . .	2.00

# PROFILE PAPERS.

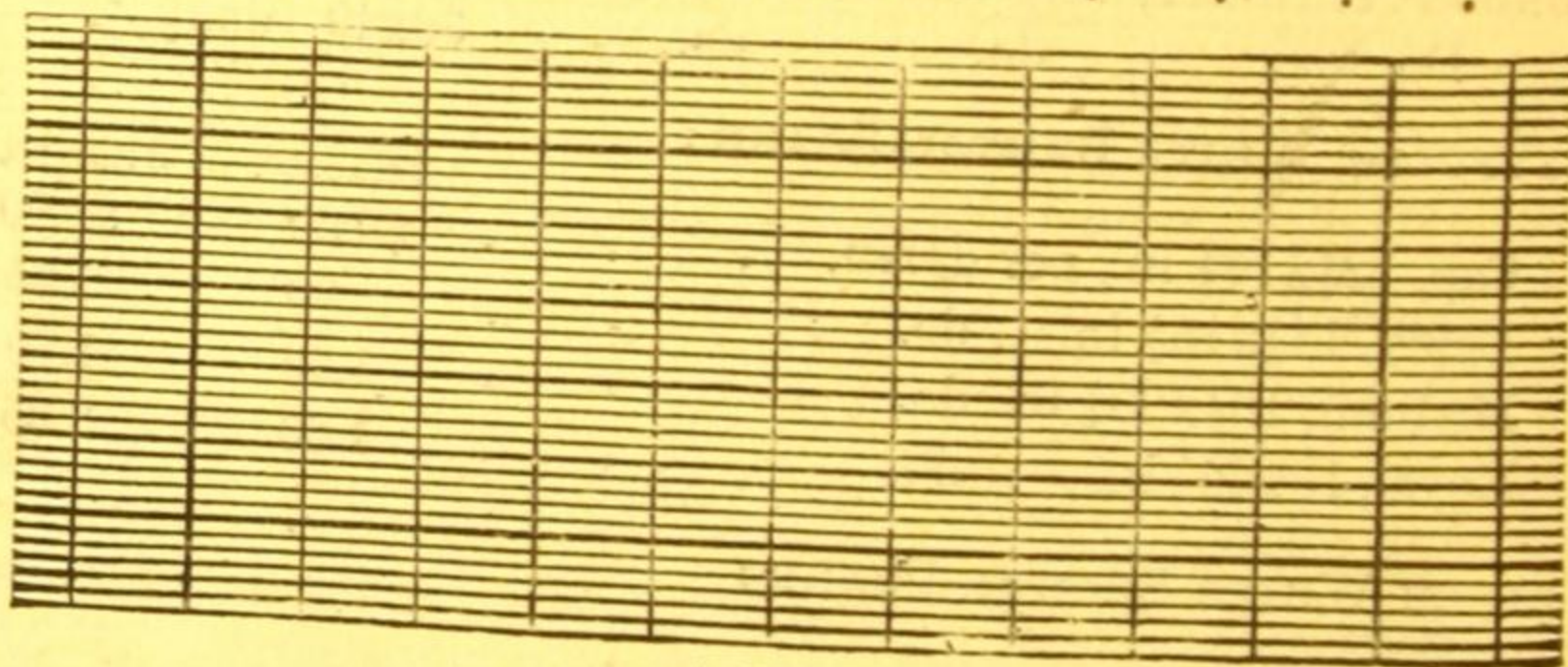
PRINTED IN RED OR GREEN.

Queen & Co.'s Profile Papers are so well known amongst engineers that comment is almost needless. None of the imitations which have been put upon the market approach the high quality of these papers, whose accuracy of ruling, uniformity, and distinctness are unequalled. Our Profile Papers are printed upon paper manufactured expressly for this purpose, of the finest grade of materials, and of light, tough, and tenacious fibre.



A 980.

No.		PRICE.
A 980.	PROFILE PAPER, PLATE A, IN SHEETS, 42 inches long by 15 inches wide, horizontal divisions, 4 to the inch, vertical divisions, 20 to the inch, and having every tenth horizontal division-line and every fiftieth vertical division-line heavier than the others. Price, per quire, \$8.50, per sheet,	
A 981.	PLATE A, IN SHEETS, 42x6½ inches, per quire, \$6.50, per sheet,	\$0.40
A 982.	PLATE A, CONTINUOUS, rulings 20 inches wide, in rolls of 50 yards, per roll, \$15.00, per yard,	.30
A 983.	PLATE A, MUSLIN BACKED, rulings 20 inches wide, in rolls of 20 yards, per yard,	.30
A 984.	PLATE A, PRINTED ON TRACING CLOTH, rulings 42x15 inches, per sheet,	.75
		1.00



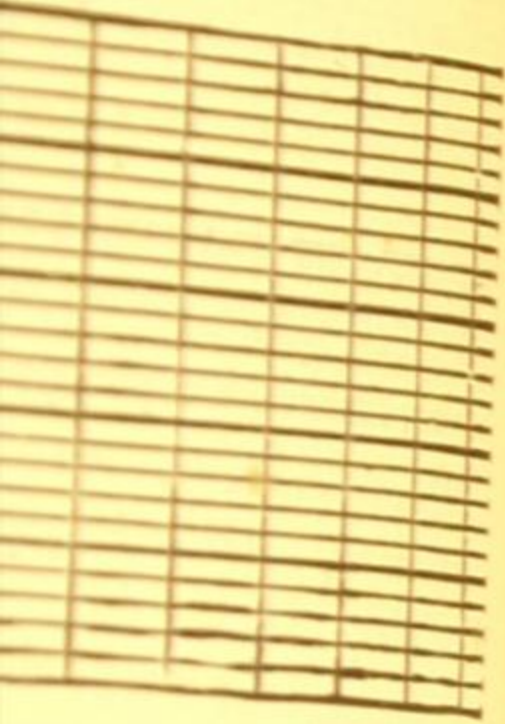
A 985.

A 985.	PROFILE PAPER, PLATE B, IN SHEETS, 42 inches long by 15 inches wide, horizontal divisions, 4 to the inch, vertical divisions, 30 to the inch, and having every fourth horizontal division and every twenty-fifth vertical division-line heavier than the other, per quire, \$8.50, per sheet,	
A 986.	PLATE B, IN SHEETS, rulings 42x6½ inches, per quire, \$6.50, per sheet,	.40
A 987.	PLATE B, CONTINUOUS, rulings 20 inches wide, in rolls of 50 yards, per roll, \$15.00, per yard,	.30
A 988.	PLATE B, MUSLIN BACKED, rulings 20 inches wide, per yard,	.30
A 989.	PLATE B, PRINTED ON TRACING CLOTH, rulings 42x15 inches, per sheet,	.75
		1.00

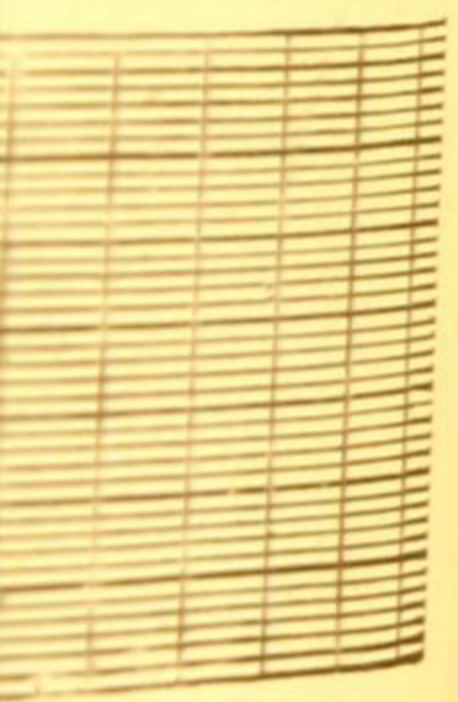
# PAPERS.

ED OR GREEN.

known amongst engineers that  
which have been put upon the  
whose accuracy of ruling, uniform  
Papers are printed upon paper  
best grade of materials, and of light

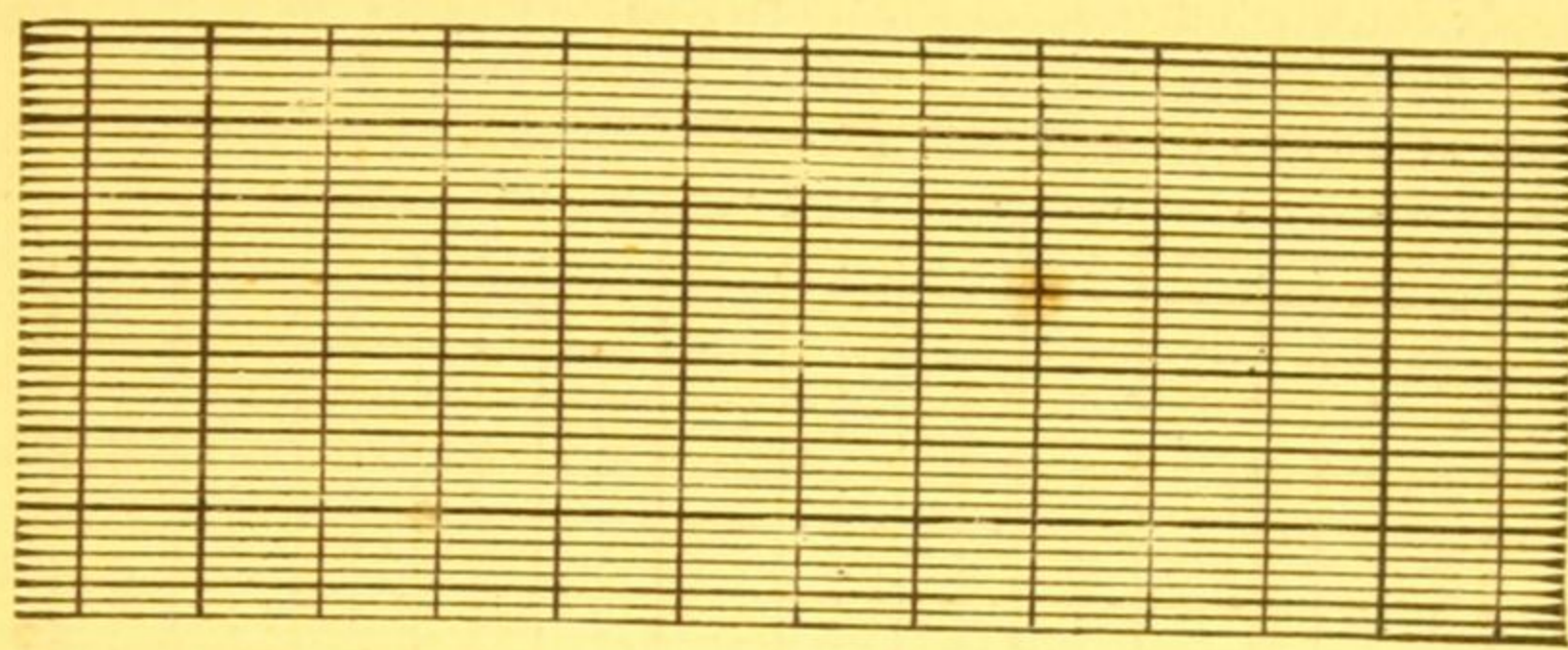


rs, 42 inches long by 15 inches  
h, vertical divisions, 20 to the  
ntal division-line and every  
r than the others. Price, per  
er quire, \$6.50, per sheet,  
hes wide, in rolls of 50 yards,  
0 inches wide, in rolls of 20  
H, rulings 42x15 inches, per



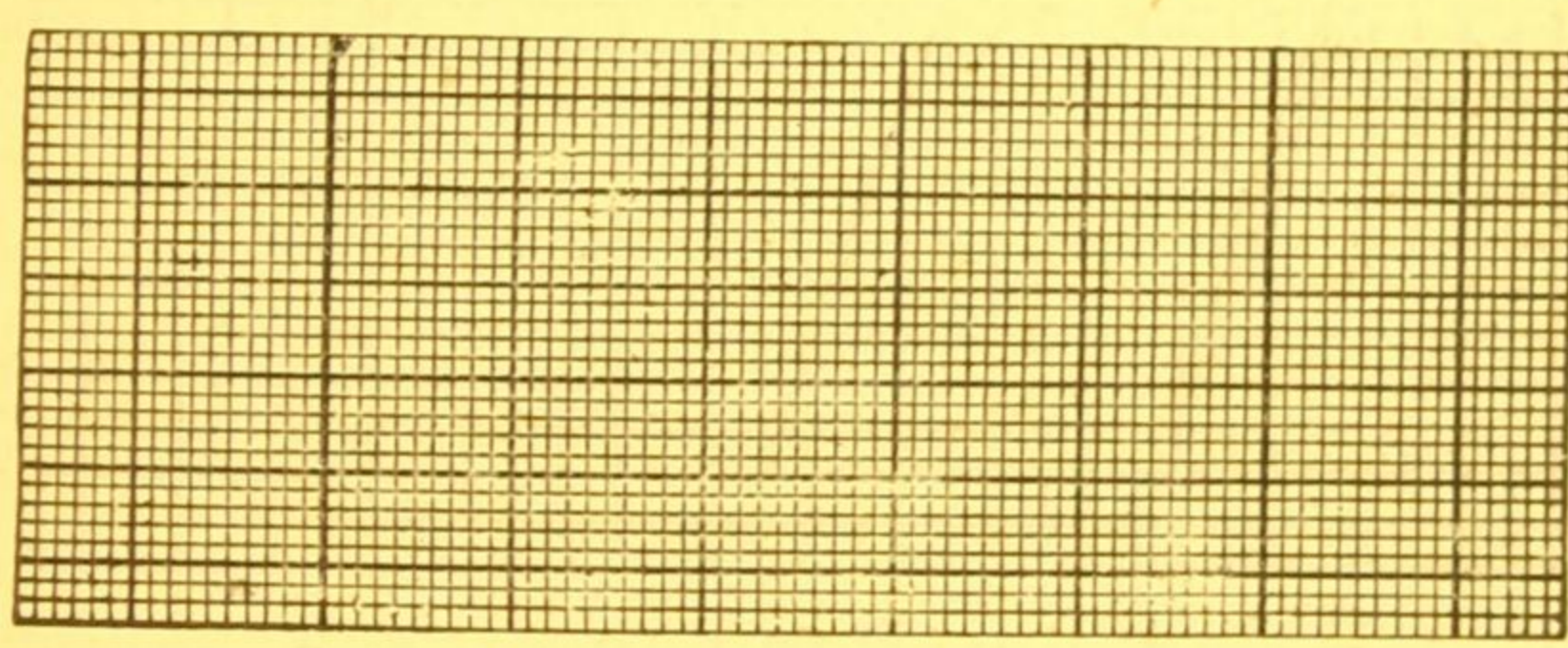
2 inches long by 15 inches  
h, vertical divisions, 20 to  
zontal division and every  
r than the other, per quire,  
hes, per quire, \$6.50, per  
wide, in rolls of 50 yards,  
hes wide, per yard,  
ulings 42x15 inches, per

## PROFILE PAPER.



PROFILE PAPER, PLATE C.

- | No.    |   | PRICE. |
|--------|---|--------|
| A 990. | PLATE C, IN SHEETS, horizontal divisions five to the inch, vertical divisions twenty five to the inch, and having every fifth horizontal division-line and every twenty-fifth vertical division-line heavier than the others. Rulings 42 inches long by 15 inches wide; per quire, \$8.50; per sheet, . . . . . | \$0.40 |



PROFILE PAPER, METRIC.

- |        |  |     |
|--------|--|-----|
| A 990. | METRIC, CONTINUOUS, in rolls of 50 yards, rulings 50 centimeters wide, in millimeters, with each fifth millimeter, each centimeter, and each decimeter proportionally heavier than the millimeter. Price, per roll, \$15.00; per yard, . . . . . | .30 |
| A 991. | METRIC, MUSLIN BACKED, rulings 20 inches wide, in rolls of 20 yards; per yard, . . . . .   | .75 |

# CROSS SECTION PAPERS.

PRINTED IN RED OR GREEN.

- | No.    |  | PRICE. |
|--------|--|--------|
| A 995. | TOPOGRAPHICAL PAPER, 14x17 inches, ruled 400 feet to the inch; per quire, \$1.75, per sheet,   | \$0.10 |
| A 996. | TRAUTWINE'S CROSS SECTION AND DIAGRAM PAPER, 10 feet to the inch, for embankments of 14 and 24 feet roadway, and for excavations of 18 and 28 feet, rulings 19 $\frac{3}{4}$ x12 inches; per quire, \$5.00, per sheet, | .25    |

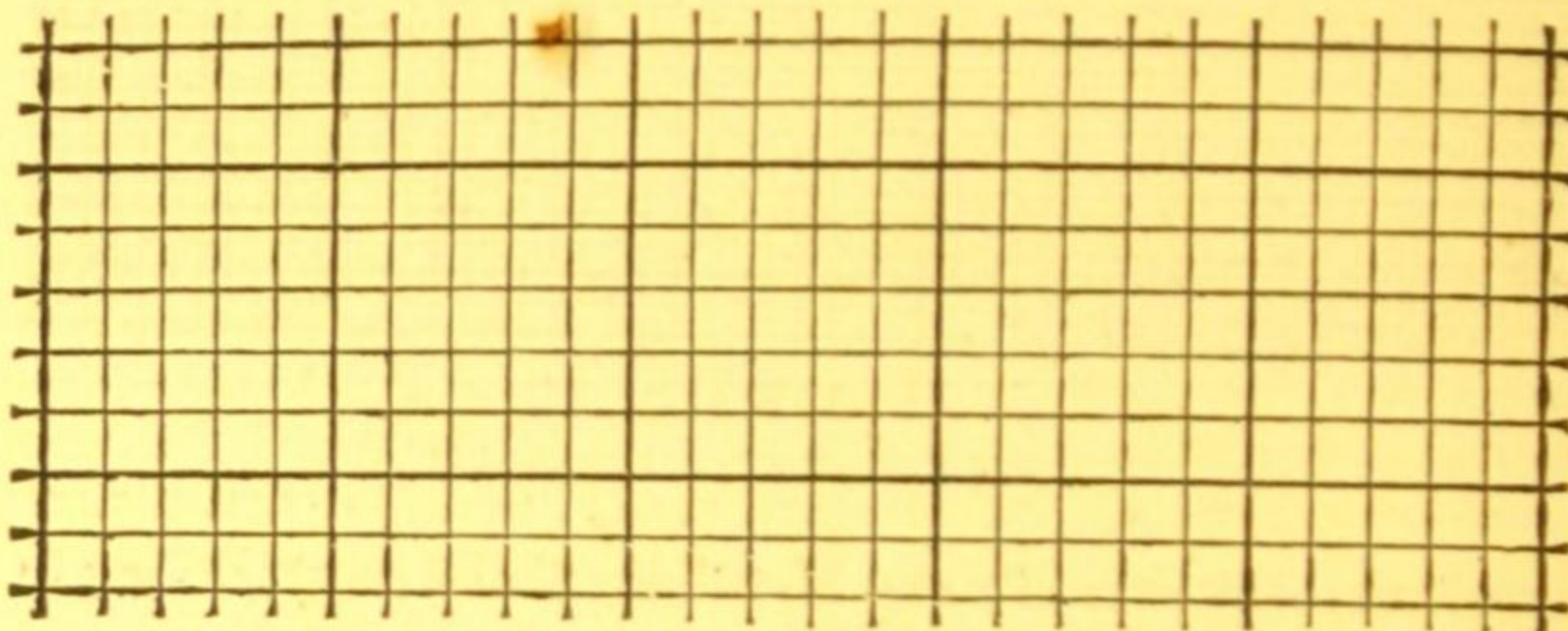


PLATE C.

- |        |   |     |
|--------|---|-----|
| A 997. | CROSS SECTION PAPER, PLATE C, rulings 20x16 inches, 8 feet to the inch; per quire, \$5.00, per sheet, | .25 |
|--------|---|-----|

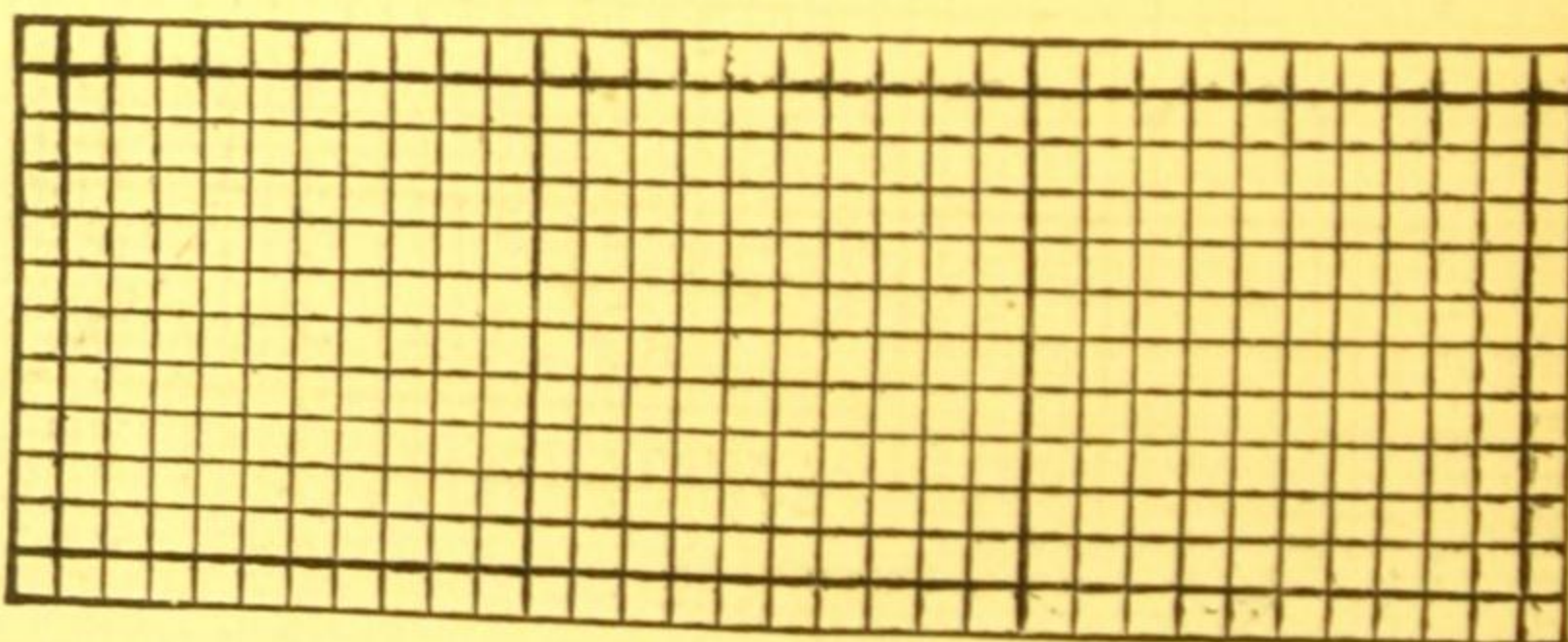


PLATE F.

- |        |  |     |
|--------|--|-----|
| A 998. | CROSS SECTION PAPER, PLATE F, rulings 20x16 inches, 10 feet to the inch; per quire, \$5.00, per sheet, | .25 |
|--------|--|-----|

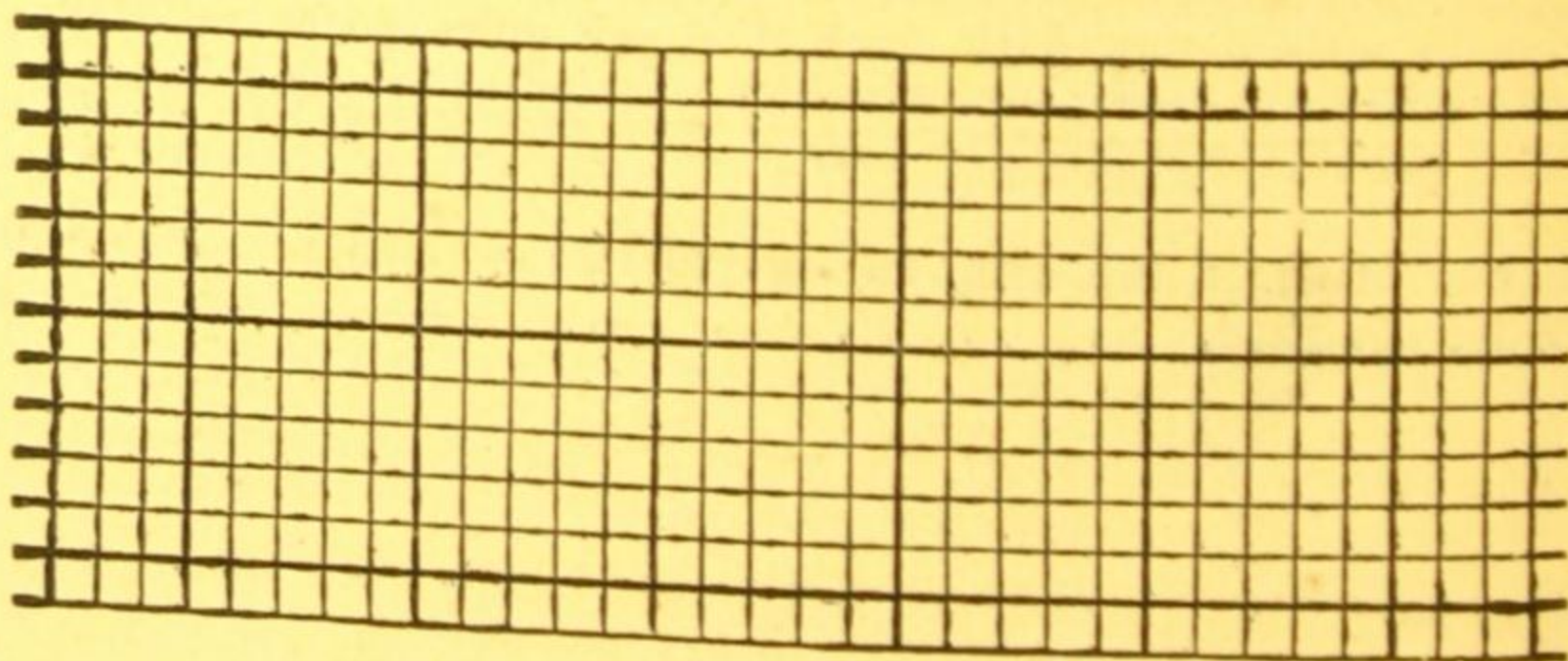


PLATE G.

- |        |  |     |
|--------|--|-----|
| A 999. | CROSS SECTION PAPER, PLATE G, rulings 22x16 inches, 10 feet to the inch, every fifth line heavy; per quire, \$5.00, per sheet, | .25 |
|--------|--|-----|

CTION PAPERS.

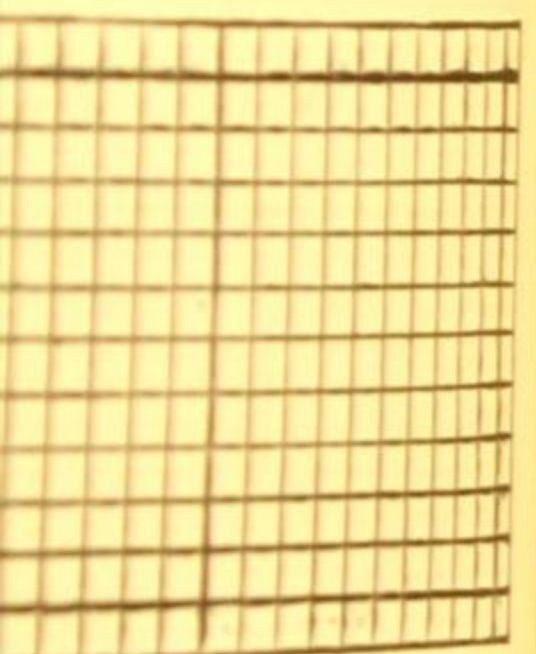
RED OR GREEN.

inches, ruled 400 feet to the inch.

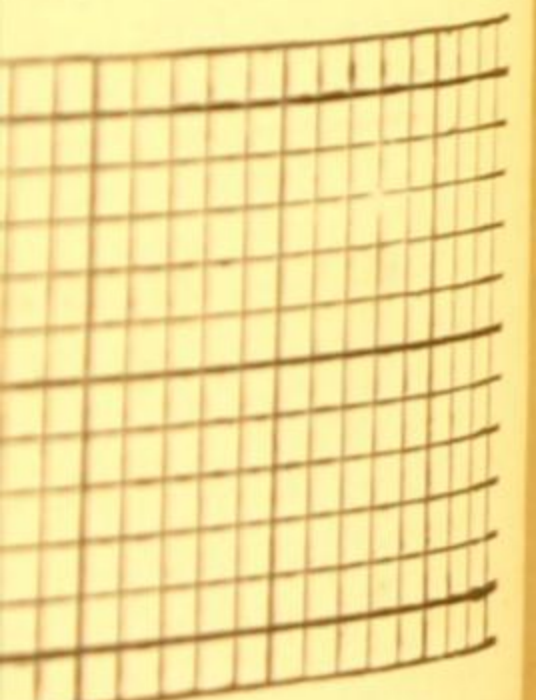
ND DIAGRAM PAPER, 10 feet to the  
nd 24 feet roadway, and for entire  
s 19 1/2 x 12 inches; per quire, \$5.00.



ATE C.  
rulings 20x16 inches, 8 feet to the



TE F.  
rulings 20x16 inches, 10 feet to



TE G.  
rulings 22x16 inches, 10 feet to  
r quire, \$5.00, per sheet,

CROSS SECTION PAPER.

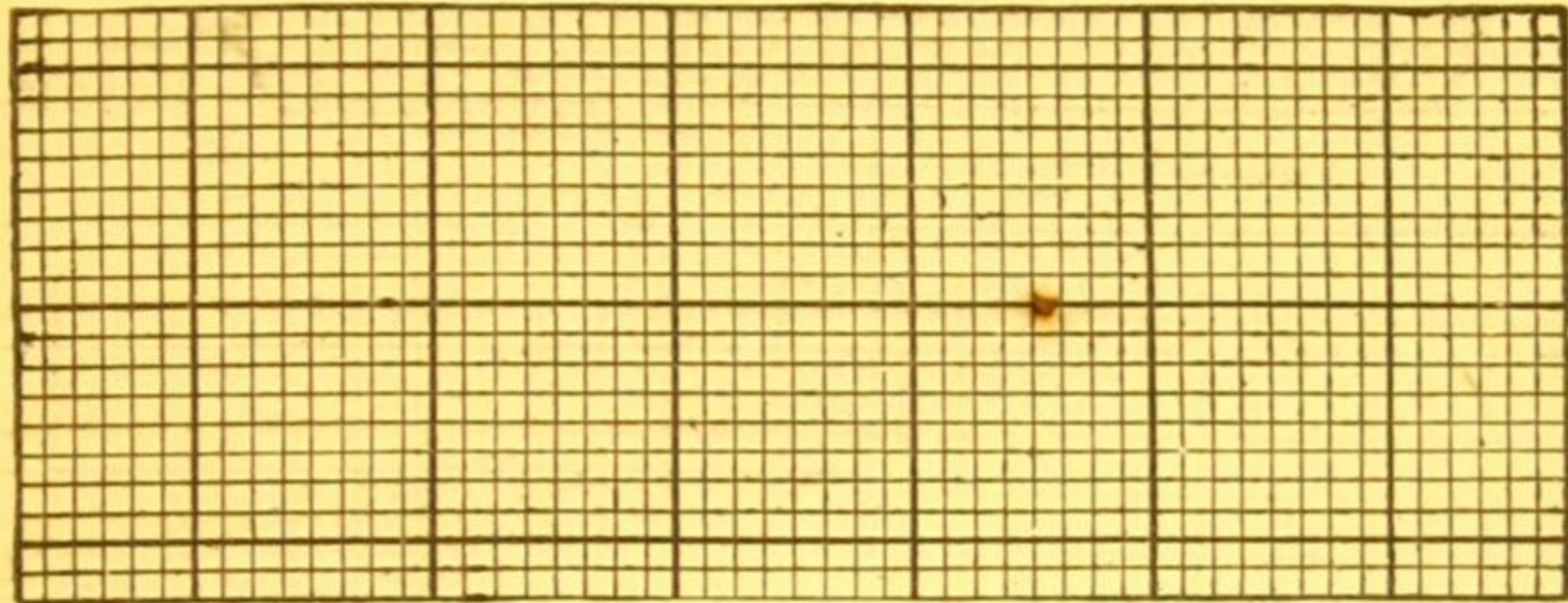
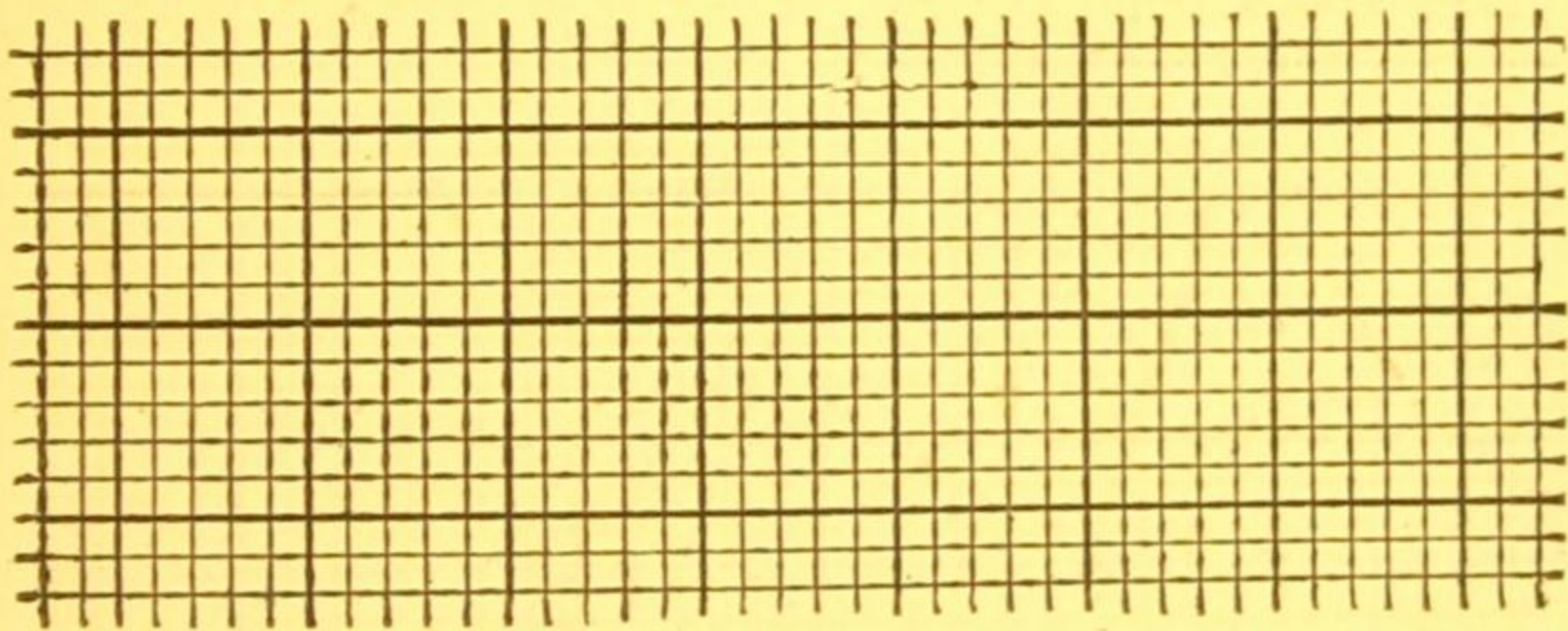


PLATE H.

No.	PRICE.
A 1000. CROSS-SECTION PAPER, PLATE H, rulings 21x16 inches, 16 feet to inch, per quire \$5.00, per sheet, . . . . .	\$0.25



METRIC.

A 1001. CROSS-SECTION PAPER—METRIC, rulings every two millimeters, size of sheet 40x50 centimeters, per quire, \$5.00, per sheet, . . . . .	.25
A 1002. CROSS-SECTION PAPER, PLATE G, printed on PARCHMENT TRACING PAPER, in sheets 18x20 inches, per quire, \$5.00, per sheet, . . . . .	.25

RULED CROSS-SECTION PAPERS.

RULED IN BLUE.

A 1003. CROSS-SECTION, 5x5 to 1 inch, 16x21, per quire, . . . . .	1.50
A 1004. CROSS-SECTION, 10x10 to 1 inch, 16x21, per quire, . . . . .	1.50
A 1005. CROSS-SECTION, 8x8 to 1 inch, 16x21, per quire, . . . . .	1.50
A 1006. CROSS-SECTION, 12x12 to 1 inch, 16x21, per quire, . . . . .	1.50

# ENGINEERS'

The Solid Lines are Ruled in


- A 1020. Level Book, 7 x4 inches, made of superior drawing paper, per dozen, . . .
- A 1021. Do. 7 x4 do. same as No. A 1020, but interleaved with blotting . . .
- A 1022. Do. 6½x4 do. extra smooth paper, per dozen, . . .
- A 1023. Profile Level Books, 7x4 inches, Level Ruling on one page, Profile Ruling . . .


- A 1024. Transit Books, 7x4 inches, made of superior drawing paper, per dozen, . . .
- A 1025. Do. same as No. A 1024, but interleaved with blotting paper, per . . .
- A 1026. Do. 6½x4 inches, extra smooth paper, per dozen, . . .


- A 1027. Record Books, 7½x5 inches, made of superior paper, per dozen, . . .

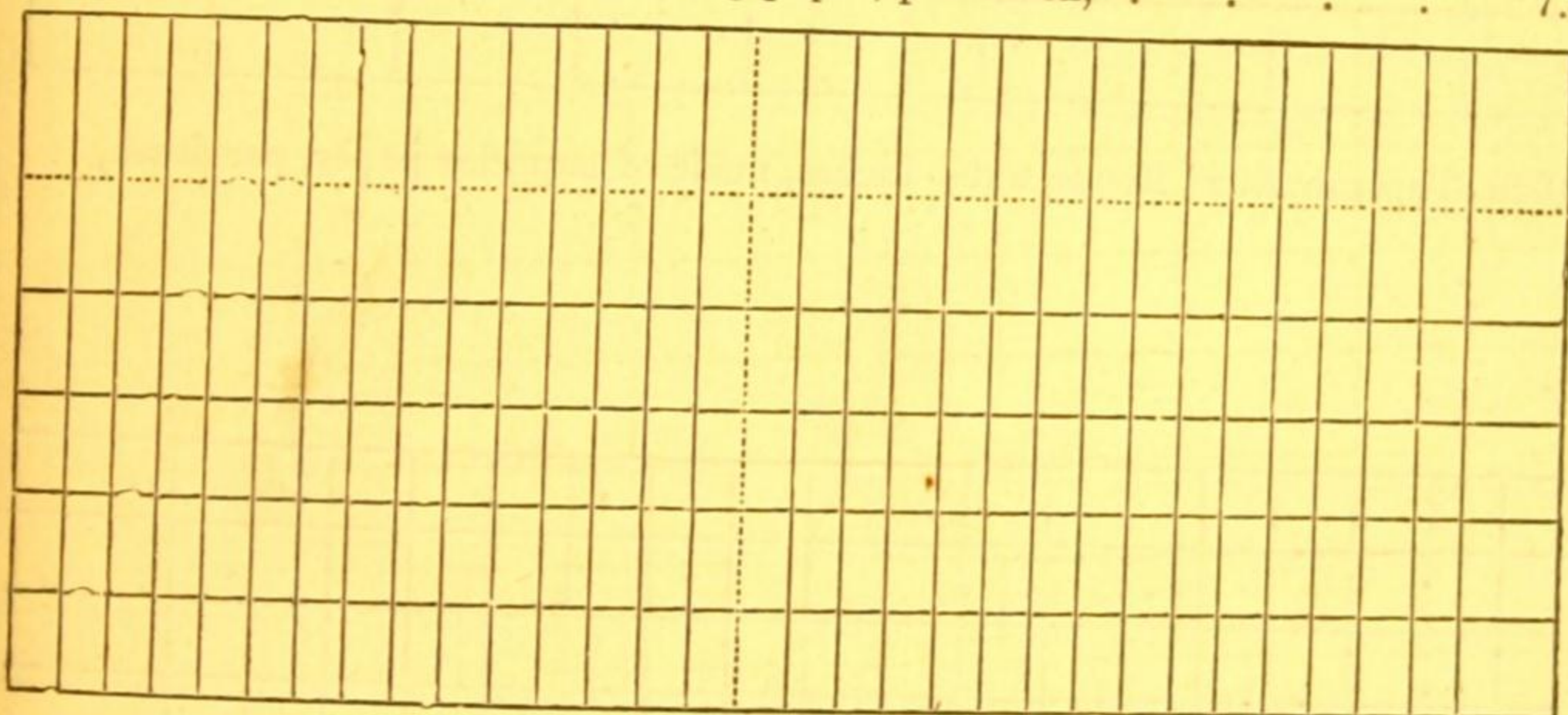


# FIELD BOOKS.

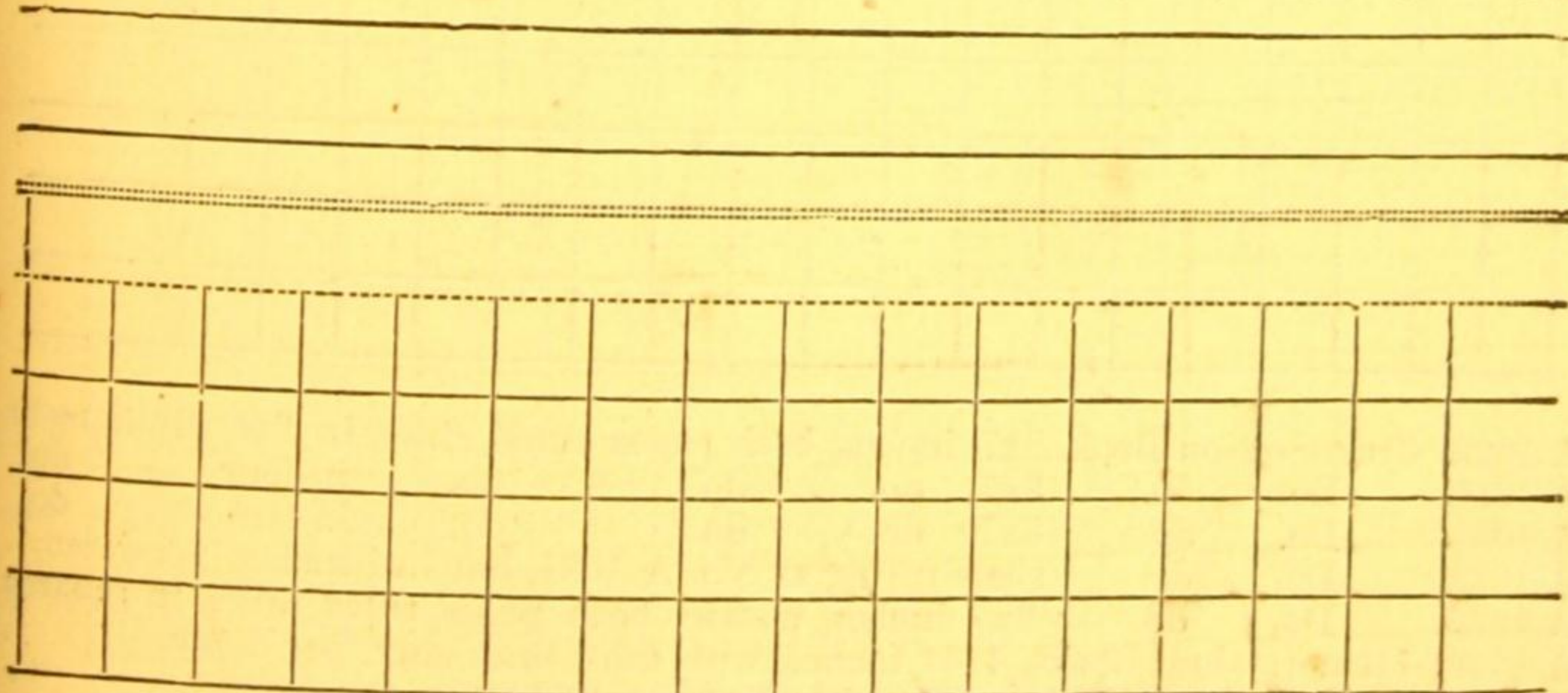
Black, the Broken Lines in Red.



paper, per dozen,	.	.	.	.	.	.	.	.	.	.	\$6.00
	.	.	.	.	.	.	.	.	.	.	6 50
on the other, made of superior drawing paper, per dozen,	.	.	.	.	.	.	.	.	.	.	4.50
	.	.	.	.	.	.	.	.	.	.	7.50



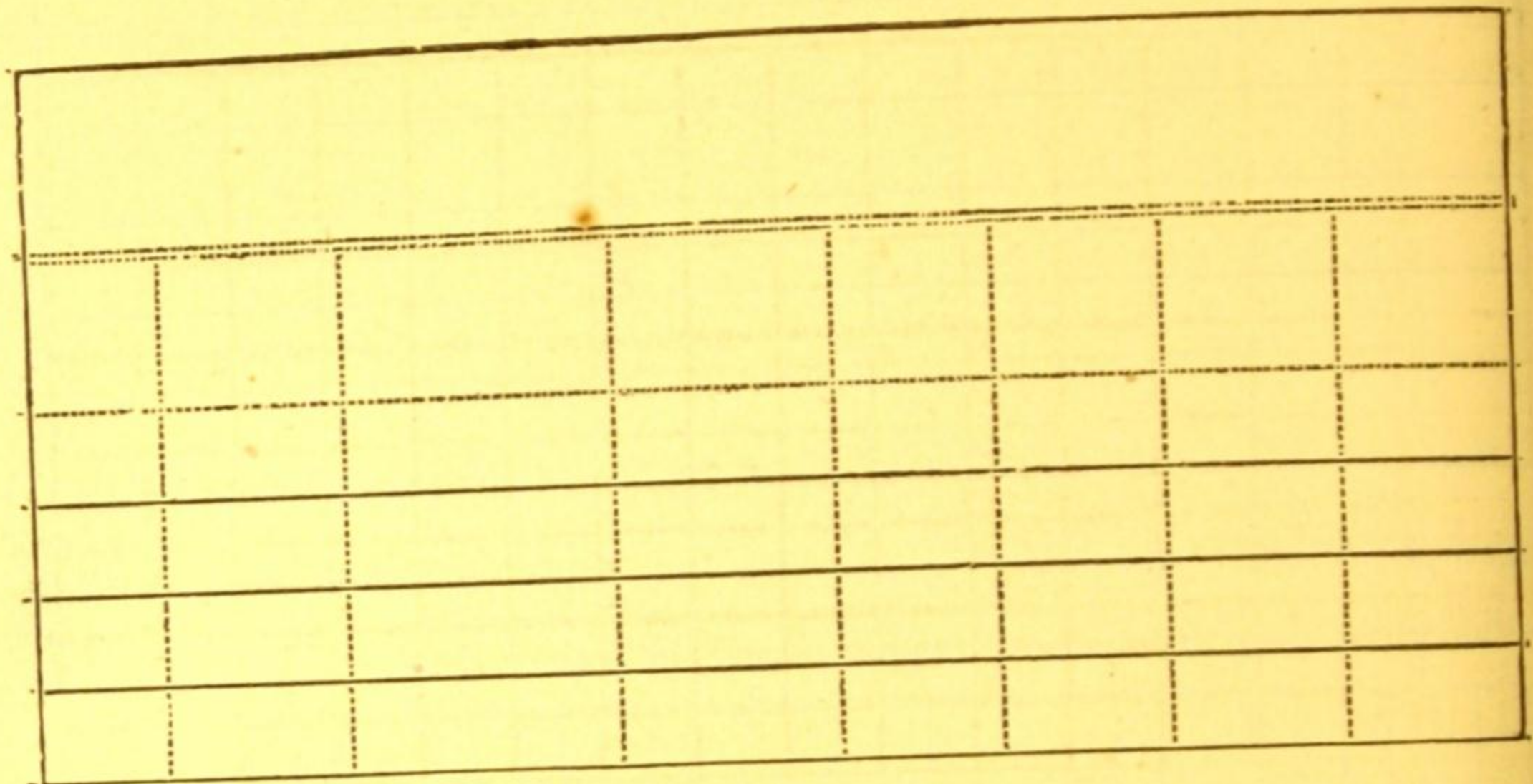
dozen,	.	.	.	.	.	.	.	.	.	.	6.00
	.	.	.	.	.	.	.	.	.	.	6.50
	.	.	.	.	.	.	.	.	.	.	4.50



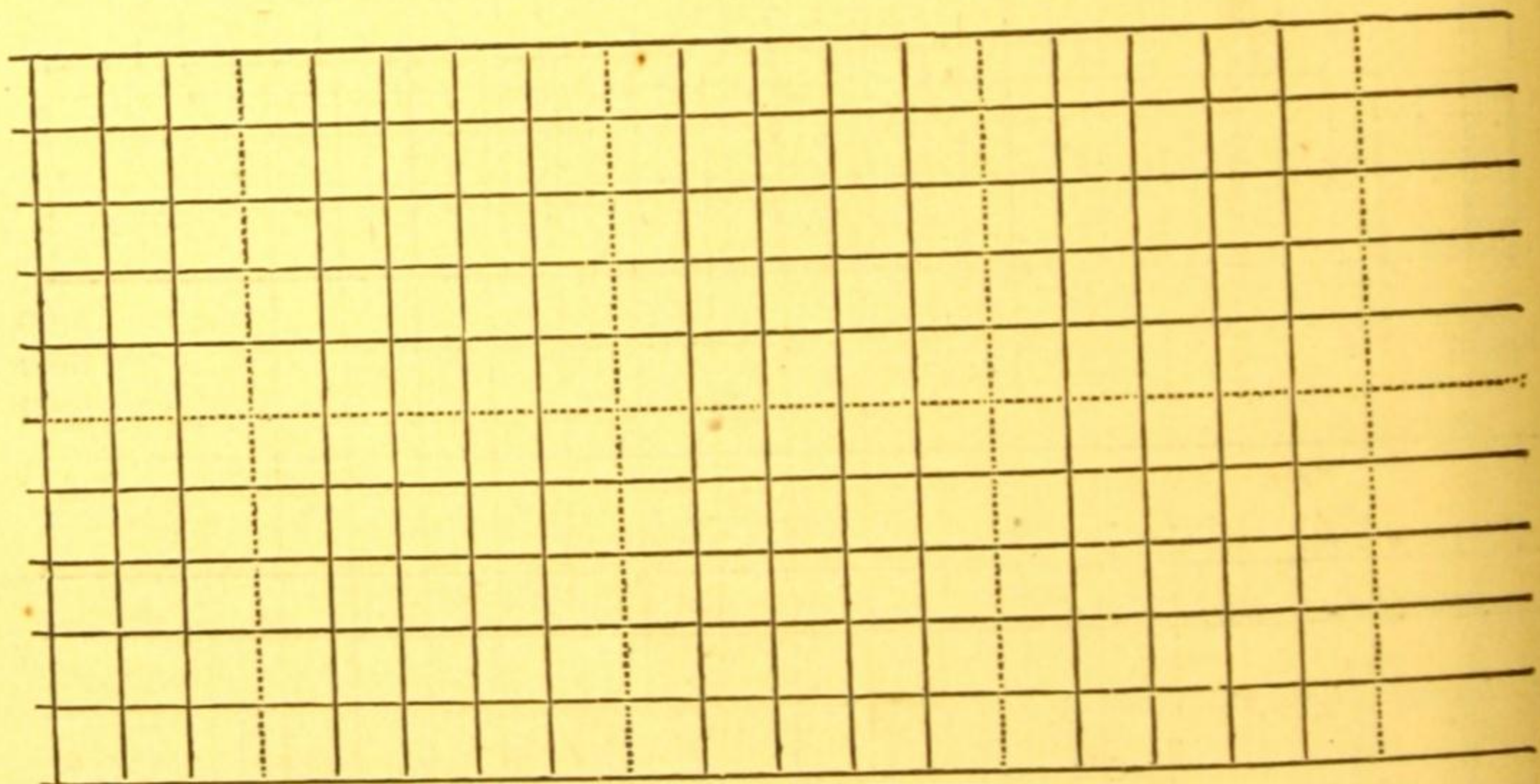
.	.	.	.	.	.	.	.	.	.	.	9.00
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# ENGINEERS'

The Solid Lines are Ruled in



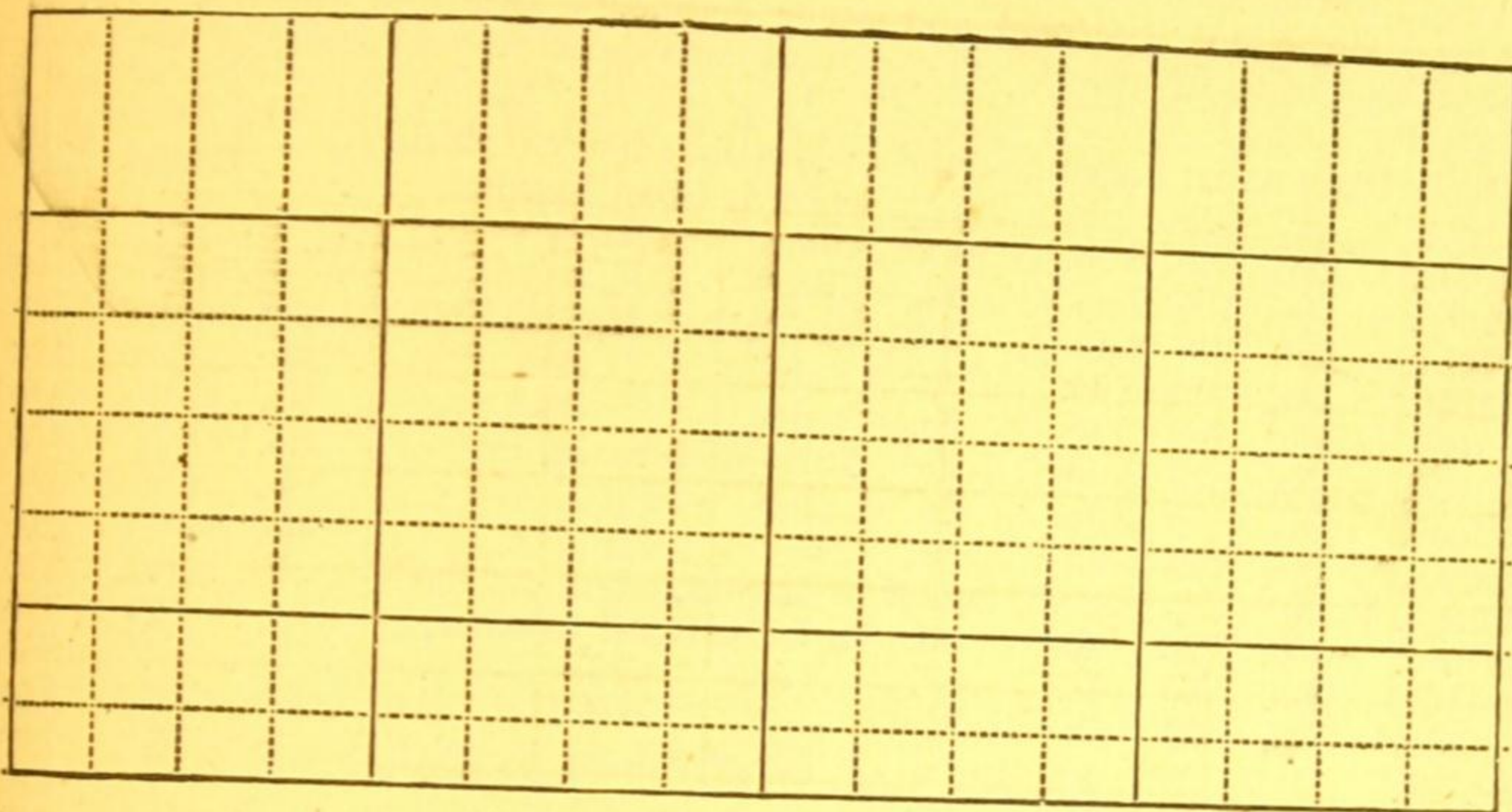
A 1028. Topographical Books, 8x5½ inches, made of superior paper, per dozen,



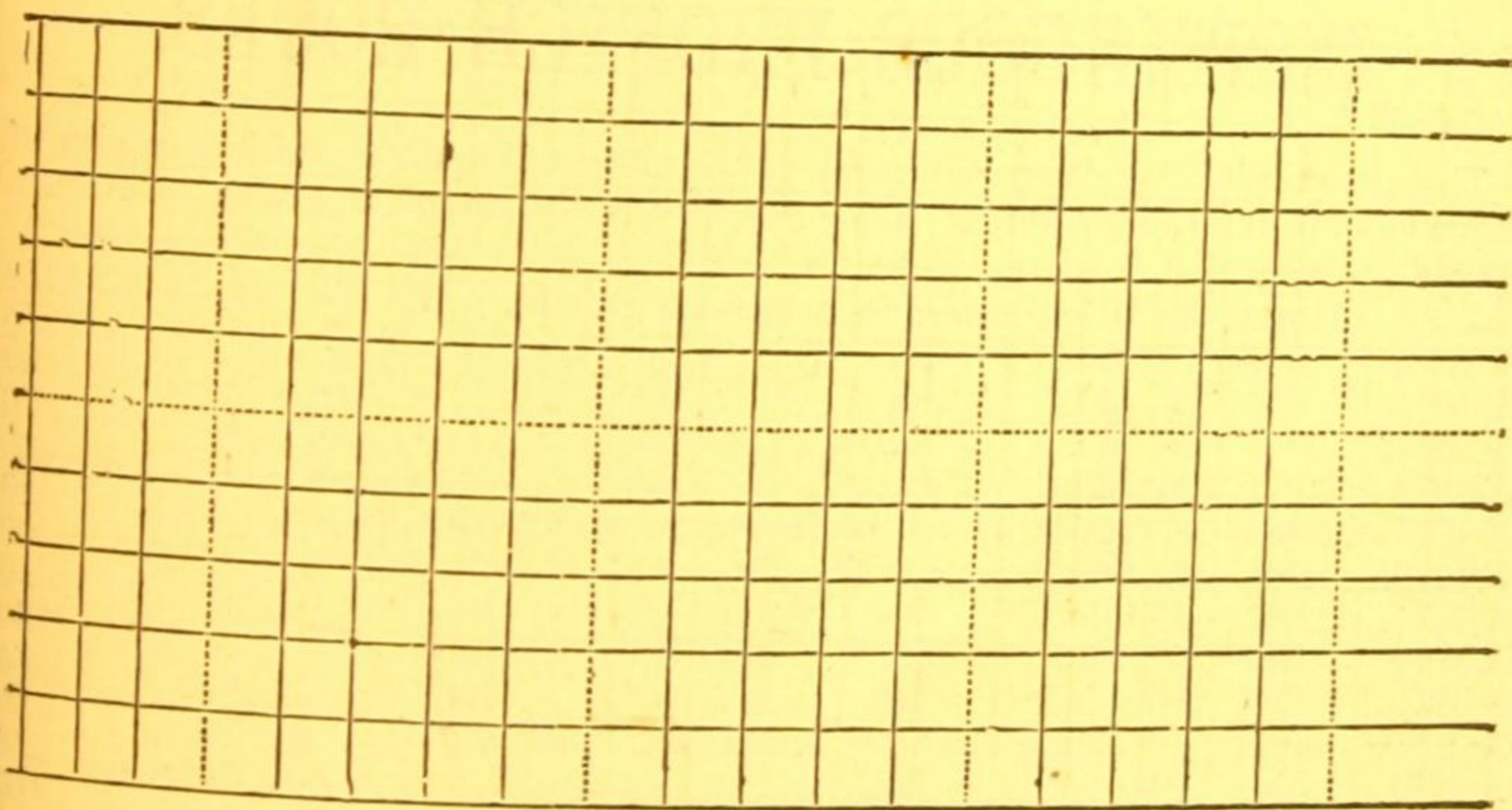
- A 1029. Cross-Section Book, 8x7 inches, both pages ruled alike, in five divisions to
- A 1030. Do. do. 8x7 do. do. do. in four do.
- A 1031. Do. do. 8x7 do. do. do. in ten do.
- A 1032. Do. do. same ruling as No. A 1031, but 7x4 inches, per dozen, .
- A 1033. Do. do. 8x7 inches, metric, both pages ruled alike, in squares
- A 1034. Memorandum Books, 4x5½ inches, with faint lines only, per dozen, . . .
- A 1035. Time Books, Weekly or Monthly Notes, 4x6½ inches, per dozen, . . .

# FIELD BOOKS.

Black, the Broken Lines in Red.



..... \$12.00



.....	inch, per dozen,	12.00
.....	do. do.	12.00
.....	do. do.	12.00
.....	do. do.	7.50
.....	of five millimeters, per dozen,	12.00
.....	.....	6.00
.....	.....	4.50

## BOUND PROFILE BOOKS.

These books are of most convenient form for Profile Record for field or office use. They are printed on both sides of a tough, thick paper, and bound in flexible covers convenient for the pocket. Each page will contain a profile of three thousand feet in length, so that each folio will contain an average section of a road as usually laid out for construction. Railroad and other engineers will find them very useful. Size of book  $9\frac{1}{2}$  by  $5\frac{3}{4}$  inches. The rulings correspond to our large profile plates, A. and B.

A 1050.	Plate A.	20 Leaves,	Bound in Muslin, edges cut flush,	. . . . .	\$1.50
A 1051.	Do.	25 do.	do. in Dark Roan Leather,	. . . . .	2.50
A 1052.	Do.	50 do.	do. do. do.	. . . . .	3.50
A 1053.	Do.	100 do.	do. do. do.	. . . . .	5.00
A 1054.	Do.	25 do.	do. Im. Turkey Morocco, with elastic band,	. . . . .	3.00
A 1055.	Do.	50 do.	do. do. do.	. . . . .	4.00
A 1056.	Do.	100 do.	do. do. do.	. . . . .	5.50
A 1057.	Do.	25 do.	do. Turkey Morocco,	do. . . . .	3.50
A 1058.	Do.	50 do.	do. do. do.	do. . . . .	4.50
A 1059.	Do.	100 do.	do. do. do.	do. . . . .	6.00
A 1060.	Plate B.	20 Leaves,	Bound in Muslin, edges cut flush,	. . . . .	1.50
A 1061.	Do.	25 do.	do. in Dark Roan Leather,	. . . . .	2.50
A 1062.	Do.	50 do.	do. do. do.	. . . . .	3.50
A 1063.	Do.	100 do.	do. do. do.	. . . . .	5.00
A 1064.	Do.	25 do.	do. Imitation Turkey Morocco, with elastic band,	. . . . .	3.00
A 1065.	Do.	50 do.	do. do. do.	. . . . .	4.00
A 1066.	Do.	100 do.	do. do. do.	. . . . .	5.50
A 1067.	Do.	25 do.	do. Turkey Morocco	do. . . . .	3.50
A 1068.	Do.	50 do.	do. do. do.	do. . . . .	4.50
A 1069.	Do.	100 do.	do. do. do.	do. . . . .	6.00

## CONTINUOUS PROFILE BOOKS.

These are made of our regular profile paper mounted upon a continuous piece of muslin and bound in book form. They possess the advantage of giving a continuous profile.

A 1070.	Plate A.	10 Miles,	Bound in American Russia,	. . . . .	\$2.00
A 1071.	Do.	15 do.	do. do. do.	. . . . .	2.50
A 1072.	Do.	25 do.	do. do. do.	. . . . .	3.00
A 1073.	Do.	50 do.	do. do. do.	. . . . .	5.00
A 1074.	Do.	100 do.	do. do. do.	. . . . .	8.00
A 1075.	Plate A.	10 Miles,	Bound in Seal-skin, with turned edges,	. . . . .	4.00
A 1076.	Do.	15 do.	do. do. do.	. . . . .	4.50
A 1077.	Do.	25 do.	do. do. do.	. . . . .	6.00
A 1078.	Do.	50 do.	do. do. do.	. . . . .	8.00
A 1079.	Do.	100 do.	do. do. do.	. . . . .	12.50
A 1080.	Plate B.	10 Miles,	Bound in American Russia,	. . . . .	2.00
A 1081.	Do.	15 do.	do. do. do.	. . . . .	2.50
A 1082.	Do.	25 do.	do. do. do.	. . . . .	3.00
A 1083.	Do.	50 do.	do. do. do.	. . . . .	5.00
A 1084.	Do.	100 do.	do. do. do.	. . . . .	8.00
A 1085.	Plate B.	10 Miles,	Bound in Seal-skin, with turned edges,	. . . . .	4.00
A 1086.	Do.	15 do.	do. do. do.	. . . . .	4.50
A 1087.	Do.	25 do.	do. do. do.	. . . . .	6.00
A 1088.	Do.	50 do.	do. do. do.	. . . . .	8.00
A 1089.	Do.	100 do.	do. do. do.	. . . . .	12.50

## SOLID SKETCH BLOCKS.

Made of WHATMAN'S "BEST" Drawing Paper, in either hot pressed or smooth, or cold pressed, with slight grain. Each Block consists of 32 leaves, so compressed as to form one solid block. By running a knife around the edge each sheet can be easily separated.

No.			UNBOUND.	*BOUND.
A 1100.	16mo Royal,	4½ x 6,		
A 1101.	8vo do.	6 x 9,	\$0.35	\$0.85
A 1102.	4to do.	9 x 12,	.60	1.25
A 1103.	Half do.	12 x 18,	1.00	1.75
A 1104.	32 Imperial,	3½ x 5½,	1.85	3.25
A 1105.	16mo do.	5½ x 7,	.30	.65
A 1106.	8vo do.	7 x 10,	.50	1.00
A 1107.	4to do.	10 x 14,	.90	1.50
A 1108.	Half do.	14 x 20,	1.60	2.40
			3.00	4.50

\* The binding has cloth sides and leather back, with a pocket and loop for pencil inside. The portfolio will last for a number of blocks.

## SOLID SKETCH BLOCKS,

MADE OF GERMANIA PAPER—Unbound.

A 1109.	4½ x 6, each,			.25
A 1110.	5½ x 7, do.			.35
A 1111.	6 x 9, do.			.40
A 1112.	7 x 10, do.			.60
A 1113.	9 x 12, do.			.75
A 1114.	10 x 14, do.			1.00

## SOLID SKETCH BLOCKS.

MADE OF HARDING'S THICK IMPERIAL PAPER. Each block contains 24 leaves.

A 1115.	16 mo Imperial,	5 x 7,		.60
A 1116.	8vo do.	7 x 10,		1.00
A 1117.	4to do.	10 x 14,		1.75

ENGLISH TINTED CRAYON PAPER.

No.		PRICE.
A 1120.	Imperial, 22x30 inches, 12 tints, per quire, . . . . .	\$2.70
A 1121.	Double Elephant, 27x40 inches, 6 tints, per quire, . . . . .	4.00
A 1122.	FRENCH TINTED CRAYON PAPER, slight grain, 12 tints, Royal, 19x25 inches, per quire, . . . . .	1.00
A 1123.	FRENCH TINTED CHARCOAL PAPER, 12 tints, Royal, 19x25 inches, per quire, . . . . .	.65
A 1124.	MICHALLET CHARCOAL PAPER, 10 tints, Royal, 19x25 inches, per quire, . . . . .	1.00

BOND PAPER FOR TRACINGS, VERY TOUGH.

	16x21	16x24	19x24	19x30
A 1125. Per 100 sheets,	\$3.25	3.75	4.00	5.00.

ENGLISH PARCHMENT.

	14x18	16x20	18x24	21½x29½	23x31
A 1126. Per dozen,	\$5.50	7.20	9.00	13.00	14.00

GELATINE OR GLASS PAPERS.

A 1127. Per dozen,	13x19	17x21 inches,	
	\$3.50	4.00.	
A 1128. TRANSFER PAPER, black, white, blue, red, yellow, green, vermilion, light blue, brown, light green, violet, orange, 10x15 inches, per quire, \$1.75, per sheet, . . . . .			.10

WHITE MOUNTING BOARD.

	22x28 inches, according to thickness, per sheet, from . . . . .	.06 to .15
A 1129. PATENT OFFICE BLANKS, per dozen, \$1.00, per sheet, . . . . .		.10

TOWNSHIP PLOTTING PAPER.

A 1130. Rulings 6x6 blocks, blocks 1 inch square, per 100 sheets, . . . . .	2.00
A 1131. Rulings 12x12 blocks, blocks 2 inches square, per 100 sheets, . . . . .	2.50

## WEAVER'S DESIGN PAPERS.

PRINTED FROM PLATE. Size of sheet, 18x23.

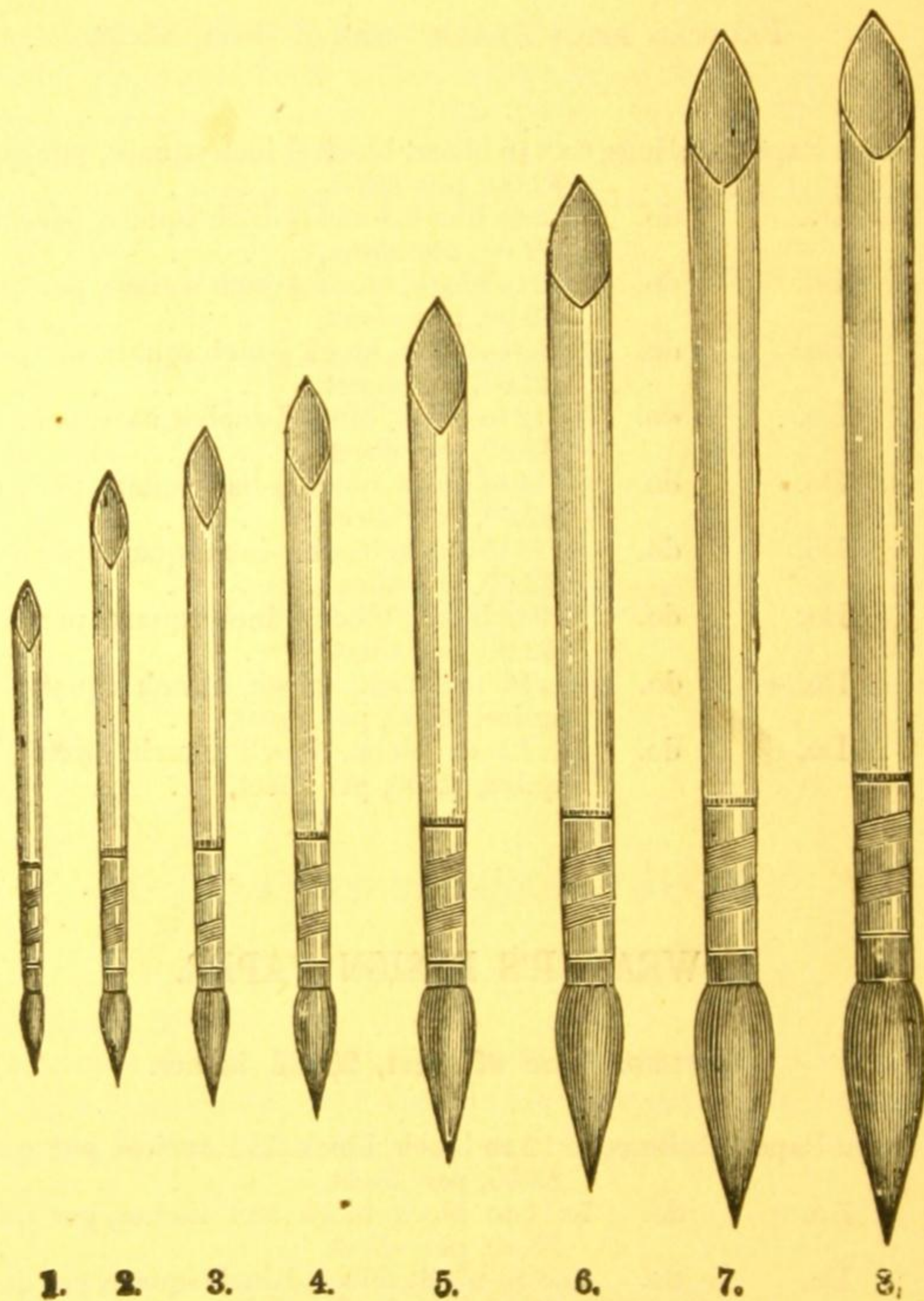
No.			PRICE.
A 1150.	Design Paper, Rulings, 6x8 to block, block $\frac{5}{8}$ -inch square, per quire,		
		\$2.00, per sheet,	
A 1151.	Do. do. 7x8 to block, block $\frac{1}{2}$ -inch square, per quire,		\$0.12
		\$2.00, per sheet,	
A 1152.	Do. do. 8x8 to block, block $\frac{1}{2}$ -inch square, per quire,		.12
		\$2.00, per sheet,	
A 1153.	Do. do. 8x10 to block, block $\frac{1}{2}$ -inch square, per quire,		.12
		\$2.00, per sheet,	
A 1154.	Do. do. 8x12 to block, block $\frac{1}{2}$ -inch square, per quire,		.12
		\$2.00, per sheet,	
A 1155.	Do. do. 8x14 to block, block $\frac{5}{8}$ -inch square, per quire,		.12
		\$2.00, per sheet,	
A 1156.	Do. do. 8x16 to block, block $\frac{5}{8}$ -inch square, per quire,		.12
		\$2.00, per sheet,	
A 1157.	Do. do. 9x9 to block, block $\frac{1}{2}$ inch square, per quire,		.12
		\$2.00, per sheet,	
A 1158.	Do. do. 10x16 to block, block $\frac{3}{4}$ -inch square, per		.12
		quire, \$2.00, per sheet,	
A 1159.	Do. do. 12x12 to block, block 1-inch square, per		.12
		quire, \$2.00, per sheet,	

## WEAVER'S DESIGN PAPER.

RULED. Size of sheet, 23x36 inches.

A 1160.	Design Paper, Rulings, 6x12 to block, block 2x1 inches, per quire,		
		\$3.50, per sheet,	
A 1161.	Do. do. 7x11 to block, block 2x1 inches, per quire,		.20
		\$3.50, per sheet,	
A 1162.	Do. do. 8x8 to block, block 1 inch square, per quire,		.20
		\$3.50, per sheet,	
A 1163.	Do. do. 8x10 to block, block 1 inch square, per		.20
		quire, \$3.50, per sheet,	
A 1164.	Do. do. 10x10 to block, block 1 inch square, per		.20
		quire, \$3.50, per sheet,	
A 1165.	Do. do. 12x12 to block, block 1 inch square, per		.20
		quire, \$3.50, per sheet,	
A 1166.	Do. do. 12x14 to block, block 1 inch square, per		.20
		quire, \$3.50, per sheet,	
A 1167.	Do. do. 14x14 to block, block 1 inch square, per		.20
		quire, \$3.50, per sheet,	
A 1168.	Do. do. 9x9 to block, block 1 inch square, per		.20
		quire, \$3.50, per sheet,	

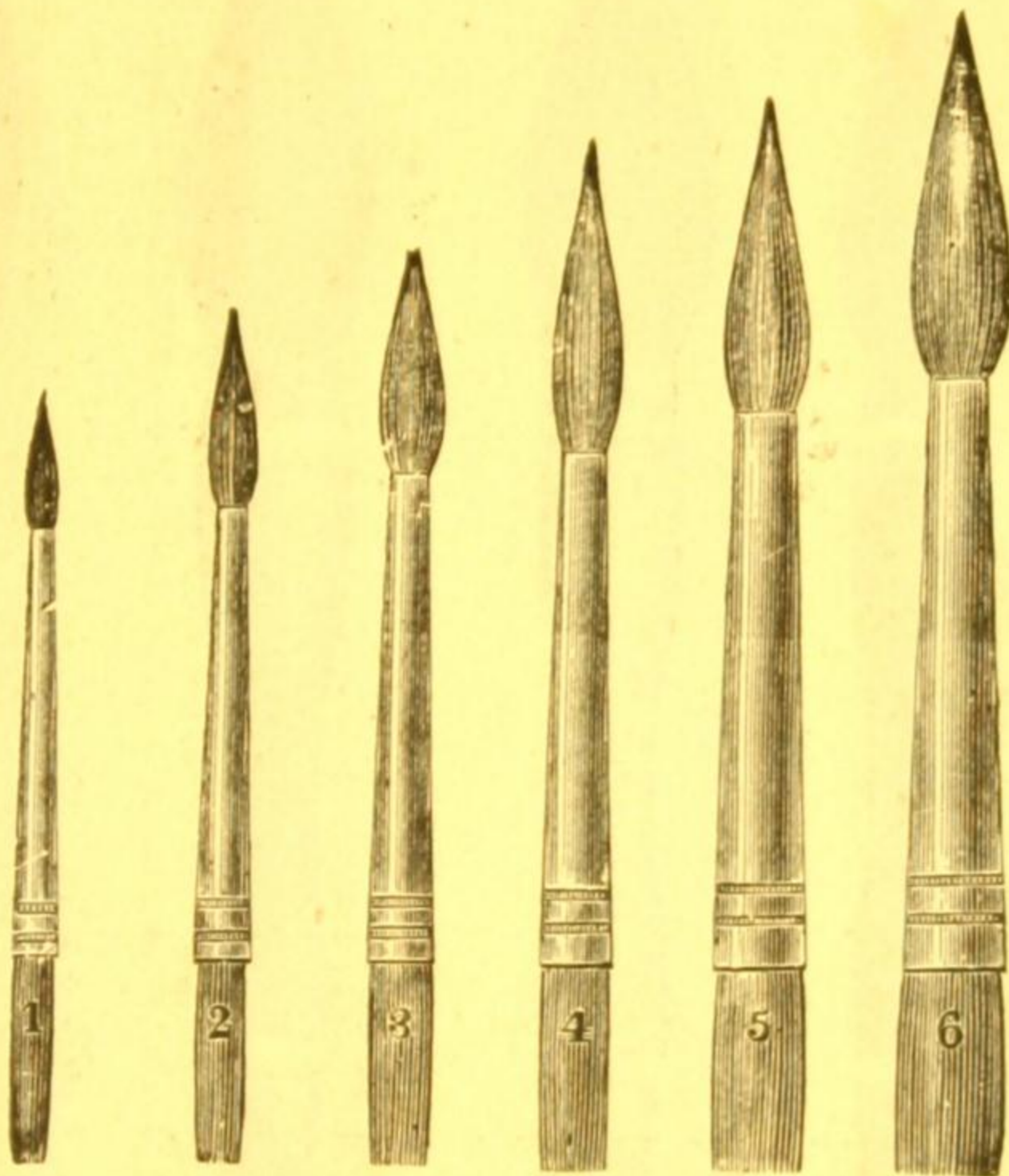
# CAMEL'S-HAIR AND SABLE BRUSHES.



A 1180 (FULL SIZE).

No.	PRICE.
A 1180. Camel's-hair Pencils, fine quality, in quills.	
Nos. 1 and 2, each, . . . . .	\$0.05
Nos. 3 and 4, each, . . . . .	.06
Nos. 5 and 6, each, . . . . .	.08
Nos. 7 and 8, each, . . . . .	.10

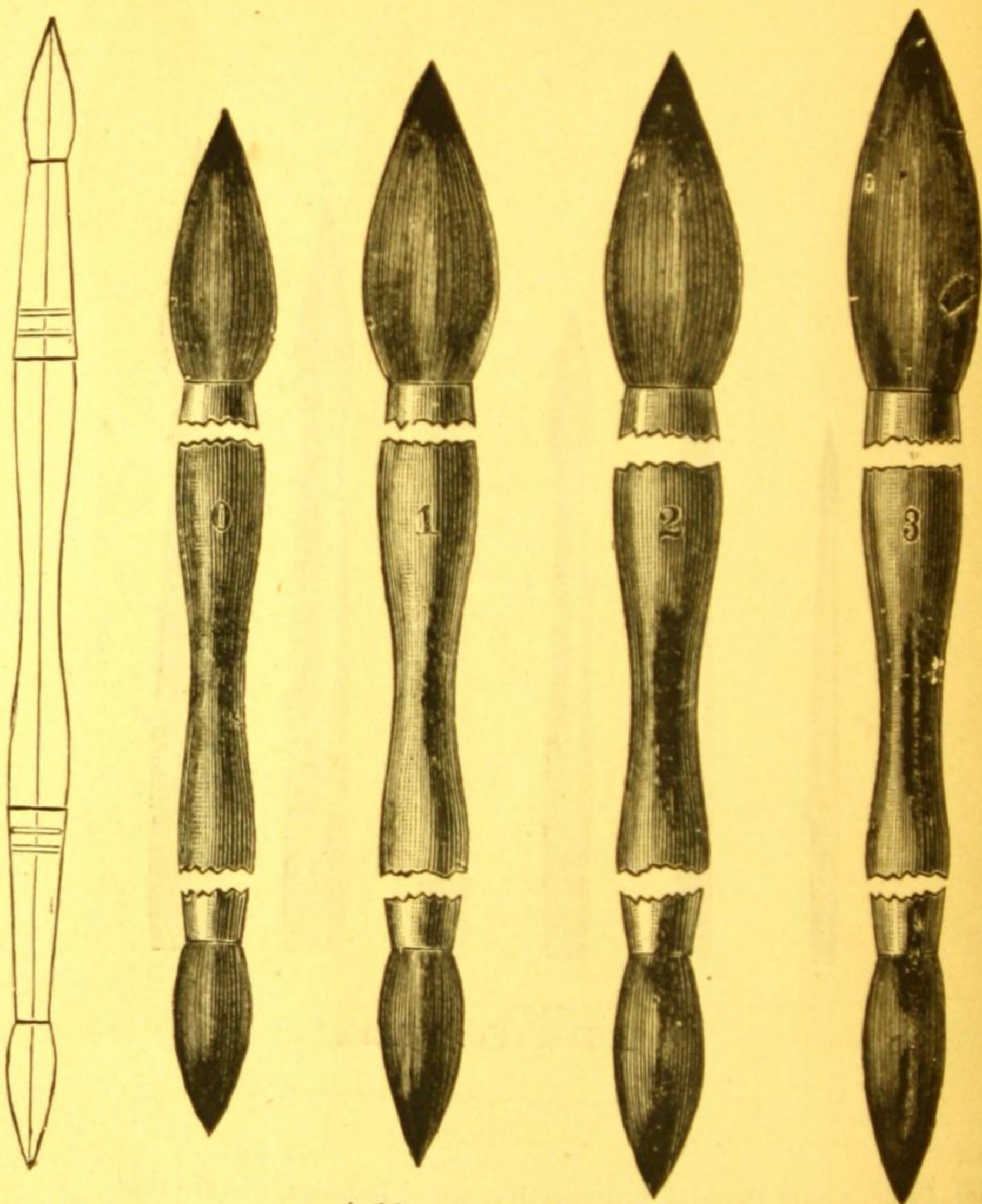




A 1181 (FULL SIZE).

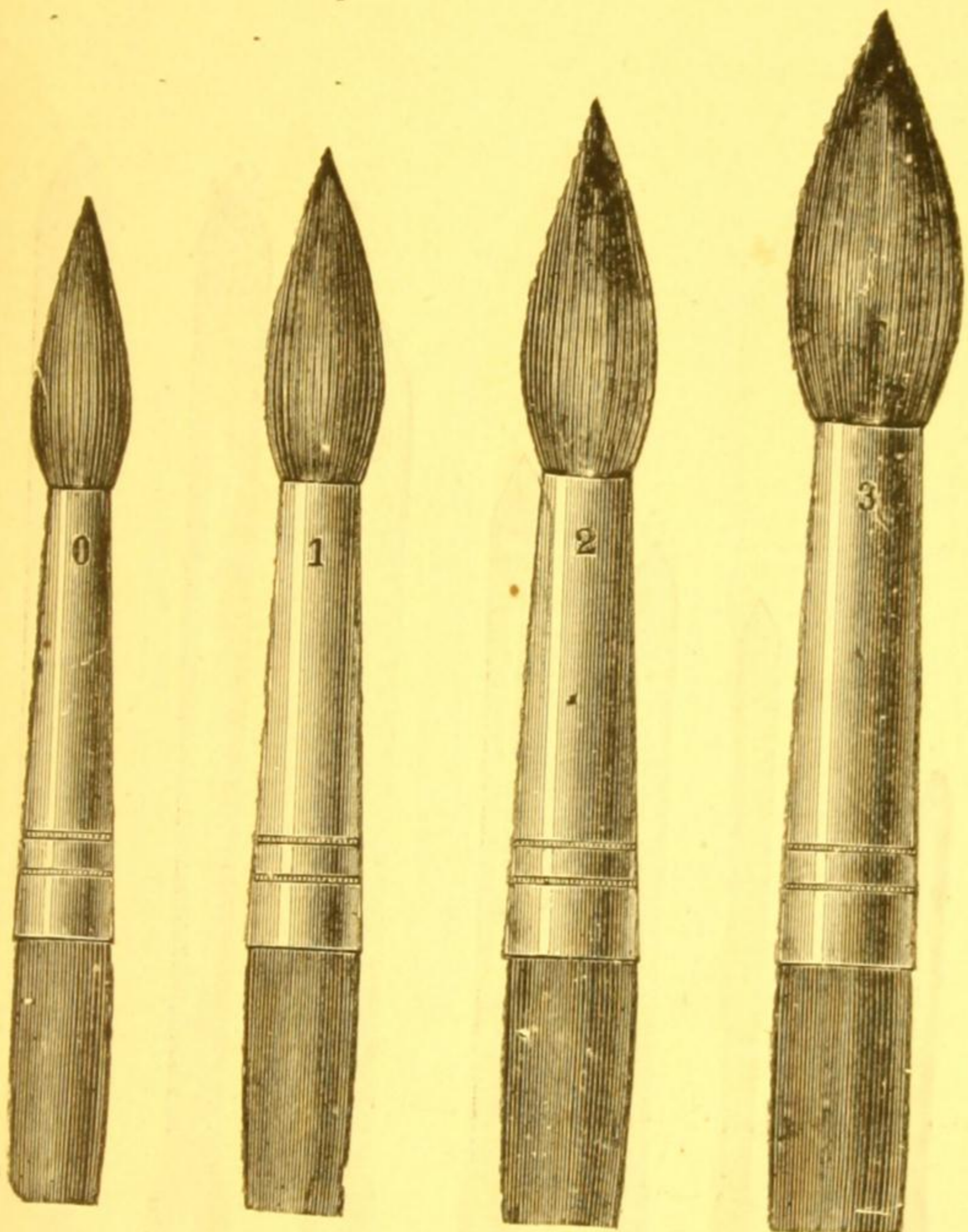
No.	PRICE
A 1181. Camel's-hair Pencils, fine quality, wood handles, metal tubes.	
Nos. 1 and 2, each, . . . . .	\$0.10
Nos. 3 and 4, each, . . . . .	.12
Nos. 5 and 6, each, . . . . .	.15

PRICE.  
\$0.05  
.06  
.08  
.10



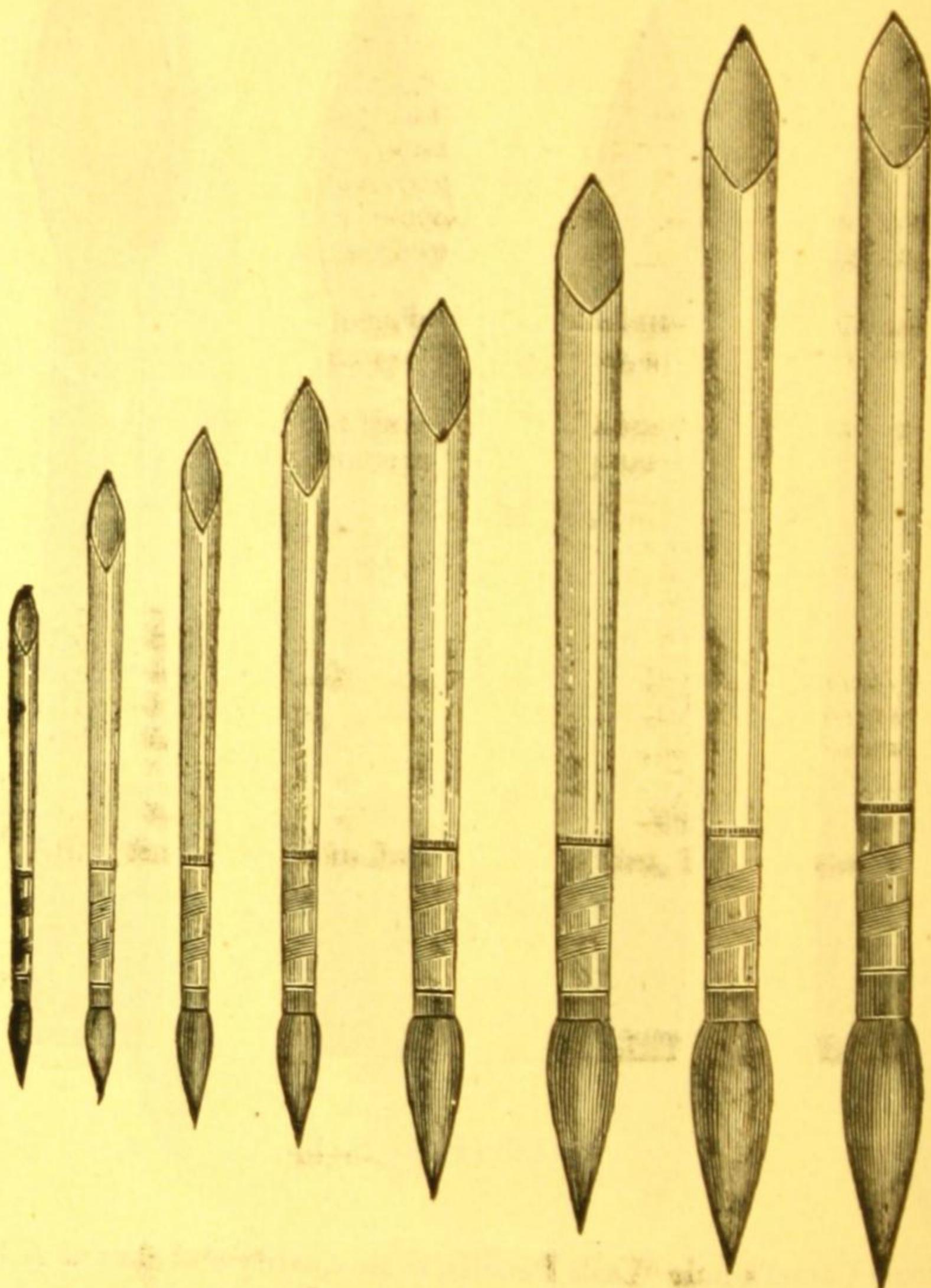
A 1182 (FULL SIZE).

No.	PRICE
A 1182. Double Camel's-hair Wash Pencils, fine quality, metal tubes, wood handles.	
Nos. 0, each,	\$0.40
Nos. 1, each,	.50
Nos. 2, each,	.60
Nos. 3, each,	.75



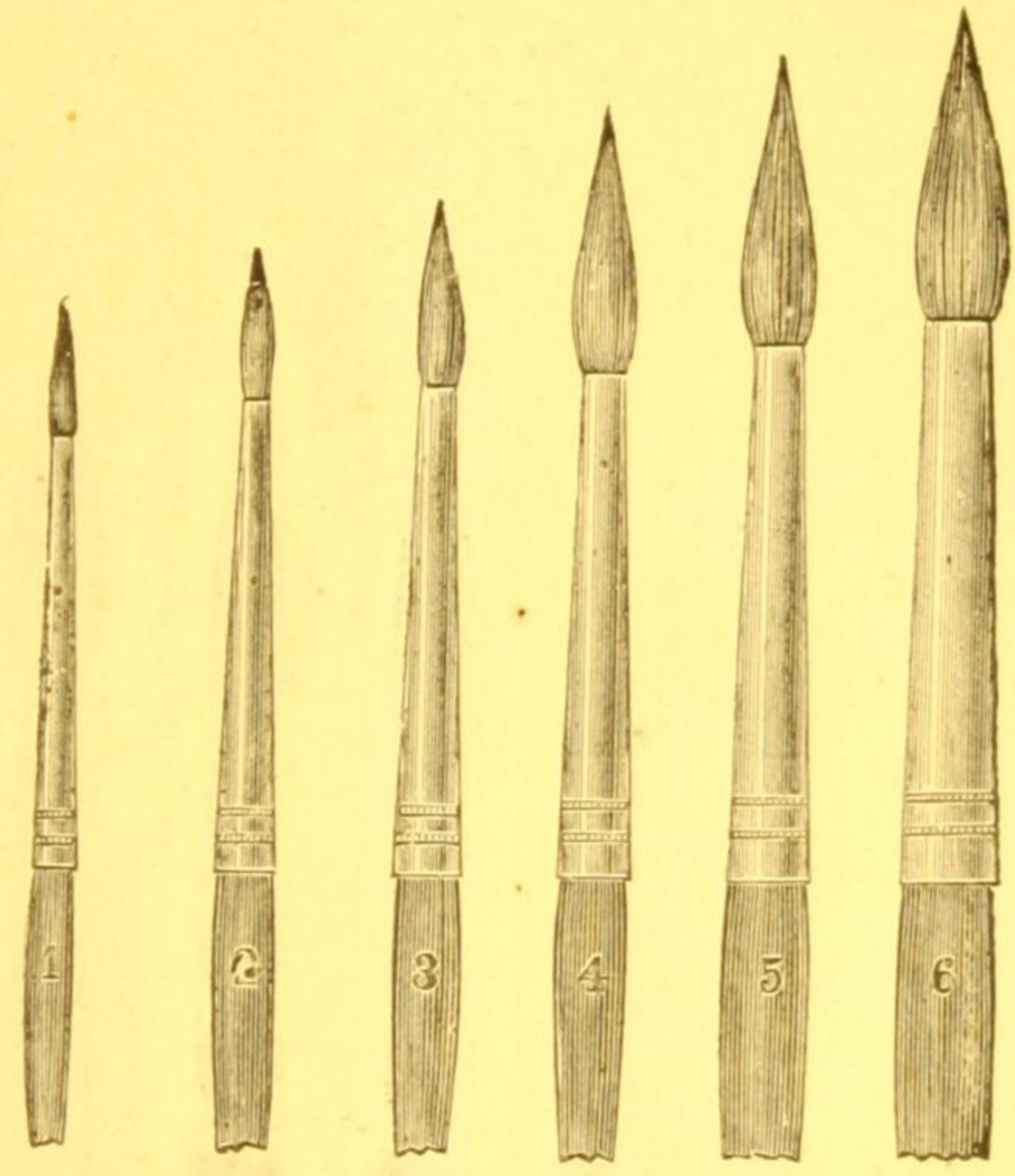
A 1183 (FULL SIZE).

No.	PRICE.
A 1183. Single Camel's-hair Wash Pencils, same quality and sizes as A 1182.	
Nos. 0, each, . . . . .	\$0.20
Nos. 1, each, . . . . .	.30
Nos. 2, each, . . . . .	.35
Nos. 3, each, . . . . .	.45
A 1184. Large Camel's-hair Pencils and Swan Quill, fine quality,	
Nos. 1 and 2, each, . . . . .	.25
Nos. 3 and 4, each, . . . . .	.40
Nos. 5 and 6, each, . . . . .	.60



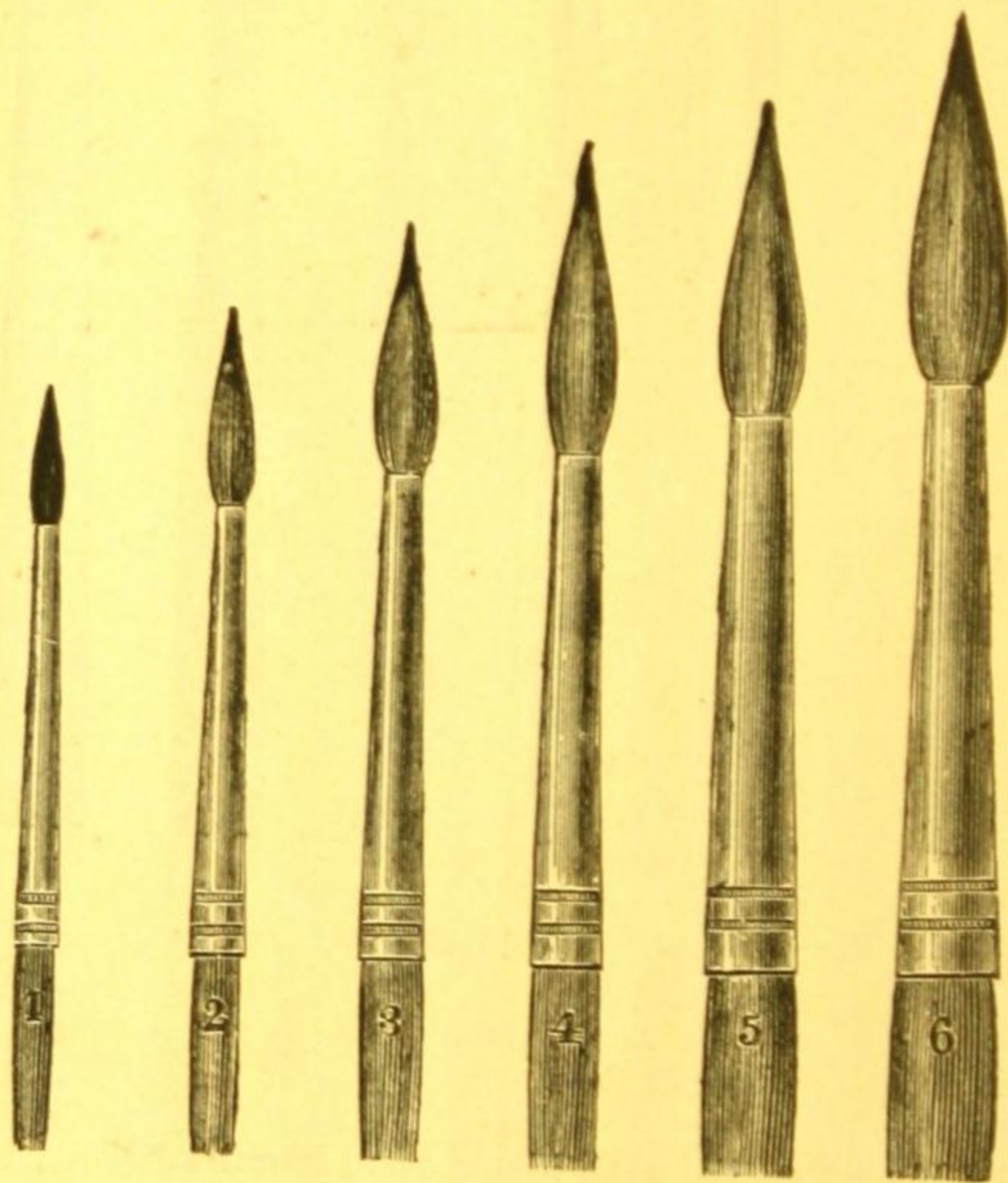
A 1185 (FULL SIZE).

No.	PRICE
A 1185 Red Sable Hair Pencils, in Quills.	
Nos. 1 and 2, each, . . . . .	\$0.25
Nos. 3 and 4, each, . . . . .	.30
Nos. 5 and 6, each, . . . . .	.40
Nos. 7 and 8, each, . . . . .	75



A 1186.

No.	PRICE
A 1186. Red Sable Hair Pencils, with black wood handles.	
Nos. 1 and 2, each, . . . . .	\$0.25
Nos. 3 and 4, each, . . . . .	.40
Nos. 5 and 6, each, . . . . .	.70
A 1187. Large Sable Hair Pencils in Swan Quills, fine quality.	
No. 0, . . . . .	2.50
No. 1, . . . . .	2.25
No. 2, . . . . .	2.00
No. 3, . . . . .	1.50
No. 4, . . . . .	1.00
No. 5, . . . . .	.75



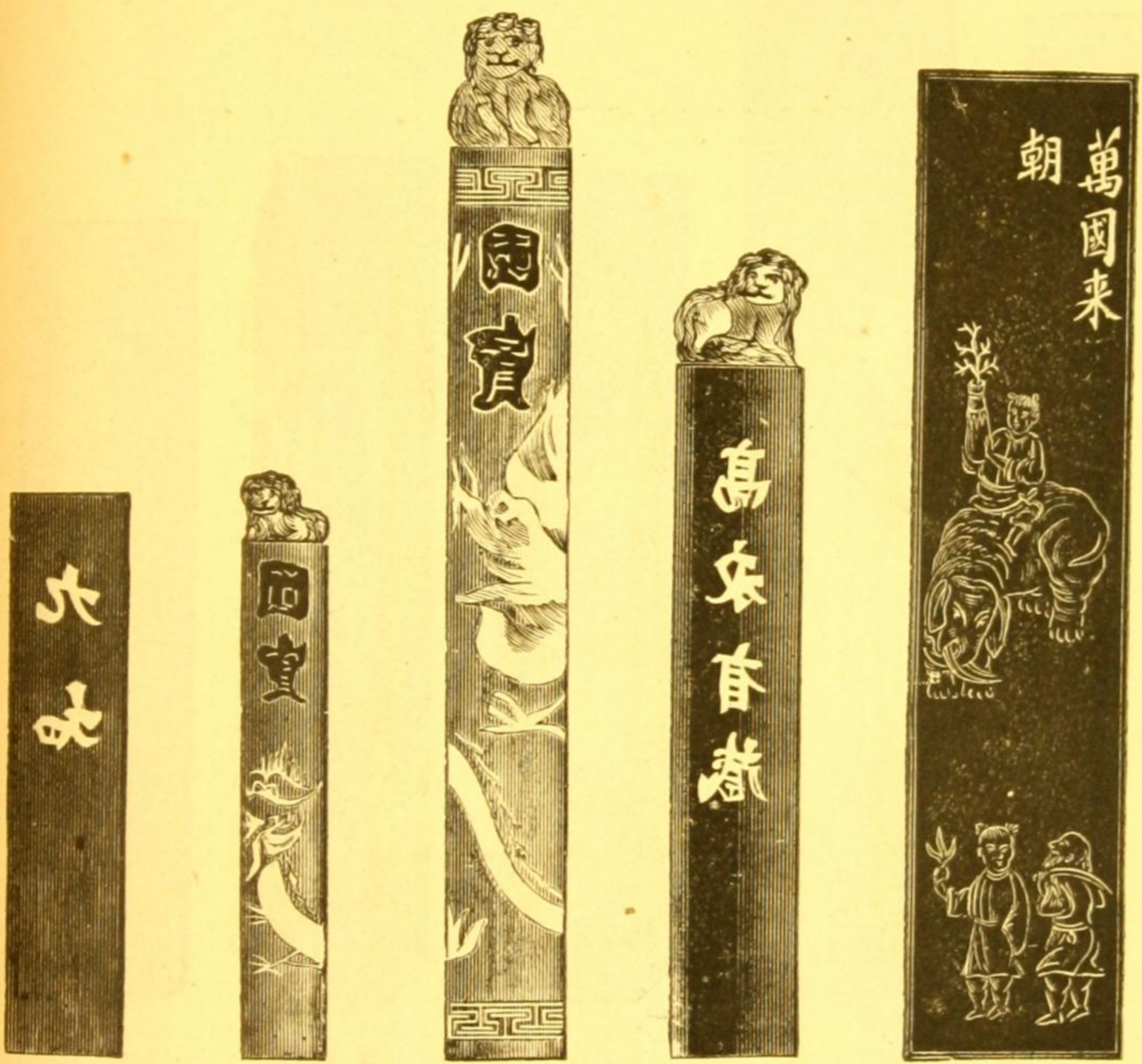
A 1188.

No.	PRICE
A 1188. Brown Sable Hair Pencils, with black wood handles, fine quality.	
Nos. 1 and 2, each, . . . . .	\$0.30
Nos. 3 and 4, each, . . . . .	.45
Nos. 5 and 6, each, . . . . .	.80
A 1189. Large Brown Sable Hair Pencils, in Swan Quills, fine quality.	
Nos. 0, each, . . . . .	3.00
Nos. 1, each, . . . . .	2.50
Nos. 2, each, . . . . .	2.00
Nos. 3, each, . . . . .	1.50
Nos. 4, each, . . . . .	1.00

# INDIA INKS.

IMPORTED BY OURSELVES DIRECT FROM CHINA.

These inks, which have had a reputation in China for over three hundred years, are most carefully selected, and are of the finest quality obtainable.



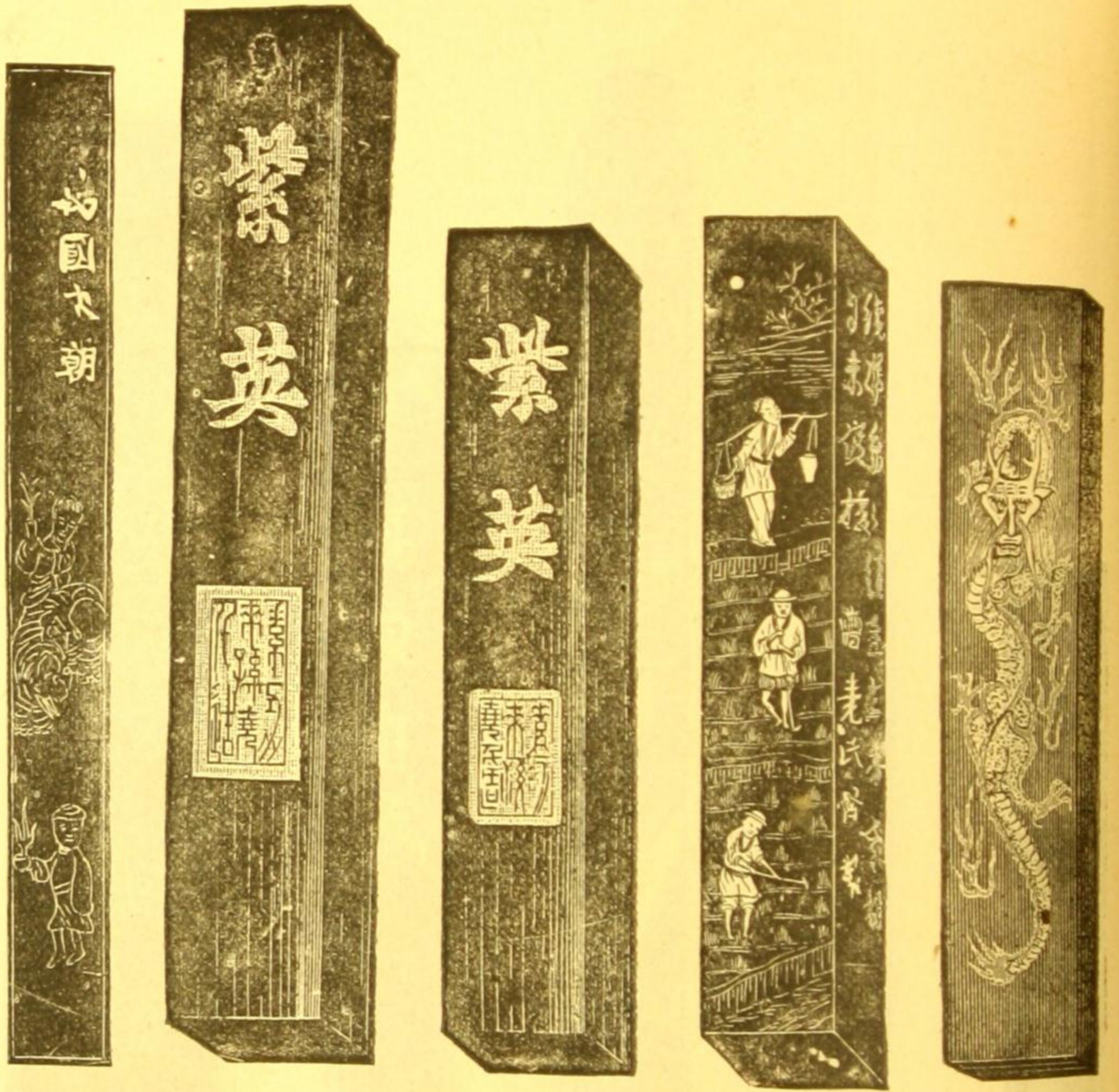
A 1200.                      A 1201A.                      A 1201c.                      A 1202.                      A 1203A.

No.	DESCRIPTION	PRICE.
A 1200	INDIA INK, square, black, gilt figures, 2 inches long, each,	\$0.10
A 1201A.	ROUND LION'S HEAD, gilt, 2½ inches long,	.25
A 1201B.	Do. do. do. 3 inches do.	.40
A 1201c.	Do. do. do. 4 inches do.	.75
A 1202A.	OVAL LION'S HEAD, black, 2½ inches long,	.25
A 1202B.	Do. do. do. 3 inches do.	.40
A 1202C.	Do. do. do. 4 inches do.	.75
A 1203A.	SQUARE, black, gilt figures, 3¼x¾x¾ inches,	1.50

ood handles, fine quality.

Quills, fine quality.

INDIA INKS.



A 1203 B.

A 1204 A.

A 1204 B.

A 1205.

A 1206.

No.		PRICE
A 1203 B.	SQUARE, black, gilt figures, $3\frac{3}{4} \times 2\frac{3}{8} \times \frac{3}{8}$ , . . . . .	\$0.75
A 1204 A.	BLACK, gilt figures, super super, . . . . .	1.50
A 1204 B.	Do. do. do. small, . . . . .	.75
A 1205.	BLACK, gilt figures, $3 \times \frac{1}{2} \times \frac{1}{2}$ , . . . . .	1.25
A 1206.	BLACK, gilt, and blue figures, with pearl, $2\frac{3}{4} \times \frac{5}{8} \times \frac{3}{8}$ , . . . . .	2.00



INDIA INKS.



A 1205.



A 1206.



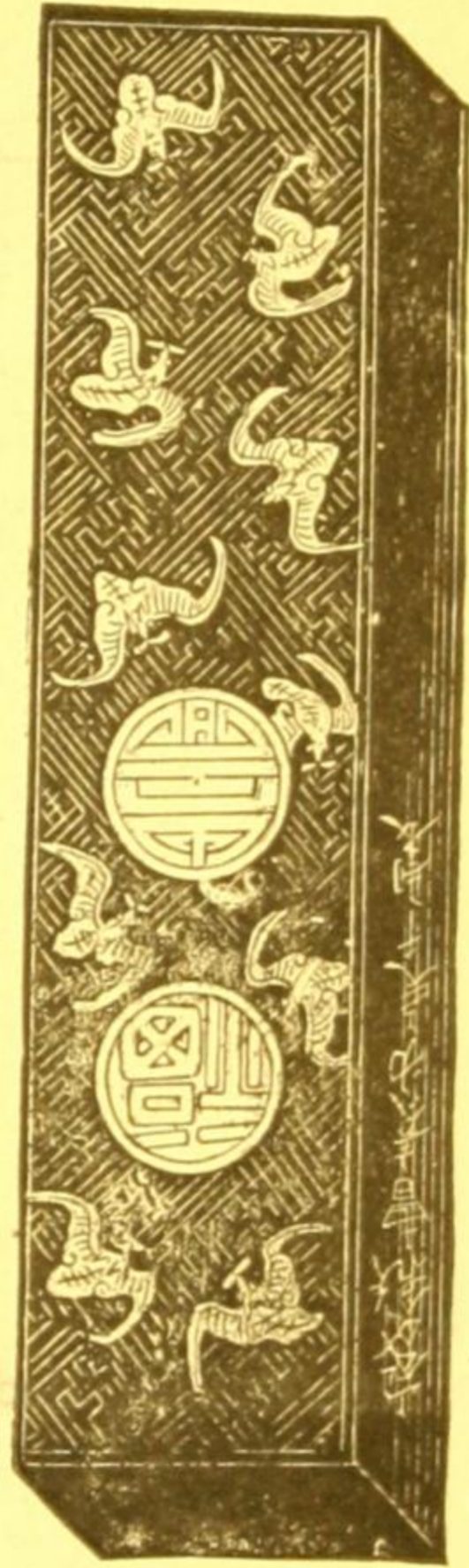
A 1207.



A 1208.



A 1209.



A 1210.

No.		PRICE.
A 1207.	ROUND LION'S HEAD, black, gilt, and silver figures, $4 \times \frac{5}{8}$ ,	\$2.00
A 1208.	HEXAGONAL, black, gilt, and silver figures, $3 \frac{3}{4}$ inches long,	2.50
A 1209.	GILT OBLONG, $2 \frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$ , fine,	3.00
A 1210.	BLACK, gilt, and silver figures, $3 \frac{1}{4} \times \frac{7}{8} \times \frac{3}{8}$ ,	4.00

INDIA INKS.



A 1211.

No.		PRICE.
A 1211.	OBLONG, black, gilt and colored figures, very fine, $4 \times 1 \frac{3}{8} \times 1 \frac{1}{2}$ . . .	\$10.00

CHINESE COLORED INKS.

	A 1212 A.	
A 1212 A.	INDIA BLUE (Ultramarine), per cake, . . . . .	.75
	B. INDIA BROWN (Bt. Sienna), . . . . .	.75
	C. INDIA YELLOW (Chrome), . . . . .	.75
	D. INDIA RED (Vermilion), . . . . .	.75
	E. INDIA LAKE (Crimson), . . . . .	1.00

# WINSOR & NEWTON'S WATER COLORS.

HARD COLORS IN CAKES OR MOIST IN CHINA PANS.



Whole Cake.

Half Cake.



Whole Pan.

A 1220.

Half Pan.

A 1220. Whole cakes or pan, 25 cents each; half cakes or pan, 15 cents each.

Antwerp Blue,  
 Bistre,  
 Blue Black,  
 \* British Ink  
 Brown Ochre,  
 Brown Pink,  
 \* Bronze,  
 Burnt Sienna,  
 Burnt Umber,  
 Chinese White,  
 Chrome Yellow,  
 Cologne Earth,  
 Deep Chrome,  
 \* Dragon's Blood,  
 Emerald Green,  
 \* Flake White,

Gamboge,  
 Hooker's Green, No. 1,  
 Hooker's Green, No. 2,  
 Indigo,  
 Indian Red,  
 Italian Pink,  
 Ivory Black,  
 \* King's Yellow,  
 Lamp Black,  
 Light Red,  
 Naples Yellow,  
 Neutral Tint,  
 New Blue,  
 Olive Green,  
 Orange Chrome,  
 Payne's Gray,

Prussian Blue,  
 Prussian Green,  
 Raw Sienna,  
 Raw Umber,  
 Red Chalk,  
 \* Red Lead,  
 \* Red Ochre,  
 Roman Ochre,  
 Sap Green,  
 Terre Verte,  
 Vandyke Brown,  
 Venetian Red,  
 Vermilion,  
 Yellow Lake,  
 Yellow Ochre.

A 1221. Whole cakes or pan, 45 cents each; half cakes or pan, 25 cents each.

\* Black Lead,  
 Brown Madder,  
 \* Chalon's Brown,  
 \* Constant White,  
 Crimson Lake,

Indian Yellow,  
 Mars Yellow,  
 Neutral Orange,  
 Purple Lake,  
 Roman Sepia,

Reuben's Madder,  
 Scarlet Lake,  
 Scarlet Vermilion,  
 Sepia,  
 Warm Sepia,

A 1222. Whole cakes or pan, 65 cents each; half cakes or pan, 35 cents each.

Cobalt Blue,

Orange Vermilion,

Violet Carmine.

A 1223. Whole cakes or pan, 90 cents each; half cakes or pan, 45 cents each.

Aureolin,  
 Burnt Carmine,  
 Cadmium Yellow,  
 Cadmium Orange,  
 Carmine,  
 French Blue,

Gallstone,  
 Green Oxide of Chromium,  
 Indian Purple,  
 Intense Blue,  
 Lemon Yellow,

Pale Cadmium Yellow,  
 Pink Madder,  
 Pure Scarlet,  
 Rose Madder,  
 Viridian.

A 1224. Whole cakes or pan, \$1.40 each; half cakes or pan, 70 cents each.

\* Field's Orange Vermilion,  
 \* Madder Carmine,

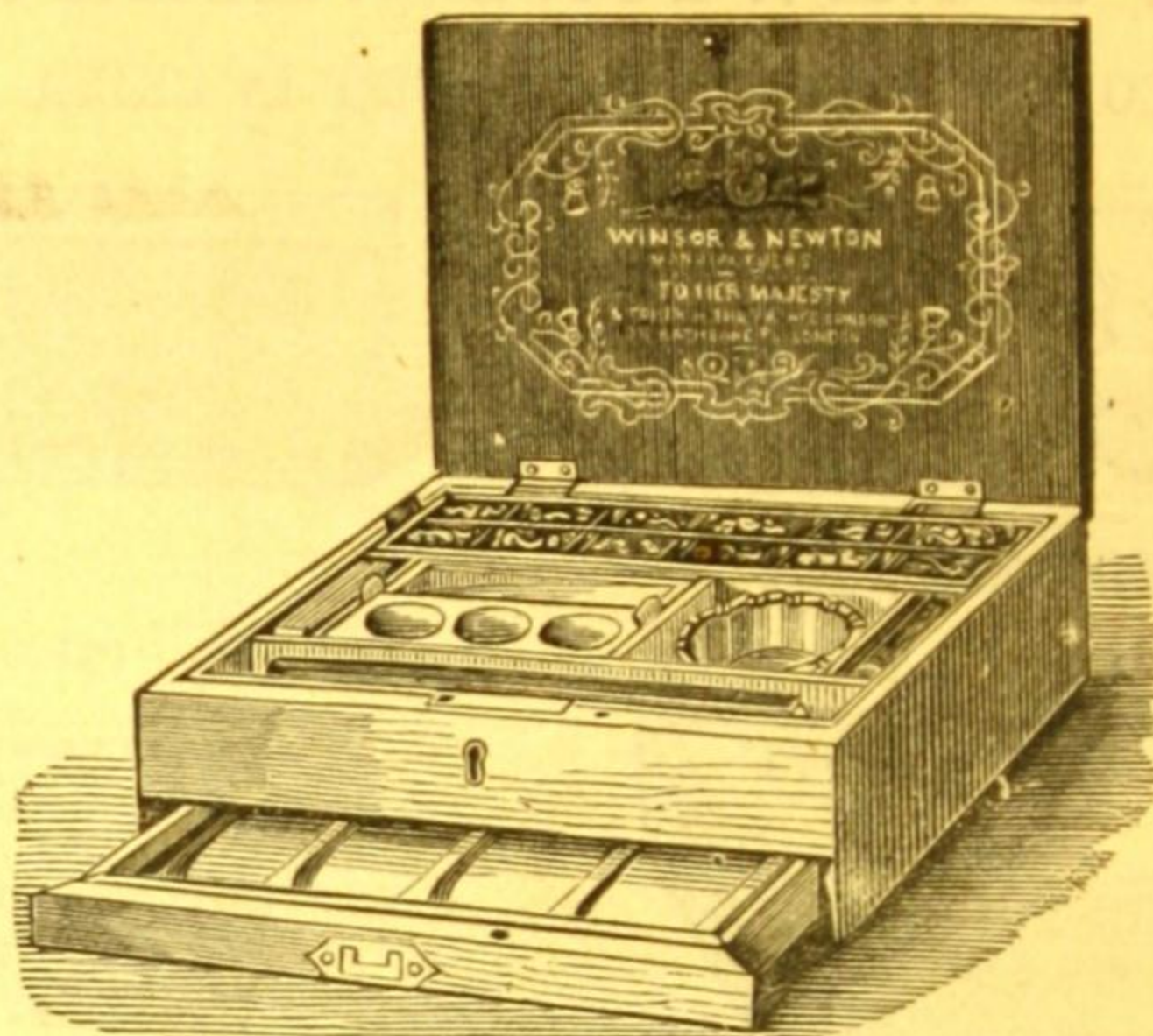
Mars Orange,  
 Purple Madder,

Smalt,  
 Ultramarine Ash.

Genuine Ultramarine,  $\frac{1}{4}$  cakes, each \$2.25. Pure Gold in cakes, \$2.50; in cups 25 cents; in shells, 20 cents.

Colors not made in pans are marked \*.

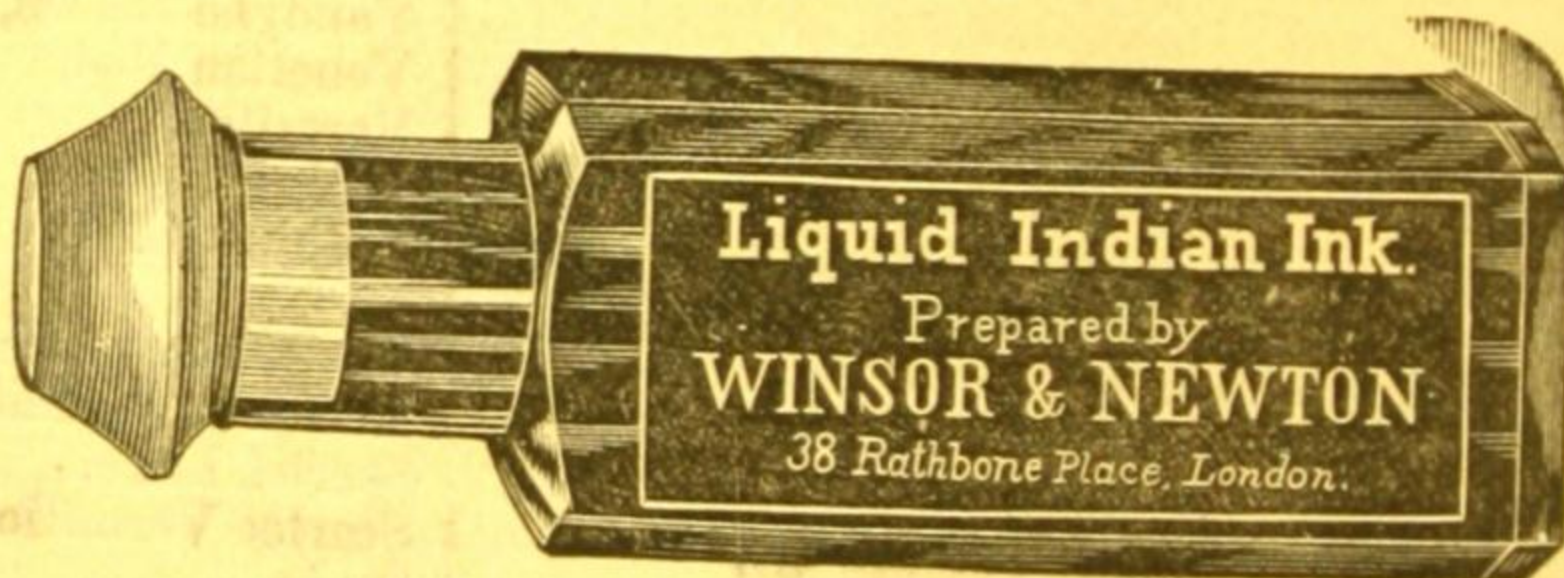
WINSOR & NEWTON'S WATER COLOR BOXES COMPLETE.



A 1225.

No.	Description	Whole cakes. PRICE	Half cakes. PRICE.
A 1225.	Polished Mahogany Box, with lock and key and drawer, paint-stone, water-glass, India-ink, brushes, and 12 colors	\$12.00	
A 1226.	Do. do. do. do. 18 do.	16.00	\$12.00
A 1227.	Do. do. do. do. 24 do.	20.00	15.00
A 1228.	Polished Mahogany Box, with sliding lid and 12 do.	5.00	3.00
A 1229.	Do. do. do. do. 18 do.	7.50	4.25

LIQUIDS, IN GLASS BOTTLES.



No.	Description	Price
A 1235.A.	Carmine,	.45
B.	Indelible Brown Ink,	.45
C.	Prout's Brown,	.45
D.	Gold Ink,	.65
E.	Extract of Ox Gall,	.35
F.	Indian Ink,	.35
G.	Chinese White,	.35
H.	Sepia,	.45
I.	Silver Ink,	.40
J.	Ox Gall, prepared in pots,	.20
K.	Pure Gold, in cakes,	2.00
L.	Do. in cups,	.25
M.	Do. in shells,	.20
N.	Silver Cakes, in cups,	.35
O.	Do. in shells,	.15

PHILADELPHIA.  
DRAWING BOXES COMPLETE

## QUEEN & CO.'S STANDARD TECHNICAL WATER COLORS.

After many experiments, we have at last perfected a series of technical colors that we believe will meet a want long felt among draughtsmen for a ready-mixed standard color of fine grade, suitable for all branches of mechanical drawing.

The advantages we claim for these colors are:

1. All time usually spent in mixing colors to proper shade is saved, and uniformity in tint is invariably produced.
2. The colors have been very carefully prepared, and are standard, such being universally used in all branches of mechanical drawing both in Europe and the United States.
3. They are made of the finest quality of water colors, and being put in moist form in pans, are always ready for use, and the liability to crumble of the cake colors is avoided.

The set described below contains the colors generally used by Architects, Machinists, Civil and Mechanical Engineers.

A 1236.		Whole Pan.	Half Pan.			Whole Pan.	Half Pan.
No.		Each.	Each.	No.		Each.	Each.
1.	Copper, . . .	\$0.40	\$0.25	9.	Lamp Black, . . .	\$0.25	\$0.15
2.	Brass, . . .	.40	.25	10.	Machinery Green, . . .	.40	.25
3.	Steel, . . .	.40	.25	11.	Vermilion, . . .	.25	.15
4.	Wrought-iron, . . .	.40	.25	12.	Leather, . . .	.40	.25
5.	Cast iron, . . .	.40	.25	13.	Prussian Blue, . . .	.25	.15
6.	Brick, . . .	.40	.25	14.	Carmine, . . .	1.15	.60
7.	Stone, . . .	.40	.25	15.	Chinese White, . . .	.25	.15
8.	Wood, . . .	.40	.25				
Set complete in Japanned Tin Box, 15 full pans, . . . . .							\$7.50
Do. do. do. half do. . . . .							5.00

### LIST OF COLORS.

Universally used in all branches of mechanical draughting, both in Europe and the United States.

- |                  |                      |                    |
|------------------|----------------------|--------------------|
| 1. Copper.       | 6. Brick.            | 11. Vermilion.     |
| 2. Brass.        | 7. Stone.            | 12. Leather.       |
| 3. Steel.        | 8. Wood.             | 13. Prussian Blue. |
| 4. Wrought-iron. | 9. Lamp Black.       | 14. Carmine.       |
| 5. Cast-iron.    | 10. Machinery Green. | 15. Chinese White. |

Nos. 1 to 8 to be diluted as may be required for light and dark shadows on machinery, stone, brick, wood, etc.

No. 9 may also be used for ink lines, the same as India ink.

No. 10 color used in painting machinery, to obviate both rust and cleaning.

NOTE.—All designed fractures or cross-sectional parts of steel, copper, wrought-iron, cast-iron, stone, brick, wood, etc., may be shown by a lighter or darker tint than that in which it is colored, or by consecutive parallel lines of same color.

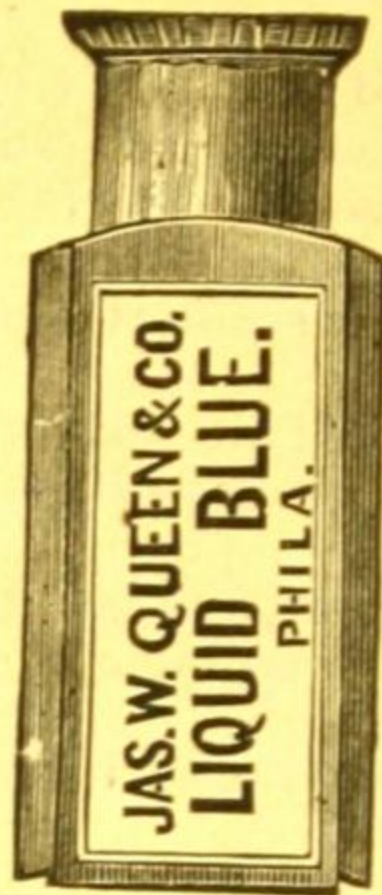
“Standard Colors.”

THEO. P. V. FAY,  
Chief Draughtsman to the P. & R. R.

Whole cakes. Price  
Half cakes. Price  
and drawer, \$12.00  
and 12 colors \$12.00  
18 do. 16.00  
24 do. 20.00  
and 12 do. 5.00  
18 do. 7.50



QUEEN'S COLORED INKS.



A 1237.



A 1240.

No.		PRICE.
A 1237.	Liquid Blue, per bottle, . . . . .	\$0.25
A 1238.	Do. Green, per bottle, . . . . .	.25
A 1239.	Do. Carmine, per bottle, . . . . .	.50

These Inks are especially recommended, being the only good liquid blue and green colors now in the market. The blue, especially, is very superior, being very brilliant and permanent.

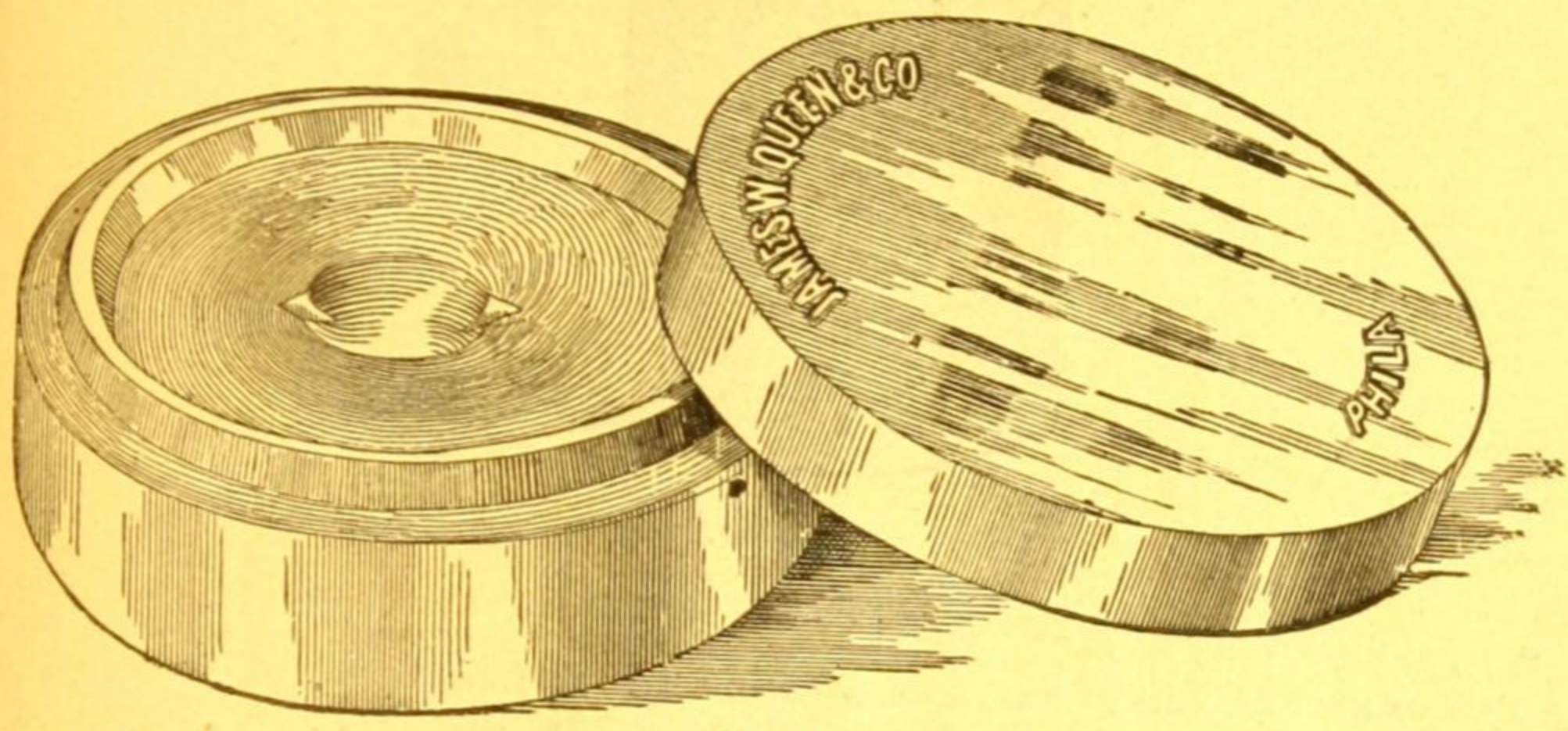
HIGGINS' AMERICAN DRAWING INKS.

A 1240.	No. 1.—General Drawing Ink, which is suitable for all general drawing, whether lines or tints, or for pen or brush work. This quality is almost identical with the finer kinds of India ink, but is much preferable, in being already fluid and in being finer and blacker. Per bottle,	.25
A 1241.	No. 2.—Waterproof Drawing Ink. This ink is best for all working, architectural, map, or other drawing designed to stand moisture, rough handling, or washing over with colors. <i>Lines drawn with this ink will resist washing immediately after drying.</i> It is not recommended for brush shading, but for lining or solid black work is superb. It is the best ink for Whatman's or other hard papers, on which it flows freely, giving fine solid black lines. Per bottle,	.25
A 1242.	Higgins' Blue Ink, . . . . .	.40
A 1243.	Do. Green Ink, . . . . .	.40
A 1244.	Do. Carmine Ink, . . . . .	.50

Higgins' Colored Inks, which have just been introduced, sustain the reputation acquired by the well-known American drawing-inks.

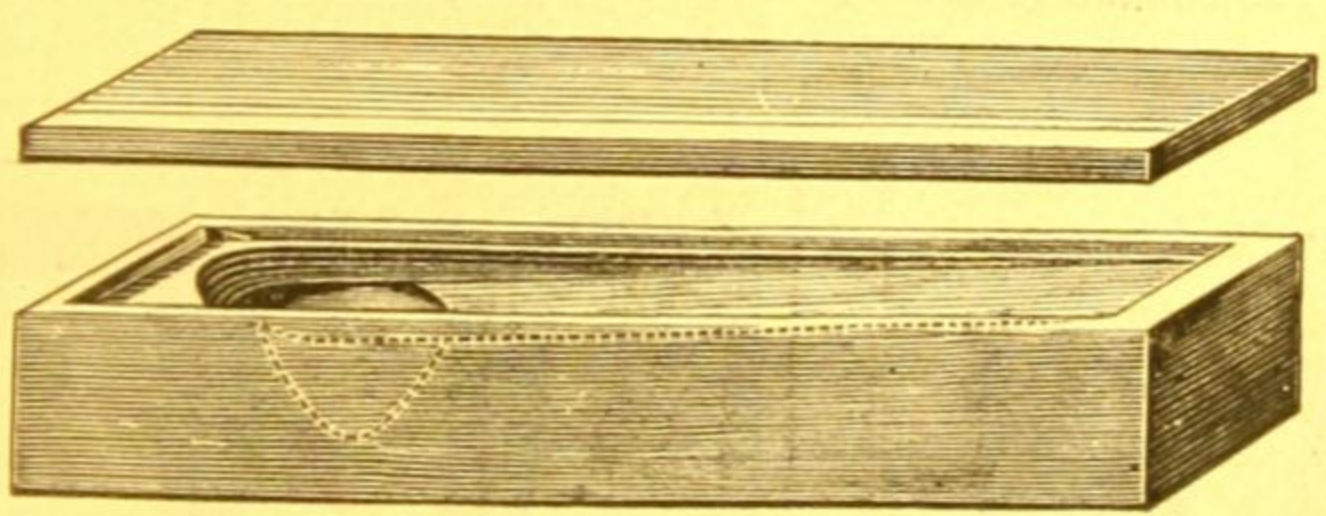
# ARTISTS' CHINA AND GLASS WARE.

## PHILADELPHIA INK SAUCER.



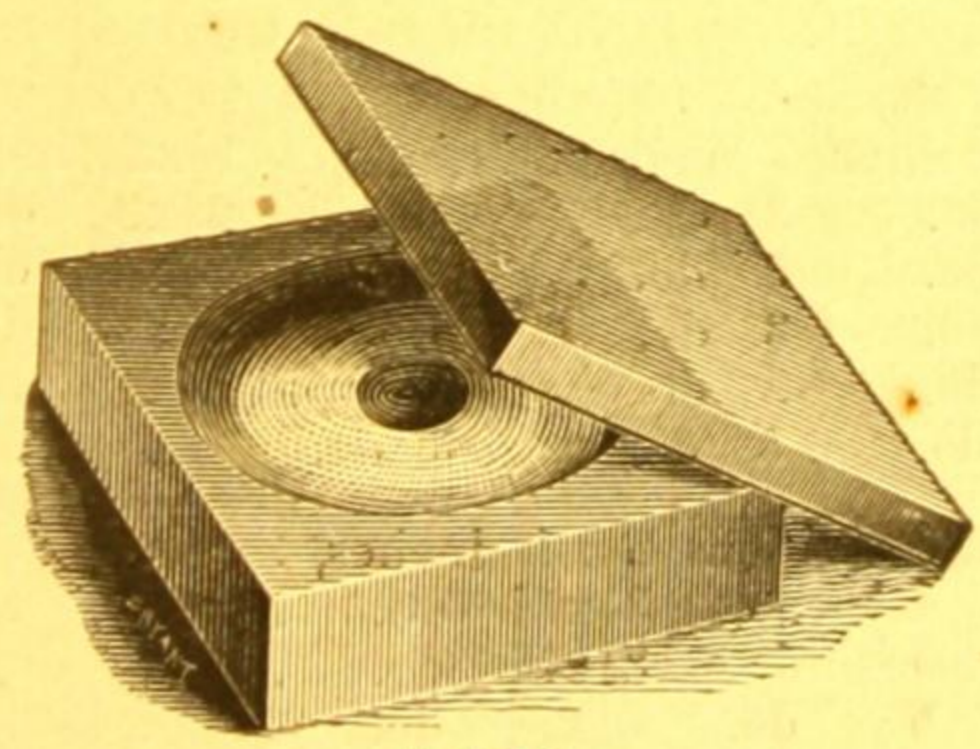
A 1245.

No.		PRICE.
A 1245.	PHILADELPHIA INK SAUCER, 3½ inches diameter, with cover, made of specially prepared milk-white glass, with ground edges, preventing evaporation when closed. Furnished with either rough or smooth grinding surface, as may be desired, each, . . . . .	\$0.50



A 1246.

A 1246.	PATENT INK SLAB, with cover, 1¾x4½ inches, each, . . . . .	.50
A 1247.	Do. do. do. 2½x5¼ do. . . . .	.60



A 1248.

A 1248.	SLATE INK SLAB, with plate-glass cover, each, . . . . .	.50
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Price  
 \$0.25  
 .35  
 .50

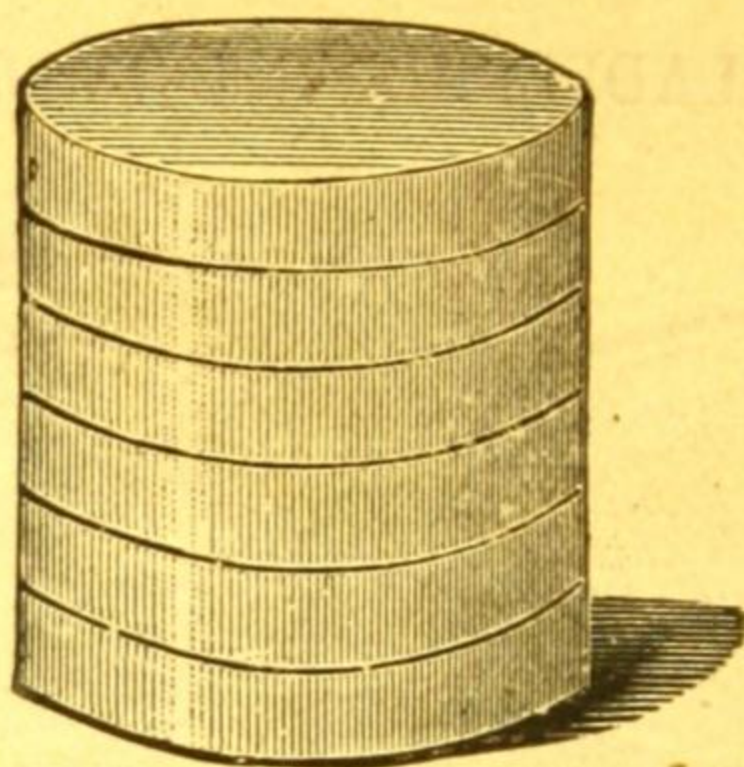
liquid blue and green  
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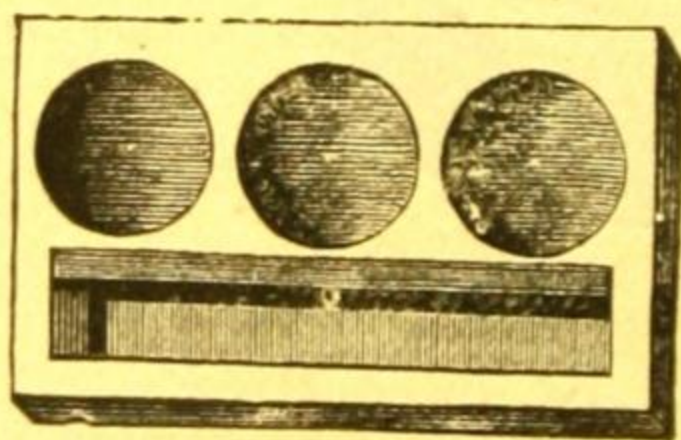
CABINET NESTS.



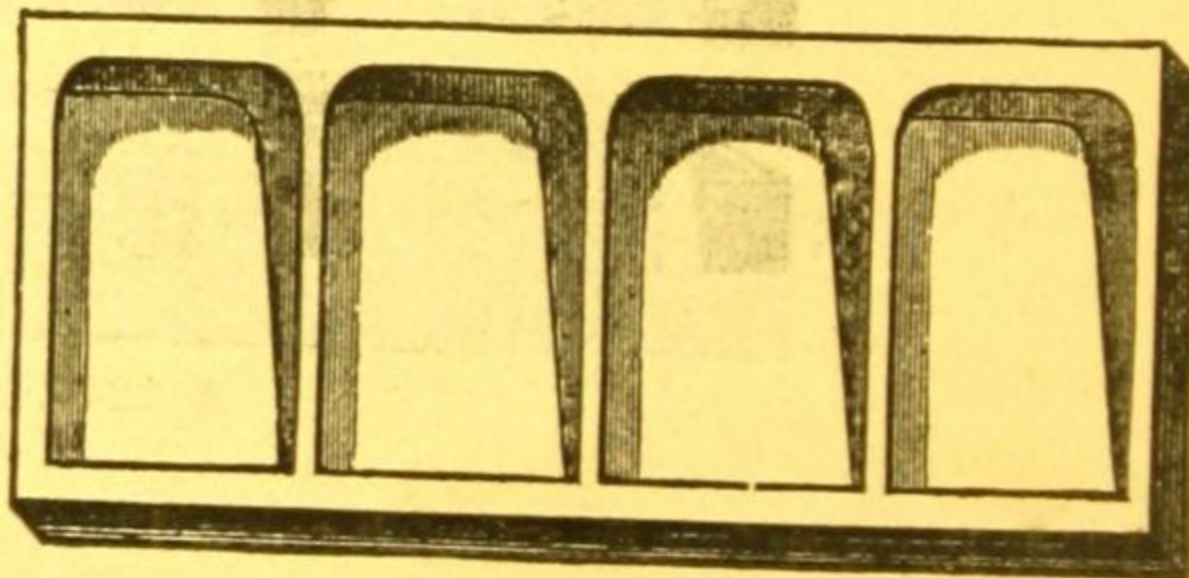
A 1249.

No.					PRICE.
A 1249.	NEST OF CABINET SAUCERS,	6 in set,	2 <sup>3</sup> / <sub>8</sub> inch,		\$0.60
A 1250.	Do. do.	6 do.	2 <sup>5</sup> / <sub>8</sub> do.		.70
A 1251.	Do. do.	6 do.	3 <sup>1</sup> / <sub>4</sub> do.		.80
A 1252.	Do. do.	6 do.	3 <sup>3</sup> / <sub>4</sub> do.		1.00
A 1253.	Do. do.	deep, 4 do.	2 <sup>5</sup> / <sub>8</sub> do.		1.20
A 1254.	Do. do.	do. 4 do.	3 <sup>1</sup> / <sub>4</sub> do.		1.50
A 1255.	Do. do.	do. 4 do.	3 <sup>3</sup> / <sub>4</sub> do.		1.75

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



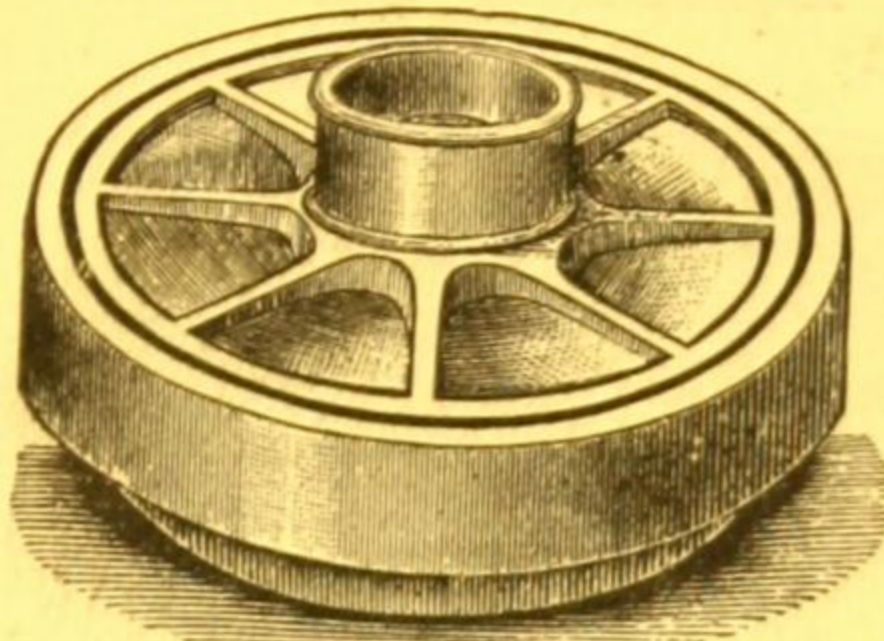
A 1256.



A 1262.

A 1256.	INK OR COLOR SLAB,	3 Wells and Slope,	1 <sup>1</sup> / <sub>2</sub> x2 <sup>3</sup> / <sub>4</sub> inches,	each,	.15
A 1257.	Do. do.	3 do. do.	2 <sup>3</sup> / <sub>8</sub> x3 <sup>5</sup> / <sub>8</sub> do.	do.	.25
A 1258.	Do. do.	3 do. do.	2 <sup>3</sup> / <sub>4</sub> x4 <sup>1</sup> / <sub>2</sub> do.	do.	.30
A 1259.	Do. do.	3 do. do.	3 x4 <sup>1</sup> / <sub>2</sub> do.	do.	.35
A 1260.	Do. do.	3 do. 3 Slopes,		do.	.25
A 1261.	Do. do.	5 do. 5 do.		do.	.70
A 1262.	SLOPING TILE,	3 divisions,	2 <sup>1</sup> / <sub>2</sub> x4 inches,		.20
A 1263.	Do. 4	do. 3 <sup>1</sup> / <sub>8</sub> x7 <sup>3</sup> / <sub>8</sub>	do.	do.	.35
A 1264.	Do. 5	do. 3 <sup>1</sup> / <sub>8</sub> x7	do.	do.	.45
A 1265.	Do. 6	do. 3 <sup>1</sup> / <sub>8</sub> x7	do.	do.	.55
A 1266.	Do. 8	do. 6 x7	do.	do.	.70
A 1267.	Do. 10	do. 6 x7	do.	do.	1.00
A 1268.	Do. 12	do. 6 x7	do.	do.	1.20





A 1269.

No. **A 1269. ARCHITECT'S SLANT AND BASIN, with 8 divisions and cup, each, .** PRICE. \$1.35

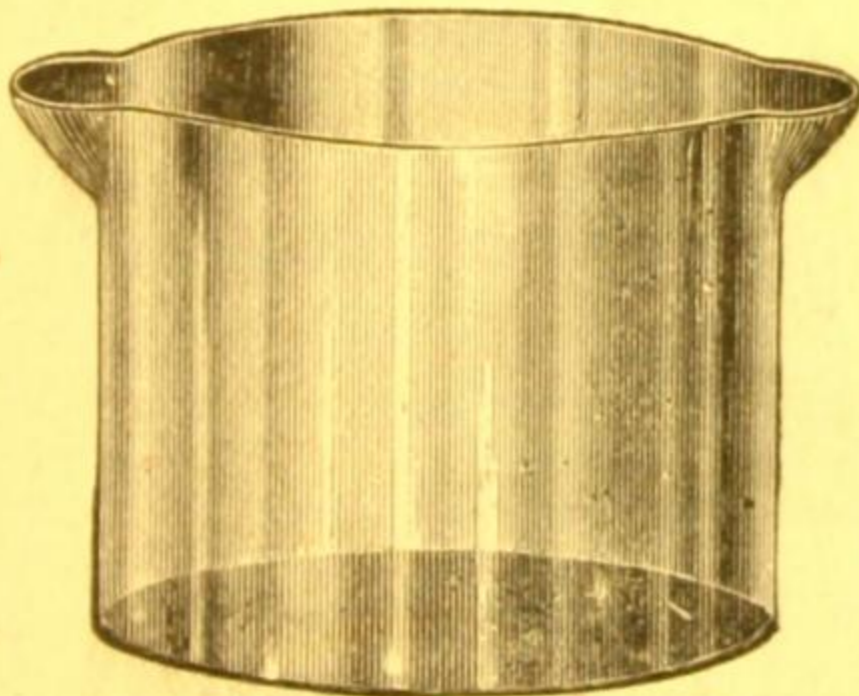


A 1270.

**A 1270. CHINA COLOR CUPS, 1½, 2, 2½, 3, 3½ inch diameter, 6, 10, 15, 25, 30 cents each.**

A 1271.

**A 1271. BRUSH REST, 5½ inches long, each, . . . . . .15**



A 1272.



A 1276.

**A 1272. ARTIST'S WATER GLASS, 2¾-inch diameter, each, . . . . .15**  
**A 1273. Do. do. 3¼ do. do. . . . .25**  
**A 1274. Do. do. 3¾ do. do. . . . .35**  
**A 1275. Do. do. 4¼ do. do. . . . .45**  
**A 1276. ARTIST'S SPONGE GLASS, each, . . . . .10**

PRICE  
 .60  
 .70  
 .80  
 1.00  
 1.20  
 1.50  
 1.75

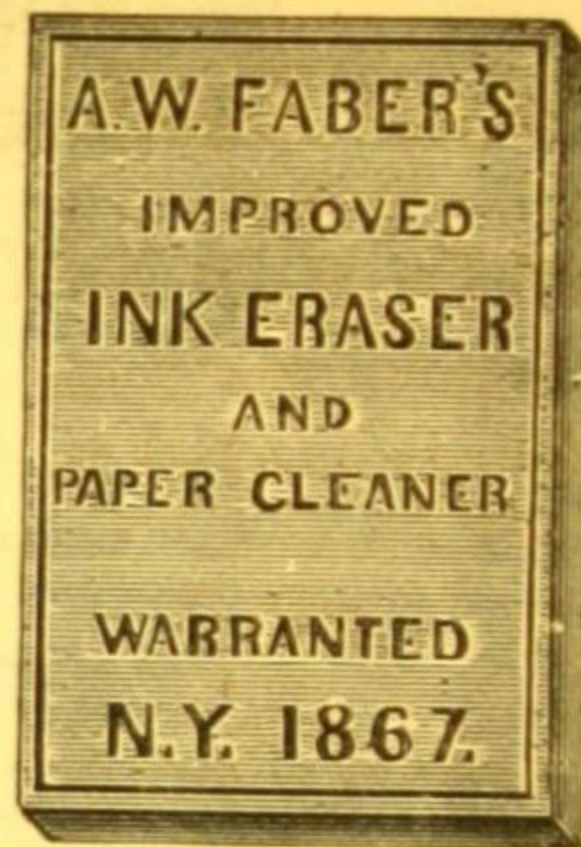
and cover.



.15  
 .25  
 .30  
 .35  
 .25  
 .70  
 .20  
 .35  
 .45  
 .55  
 .70  
 1.00  
 1.20



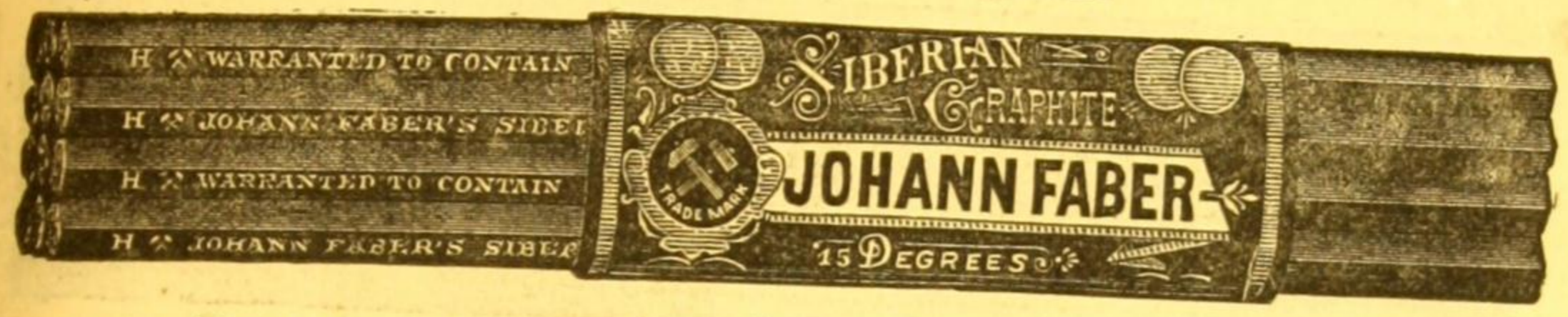
A 1291.



A 1293.

No.					PRICE.
A 1291.	A. A. W. FABER'S	COMBINED INK AND PENCIL ERASER,	small, each,		\$0.20
A 1292.	B. Do.	do.	do.	large, do.	.30
A 1293.	A. W. Faber's	Improved Ink Eraser,	small, 5 cents;	large,	.10
A 1294.	FABER'S	PENCIL ERASER and Brush Combined,	small, each,		.18
A 1295.	Do.	do.	do.	large, do.	.30
A 1296.	COUTE'S	PENCIL AND INK ERASING STUMPS,	wooden centre,		
A 1297.	Do.	do.	do.	small, each,	.13
A 1298.	Do.	do.	do.	wooden centre, medium, each,	.20
A 1299.	SPONGE RUBBER,	for cleaning drawings,	1 x1 x1, each,		.30
A 1300.	Do.	rubber back,	2½ x1¾ x½,	do.	.10
A 1301.	Do.		2 x4 x1,	do.	.25
A 1302.	Do.		6 x4 x1,	do.	.60
A 1303.	NIGRIVORINE	ERASER AND BLENDER,	all rubber, pointed on both ends, small size, each,		1.50
A 1304.	Do.	do.	do.	No. 2, each,	.05
A 1305.	Do.	do.	do.	No. 3, do.	.07
A 1306.	RUBBER TIPS,	Hexagon, each,			.10
A 1307.	MOUTH GLUE,	per dozen,			.02
A 1308.	Do.	fine perfumed, per dozen,			.40
A 1309.	PENCIL POINTER,	sand-paper tablet, 2 x2½ inches,			.75
A 1310.	Do.	do.	1½ x4	do.	.10
A 1311.	Do.	do.	2½ x4	do.	.12
A 1312.	PENCIL POINTER,	wooden handle, 2 x2½	do.		.15
A 1313.	Do.	do.	1½ x4	do.	.15
A 1314.	Do.	do.	2½ x4	do.	.15
					.20

# LEAD PENCILS.



## JOHANN FABER'S NEW SIBERIAN LEAD PENCILS.

A-1821. Warranted to contain SIBERIAN GRAPHITE and degree, 6 B, 5 B, 4 B, 3 B, 2 B, B, HB, F, H, 2 H, 3 H, 4 H, 5 H and 6 H, each, 15 cents; per dozen . . . . . \$1 25

## SIBERIAN PENCILS IN DRAWING SETS.

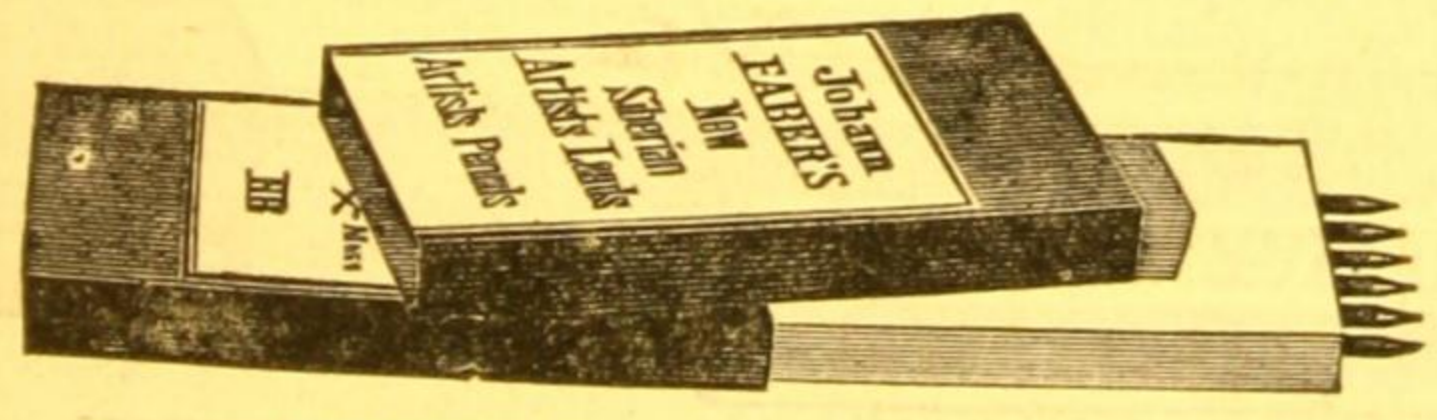
JOHANN FABER'S SIBERIAN PENCILS, 5 in a box . . . . .	\$1 00
“ “ “ 7 “ . . . . .	1 25
“ “ “ 10 “ . . . . .	1 60
“ “ “ 5 “ . . . . .	1 25

With knife and rubber.



## SIBERIAN ARTISTS' PENCILS.

6 H-6 B, each . . . . . \$ 30  
 Double-pointed ends, F and 2 H, 2 B and HB, each . . . . . 40



## SIBERIAN ARTISTS' LEADS.

6 B-6 H, in boxes of six leads, per box . . . . . \$ 60

A W. FABER'S  
 IMPROVED  
 INK ERASER  
 AND  
 PAPER CLEANER  
 WARRANTED  
 N.Y. 1867.

A 1293.

PENCIL ERASER, small, each  
 do. large, do.  
 5 cents; large,  
 combined, small, each,  
 large, do.  
 STUMPS, wooden centre,  
 small, each,  
 wooden centre,  
 medium, each,  
 wooden centre,  
 large, each,  
 xl xl, each,  
 xl xl, do.  
 xl xl, do.  
 xl xl, do.  
 rubber, pointed on both  
 small size, each,  
 do. No. 2, each,  
 do. No. 3, do.

inches,  
 do.  
 do.  
 do.  
 do.  
 do.

JOHANN FABER'S NEW POLYGRADE PENCILS.



Round, black polished, gold, No. 1, 2, 3, 4 (round gilt), per dozen . . . . . \$ 50



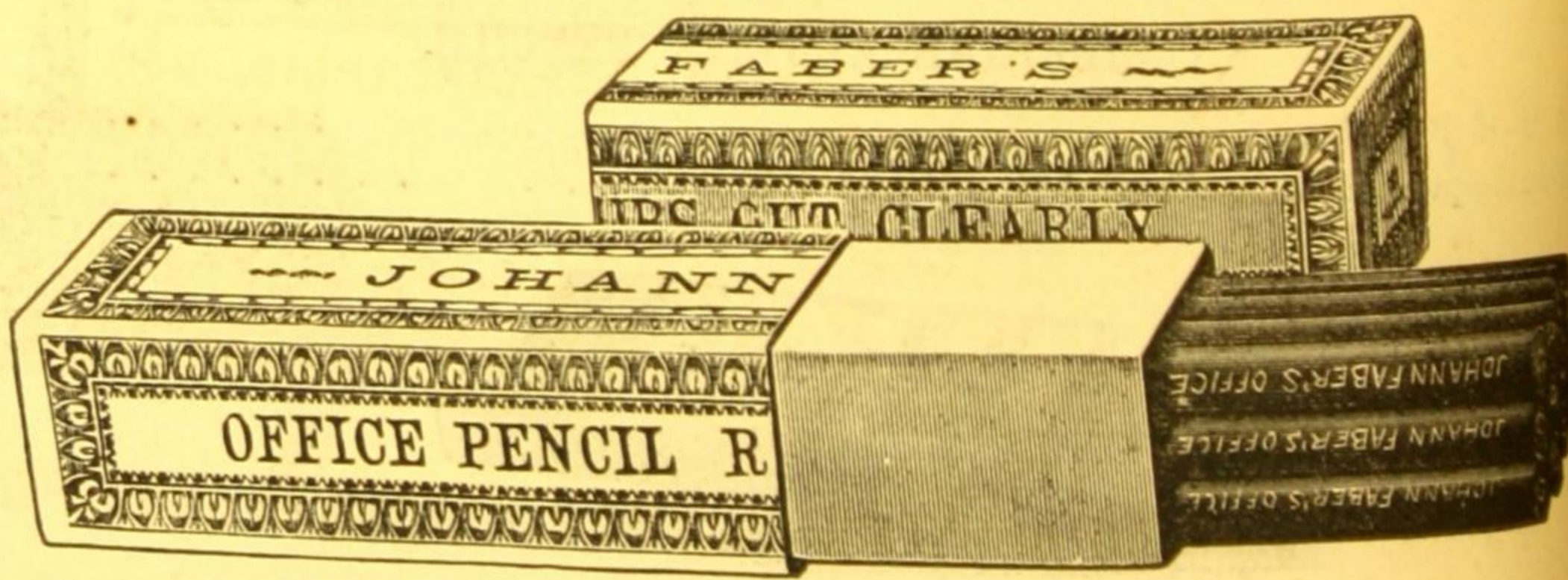
Hexagon, red polished, gold, No. 1, 2, 3, 4, 5 (hexagon gilt), per dozen . . . \$ 75



Finest and best Hexagon, red polished, gold, 6 B—6 H, per dozen . . . . . \$1 00  
Round, natural polished, silver, 4 B—4 H (English round), per dozen . . . . . 50

JOHANN FABER'S NEW PENCILS IN CEDAR.

Hexagon, red polished, silver stamp, No. 1, 2, 3 (red silver), per dozen . . . \$ 40  
" black stained cedar, red polished, silver stamped Dessin, No. 1, 2, 3, 4 (Dessin silver), per dozen . . . . . 60



JOHANN FABER'S NEW OFFICE PENCIL.

1 dozen in pull-off box, per dozen . . . . . \$ 75

CO., PHILADELPHIA.

POLYGRADE PENCILS



(round gilt), per dozen . . . . .



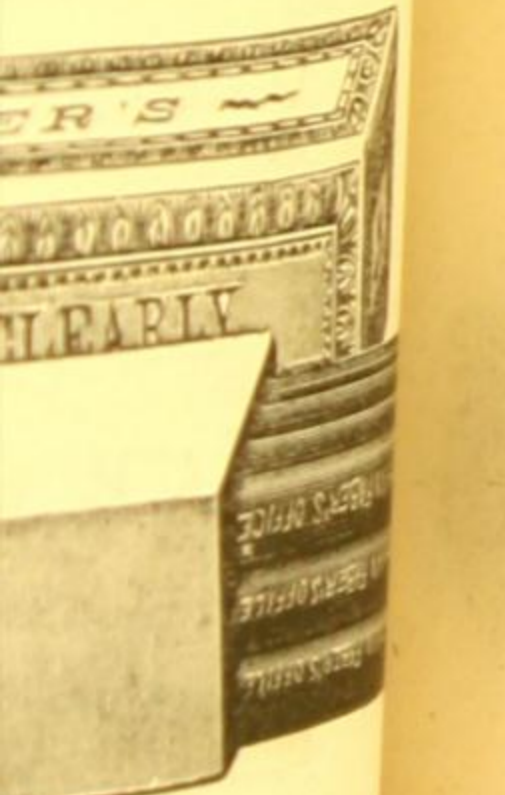
5 (hexagon gilt), per dozen . . . . .



6 B-6 H, per dozen . . . . .  
(English round), per dozen . . . . .

PENCILS IN CEDAR

3 (red silver), per dozen . . . . .  
silver stamped Dessin, No. 1 . . . . .



OFFICE PENCIL

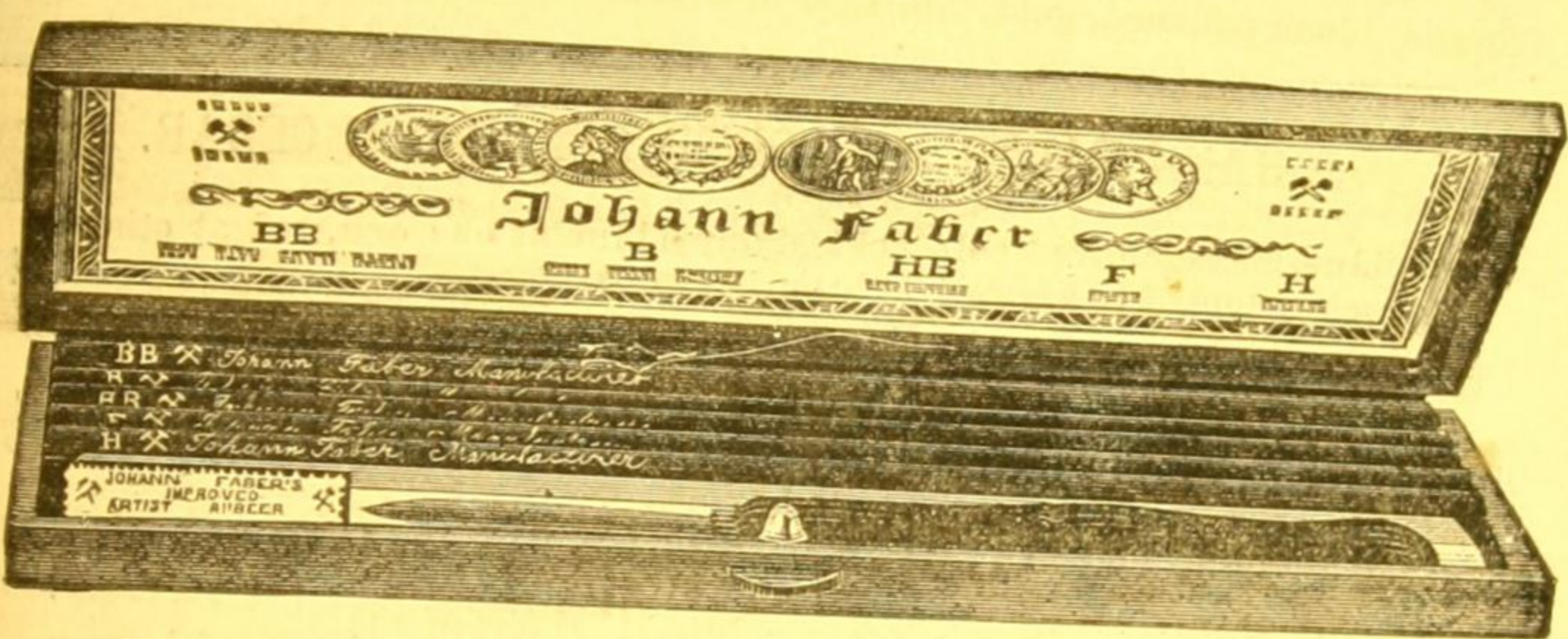
JAMES QUEEN & CO., PHILADELPHIA.

C-130

### JOHANN FABER'S POLYGRADE ARTISTS' PENCILS.

WITH MOVABLE LEADS.

Hexagon, red polished, gold stamp, No. 1, 2, 3, 4, 5, each . . . . .	25
Artists' Leads for the above, Nos. 1, 2, 3, 4, 5, 6 leads in a box, per box . . . . .	50

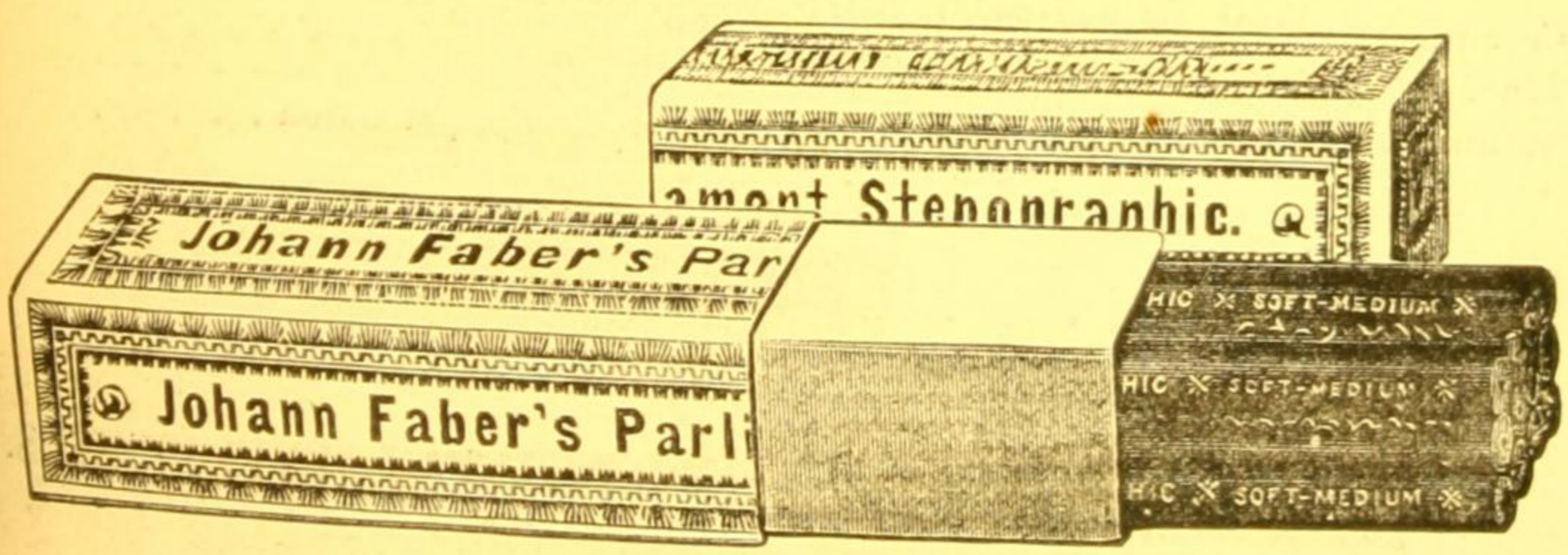


### JOHANN FABER'S DRAWING SETS.

CONTAINING

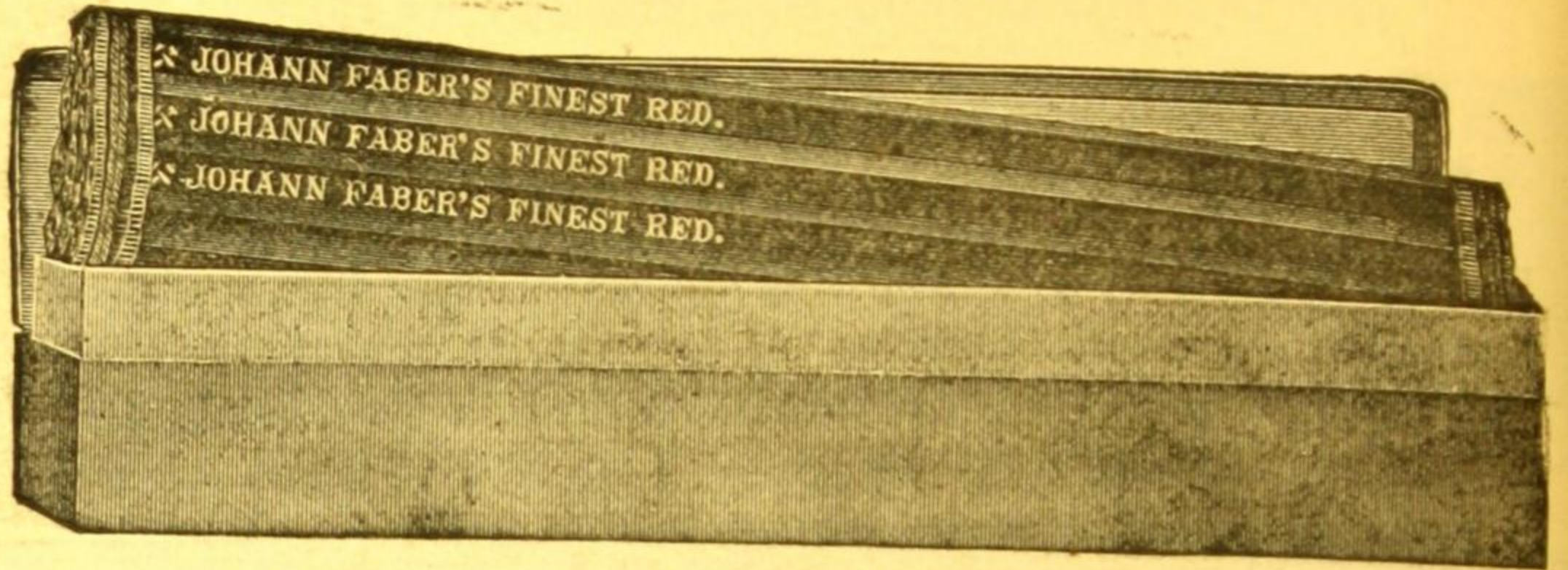
4 Round gilt, No. 1, 4, in pull-off card-board case, each . . . . .	25
5 English, natural polished, silver, in wood case, " . . . . .	50
7 " " " " " " . . . . .	65
5 " " " " " " . . . . .	75

With knife and rubber.



### JOHANN FABER'S NEW PARLIAMENT STENOGRAPH LEAD PENCILS.

In 4 degrees—soft, soft medium, medium, hard—round, gold stamped per doz., \$	75
" " " " " " hexagon, " " "	30



JOHANN FABER'S COLORED PENCILS IN CEDAR.

Red and blue, hexagon, red pol., gold stamp (blue at one end, red at other), 9 inches long, in boxes of 1 dozen, per dozen . . . . .	\$1 25
Carmine pencils, hexagon, red pol., gold stamp, 7 inches long, in boxes of 1 dozen, per dozen . . . . .	1 00
Blue pencils, hexagon, blue pol., gold stamp, 7 inches long, in boxes of 1 dozen, per dozen . . . . .	1 00
Red pencils, round, red pol., gold stamp, 7 inches long, in boxes of 1 dozen, per dozen . . . . .	80
Blue pencils, round, blue pol., gold stamp, 7 inches long, in boxes of 1 dozen, per dozen . . . . .	75
Green pencils, round, green pol., gold stamp, 7 inches long, in boxes of 1 dozen, per dozen . . . . .	75

NEW TRIANGULAR RED AND BLUE PENCILS IN CEDAR.

Carmine, triangular, red polished, silver stamp, per dozen . . . . .	\$1 00
Blue, " blue " " " . . . . .	1 00
Carmine and blue triangular, red polished, silver stamp, per dozen . . . . .	1 00

JOHANN FABER'S WAX CRAYONS OR CRETA LAEVIS PENCILS.

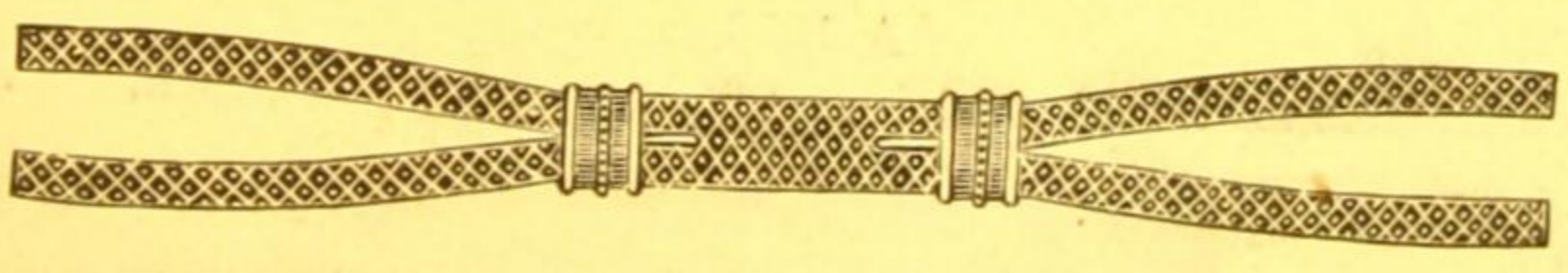
(48 SHADES.)

Box containing 6 wax crayons, polished, each . . . . .	75
" 12 " " " " . . . . .	1 50
" 18 " " " " . . . . .	2 00
" 24 " " " " . . . . .	2 50

### CRAYONS.

No.						PRICE.
A 1333.	BLACK CONTÉ CRAYONS,	in wood,	Nos. 1 and 2,	per dozen,	.	\$0.60
A 1334.	Do.	do.	do.	do.	.	.90
A 1335.	Do.	do.	No. 3,	do.	.	1.25
A 1336.	Do.	do.	Velvet, very soft,	per dozen,	.	.20
A 1337.	Do.	do.	square, Nos. 1, 2, 3,	a dozen in box,	.	.40
A 1338.	Do.	do.	round, Nos. 1, 2, 3,	do.	.	.60
A 1339.	WHITE CONTÉ CRAYONS,	in wood,	per dozen,		.	.60
A 1340.	Do.	do.	square, Nos. 1, 2, 3,	a dozen in box,	.	.20
A 1341.	Do.	do.	round, Nos. 1, 2,	do.	.	.40
A 1342.	CONTÉ CRAYON SAUCE,	in tin foil,	dozen, small,	75 cents, large,	.	1.20
A 1343.	FABER'S WAX CRAYONS,	in boxes,				
		6	12	18	24	36
		each \$0.75	1.50	2.00	2.50	3.25
						48 inches.
A 1344.	RED CHALK CRAYONS,	per dozen,				.60
A 1345.	Do.	do.	in lumps,	per pound,	.	.30
A 1346.	RED CHALK PENCILS,	for marking stakes,	best quality,	per dozen,	.	1.25
A 1347.	Do.	do.	in cedar,	do.	.	.75
A 1348.	YELLOW LEATHER STUMPS,	assorted,	Nos. 1 to 8,	do.	.	1.20
A 1349.	CORK STUMPS,	do.	do.	do.	.	1.20
A 1350.	PITH do.	medium and large,	each,	.	.	.15
A 1351.	MINUTE STUMPS,	for delicate work,	gray paper,	each,	.	.10
A 1352.	Do.	do.	do.	rose or white paper,	each,	.12

### CRAYON HOLDERS.



A 1353.

A 1353.	BRASS, 4 inches,	each, \$0.05,	per dozen,	.50
A 1354.	Do. 5 do.	do. .06,	do.	.60
A 1355.	Do. 6 do.	do. .07,	do.	.70
A 1356.	GERMAN SILVER, 4 inches,	do. .08,	do.	.80
A 1357.	Do. 5 do.	do. .08,	do.	.80
A 1358.	Do. 6 do.	do. .10,	do.	1.00
A 1359.	Do.	with ebony handle,	do. .10,	do.
A 1360.	Do.	do. do. double,	do. 15,	do.
				1.50

SOENNECKEN'S ROUND WRITING PENS.



A 1365.

- No.  
 A 1365. Pens, single pointed, Nos. 1, 2, 2½, 3, 3½, 4, 5, 6, per ¼ gross, 35 cents,  
 per gross, . . . . . \$1.10



A 1366.

- A 1366. Pens, double pointed, Nos. 10, 20, 30, per ¼ gross, \$1.00, per dozen, .50  
 A 1367. Sample assortment of single and double pointed pens, 25 in a box,  
 per box, . . . . . .35



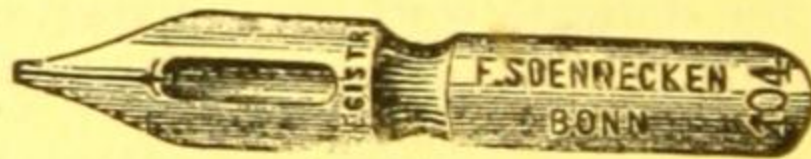
A 1368.

- A 1368. Ink Holders for single and double pens, per box of six, 30 cents,  
 each, . . . . . .10



A 1369.

- A 1369. Round Writing Parallel Pens and Holder, complete with nine pens,  
 each, . . . . . 1.00  
 A 1370. Pens only, per dozen, 75 cents, each, . . . . . .10



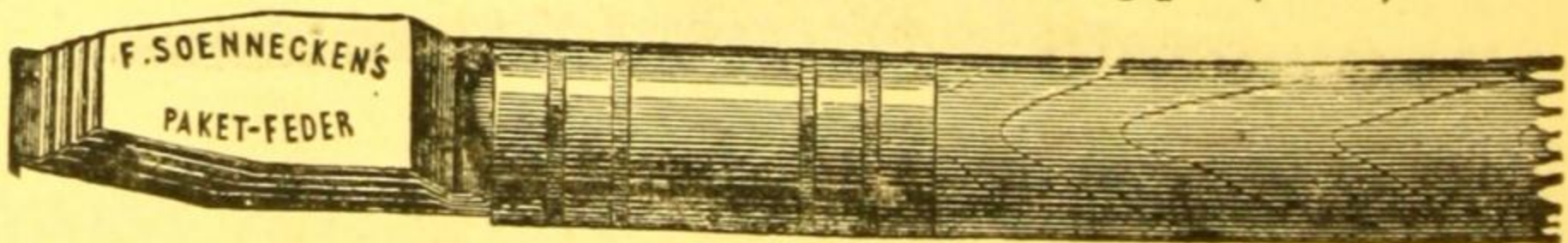
A 1371.

- A 1371. Fluent Writing Pens, square pointed, Nos. 206, 207, 208, oblique  
 pointed, Nos. 106, 107, 108, per ¼ gross, 35 cents, per gross, . . . 1.10  
 A 1372. Sample box, containing 25 pens assorted, per box, . . . . . .35



A 1373.

- A 1373. Pen Holders for round writing and fluent writing pens, each, . . . . . .10



A 1374.

- A 1374. Parcel Pens in 4 different widths, for bold and large lettering, Nos.  
 131, 133, 135, 137, each, . . . . . .25  
 A 1375. Ruled Papers, to serve as lines for the different sizes of letters in  
 round writing, 6 patterns, per sheet, . . . . . .06  
 A 1376. Methodical Text-Book on Round Writing, by F. Soennecken, per  
 copy, . . . . . 1.25

This book is essential to the thorough acquirement of the art of round writing.



PHILADELPHIA.  
ING PENS.

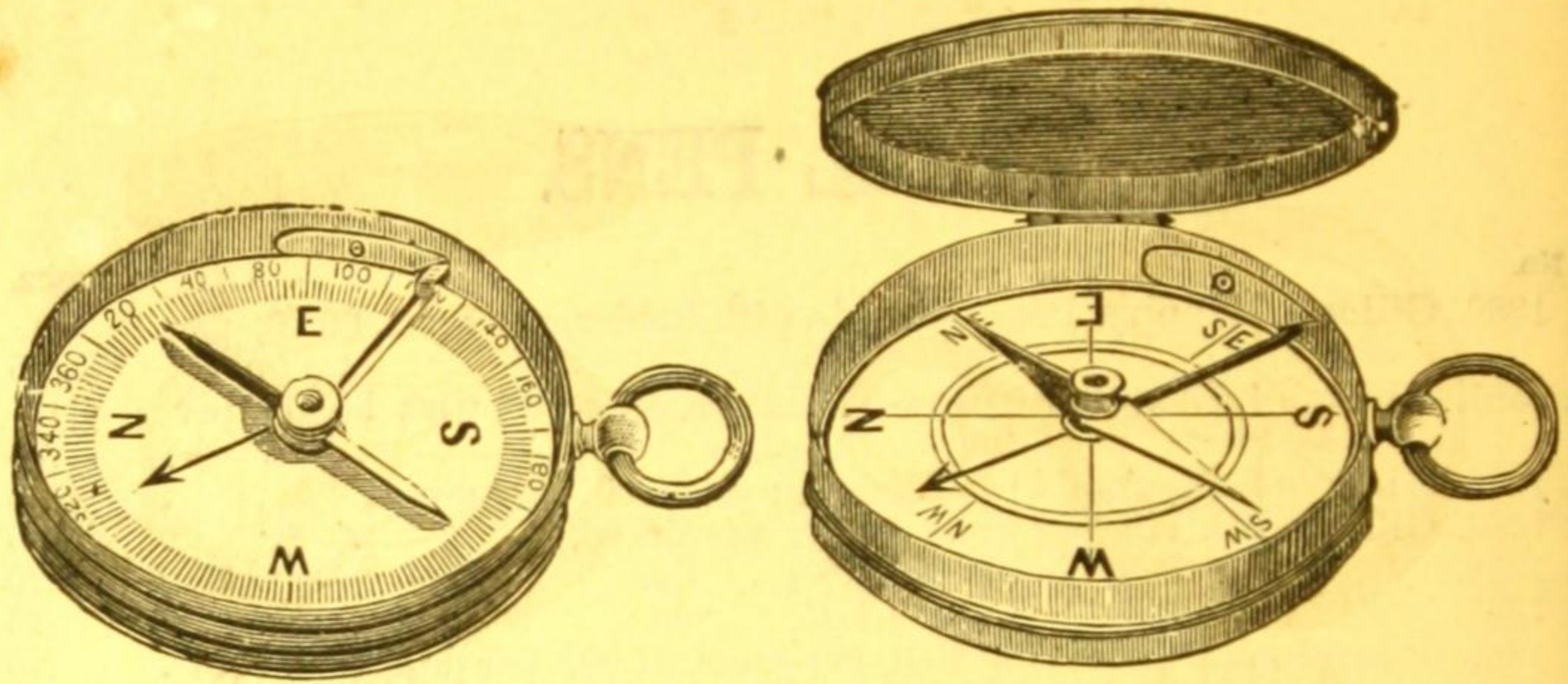
## STEEL PENS.

No.		PRICE.
A 1380.	Gillott's Mapping Pens, on cards, with holder, per gross, \$6.00, per dozen,	\$0.75
A 1381.	Gillott's Lithographic Crow-quill Pens, on cards, with holder, per gross, \$6.00, per dozen,	.75
A 1382.	Gillott's Lithographic Pens, per gross, \$5.00, per dozen,	.75
A 1383.	Gillott's No. 170, per gross, \$1.20, per dozen,	.15
A 1384.	Do. 303, do. 1.50, do.	.20
A 1385.	Do. 404, do. 1.25, do.	.15
A 1386.	Esterbrook's Engraving Pen, per gross, \$1.00, per dozen,	.20
A 1387.	Do. Falcon Pen, do. .75, do.	.15
A 1388.	Do. Commercial Pen, do. .75, do.	.15

## MISCELLANEOUS STATIONERY.

Rogers' Steel-blade Eraser, cocoa handles, each,	.60
Do. do. do. with ivory handle,	.75
Do. do. do. with ebony do., double-edged, combining knife and eraser,	1.00
Best Foolscap Paper, 7 $\frac{3}{4}$ x12 $\frac{1}{4}$ inches, per ream, \$5.00, per quire,	.35
Best Letter Paper 8x10 inches. do. 4.50, do.	.30
Best Commercial Note, 5x8 inches, do. 2.75, do.	.20
Superior Post-office Paper, buff tint, do. 7.50, do.	.50
Superior White Envelopes, letter size. per 1,000,	4.00
Do. Buff do. do. do.	3.50
Do. do. do. Legal, letter size, per 1,000,	7.00
Arnold's Writing Ink, per quart,	.75
Do. Copying do. do.	1.25
David's Carmine, in 2-ounce bottles, glass stopper, per bottle,	.50
Copying Book, letter size, each,	2.50
Mucilage, per quart, \$1.25, per cone (3 ounce),	.25
Rubber Bands, $\frac{1}{4}$ inch wide, 2 inches long, per gross, \$0.90, per dozen,	12
Do. $\frac{1}{4}$ do 2 $\frac{1}{2}$ do. do. 1.15, do.	.15
Do. $\frac{1}{4}$ do 3 do. do. 1.35, do.	.20
Do. $\frac{1}{4}$ do 3 $\frac{1}{2}$ do. do. 1.50, do.	.25
Do. $\frac{1}{2}$ do 2 do. do. 1.75, do.	.25
Do. $\frac{1}{2}$ do 2 $\frac{1}{2}$ do. do. 2.00, do.	.30
Do. $\frac{1}{2}$ do 3 do. do. 2.25, do.	.35
Do. $\frac{1}{2}$ do 3 $\frac{1}{2}$ do. do. 2.50, do.	.40
Do. $\frac{1}{2}$ do assorted lengths, do. 2.00.	
Do. $\frac{1}{8}$ do 1 $\frac{1}{4}$ inches long, for tickets, etc., per gross,	.25
All other sizes Rubber Bands furnished at proportional rates.	
Sand-paper Tablets, for pointing pencils, No. 1 Medium, No. 2 Rough, each,	.15
Files, mounted on blocks, No. 1, No. 2, each,	.25
Arkansas Oil Stones, from 25 cents to \$2.00 each.	
Do. do. in cases, from \$1.00 to \$2.50 each.	

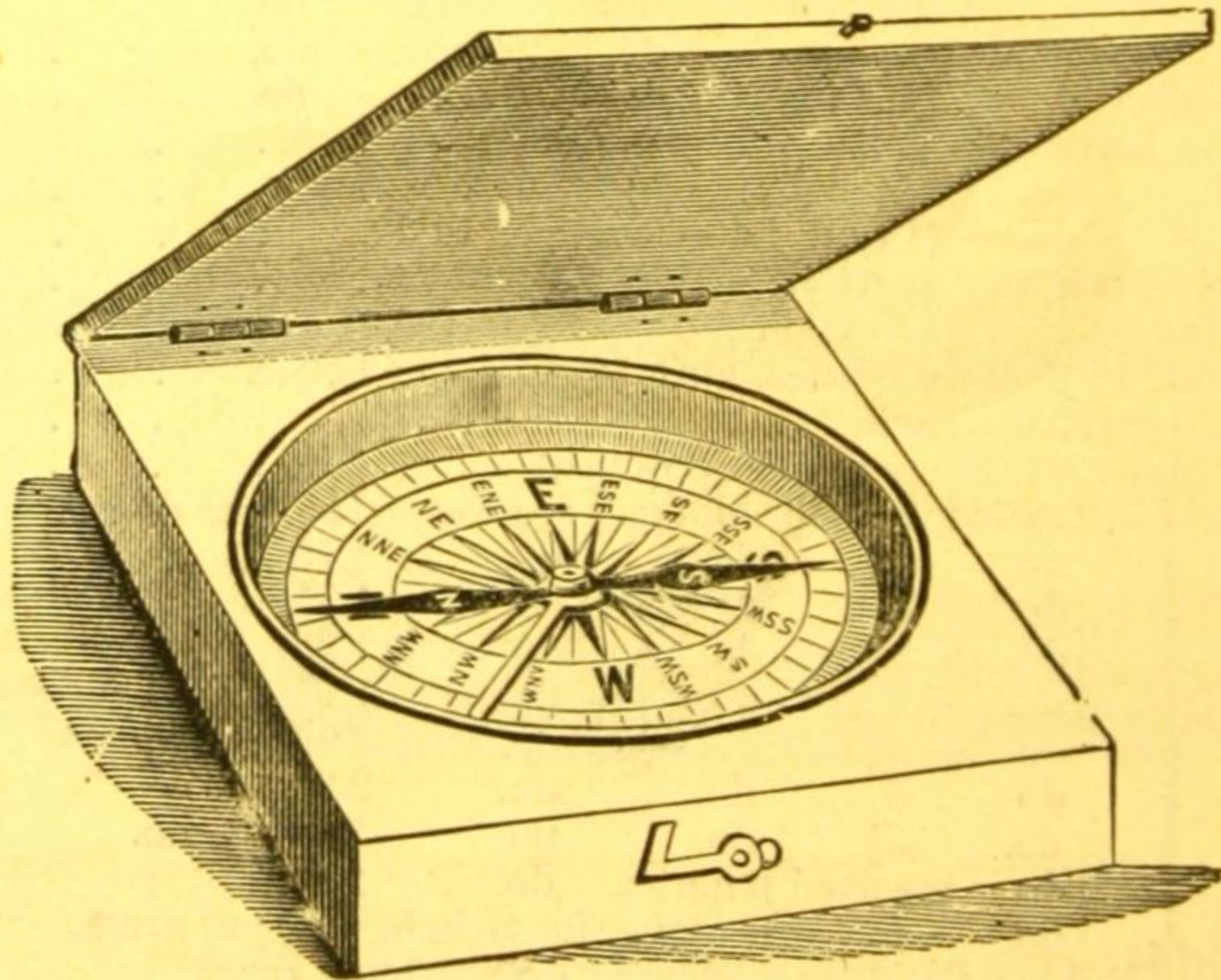
# POCKET COMPASSES.



A-1451 A.

A-1450 A.

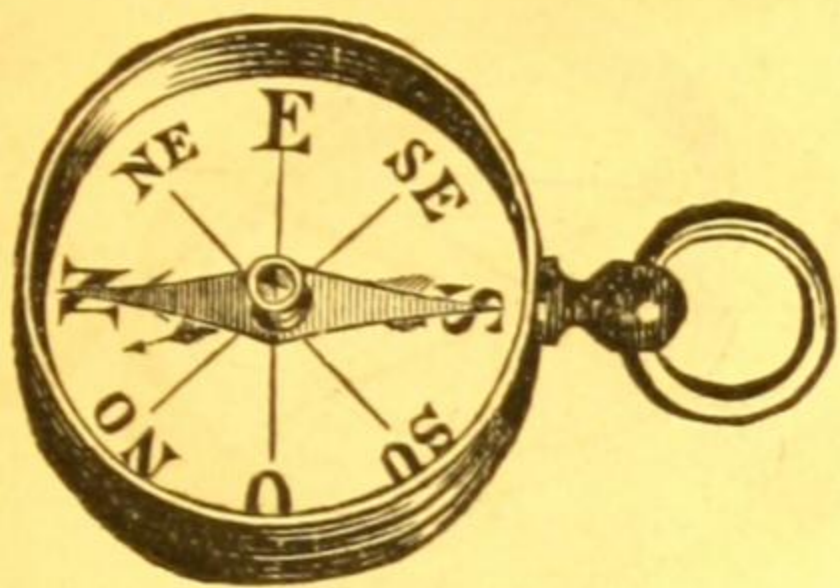
No.		PRICE.
A-1450	A. Pocket Compass, brass, watch pattern with cover and raised ring, 30 mm., or about 1 1/4 inches in diameter, . . . . .	\$0 30
	B. Same as above, 35 mm., or about 1 3/8 inches in diameter, . . . . .	40
	C. " " 40 " " 1 1/2 " " . . . . .	50
	D. " " nickel-plated, 30 mm. in diameter, . . . . .	40
	E. " " " " 35 " " . . . . .	50
	F. " " " " 40 " " . . . . .	60
A-1451	A. Pocket Compass, brass, watch pattern, blue needle with stop, 30 mm., or about 1 1/4 inches in diameter, . . . . .	40
	B. Same as above, 35 mm., or about 1 3/8 inches in diameter, . . . . .	50
	C. " " 40 " " 1 1/2 " " . . . . .	60
	D. " " nickel-plated, 30 mm. in diameter, . . . . .	50
	E. " " " " 35 " " . . . . .	60
	F. " " " " 40 " " . . . . .	70



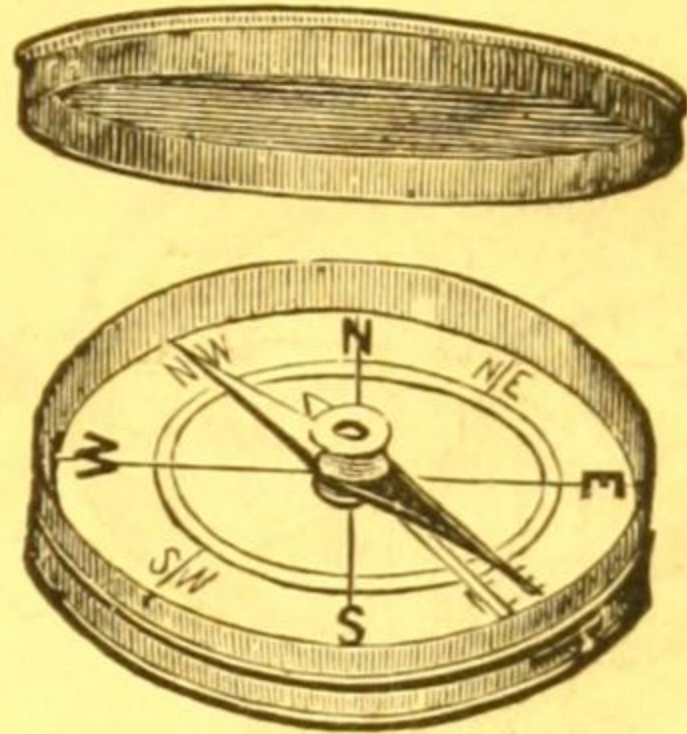
A-1452 B.

A-1452 A. Pocket Compass, mahogany case, 1 1/2 inches square, with stop to needle, . . . . .

No.		PRICE.
A-1452	B. Pocket Compass, same as above, 2 inches square, . . . . .	\$2 00
C.	" " " " 2½ " " . . . . .	2 25
D.	" " " " 3 " " . . . . .	2 75

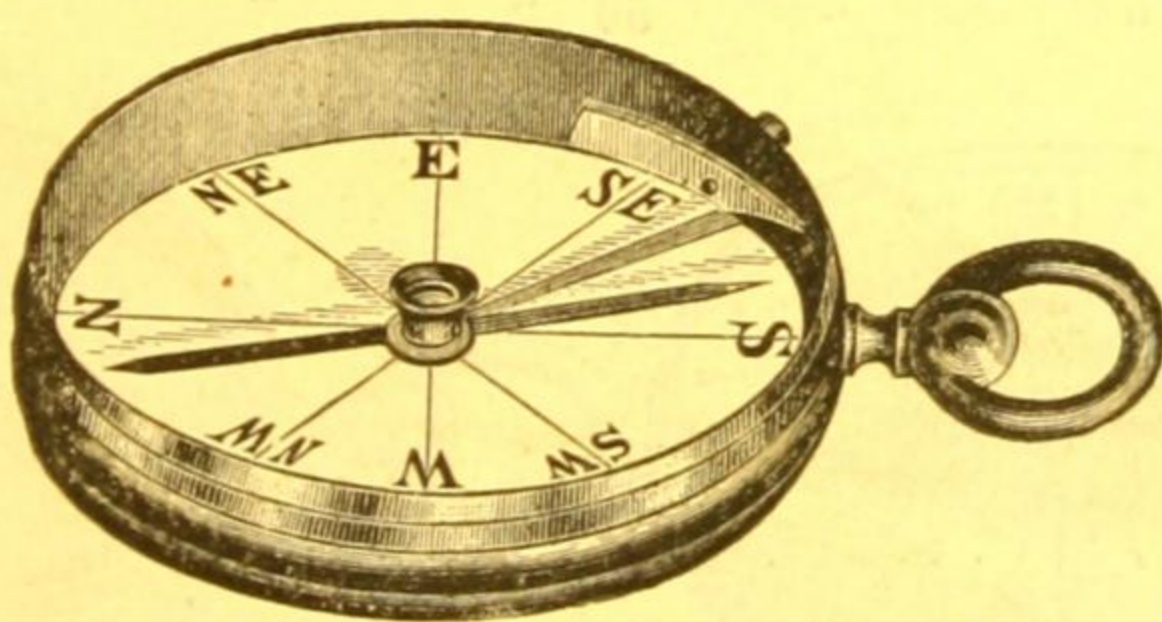


A-1453 A.



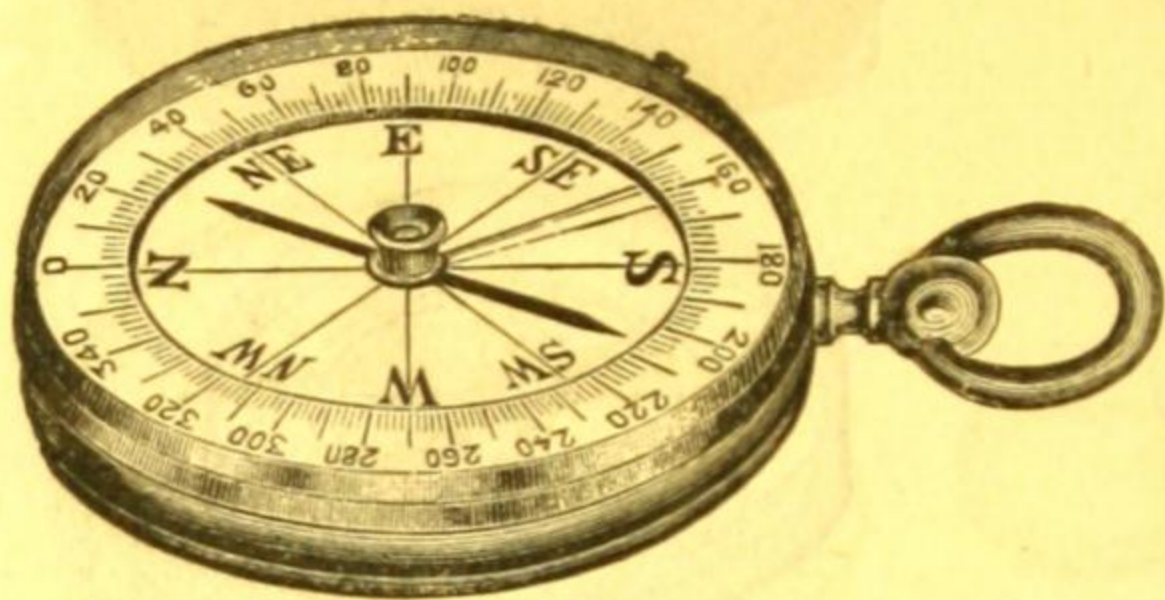
A-1454 A.

A-1453	A. Pocket Compass, brass, round with cover, 35 mm., or about 1½ inches in diameter, . . . . .	25
	B. Same as above, 45 mm., or about 1¾ inches in diameter, . . . . .	30
	C. " " 50 " " 2 " " . . . . .	35
	D. " " nickel-plated, 35 mm. in diameter, . . . . .	30
	E. " " " 45 " " . . . . .	35
	F. " " " 50 " " . . . . .	40
A-1454	A. Pocket Compass, brass, watch pattern, metal dial, 25 mm., or about 1 inch in diameter, . . . . .	35
	B. Same as above, 40 mm., or about 1½ inches in diameter, . . . . .	50
	D. " " nickel-plated, 25 mm. in diameter, . . . . .	50
	E. " " " 40 " " . . . . .	75

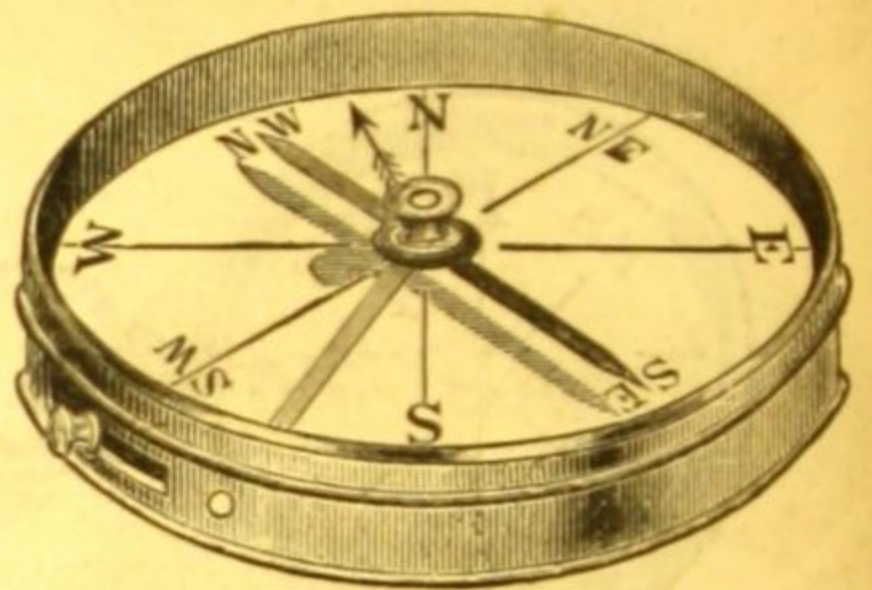
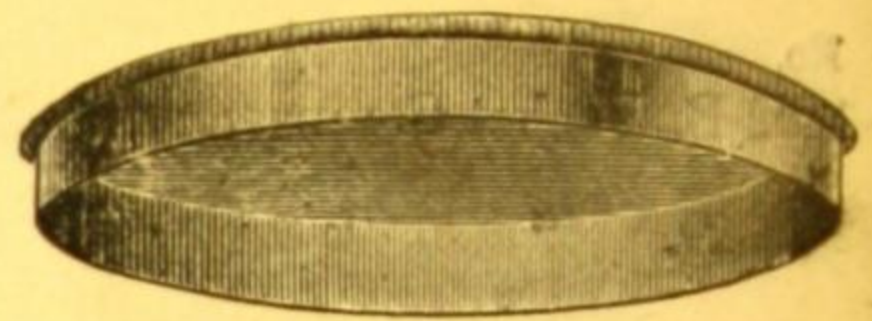


A-1455 B and A-1456 C.

A-1455	A. Pocket Compass, brass, watch pattern, metal dial, agate centre, bar needle with stop, 40 mm., or about 1½ inches in diameter, . . . . .	80
	B. Same as above, 50 mm., or about 2 inches in diameter, . . . . .	1 00
	D. " " nickel-plated, 40 mm. in diameter, . . . . .	1 00
	E. " " " 50 " " . . . . .	1 25
A-1456	A. Pocket Compass, brass, watch pattern, metal dial, agate centre, with stop, 25 mm., or about 1 inch in diameter, . . . . .	75
	B. Same as above, 40 mm., or about 1½ inches in diameter, . . . . .	1 00
	C. " " 50 " " 2 " " . . . . .	1 00
	D. " " nickel-plated, 25 mm. in diameter, . . . . .	1 00
	E. " " " 40 " " . . . . .	1 25
	F. " " " 50 " " . . . . .	1 50

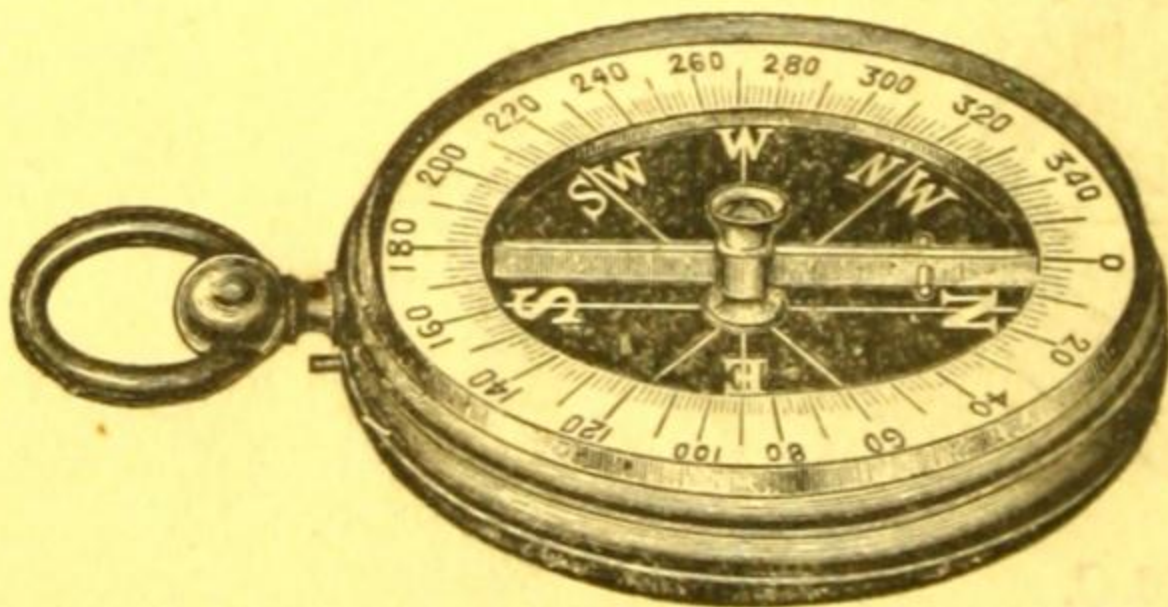


A-1457 A.

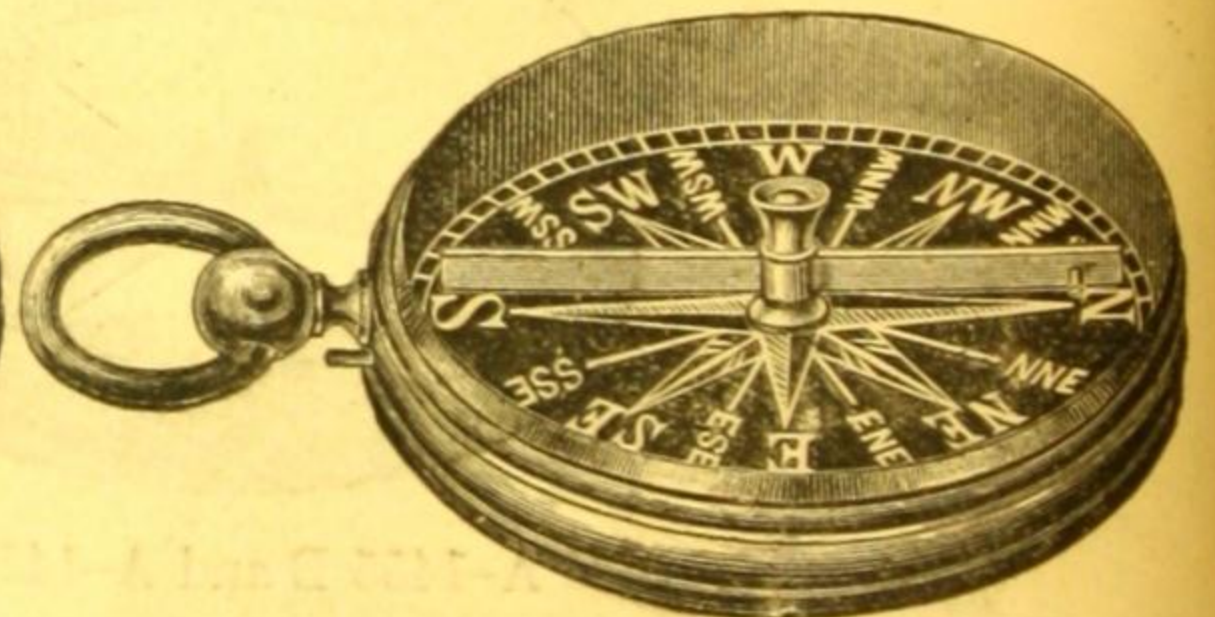


A-1458 B.

No.	PRICE.
A-1457 A. Pocket Compass, brass, watch pattern, metal dial, raised ring, agate centre, bar needle, with stop, 40 mm., or about 1½ inches in diameter, . . . . .	\$1 25
D. Same as above, nickel-plated, . . . . .	1 50
A-1458 B. Pocket Compass, brass, round with cover, metal dial, stop to needle, 50 mm., or about 2 inches in diameter, . . . . .	1 00
D. Same as above, nickel-plated, 40 mm., or about 1½ inches in diameter, . . . . .	1 00
E. Same as above, nickel-plated, 50 mm., or about 2 inches in diameter, . . . . .	1 50
A-1459 A. Pocket Compass, brass, round with cover, metal dial, agate centre, bar needle, with stop, 40 mm., or about 1½ inches in diameter, . . . . .	1 00
B. Same as above, 50 mm., or about 2 inches in diameter, . . . . .	1 25
D. " " nickel-plated, 40 mm. in diameter, . . . . .	1 25
E. " " " 50 " " " . . . . .	1 75



A-1460 D.



A-1461 D.

A-1460 D. Pocket Compass, nickel-plated, watch pattern, black enameled dial with gilt figures, raised ring, agate centre, edge bar needle, improved stop, 35 mm., or about 1⅓ inches in diameter, new, . . . . .	2 75
E. Same as above, 40 mm., or about 1½ inches in diameter, . . . . .	3 00
F. " " 50 " " 2 " " " . . . . .	3 25
A-1461 D. Pocket Compass, nickel-plated, watch pattern, black enameled dial with gilt figures, agate centre, edge bar needle, improved stop, 35 mm., or about 1⅓ inches in diameter, new, . . . . .	3 00
E. Same as above, 40 mm., or about 1½ inches in diameter, . . . . .	3 50
F. " " 50 " " 2 " " " . . . . .	3 75

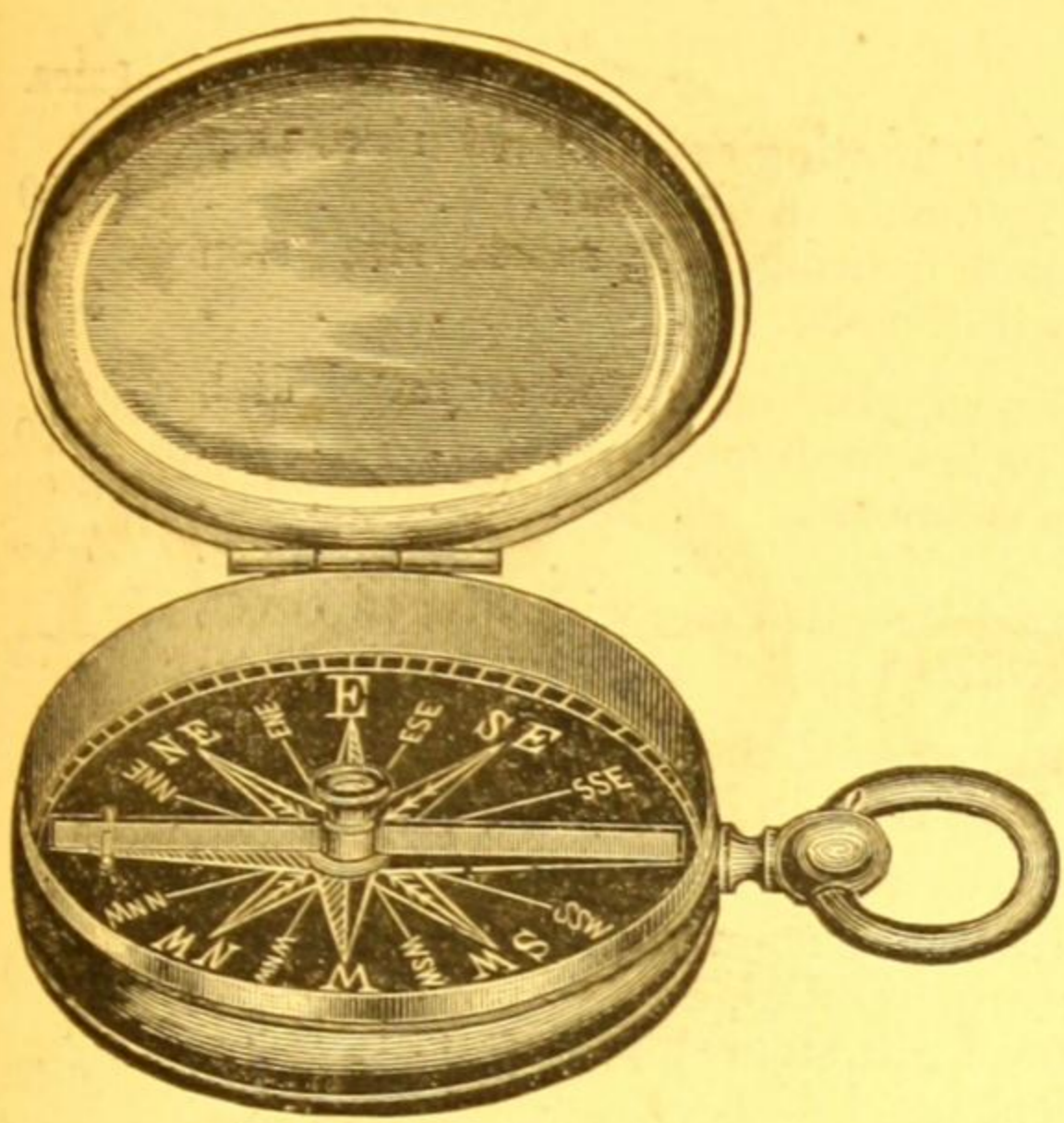


A-1458 B.

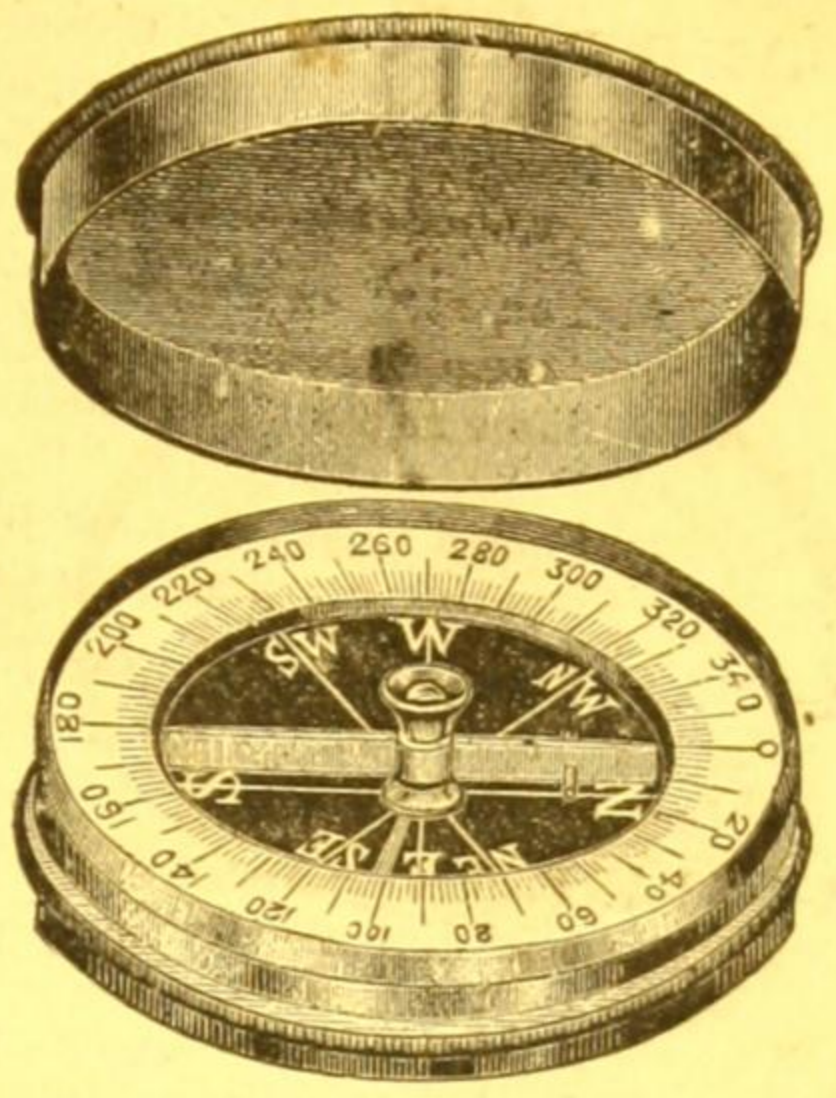
dial, raised ring,  
r about 1 1/2 inches  
\$1 25  
1 50  
metal dial, stop to  
1 00  
out 1 1/2 inches in  
1 00  
out 2 inches in  
1 50  
metal dial, agate  
out 1 1/2 inches in  
1 00  
1 25  
meter,  
er,  
1 25



D.  
black enameled  
re, edge bar  
in diameter,  
2 75  
3 00  
meter,  
3 25  
black enameled  
le, improved  
3 00  
3 50  
eter,  
3 75

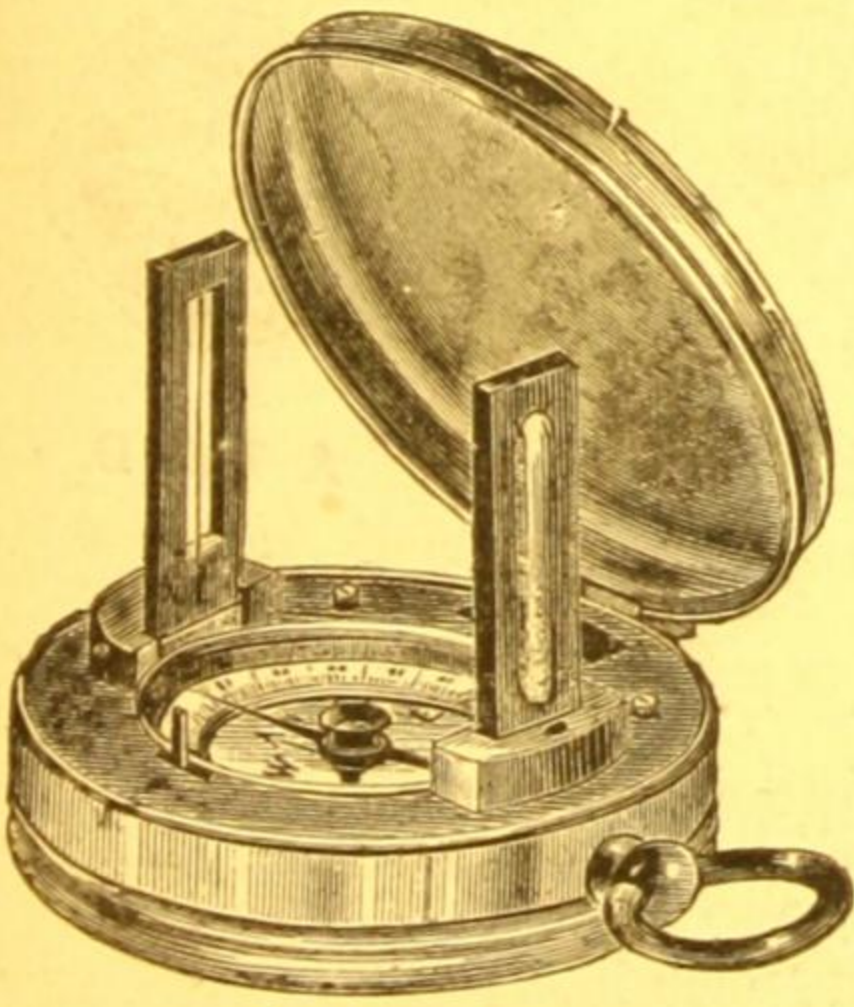


A-1462 D.

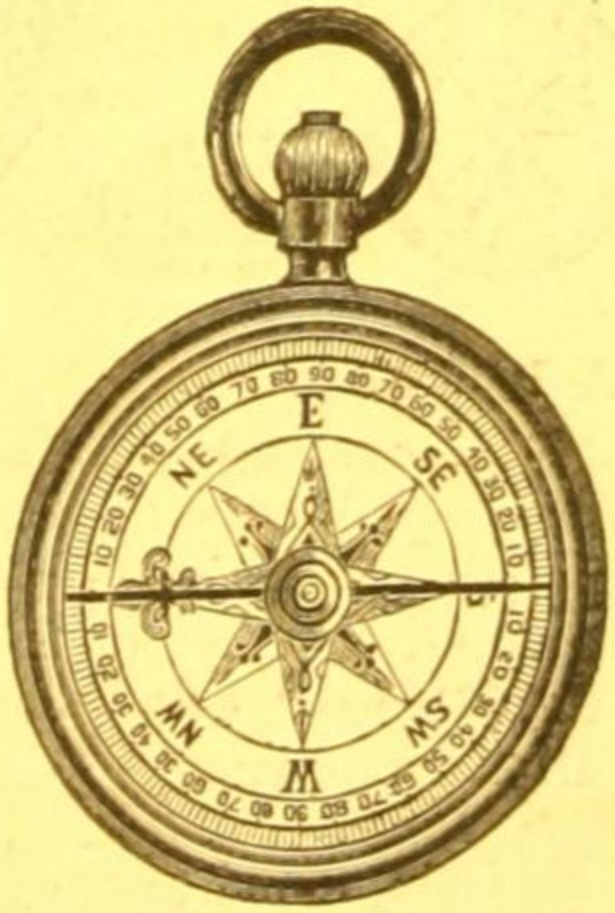


A-1464 A.

No.	DESCRIPTION	PRICE
A-1462 D.	Pocket Compass, nickel-plated, hunting-case watch pattern, black enameled dial with gilt figures, agate centre, edge bar needle, improved stop, 35 mm., or about 1 3/8 inches in diameter, <i>new</i> ,	
E.	Same as above, 40 mm., or about 1 1/2 inches in diameter,	\$3 75
F.	" " 50 " " 2 " "	4 00
A-1463 A.	Pocket Compass, brass, hunting-case watch pattern, metal dial with graduations, agate centre, bar needle with stop, 40 mm., or about 1 1/2 inches in diameter,	4 50
D.	Same as above, nickel-plated,	1 75
A-1464 A.	Pocket Compass, brass, round, in cast brass case with cover, black enameled dial with gilt figures, raised ring, agate centre, edge bar needle with stop, 35 mm., or about 1 3/8 inches in diameter, <i>new</i> ,	2 00
B.	Same as above, 50 mm., or about 2 inches in diameter,	2 25
C.	" " 60 " " 2 3/8 " "	2 50
D.	" " nickel-plated, 35 mm. in diameter,	2 75
E.	" " " 50 " "	2 50
F.	" " " 60 " "	2 75
		3 25



A-1465 A.



A-1466 A.

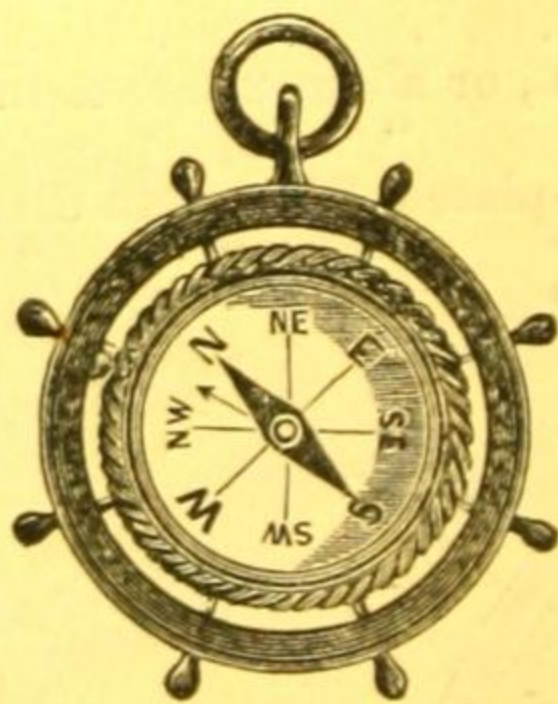
A-1465 A. Pocket Compass, nickel-plated hunting case, raised ring, stop to needle, folding sights, 2 inches in diameter, . . . . . 4 25

No.		PRICE.
A-1465	B. Pocket Compass, nickel-plated hunting case, raised ring, stop to needle, folding sights, 2 $\frac{3}{4}$ inches in diameter, . . . . .	\$7 00
	C. Pocket Compass, nickel-plated hunting case, raised ring, stop to needle, folding sights, with levels, . . . . .	8 00
A-1466	A. Pocket Compass, watch pattern, gilt, enameled or metal dial, stem stop, bar needle, 1 $\frac{1}{4}$ inches in diameter, . . . . .	5 00
	B. Same as above, 1 $\frac{1}{2}$ inches in diameter, . . . . .	6 00
	C. " " " 1 $\frac{3}{4}$ " " " " " " . . . . .	7 00
	D. Pocket Compass, nickel-plated or gilt case, with hinged cover, spring catch and stop to needle in joint of cover, . . . . .	3 75
A-1467.	Pocket Compass, nickel-plated or gilt case, with hinged cover, spring catch, bar needle with stop in joint of cover, 2 inches in diameter, . . . . .	5 00
A-1468	A. Pocket Compass, watch pattern, gilt, stem stop, in case, 1 $\frac{1}{4}$ inches in diameter, Singer's patent pearl dial, . . . . .	5 50
	B. Pocket Compass, watch pattern, gilt, stem stop, in case, 1 $\frac{1}{2}$ inches in diameter, Singer's patent pearl dial, . . . . .	6 00
	C. Pocket Compass, watch pattern, gilt stem stop, in case, 1 $\frac{3}{4}$ inches in diameter, Singer's patent pearl, . . . . .	6 50

CHARM COMPASSES.



A-1469 A.



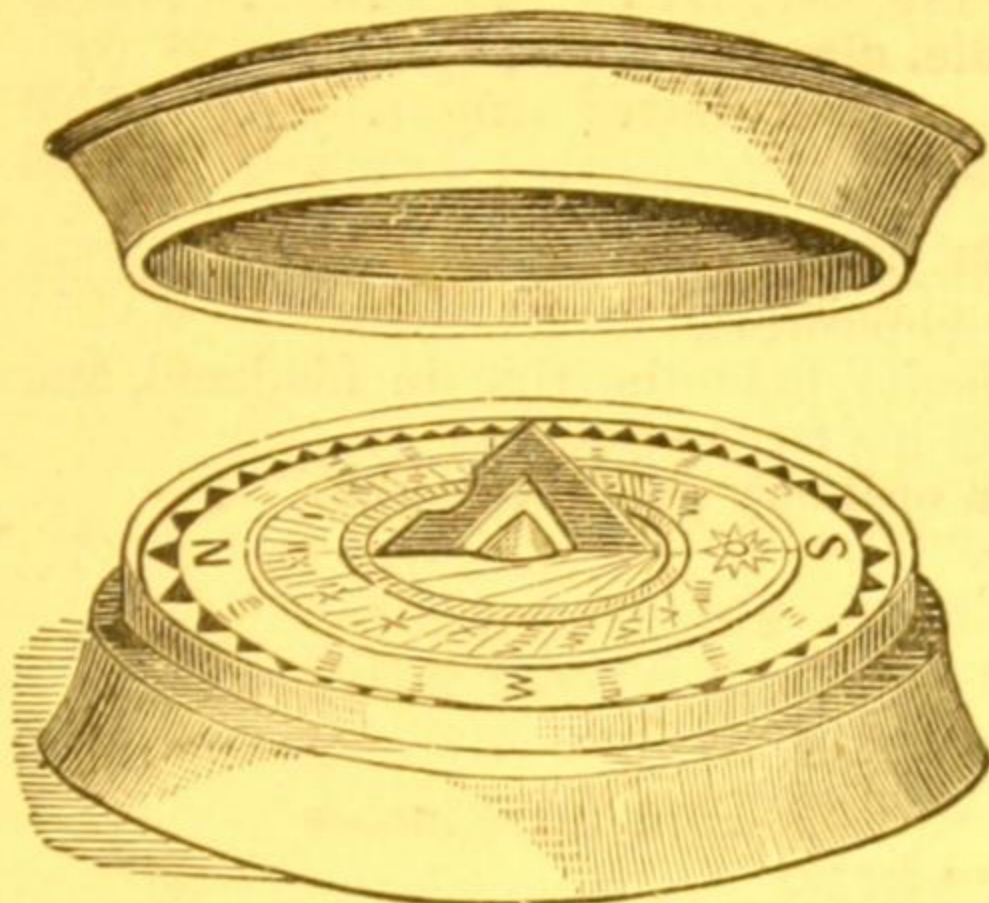
A-1469 B.



A-1469 D.

A-1469	A. Gilt, round, $\frac{1}{2}$ inch, . . . . .	25
	B. " " " 1 " . . . . .	50
	C. Gilt band, with glass on each side, $\frac{3}{4}$ inch, . . . . .	1 50
	D. Nickel-plated, gimbal mounted; small, \$2.00; medium, \$2.25; large, . . . . .	2 50
	E. Gold, round case, engraved back, $\frac{1}{2}$ inch in diameter, . . . . .	3 50
	F. " " " engraved or stone back, $\frac{3}{4}$ inch diameter, . . . . .	5 00
	G. " anchor pattern, $\frac{3}{4}$ inch diameter, . . . . .	7 50
	H. " plain band, pebble compass, $\frac{3}{4}$ inch diameter, . . . . .	10 00

SUN-DIAL COMPASSES.



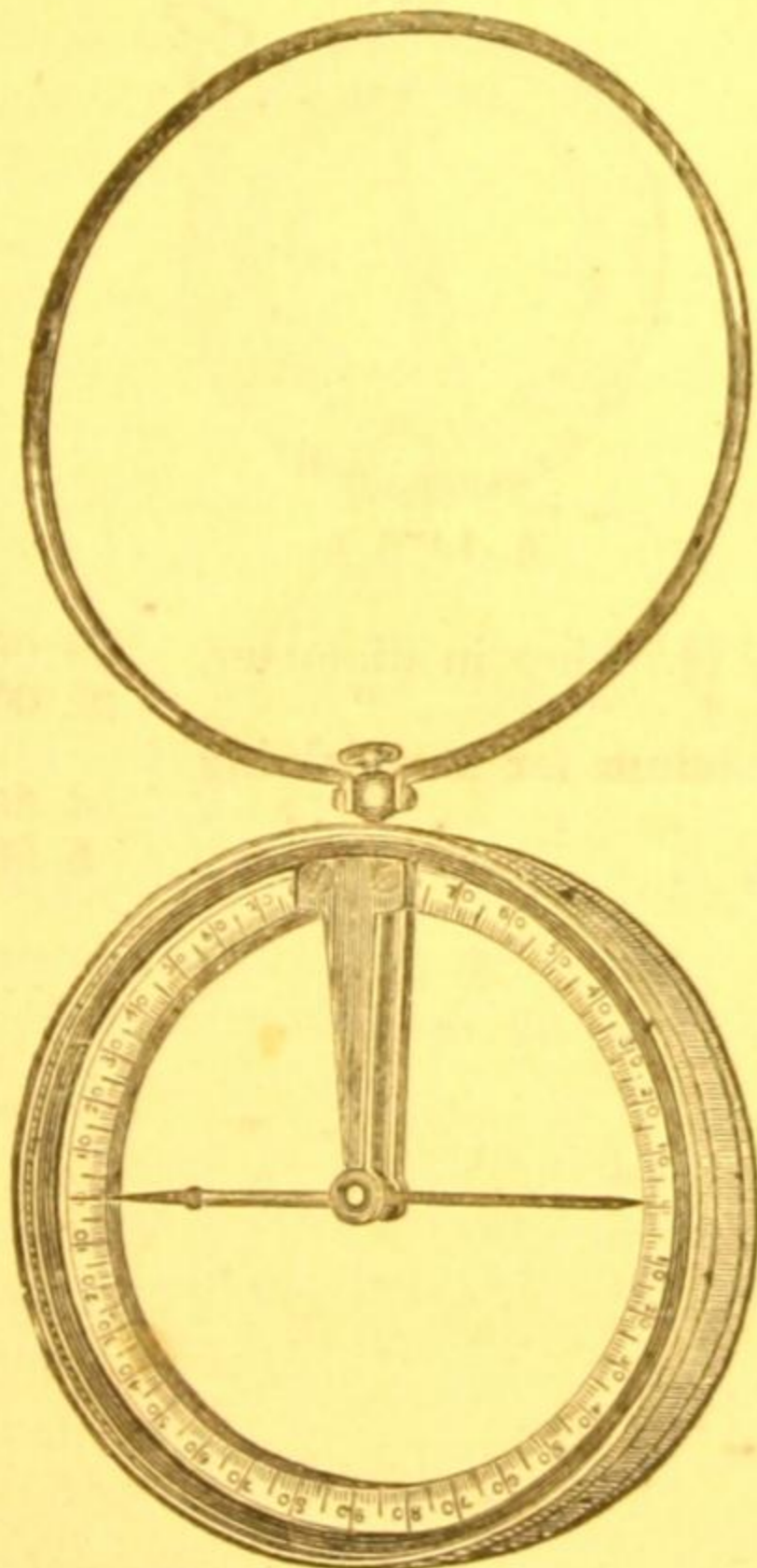
A-1470 A.



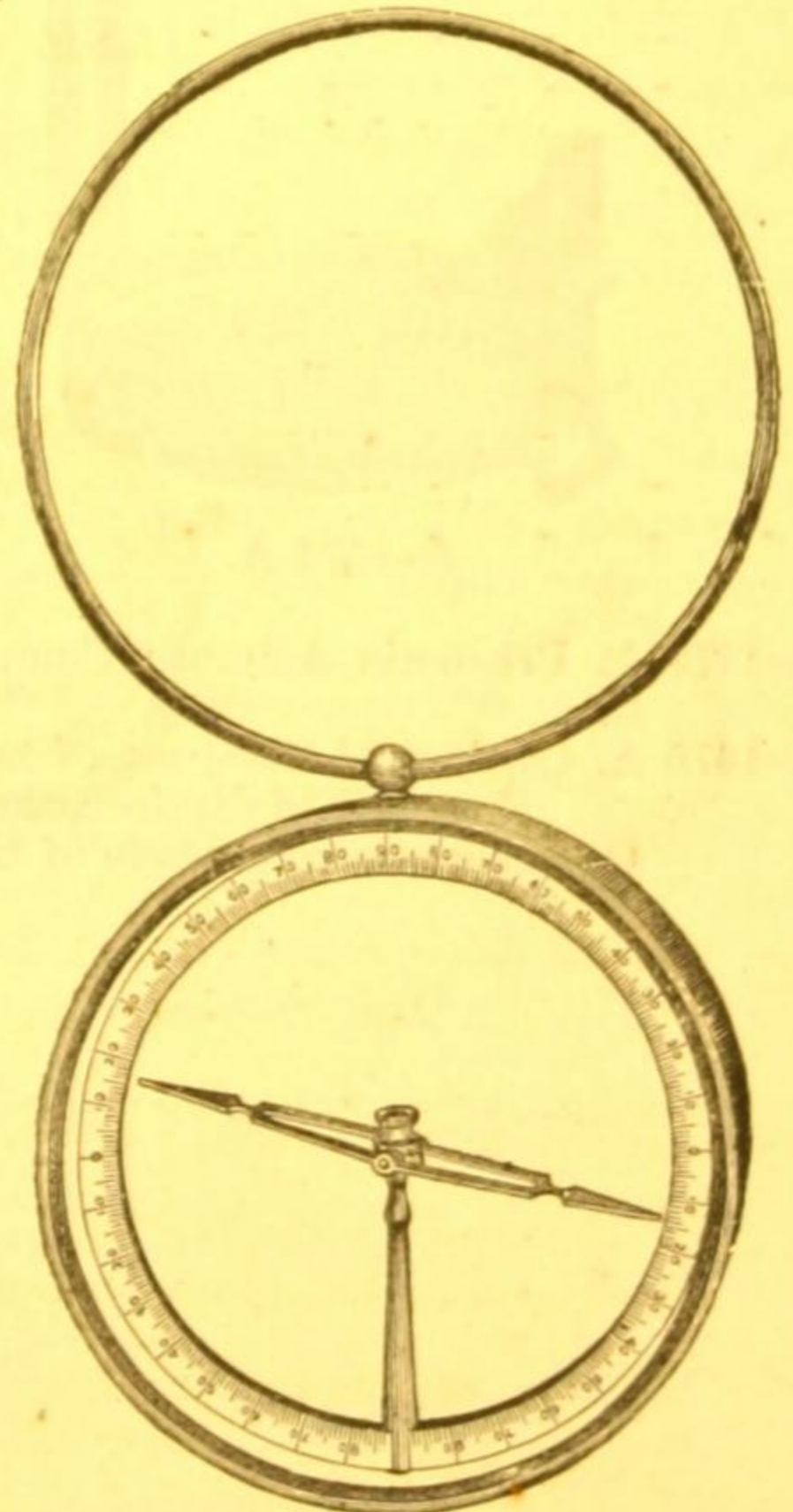
A-1471 A.

No.	PRICE.
A-1470 A. Pocket Compass and Sun-dial, wood box, with cover,	\$0 50
B. " " mahogany case, with Universal Sun-dial,	8 00
C. Pocket Compass, brass, with levels and leveling screws, and Universal Sun-dial,	14 00
A-1471 A. Pocket Compass, brass, with hinged cover and Sun-dial, 2 inches diameter,	4 00
B. Pocket Compass, brass, with hinged cover and Sun-dial, 2½ inches diameter,	5 50

Sun-dials, for lawn use, made to order for any latitude.



A-1472 A.



A-1472 B.

PRICE.

\$7 00

8 00

5 00

6 00

7 00

3 75

5 00

5 50

6 00

6 50

25

50

1 50

2 50

3 50

5 00

7 50

10 00

139

No. A-146

A-146

A-14

A-14

No.	Description	PRICE.
A-1472	A. Miner's Compass, for tracing iron ore, . . . . .	\$12 00
	B. " " Norwegian needle, glass both sides, with brass covers, 3-inch needle, . . . . .	12 00
	C. Same as above, with 4-inch needle, . . . . .	15 00

This consists essentially of a dipping-needle, about 2½ inches long, which inclines toward any mass of iron, and thus discovers its position.

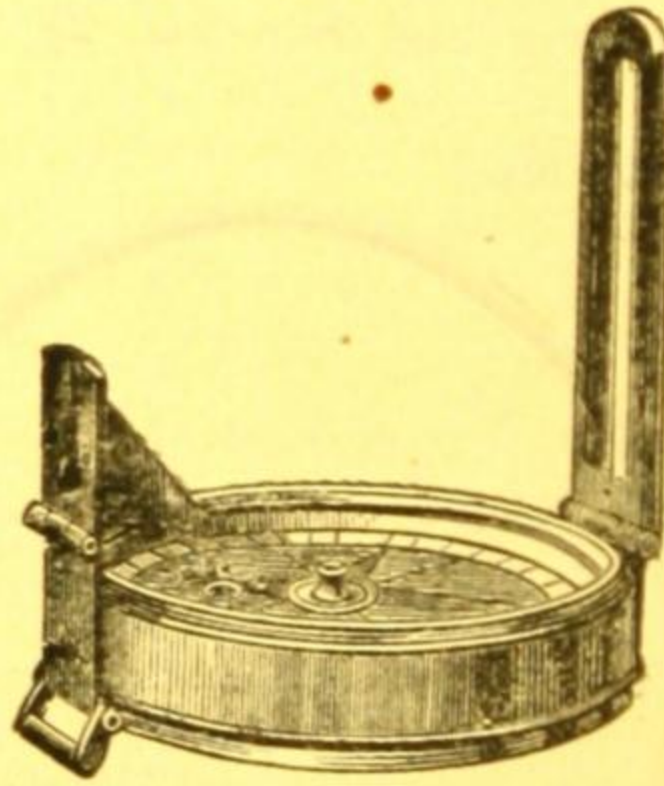
When used for tracing ore, the observer should hold the ring in his hand, and keep the needle north and south, standing with his face to the west.

If held horizontal, it serves, of course, as an ordinary pocket compass.

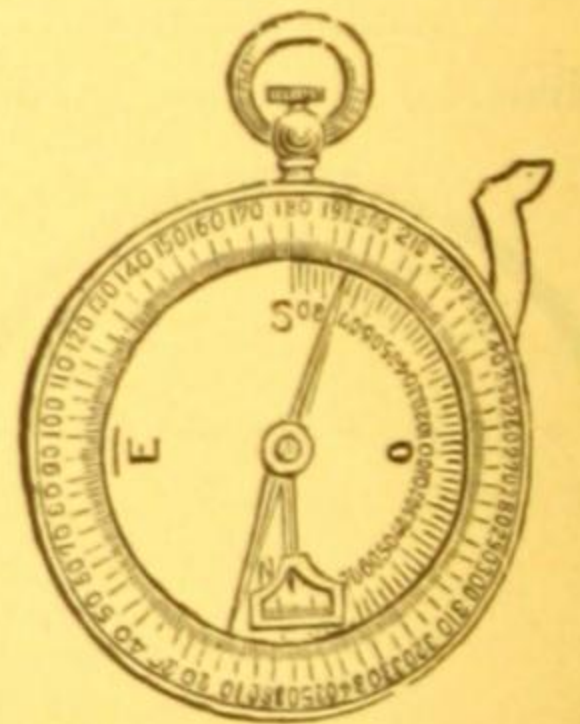
**BOAT COMPASSES.**

Boat Compass, floating card dial, double gimbal mounting, nickel-plated case with cover,

A-1473	A. 1¾ inches diameter, . . . . .	4 25
	B. 3 " " . . . . .	6 00
	C. 4½ " " . . . . .	14 00



A-1474 A.



A-1475 A.

A-1474	A. Prismatic Azimuth Compass, of brass, 2¾ inches in diameter, . . . . .	18 00
	B. " " " " 4 " " " . . . . .	22 00
A-1475	A. Geological Compass, of brass, with pendulum for ascertaining the angle of dip in rocks, . . . . .	4 50
	D. Same as above, made of German silver, . . . . .	5 50



## TO THE ENGINEERING PROFESSION.

We beg to ask your attention to the high class TRANSITS and LEVELS illustrated in the following pages. For a number of years past we have been turning out, in our own factory, a limited number of very high class instruments, which in every instance have been received with the utmost favor by engineers, and have been eagerly sought for. Yielding to the very urgent demand for instruments of OUR OWN MAKE, we have greatly enlarged our facilities, have put in tools of the most recent form, and have entered largely upon the manufacture of ENGINEERS' and SURVEYORS' TRANSITS and LEVELS, and other INSTRUMENTS OF PRECISION of the HIGHEST GRADE.

Your attention is particularly directed to the IMPROVEMENTS introduced by us of an ALUMINIUM BRONZE PLATE, by which greater lightness and extreme rigidity are attained, and to the PHOSPHOR BRONZE CENTRE, which gives a centre absolutely true and practically indestructible.

You will also observe the position of the verniers, which, placed at an angle of 30° with the telescope, are situated so as to be read without change of the observer's position.

Particular attention has been given to the optical qualities of the Telescopes, both for transits and levels, and the highest power consistent with good field and light has been secured. It is to be observed in this connection, that high power is not alone the most desirable quality in a telescope; and even when high power is, by the finest possible optical combination, united with a large field and good light, there are conditions where the power of such a telescope is a barrier to its use, as in foggy weather, when the fog itself is magnified in the same ratio as the object.

It follows from this, therefore, that on our eastern coast and in the Southern States, for the greater portion of the year, a telescope of comparatively low power, but of fine optical qualities, can be used on more days and with greater satisfaction than one of high power. On the Western plains telescopes of much higher power are available.

We should be glad, therefore, if engineers, in ordering, would state whether they desire to have a telescope with "USUAL" or "HIGH" power.

Our ENGINEERS' LEVELS, our new RECONNAISSANCE TRANSIT, our new ARCHITECTS' LEVELS, SURVEYORS' COMPASSES, and RAILROAD and VERNIER POCKET COMPASSES are all of the most improved construction and of the same quality as our Engineers' Transits, and leave nothing to be desired in point of finish or adaptation to their several uses.

Our ENGINEERS' ANEROIDS, compensated and specially tested and adjusted for use in engineering, are arranged by us to read in absolute coincidence with the mercurial column, and in accuracy of work and non-liability to get out of order are unequalled.

*J. W. Queen & Co.*

PHILADELPHIA, April, 1887.



A-1475 A

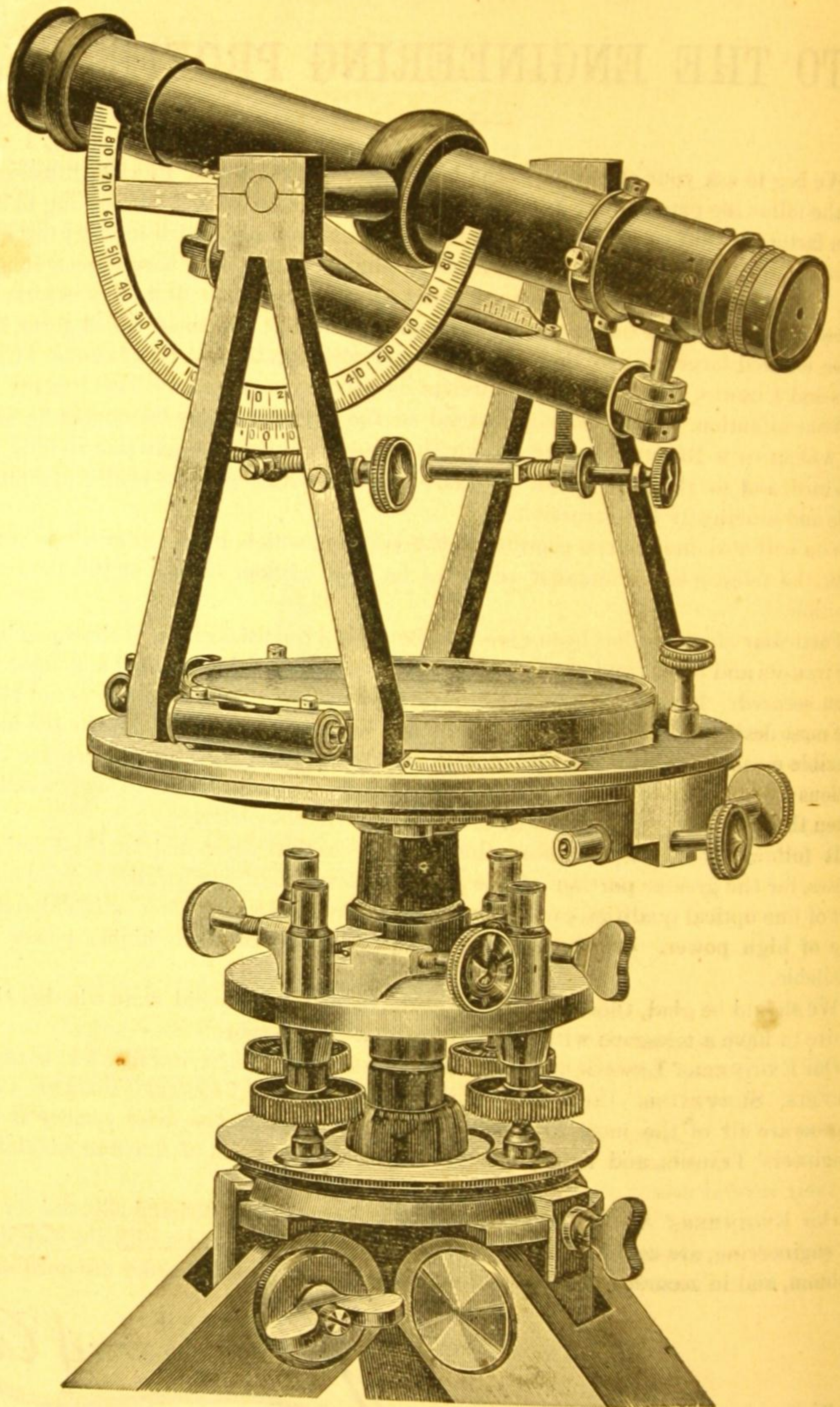
of brass, 2 1/4 inches in diameter  
with pendulum for ascertaining  
man silver,

### COMPASSES.

double gimbal mounting, nickel-plated

.....  
.....  
.....

acing iron ore,  
gian needle, glass both sides, with lens  
ch needle,  
ng-needle, about 2 1/2 inches long, which  
scovers its position.  
server should hold the ring in his hand  
nding with his face to the west  
rse, as an ordinary pocket compass



COMPLETE IMPROVED ENGINEERS' TRANSIT.

## TRANSITS.

### IMPROVED COMPLETE ENGINEER'S TRANSIT.

The illustration on preceding page shows our new Improved Complete Engineer's Transit, as now made. A very important improvement in this instrument is the introduction of a percentage of Aluminium Bronze in the plate, by which greater lightness and rigidity are secured, and the Phosphor Bronze centre, by which an absolutely true and practically indestructible centre is obtained. The instrument is finished by hand throughout and of the highest class of workmanship, and warranted to keep its adjustments under all conditions of legitimate use.

The Telescope, 12 inches in length, is fitted with a combination of lenses arranged to give the maximum of power with the largest field and abundance of light. It is arranged with patent focusing screw, by which the focus is adjusted without disturbing the line of collimation.

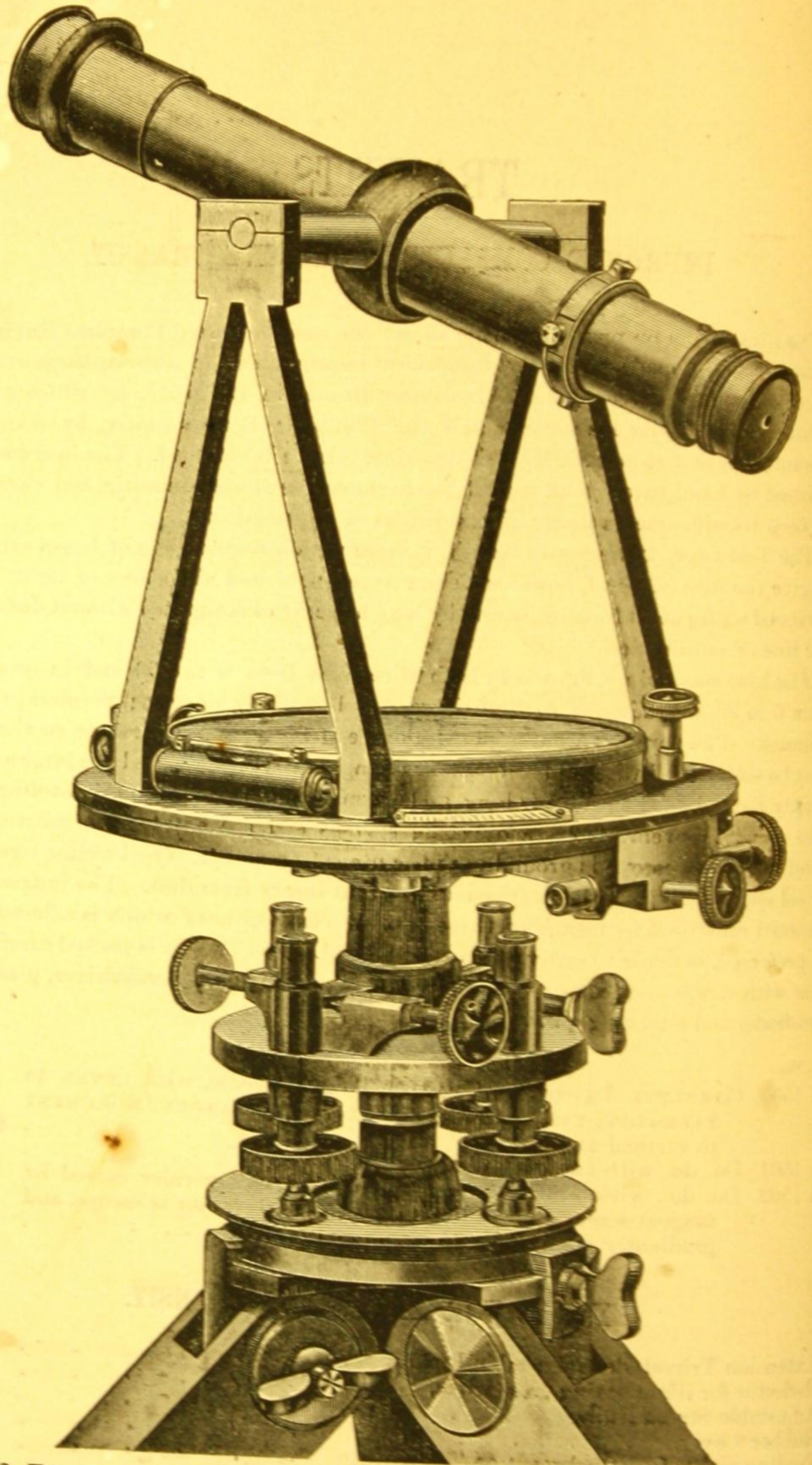
The horizontal limb, figured in both directions from 0 to 360 and in quadrants from 0 to 90, is graduated to half degrees and reads by opposing verniers to single minutes. The verniers are placed at an angle of 30° with the telescope so that they may be easily read without the observer changing his position, and are large and distinctly figured. The centre is long and permanently attached to the leveling head. The tangent movements have opposing springs and are extremely sensitive. The level bulb to telescope is ground with the utmost accuracy. The leveling screws are broad edged and packed or capped to prevent injury from dust. The instrument is fastened on tripod by means of three beveled clamps, one of which is adjustable, or, if preferred, is made to screw on to tripod head. The Transit is packed carefully in case with straps and lock on box, and with magnifying glass, screwdriver, plumbbob, sunshade, and adjusting pins.

No.	PRICE.
A 1500. COMPLETE IMPROVED TRANSIT, 5-inch needle, with LEVEL to TELESCOPE, VERTICAL ARC and CLAMP and TANGENT MOVEMENT to vertical axis, . . . . .	\$180.00
A 1501. Do. do. with variation plates, . . . . .	185.00
A 1502. Do. do., with 6-inch vertical arc on silver with vernier moved by tangent screw, and reading to 30 seconds, level on telescope, and gradienter combined with clamp and tangent, . . . . .	200.00

### EXTRAS FOR ENGINEER'S TRANSIT.

Extension Tripod with adjustable legs, . . . . .	\$15.00
Reflector for illuminating cross wires, . . . . .	4.00
Adjustable Studia Hairs, . . . . .	5.00
Rubber Cover, . . . . .	1.00
Folding Sights for attachment on Telescope, . . . . .	10.00





A 1503. ENGINEERS' PLAIN TRANSIT, long centre, 5-inch needle, . \$150.00

## SURVEYOR'S TRANSITS.

### SURVEYOR'S TRANSIT, WITH DOUBLE VERNIER.

The Surveyor's Transit is similar in form to the Engineer's Transit, having the verniers arranged in the same way, but with short centre, the leveling head detaching from the upper part of the transit and being packed separately with the instrument in the box. The telescope is 12 inches long. The compass circle is divided to half degrees, and has variation plate with vernier for obtaining the magnetic variation of the needle.

All the latest improvements are furnished with this instrument.

No.	PRICE.
A 1505. SURVEYOR'S TRANSIT, Plain Telescope, two verniers to limb, 4-inch needle,	\$125.00
A 1506. SURVEYOR'S TRANSIT, 4-inch needle, two verniers to limb, level on telescope, with ground bulb and scale, with vertical circle on silver, reading by vernier to single minutes, and clamp and tangent movement to axis of telescope,	155.00
A 1507. SURVEYOR'S TRANSIT, Plain Telescope, two verniers to limb, 5-inch needle,	130 00
A 1508. SURVEYOR'S TRANSIT, 5-inch needle, two verniers to limb, level to telescope, with $4\frac{1}{2}$ -inch vertical circle on silver, reading by vernier to single minutes, level on telescope, with ground bubble and scale and clamp and tangent movement to axis of telescope,	160.00

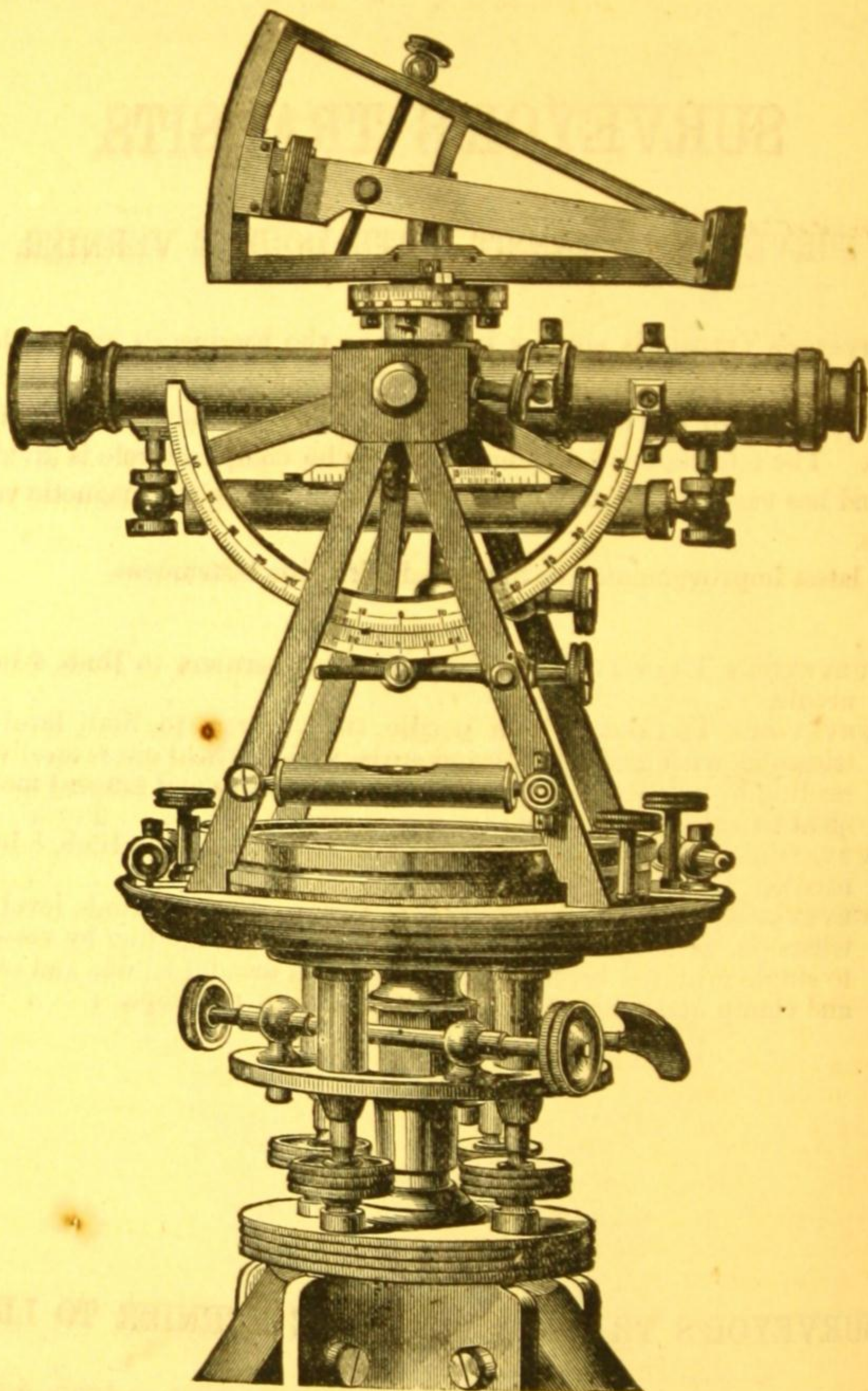
### SURVEYOR'S TRANSIT, WITH ONE VERNIER TO LIMB.

A 1510. SURVEYOR'S TRANSIT, Plain Telescope, one vernier to limb, 4-inch needle,	110.00
A 1511. SURVEYOR'S TRANSIT, 4-inch needle, one vernier to limb, with level on telescope and clamp and tangent movement to axis of telescope,	128.00
A 1512. SURVEYOR'S TRANSIT, 5-inch needle, one vernier to limb, plain telescope,	115.00
A 1513. SURVEYOR'S TRANSIT, 5-inch needle, one vernier to limb, level to telescope, with clamp and tangent movement to axis of telescope	133.00



centre, 5-inch needle,

## SOLAR TRANSITS.

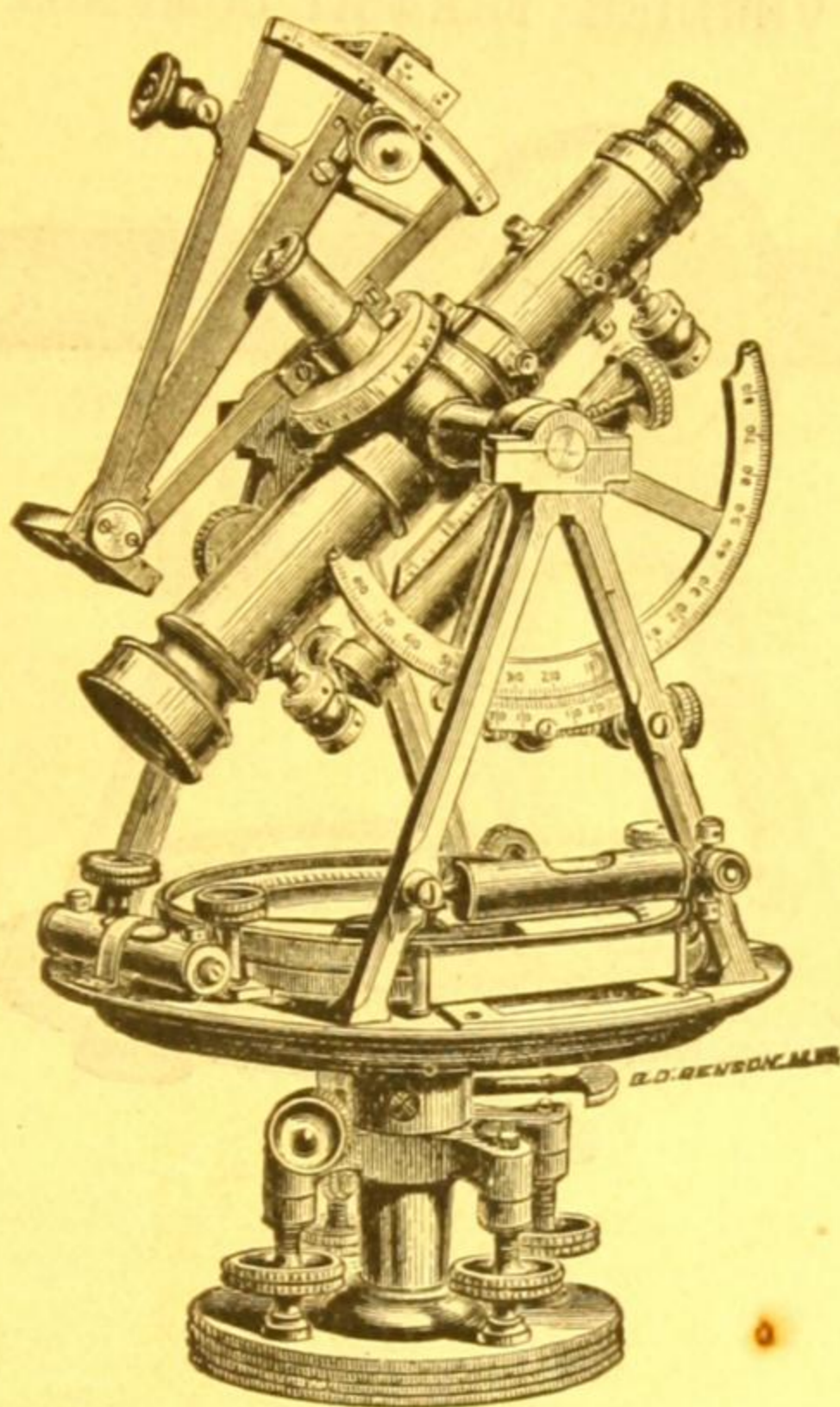


A 1520.

- | No.     |   | PRICE.   |
|---------|---|----------|
| A 1520. | ENGINEER'S TRANSIT, 5-inch needle; with solar attachment, 6-inch vertical arc, divided on silver, reading to thirty seconds, level on telescope, clamp and tangent to axis of telescope, with declination arc reading to thirty seconds. With variation plate to compass, . | \$250.00 |
| A 1521. | SURVEYOR'S TRANSIT, 5-inch needle, with solar attachment, double verniers, arc, level to telescope, clamp and tangent movement, etc.,   | 226.00   |

TRANSITS.

LIGHT MOUNTAIN OR MINING TRANSIT.



Showing Transit with the Patent Solar Attachment.

This instrument, introduced by us to meet the demand for a light transit for use in the mountains or mines, has all the attachments of our complete engineers' instrument, and differs from it only in lightness of construction and consequent portability. The Mining Transit has arc, level to telescope, clamp and tangent movement to axis of telescope, double Verniers reading to single minutes, with reflectors for illumination, long centre, leveling screws packed so as to prevent injury from dust, with improved tangent motion to parallel plates. Needle, 4 inches long. Telescope, 9 inches long, with power of 22 diameters. Packed in leather covered case, with strap.

Weight of Transit, 9 $\frac{3}{4}$  lbs. ;

Weight of Tripod, 5 lbs.

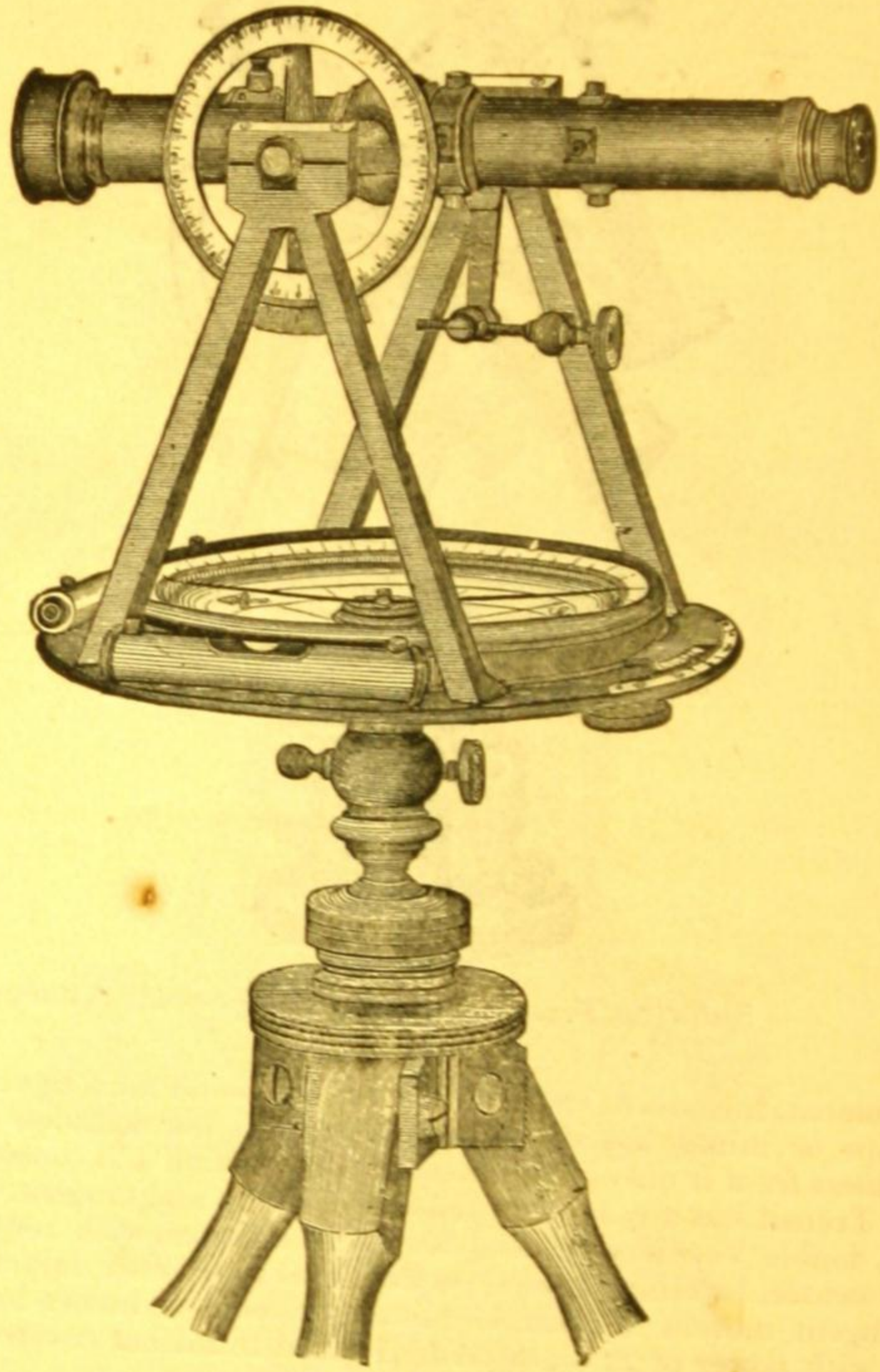
A 1525. Price of Transit, complete as above,	\$180.00
A 1526. Plain Transit, without arc, level to telescope, or clamp and tangent movement,	150 00

EXTRAS FOR LIGHT ENGINEERS' TRANSIT.

Variation Plate (for laying off variations of needle), when supplied with a new Transit,	4.00
Reflector for Illuminating Cross Wires,	4.00
Extra Top Telescope for vertical sighting,	.35.00
Diagonal Prism for Eye-piece,	10.00
Adjustable Stadia Hairs in Telescope, when supplied with a new instrument,	5.00
Rubber Cover for Transit,	1.00
Solar Attachment,	65.00

with solar attachment, 6-inch  
ing to thirty seconds, level on  
of telescope, with declination  
variation plate to compass,  
with solar attachment, double  
and tangent movement, etc.

## VERNIER TRANSIT COMPASS.



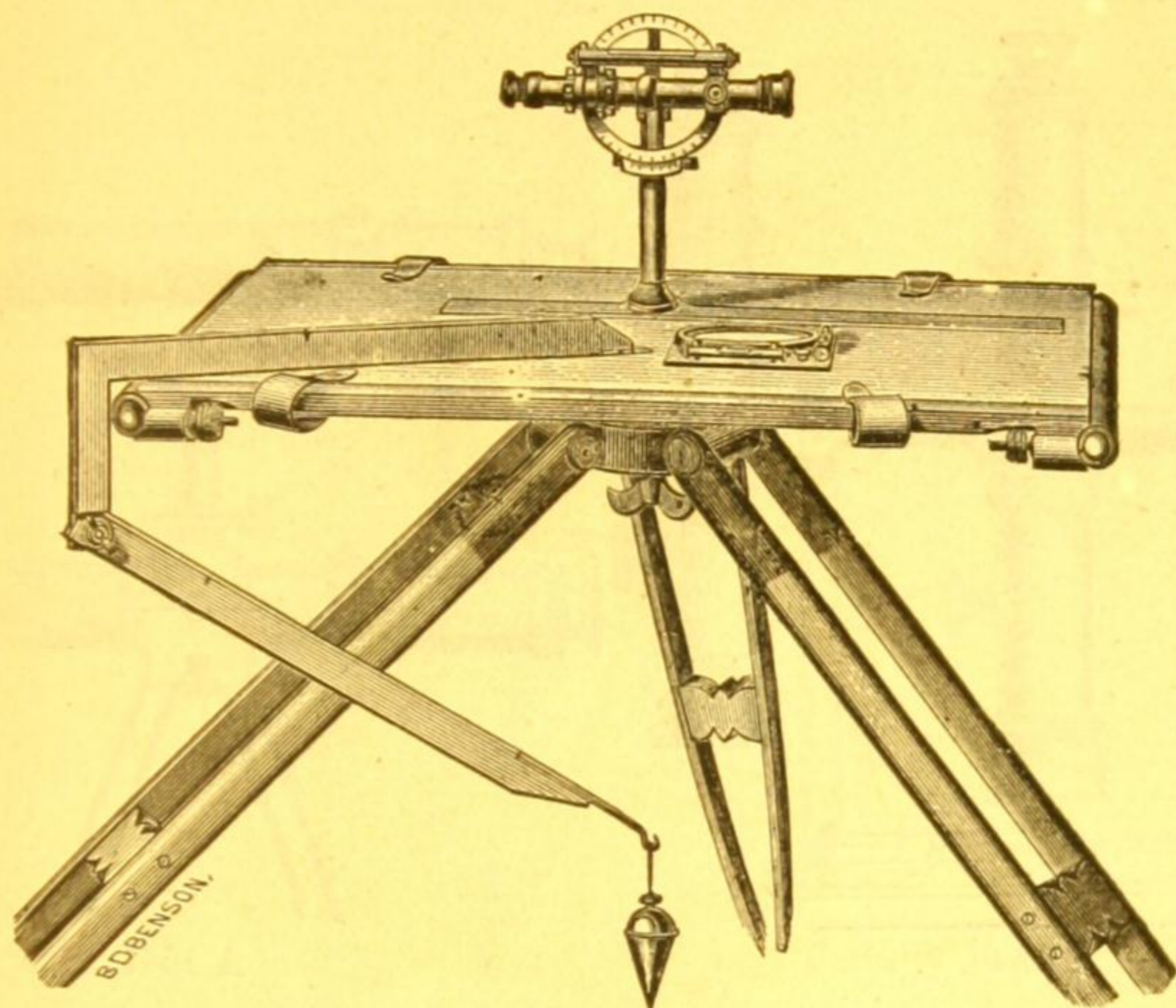
A 1531.

The Vernier Transit, which is essentially a Vernier Compass, with a telescope instead of sights, is an accurate and rapid-working instrument. The telescope is 12 inches long and sufficiently powerful to set a flag at a distance of two miles on a clear day.

No.	DESCRIPTION	PRICE
A 1530.	VERNIER TRANSIT, 4-inch or 5-inch needle, compass tripod, plain,	\$70.00
A 1531.	VERNIER TRANSIT, 4-inch or 5-inch needle, with 3½-inch vertical circle, level on telescope, and clamp and tangent movement to axis of telescope,	96.00
A 1532.	VERNIER TRANSIT, 6-inch needle, plain telescope, compass tripod,	75.00
A 1533.	VERNIER TRANSIT, 6-inch needle, 3½ inch vertical circle, level on telescope, clamp and tangent movement to axis of telescope,	100.00



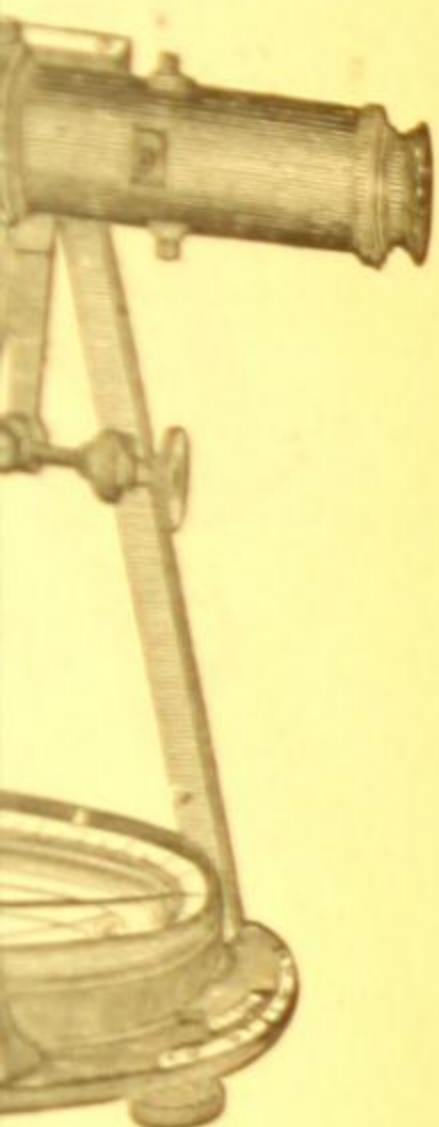
PLANE TABLES.



A 1535.

No.	PRICE.
1. Plane Table, board 24x30 inches, mounted on large tripod, with leveling socket and clamp, and with plumbing-bar, plummet, and clasps for paper, . . . . .	\$45.00
Combined compass and levels, with square base, . . . . .	15.00
Alidade with compass sights, . . . . .	15.00
Total, . . . . .	\$75.00
2. Plane Table, with board, etc., same as No. 1, . . . . .	\$45.00
Combined compass and levels, . . . . .	15.00
Alidade, same as No. 1, supplied with telescopic sight, with stadia, vertical circle to 5 minutes, level, and clamp and tangent, . . . . .	50.00
Total, . . . . .	\$110.00
3. Plane Table, with board, etc., same as No. 1, . . . . .	\$45.00
Combined compass and levels, . . . . .	15.00
Alidade, with telescope 9 inches long, power 20 diameters, with stadia, vertical circle to 5 minutes, level on telescope, and clamp and tangent, mounted on column as in engraving, . . . . .	70.00
Total, . . . . .	\$130.00
4. Plane Table, with board, etc., same as No. 1, . . . . .	\$45.00
Combined compass and levels, . . . . .	15.00
Alidade, with telescope 11 inches long, with stadia, 4½-inch vertical circle on silver to 1 minute, level on telescope, and clamp and tangent, on column, power of telescope 24 diameters, . . . . .	90.00
Total, . . . . .	\$150.00
5. Set of three leveling screws for any of the above-named Plane Tables, extra, . . . . .	10.00
6. Clamp and tangent, for movement in azimuth, extra, . . . . .	5.00

NSIT COMPASS.

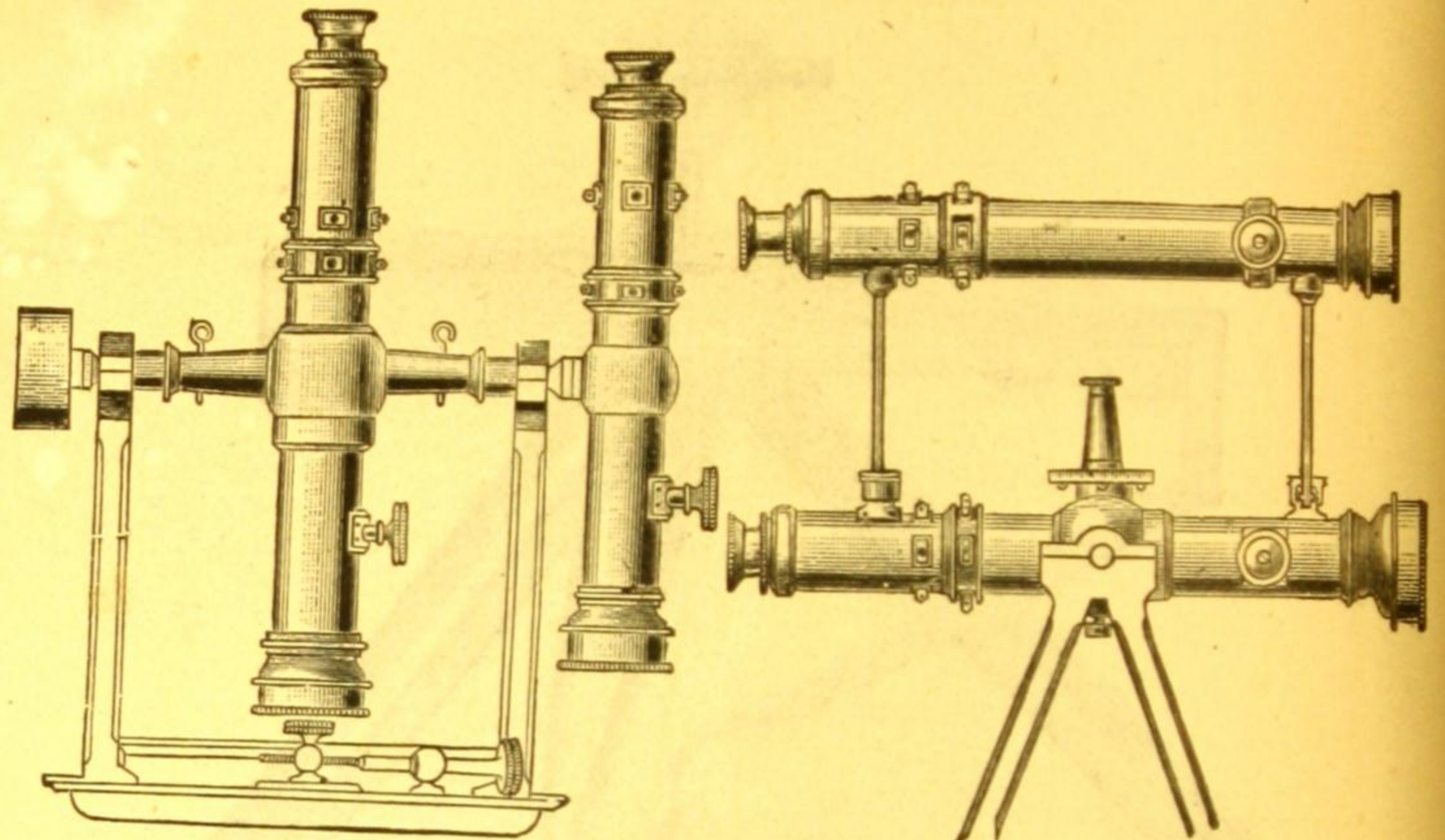


Vernier Compass, with a telescopic instrument. The telescope flag at a distance of two miles

compass tripod, plain, with 3½-inch vertical and tangent movement to

telescope, compass tripod, vertical circle, level on axis of telescope,

EXTRA TELESCOPES FOR VERTICAL SIGHTING.

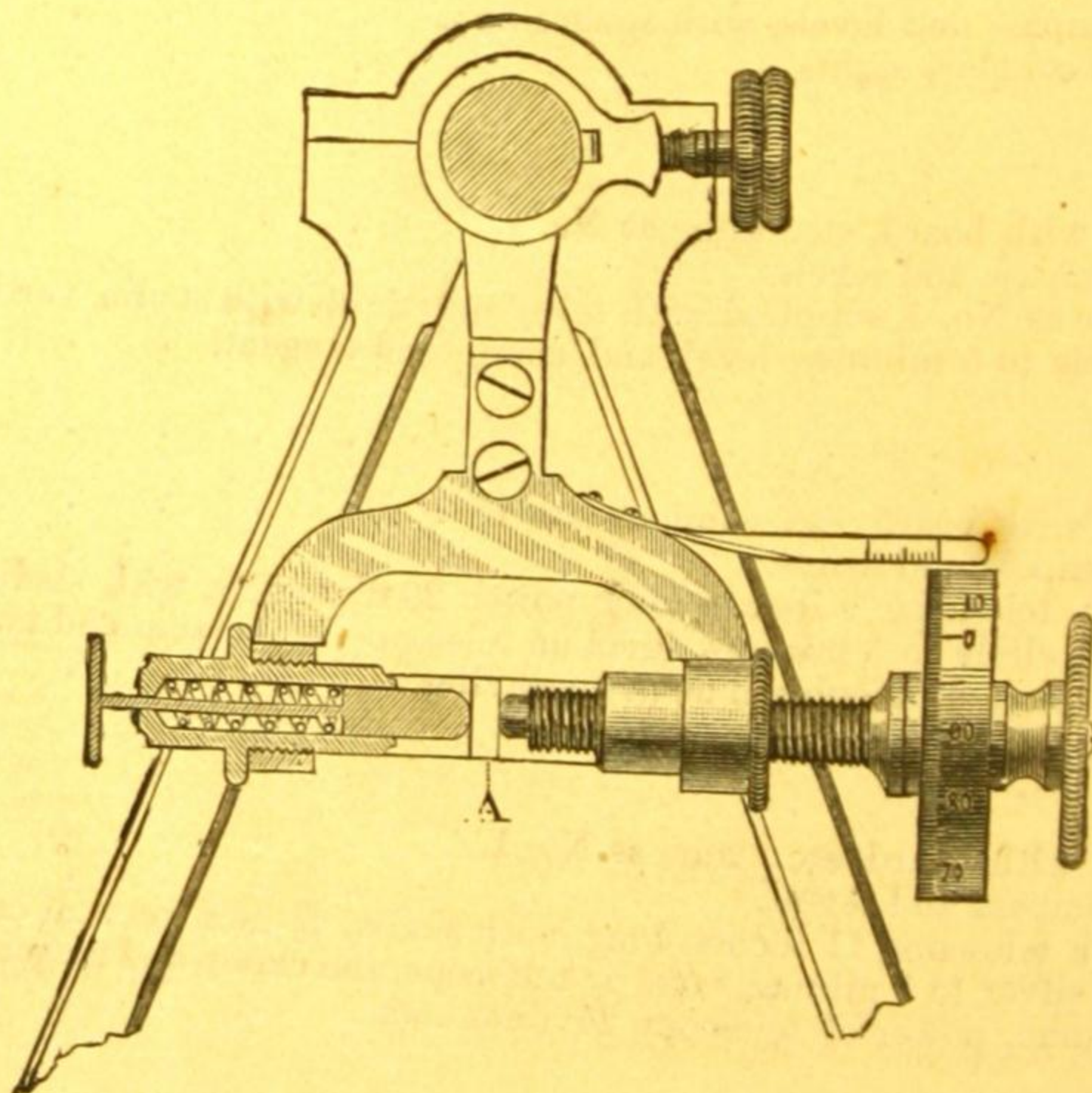


A 1540.

A 1541.

No.		PRICE
A 1540.	Detachable Telescope, for Vertical Sighting, . . . . .	\$25.00

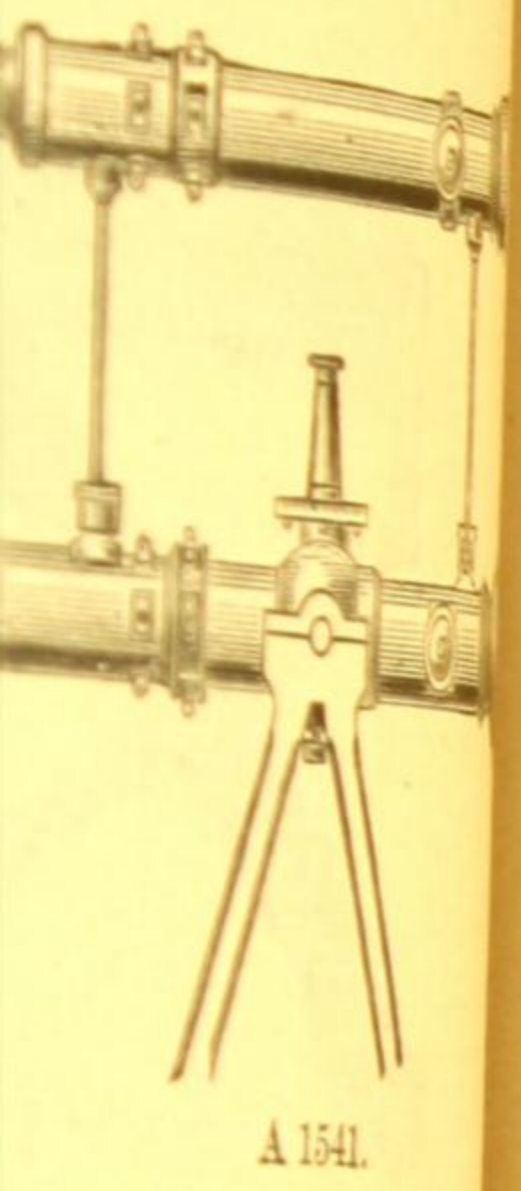
GRADIENTER.



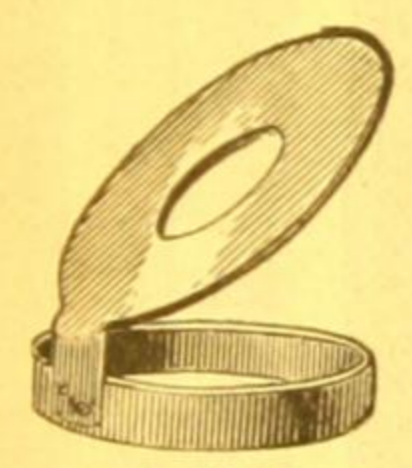
A 1542.

A 1542.	Gradienter, for attachment to Transit, for determining grades, distances, etc., . . . . .	18.00
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EXTRAS TO TRANSITS.



A 1541.



A 1547.

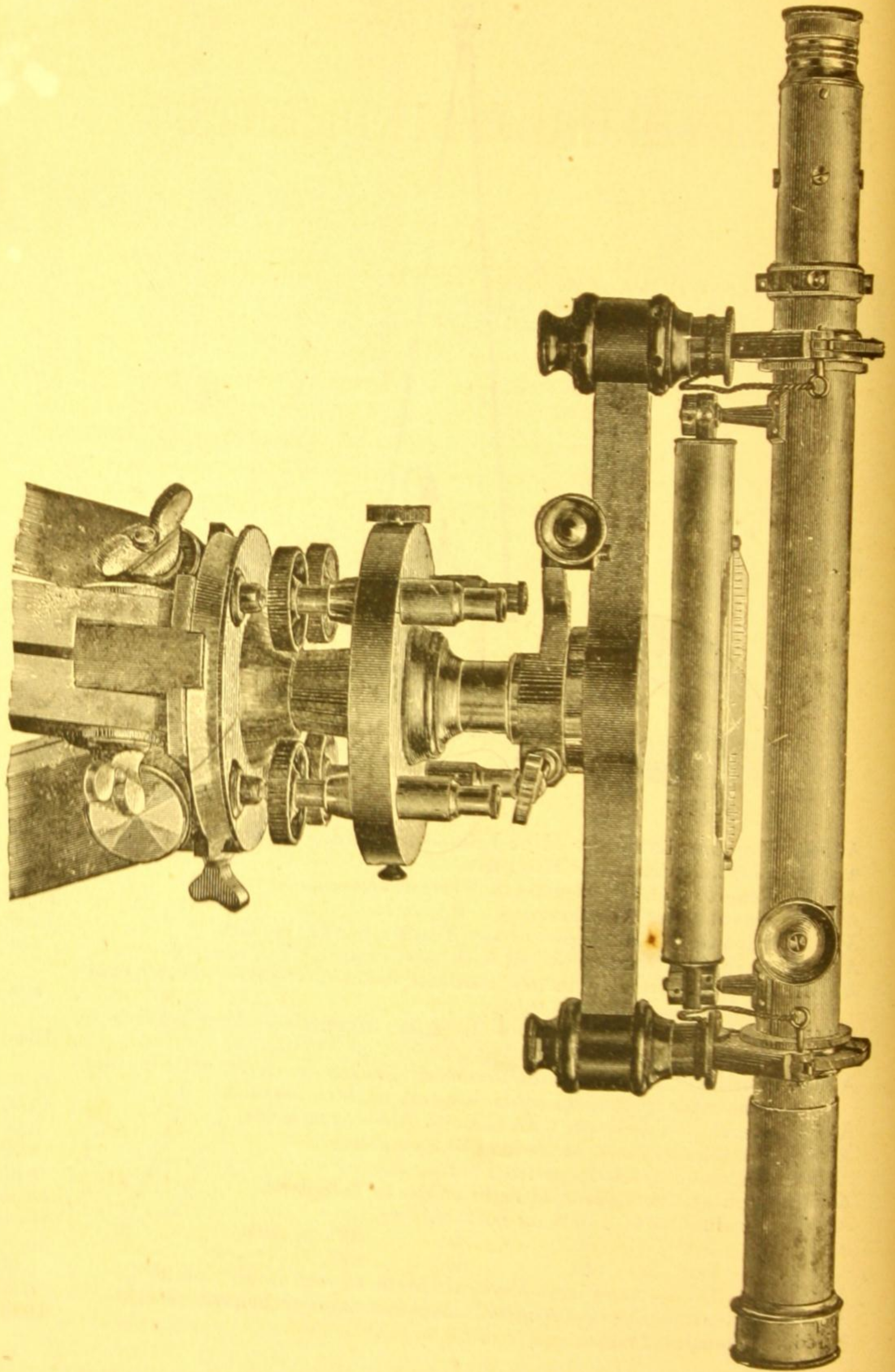


A 1545.

A 000.

- A 1545. Plummet Lamp, for Mine Engineering, hung in gimbals, . . . \$10.00
- A 1546. Diagonal Prism, for Eye-piece, . . . . . 8.00
- A 1547. Reflector for Object-glass of Transit Telescope, . . . . . 4.00
- A 1548. Patent Solar Attachment, . . . . . 60.00
- A 1549. Variation Plate, added to any Transit sent for repairs, . . . . . 15.00
- A 1550. Variation Plate furnished with new Transit, when ordered, . . . . . 4.00
- A 1551. Vertical Circle, 3½ inches diameter, divided on silver, vernier reading to five minutes, . . . . . 8.00
- A 1552. Vertical Circle, 4½ inches diameter, divided on silver, reading to single minutes, . . . . . 12 00
- A 1553. Vertical Circle, 6 inches diameter, divided on silver, with vernier, movable by tangent screw, reading to thirty seconds, . . . . . 18.00
- A 1554. Level on Telescope, with Ground Bubble and Scale, . . . . . 12.00
- A 1555. Rack-and-Pinion Movement to Eye-piece, . . . . . 5.00
- A 1556. Sights on Telescope, with Folding Joints, . . . . . 8 00
- A 1557. Sights on Standards, at right angles to Telescope, . . . . . 8.00
- A 1558. Graduation of Limb, on Solid Silver, . . . . . 10.00
- A 1559. Do. do. do. 20'' or 30'', . . . . . 10.00
- A 1560. Do. do. do. 10'', . . . . . 30.00
- A 1561. Do. on 4½-inch Vertical Circle, to read to 20'' or 30'', . . . . . 5.00
- A 1562. Extension Tripod furnished instead of regular Tripod, extra, . . . . . 5.00
- A 1563. Extension Tripod, . . . . . 15.00

A 1570.



## LEVELING INSTRUMENTS.

### IMPROVED ENGINEER'S Y LEVELS.

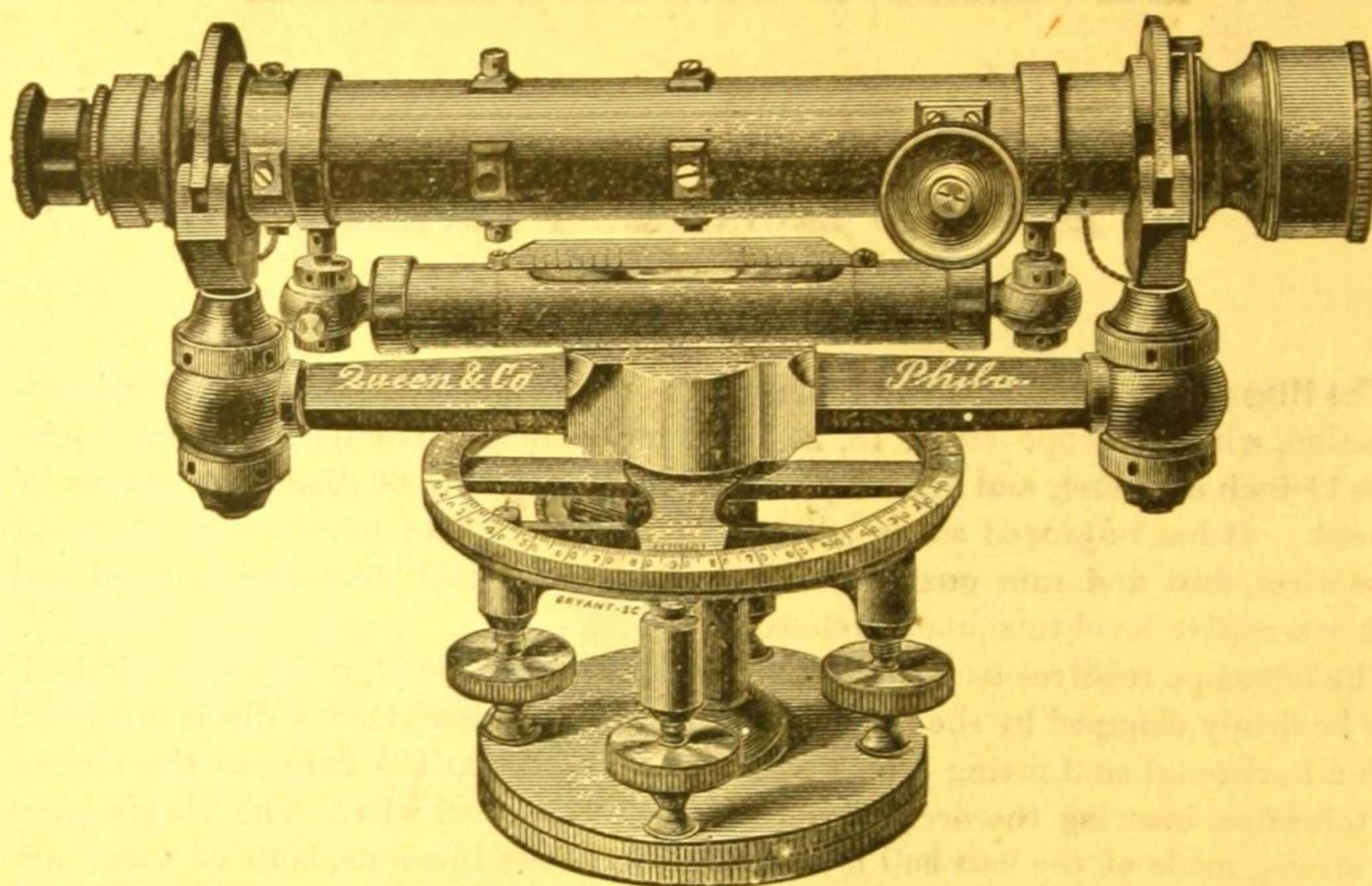
The illustration represents our ENGINEER'S Y LEVELS of the most improved construction, with telescope either 18, 20, or 22 inches long. The telescope has object-glass  $1\frac{1}{4}$ -inch diameter, and gives a power of 48 diameters or 60 diameters, as may be desired. It has improved screw adjustment to eye-piece of telescope for focusing cross wires, dust and rain guard to object slide, with 8-inch accurately ground and highly sensitive level tube under telescope.

The telescope revolves truly in the Y's by rings of bell metal, which, when desired, may be firmly clamped by the clips and held in any position. One Y dip is furnished with a horizontal stud fitting into a semi cylindrical cut on the flange of the ring of the telescope, insuring the accurate position of the vertical wire. The Y's are large and strong, made of the best bell metal, each Y having two nuts, both of which are adjustable with the ordinary steel pin. The level bar is made round, of fine bronze, and so proportioned as to have the greatest strength in the parts most subject to severe strains. The upper portion of the instrument, including the spindle, is detachable from the parallel plate head, and is firmly and securely fastened to the head by an improved clamping collar which grasps the spindle when in the socket. A spring catch holds the spindle the moment it is placed in its socket. The leveling screws are made large with a broad edge and concave to avoid unnecessary weight, and are capped and packed to prevent injury from dust. The level is fastened on tripod either by beveled clamps or by screw as may be desired.

The instrument is packed erect in box, which contains sunshade, wrench, screw-driver, and adjusting pins, with rubbers on bottom of box to prevent jarring in transportation.

No.	PRICE.
A 1570. Engineer's Y Level; 18-inch telescope complete, with tripod as above,	\$110.00
A 1571. Engineer's Y Level; 20-inch telescope complete, with tripod as above,	110.00
A 1572. Engineer's Y Level, 22-inch telescope complete, with tripod,	115.00
A 1573. Light Engineer's Y Level, 15-inch telescope, has the same general arrangement as the regular engineer's level, but the leveling head remains attached to the spindle, and the whole instrument is somewhat smaller and lighter; complete, with tripod,	100.00

## THE ARCHITECT'S LEVEL.



A 1576.

No.	PRICE.
A 1576. Architect's Level, complete with tripod, . . . . .	\$50.00

This admirable instrument, although only recently introduced by us in its improved form, has already met with a very large sale among Architects, Builders, Millwrights, and others engaged in construction, and among Engineers and Surveyors, by whom it is used in city work.

The Telescope is 12 inches long, and of the finest optical qualities, and is arranged and adjusted as in the regular engineer's level. It is furnished with a carefully ground long level. The instrument turns upon a horizontal circle 3 inches in diameter, graduated from 0 to 90 each way, and is read to five minutes by a vernier which is fixed to the spindle. Packed in box, with strap.

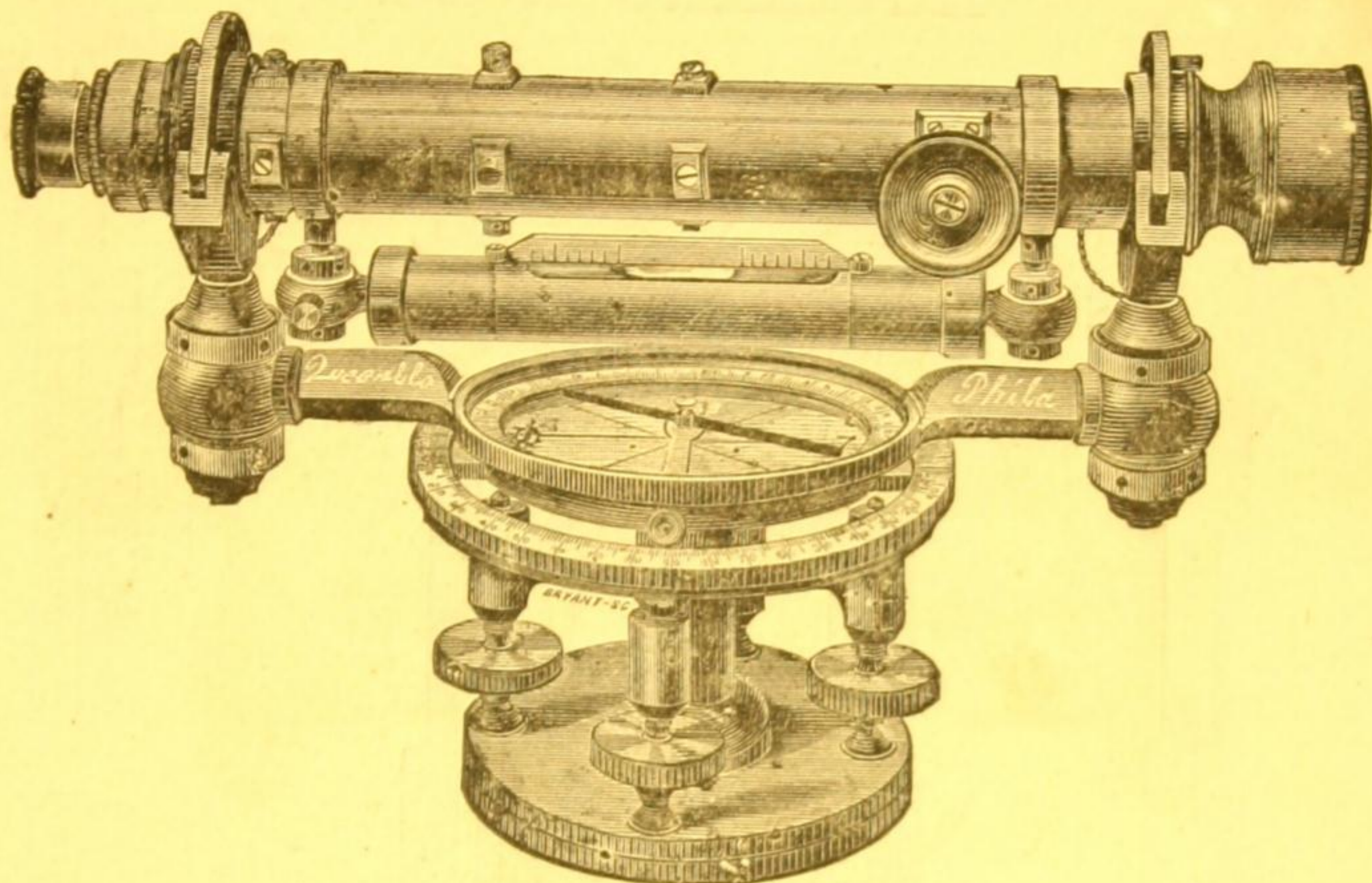
OFFICE OF SUPERINTENDENT OF CONSTRUCTION,  
U. S. Court-House, etc.,  
Clarksburgh, W. Va., April 4th, 1887.

JAMES W. QUEEN & Co., PHILADA.

SIRS:—Please find inclosed draft for amount in full for Architect's Level. In justice to you, I will say that the instrument far excels what I expected. It is both finely finished and adjusted, and will do the work as well as one costing three times its cost.

Respectfully,  
(Signed,) CHAS. L. HICKMAN.

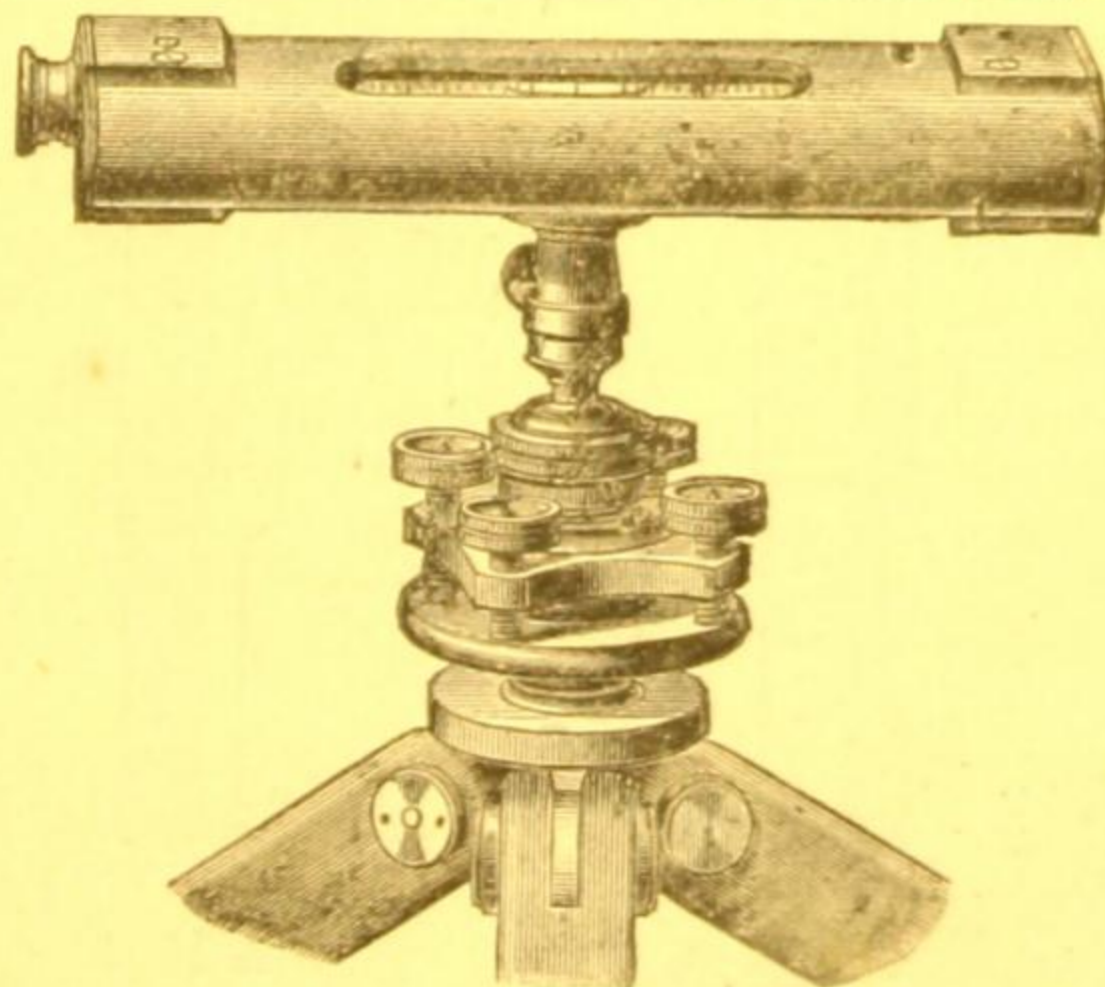
THE ARCHITECT'S COMPASS LEVEL.



A 1577.

No.	DESCRIPTION	PRICE.
A 1577.	This instrument is similar to the Architect's Level before described, but is fitted with compass with $3\frac{1}{2}$ -inch needle. This is so arranged that it adds practically nothing to the weight or bulk, and does not interfere with the portability of the instrument, whilst its value, in many kinds of work, is obvious.—Architect's Compass Level, complete, with tripod, . . . . .	\$65.00

FARMER'S OR DRAINAGE LEVEL.



A 1578: 1580

A 1577.	Farmer's or Drainage Level, with Jacob Staff mountings, . . . . .	15.00
A 1579.	Do. do. do. do. plain tripod, . . . . .	20.00
A 1580.	Do. do. do. do. tripod and leveling screws, . . . . .	25.00

PRICE.  
\$50.00

ed by us in its  
hitects, Builders,  
gineers and Sur-  
and is arranged  
carefully ground  
hes in diameter,  
vernier which is

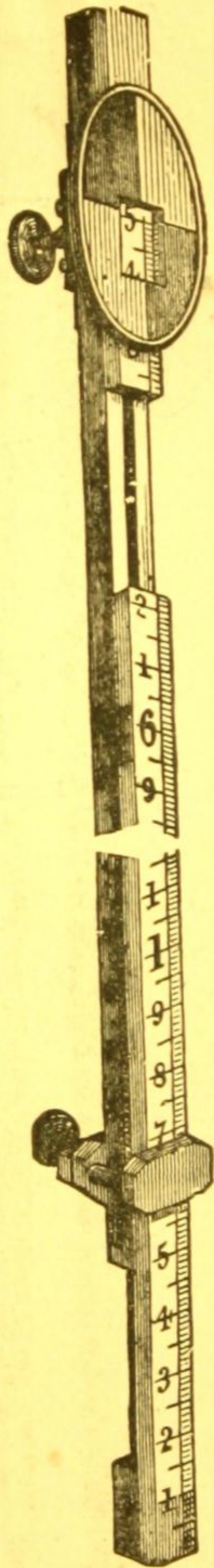
ON,  
April 4th, 1887.

ect's Level. In  
expected. It is  
one costing three

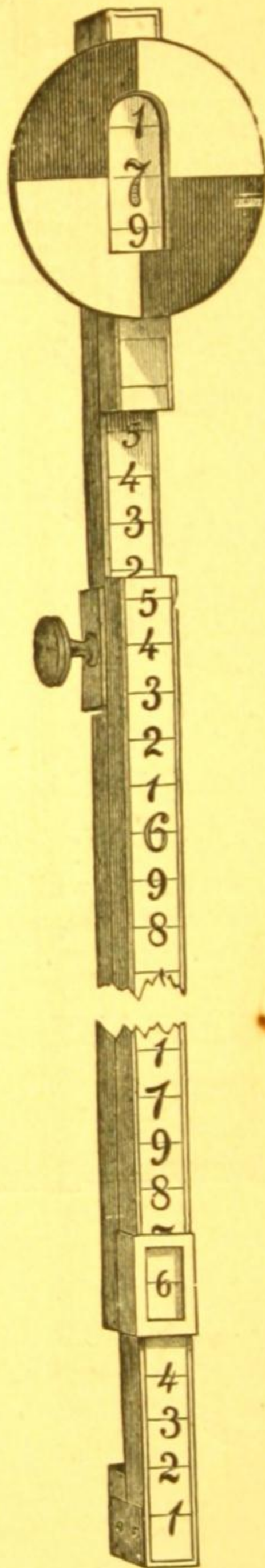
L. HICKMAN.

JAMES W. QUEEN & CO., PHILADELPHIA.

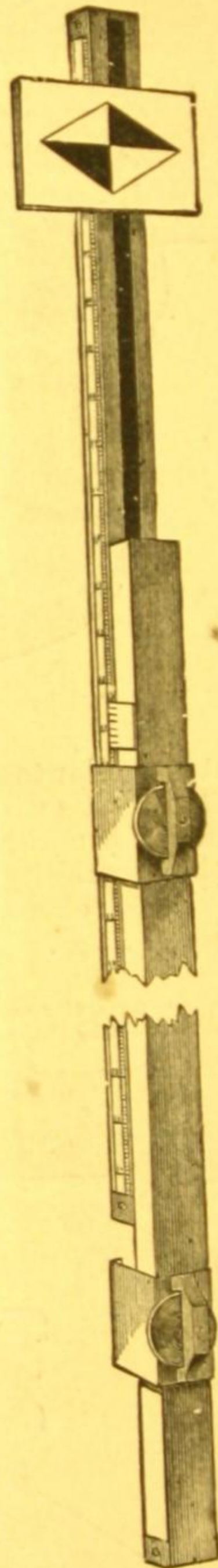
# LEVELING RODS.



A 1591.



A 1590.



A 1594.



A 1592.

PRICE.

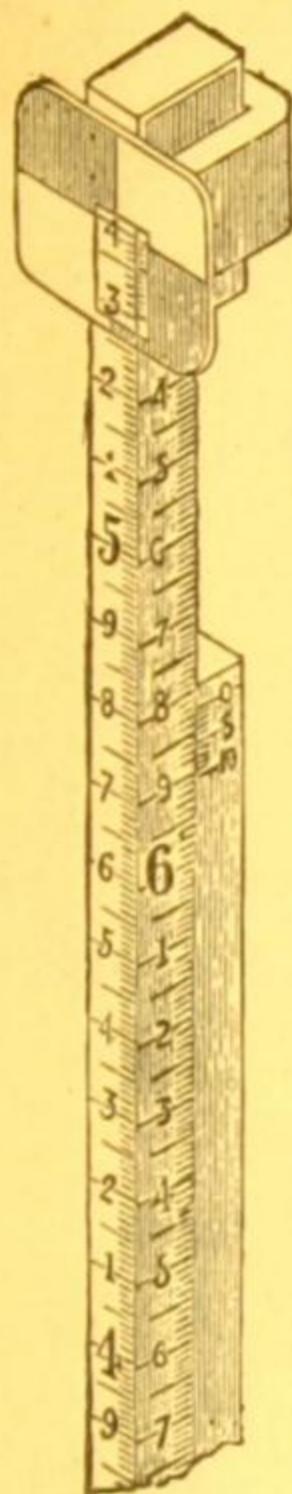
No.			
A 1590.	Philadelphia Rod, made of seasoned mahogany, 7 <sup>3</sup> / <sub>10</sub> feet closed, sliding to 13 feet,		\$16.00
A 1591.	New York Rod, made of satin wood, 6 <sup>8</sup> / <sub>10</sub> feet closed, sliding to 12 feet,		16.00
A 1592.	New York Rod, in 3 parts, 5 feet closed, sliding to 13 feet,	.	18.00
A 1593.	Do. do. 4 do. 5 feet closed, sliding to 16 feet,	.	20.00
A 1594.	Boston Rod, 6 feet closed, sliding to 11 feet,	.	16.00



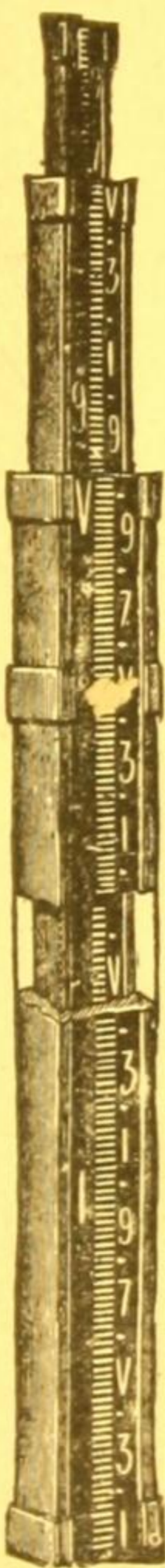
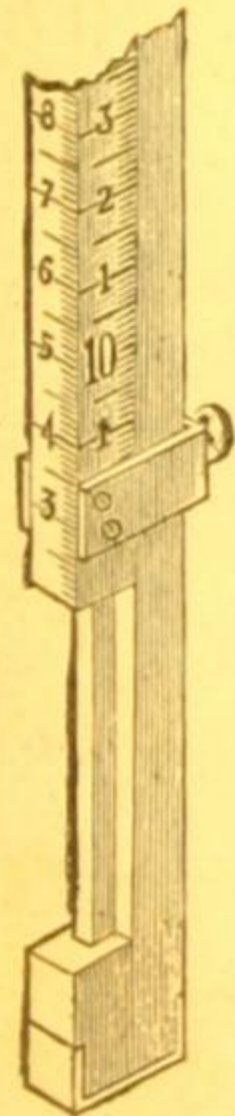
G RODS.



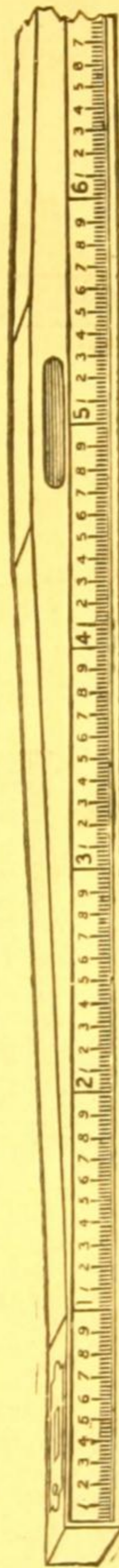
A 1594.



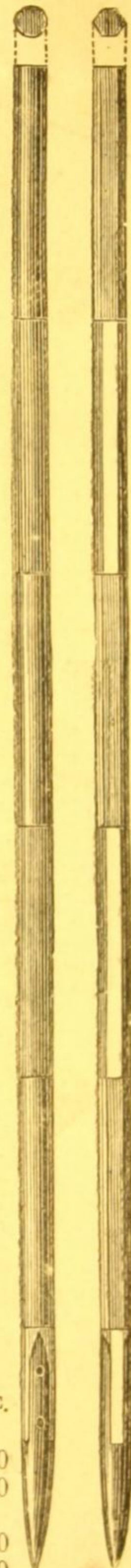
A 1595.



A 1596.



A 1597.

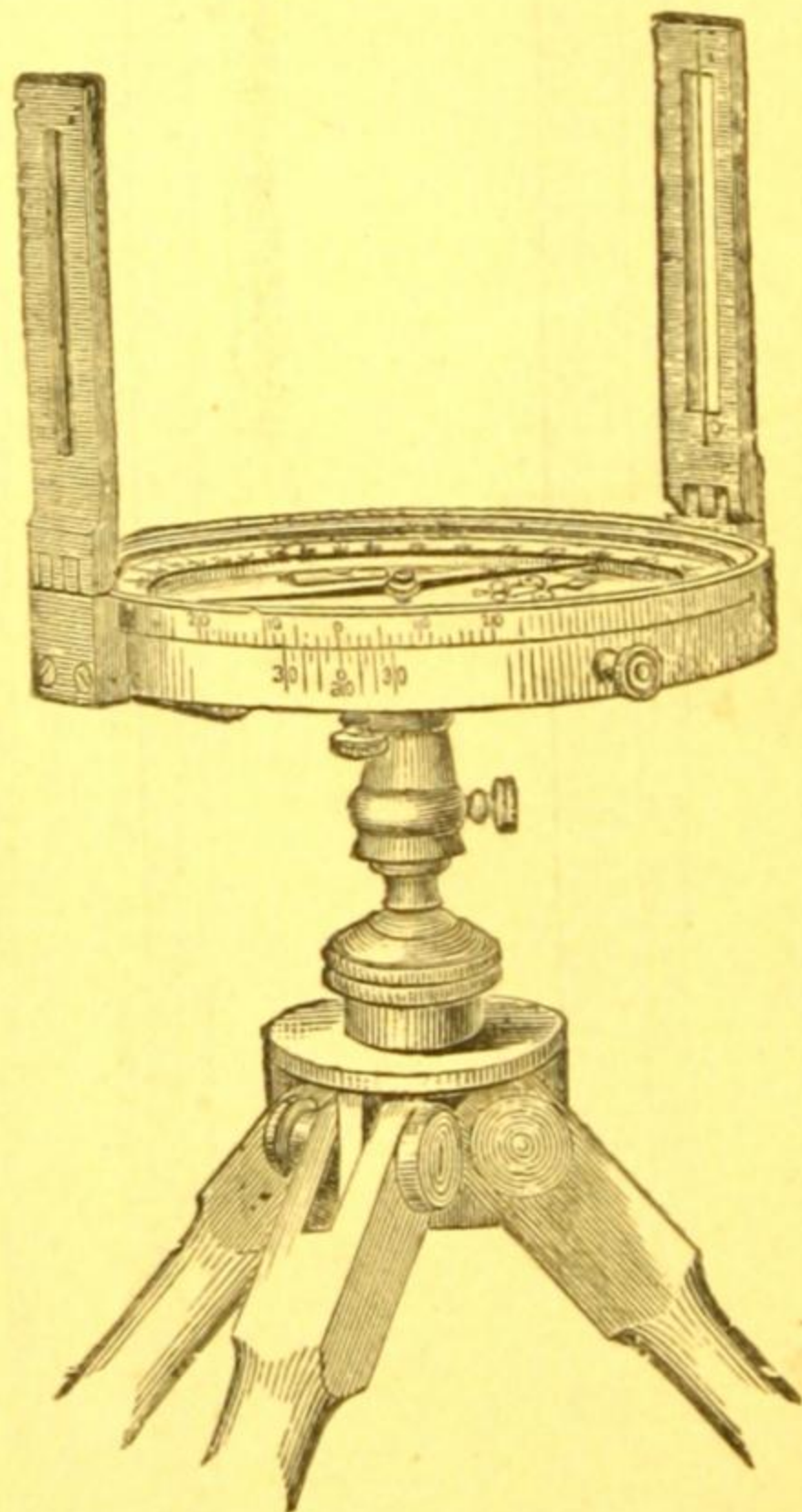


A 1599.

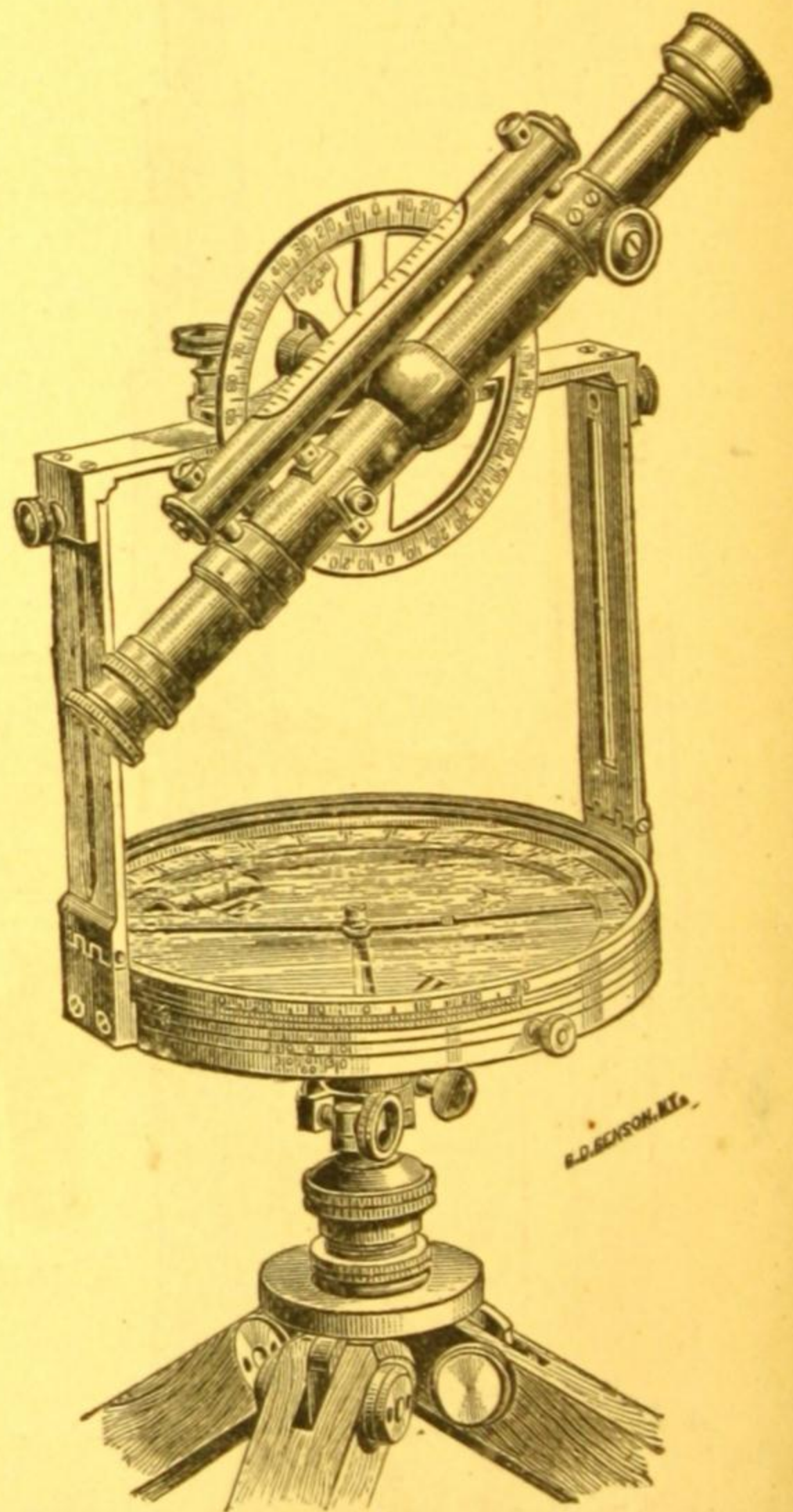
No.	DESCRIPTION	PRICE.
A 1595.	Architect's Rod, reading to inches and 16ths, 5½ feet closed, sliding to 10 feet,	\$6.00
A 1596.	Telescopic Rod, 5 feet long, sliding to 14 feet,	24.00
A 1597.	Cross Section Rod, 10 feet long, with level bulb at each end,	10.00
A 1598.	Telemeter or Stadia Rod, 6 feet closed, opening to 12 feet,	12.00
A 1599.	Ranging Pole, 6 feet long, with steel-pointed shoe and divided off in feet, which are painted red and white alternately,	2.00
A 1600.	Ranging Pole, 8 feet long,	2.25
A 1601.	Ranging Pole, 10 feet long,	2.50
A 1602.	Aligning or Ranging Pole, 6 feet long, hung in gimbals,	4.00

seasoned mahogany, 7½ feet closed,  
 wood, 6½ feet closed, sliding to 12  
 feet closed, sliding to 13 feet,  
 sliding to 16 feet,

# SURVEYOR'S COMPASSES.



A 1610, with Tripod.



A 1615.

No.	PRICE.
A 1610. Surveying Compass, with folding sights, needle $3\frac{1}{2}$ inches long, nonius on side of compass, box for adding and subtracting magnetic variations, two straight levels, Jacob Staff mountings, . . . . .	\$16.00
A 1611. Same as above, but with $4\frac{1}{2}$ -inch needle, . . . . .	18.00
A 1612. Surveying Compass, same as No. 1610, but without nonius, needle $3\frac{1}{2}$ inches long, . . . . .	13.50

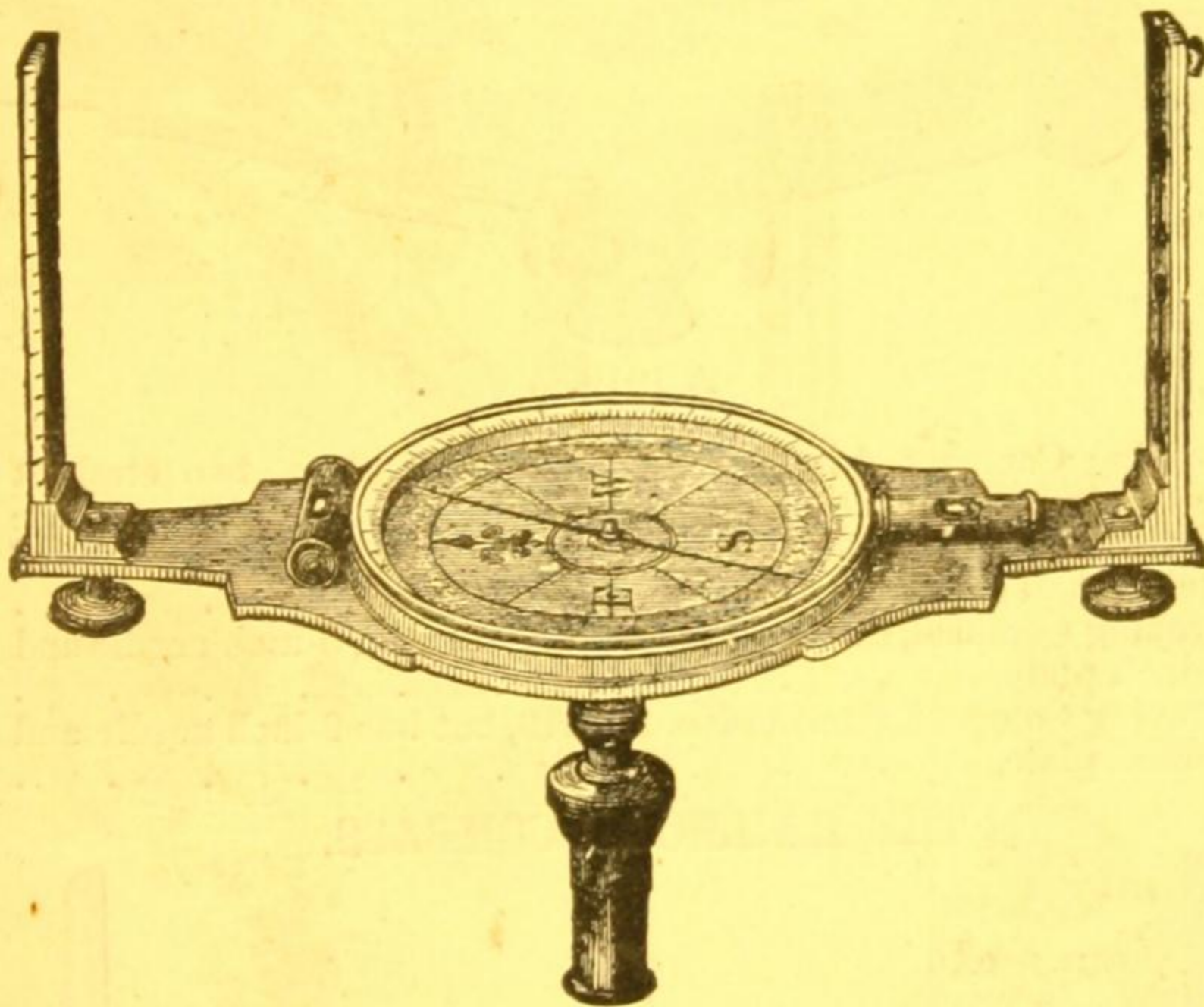
No.	PRICE.
A 1613. Surveying Compass, same as No. A 1612, without levels and nonius, needle $3\frac{1}{2}$ inches long, . . . . .	\$12.00
A 1614. Surveying Compass, same as No. A 1613, but needle $2\frac{1}{2}$ inches long, Tripod, with cherry legs, for any of above compasses, . . . . .	10.00 7.00
A 1615. Vernier Pocket Compass, $4\frac{1}{2}$ -inch needle, with clamp and tangent spindle, and fitted with Telescopic Sight No. 1, with extras of level on telescope, vertical circle with vernier reading to five minutes, and clamp and tangent to axis of telescope, including tripod, . . . . .	55.00

COMPASSES.



A 1615.

PLAIN COMPASS.

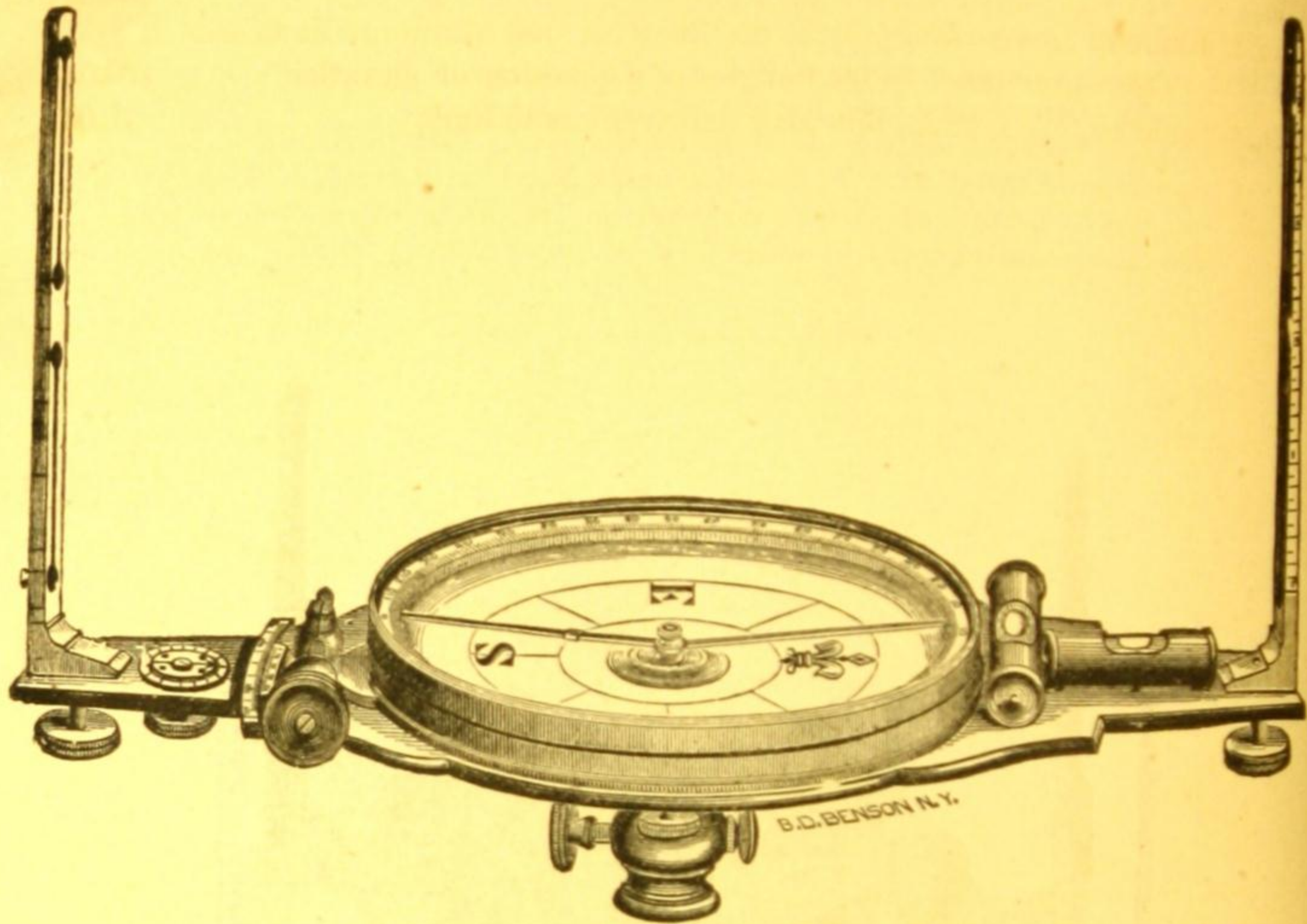


A 1616.

A 1616. Surveying Compass, 4-inch needle, $12\frac{1}{2}$ -inch plate, two straight levels, Jacob Staff mountings, and sights graduated for taking angles of elevation and depression, . . . . .	25.00
A 1617. Surveying Compass, 5-inch needle, $15\frac{1}{2}$ -inch plate, two straight levels, outkeeper and Jacob Staff mountings, and sights graduated for taking angles of elevation and depression, . . . . .	30.00
A 1618. Surveying Compass, 6-inch needle, $15\frac{1}{2}$ -inch plate, two straight levels, outkeeper and Jacob Staff mountings, and sights graduated for taking angles of elevation and depression, . . . . .	35.00

sights, needle  $3\frac{1}{2}$  inches long, nonius  
ing and subtracting magnetic varia-  
Staff mountings, . . . . .  
needle, . . . . .  
1610, but without nonius, needle  $3\frac{1}{2}$

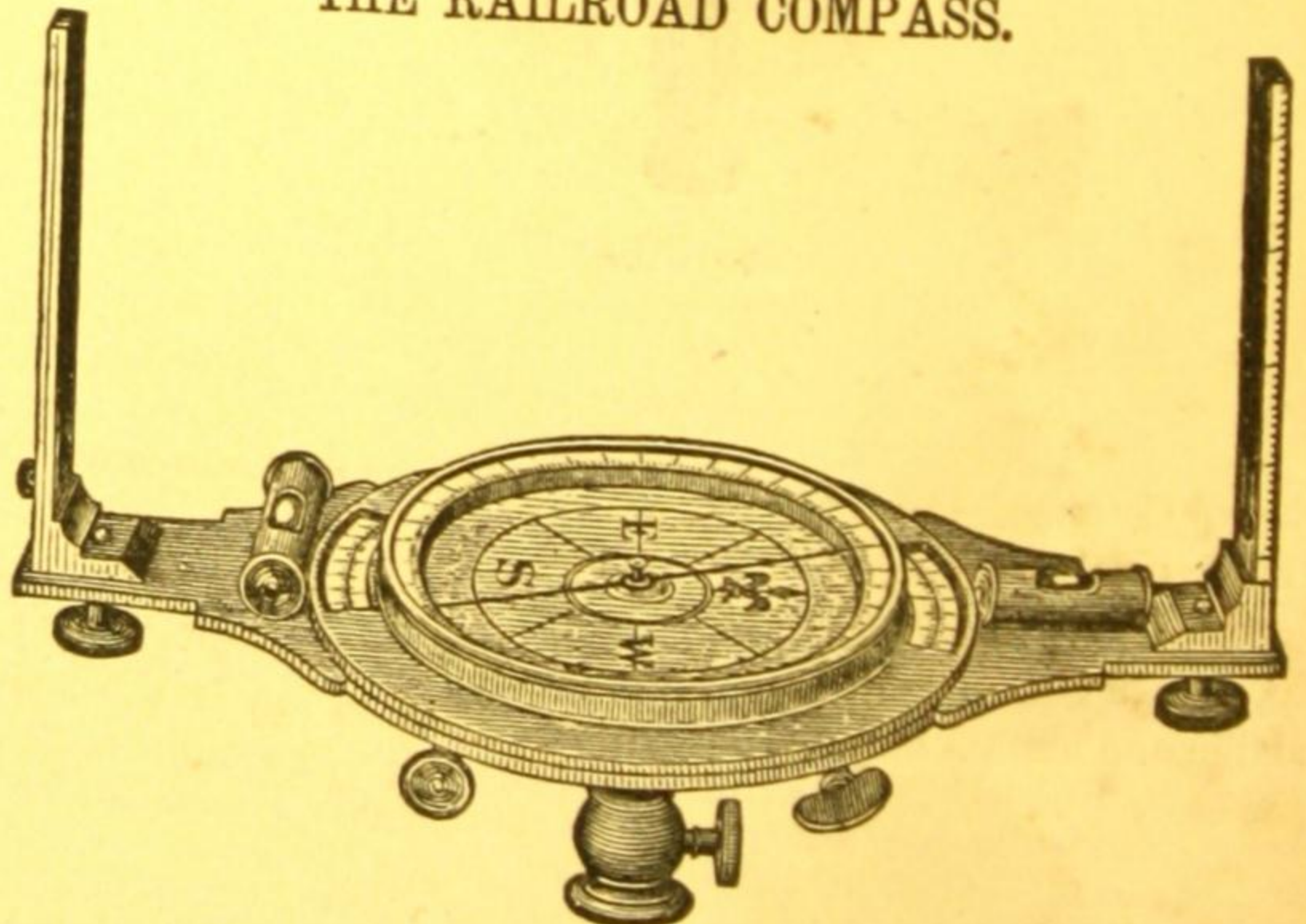
VERNIER COMPASS.



A 1619.

- | No.     |   | PRICE   |
|---------|---|---------|
| A 1619. | Surveying Compass, 4-inch needle, 12½-inch plate, two straight levels, outkeeper and nonius for adding or subtracting the magnetic variations of the needle, and sights graduated for reading angles of elevation and depression, | \$30.00 |
| A 1620. | Surveying Compass, same as No. A 1619, but with 5-inch needle and 15½-inch plate,   | 35.00   |
| A 1621. | Surveying Compass, same as No. A 1619, but has 6-inch needle and 15½-inch plate,  | 40.00   |

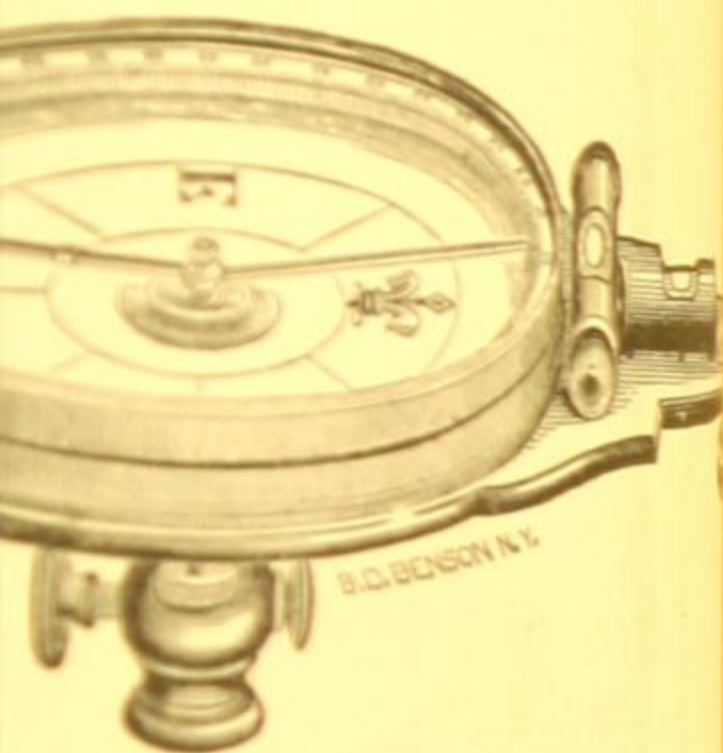
THE RAILROAD COMPASS.



A 1622.

The Railroad Compass has the Main Plate, Levels, Sights, and Needle of the ordinary Surveying Compass, but has also underneath the main plate a divided circle or limb by which horizontal angles to

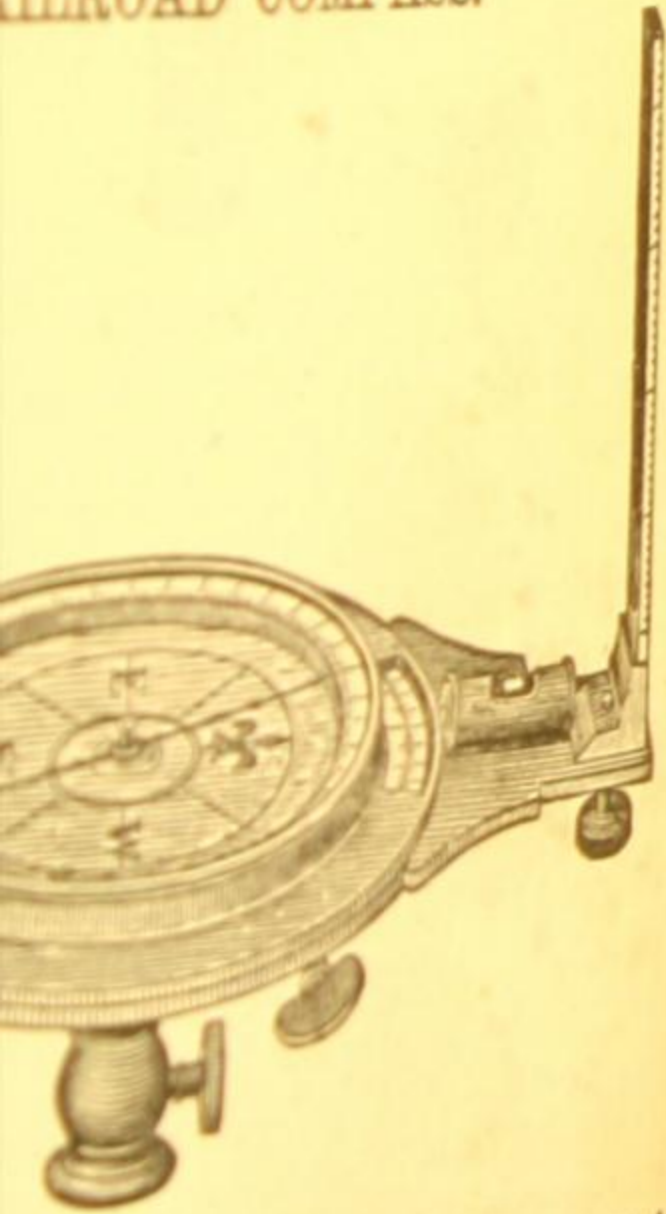
No.	PRICE.
A 1623. Railroad Compass, 5½-inch needle, with one vernier to limb, and sights graduated to read angles of depression or elevation, . . . . .	\$60.00
A 1624. Same as No. A 1623, but with two verniers to limb, . . . . .	75.00



A 1619.

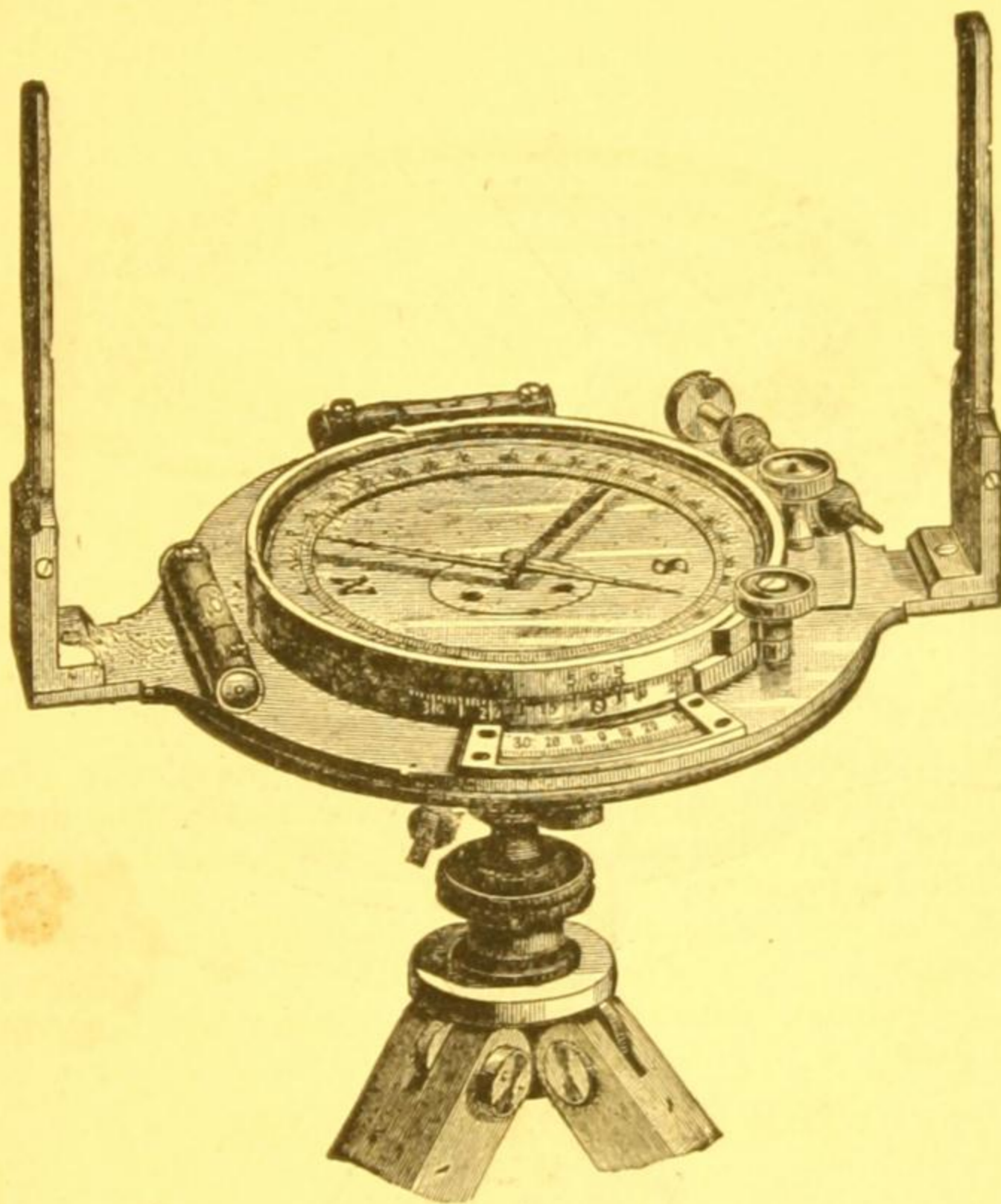
ch needle, 12¼-inch plate, two straight  
 us for adding or subtracting the magnetic  
 and sights graduated for reading angles of  
 as No. A 1619, but with 5-inch needle and  
 as No. A 1619, but has 6-inch needle and

RAILROAD COMPASS.



A 1622.

Levels, Sights, and Needle of the  
 divided circle of the

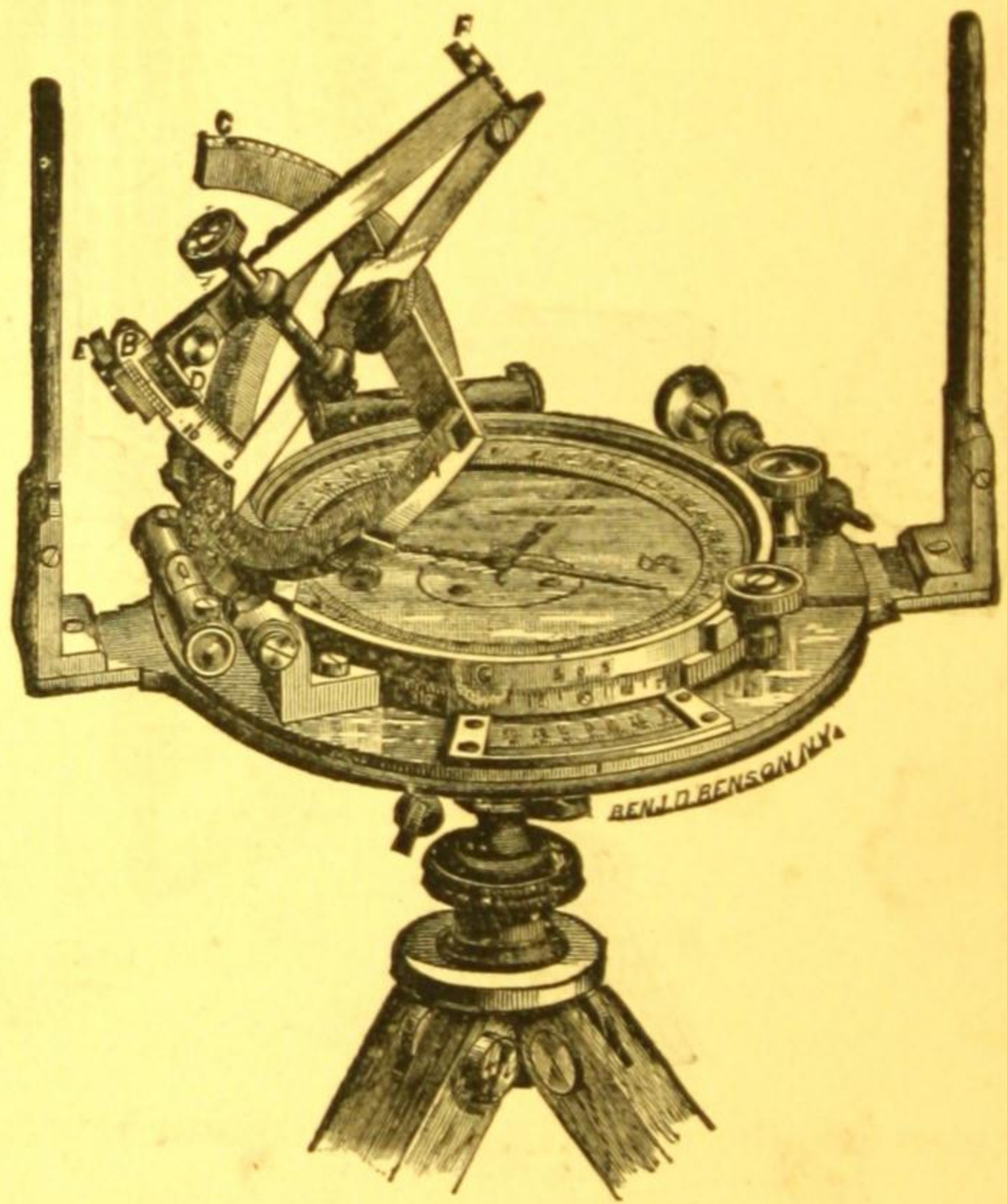


A 1625

A 1625. Railroad Compass, 4½-inch needle, clamp and tangent movement to limb, vernier reading to single minutes, complete with tripod, . . . . .	45.00
A 1626. Tripod, with cherry legs, furnished to any of the compasses, . . . . .	5.00
A 1627. Tripod, with cherry legs, with parallel plates and leveling screws, and clamp and tangent movement, furnished to any of the compasses, . . . . .	18.00

All of the compasses are packed in handsome mahogany boxes.

## SOLAR COMPASSES.



A 1630.

No.	PRICE.
A 1630. Pocket Solar Compass, complete, with tripod and mahogany box, .	\$105.00
A 1631. Pocket Solar Compass, as above, with Leveling Plates, .	120.00
A 1632. Burt's Solar Compass, with adjusting socket and Leveling Tripod,	210.00

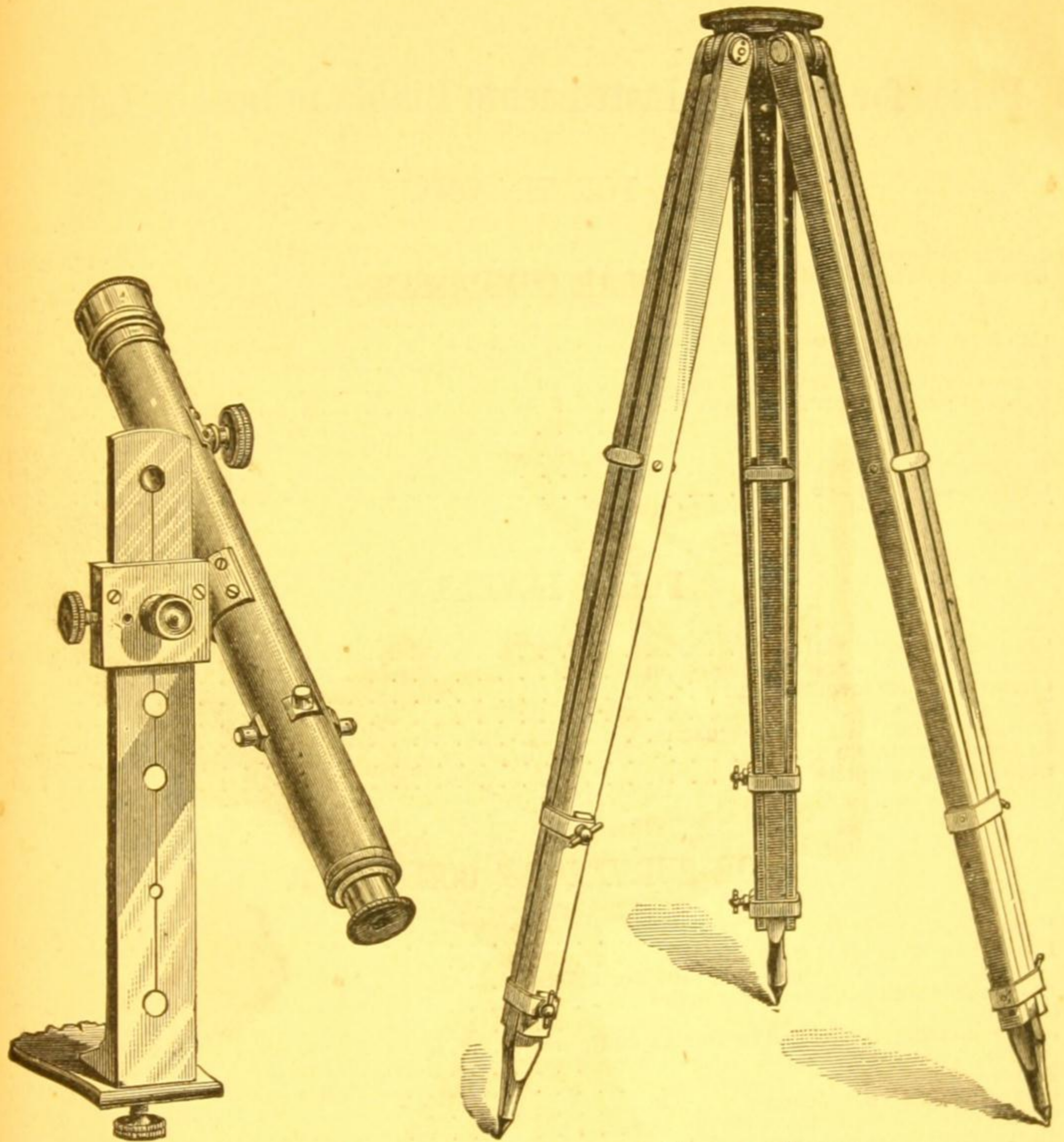
EXTRAS FOR COMPASSES.

COMPASSES.



1630.

with tripod and mahogany box,  
with Leveling Plates,  
fastening socket and Leveling Tripod,



TELESCOPIC SIGHT, ATTACHABLE TO COMPASS SIGHT.

No.	DESCRIPTION	PRICE.
A 1635.	Nine-inch Achromatic Telescope, power about 10 diameters, .	\$12.00
A 1636.	Do. do. do. larger diameter object-glass and power 20 diameters, .	17.00
A 1637.	Do. do. do. with stadia wires for measuring distances, .	20.00
A 1638.	Vertical Circle, with Vernier to 5 minutes for Telescopic Sight, .	5.00
A 1639.	Level on Telescope, . . . . .	5.00
A 1640.	Clamp and Tangent to Axis of Telescope, . . . . .	5.00
A 1641.	Leather Case, with shoulder strap, for pocket compasses, according to size, from . . . . .	\$2.00 to 5.00
A 1642.	Tripod for Compasses, . . . . .	5.00
A 1643.	Patent Extension Tripod for Surveyor's Compass, . . . . .	12.00
A 1644.	Do. do. do. for Pocket Compass, . . . . .	10.00
A 1645.	Compass Tripod, with leveling screws and clamp and tangent movement, . . . . .	18.00
A 1646.	Tripod for Pocket Compass, with leveling plates and clamp and tangent, . . . . .	15.00
A 1647.	Compass Tripod Mountings, without legs, rack movement to vernier of Vernier Pocket Compass, . . . . .	4.00

Prices for Parts of Instruments Liable to Loss or Injury.

FOR TRANSIT.

	PRICE.
Needle and centre pin . . . . .	\$2 50
Ground glass level vial for plate or standard, each . . . . .	50
Do. do. brass mounted complete, for plate or standard, each . . . . .	2 50
Do. do. for telescope, each . . . . .	1 50
Cap for eye-piece or object-glass, each . . . . .	75
Shade for object-glass, . . . . .	75
Clamp screws for horizontal limb, each . . . . .	75
Tangent screw for leveling head . . . . .	1 50
Clamp do. do. . . . .	75
Leveling do. do. each . . . . .	1 50
Eye-piece, complete . . . . .	6 00
Object-glass, complete . . . . .	6 00

FOR Y LEVELS.

Ground glass level vial . . . . .	\$2 00
Cap for eye-piece or object-glass, each . . . . .	75
Clamp screw for leveling head . . . . .	75
Tangent do. do. . . . .	1 50
Leveling do. do. each . . . . .	1 50
Eye-piece, complete . . . . .	6 00
Object-glass, complete . . . . .	7 00

FOR SURVEYORS' COMPASSES.

Needle and centre pin . . . . .	\$2 50
Plain glass level vials, each . . . . .	15
Do. do. brass mounted, complete . . . . .	1 50
Brass cover for compass of our make . . . . .	1 00
Outkeeper . . . . .	1 00
Staff mounting, brass head (without spindle) . . . . .	2 50
Do. steel point . . . . .	60
Ball-spindle, fitted . . . . .	1 50
Compass sight vanes, each . . . . .	2 50
Clamp screw for spindle or sight vane . . . . .	75
Tangent screw for moving vernier . . . . .	1 50
Staff mountings, complete, for pocket compass . . . . .	\$2 50 to 3 50

MISCELLANEOUS.

Patent Extension Tripod, Fig. 17, for Engineers' Transit or Level . . . . .	\$15 00
Extension legs only, with clamps, do. do. per set . . . . .	10 00
Plain Mahogany Tripod, do. do. . . . .	10 00
Mahogany tripod, legs only, do. do. per set . . . . .	5 00
Tripod head, with bolts, do. do. . . . .	5 00
Wooden Cap, with brass screw plate, for tripod head . . . . .	75
Ring for tripod legs . . . . .	15
Brass bolts do. each . . . . .	50
Metal points do. do. . . . .	50
Screw-drivers, each . . . . .	20
Steel adjusting pins, each . . . . .	5
Brass wrench for centre pin . . . . .	10
Glass circle for compass face . . . . .	25
Mahogany case with lock and key and leather strap, fitted complete for Transit or Level . . . . .	6 00
Do. do. do. do. for Compass . . . . .	5 00
Regraduating compass circle . . . . .	5 00
Do. horizontal limb and verniers of Transit . . . . .	10 00
Do. vertical do. do. . . . .	5 00



ents Liable to Loss or Injury.  
RANST.

ch  
for plate or standard, each

LEVELS.

RS' COMPASSES.

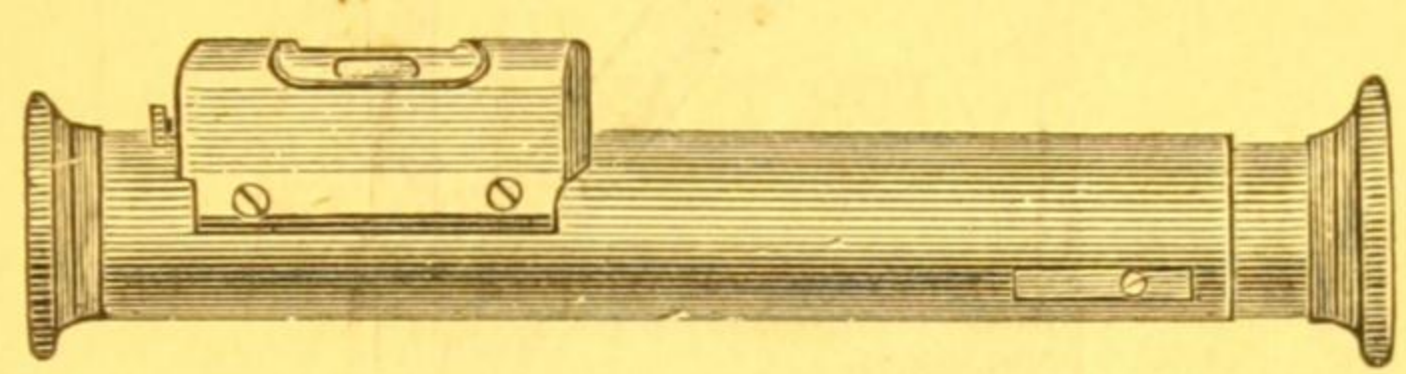
ANEOUS.

Transit or Level . . . per set  
do. . . per set  
do. . . per set  
do.

trap, fitted complete for Transit or Level  
do. for Compass

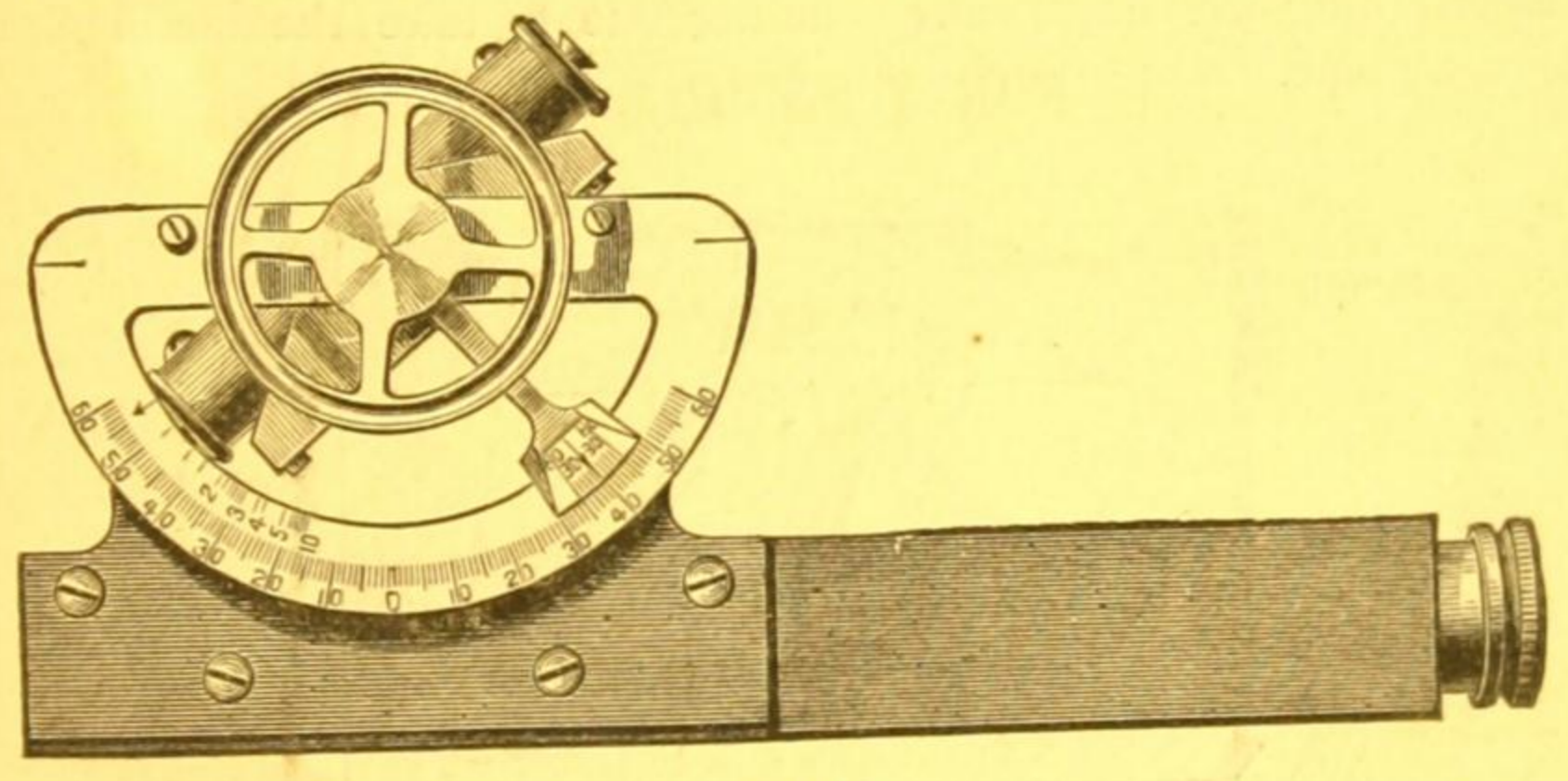
transit

### HAND LEVELS.



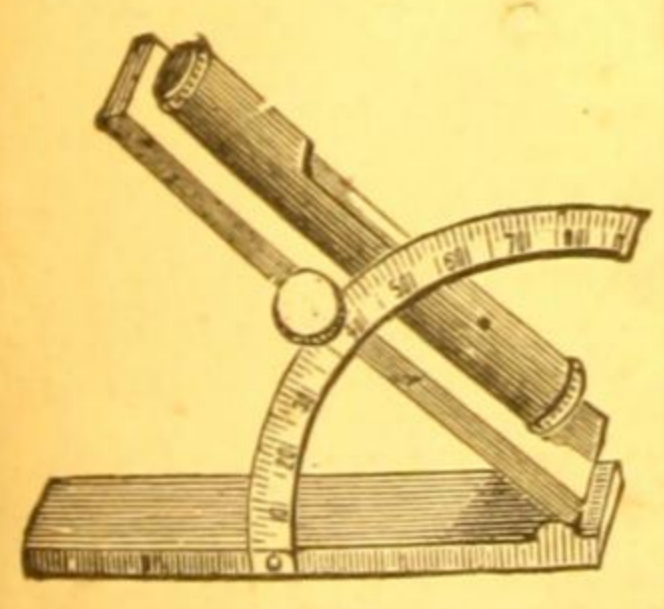
A 1650.

No.		PRICE.
A 1650.	LOCKE'S HAND, brass, . . . . .	\$9.00
A 1651.	Do. nickeled, . . . . .	10.00
A 1652.	Do. German silver, . . . . .	10.00

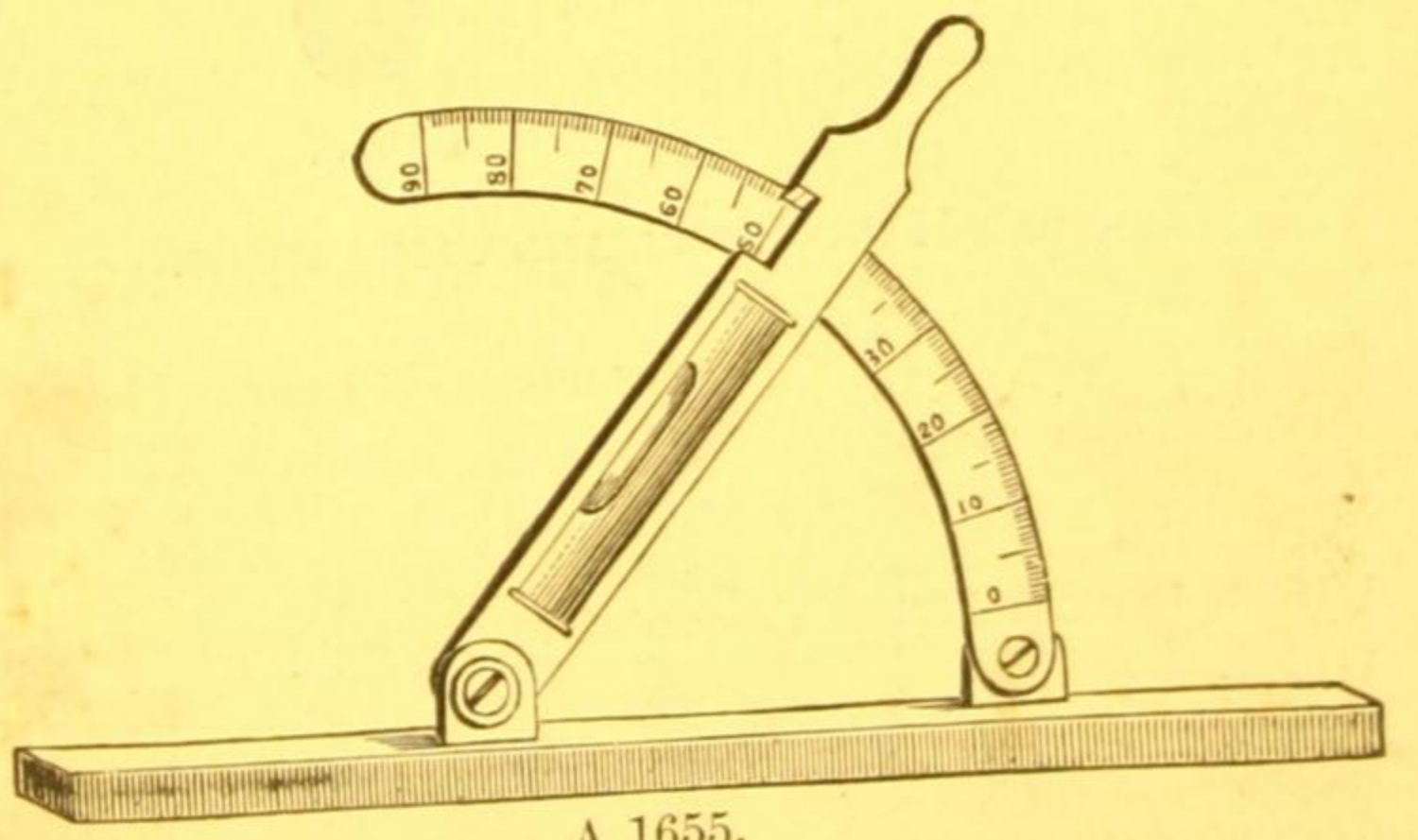


A 1653.

A 1653.	ABNEY LEVEL AND CLINOMETER, a combination of the "Locke Hand Level," with the Clinometer, giving angles of elevation and slopes, in wood box, . . . . .	15.00
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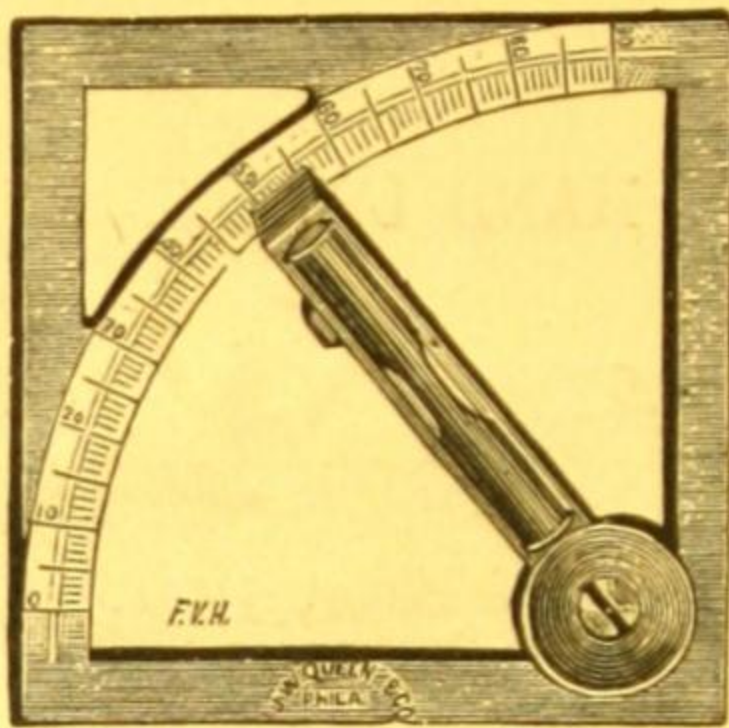


A 1654.



A 1655.

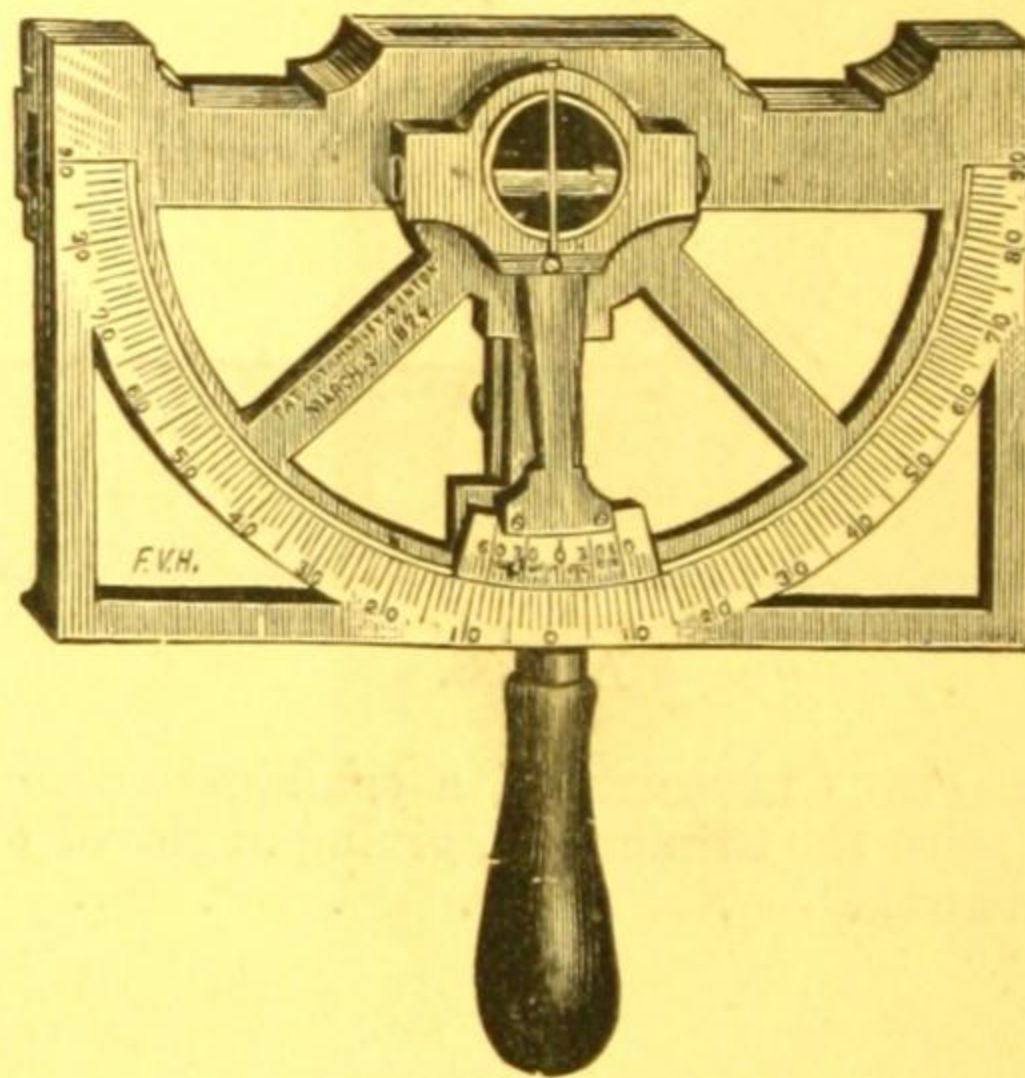
A 1654.	CLINOMETER OR SLOPE LEVEL, small, in morocco box, . . . . .	8.00
A 1655.	Do. do. large, do. . . . .	12.00
A 1656.	Do. do. do. with perpendicular sight, . . . . .	15.00



A 1657.

No.	PRICE.
A 1657. CLINOMETER, of square frame, with arc running diagonally across, in box, . . . . .	\$12.00

This form gives the instrument great firmness, and either of the four sides can be used for ascertaining the slope, thus enabling one to take the inclination of the under side of a plane.

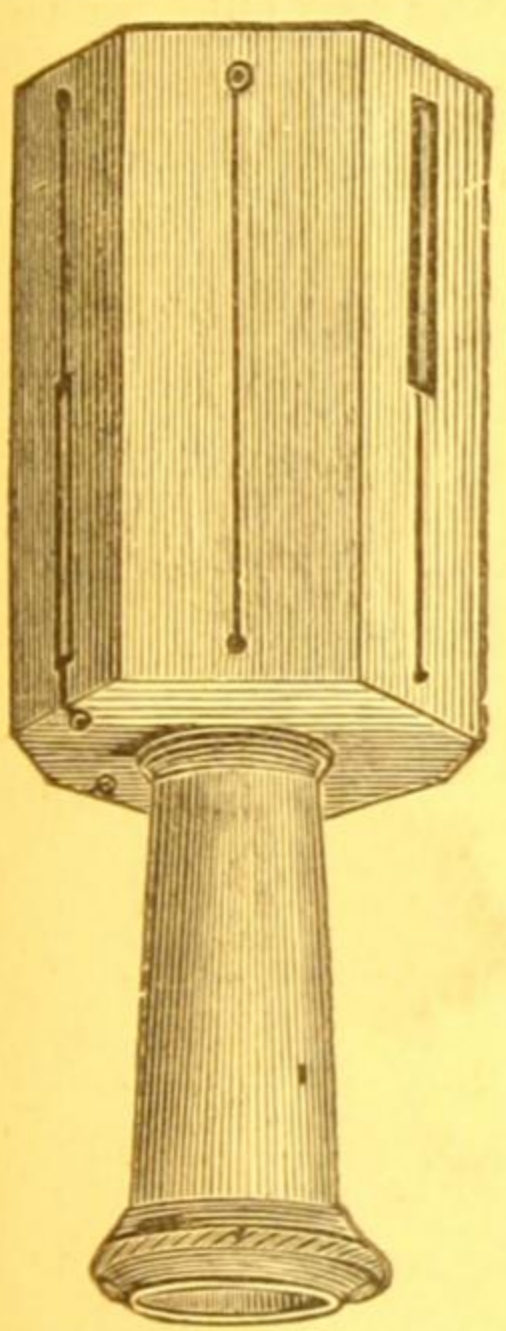


A 1658.

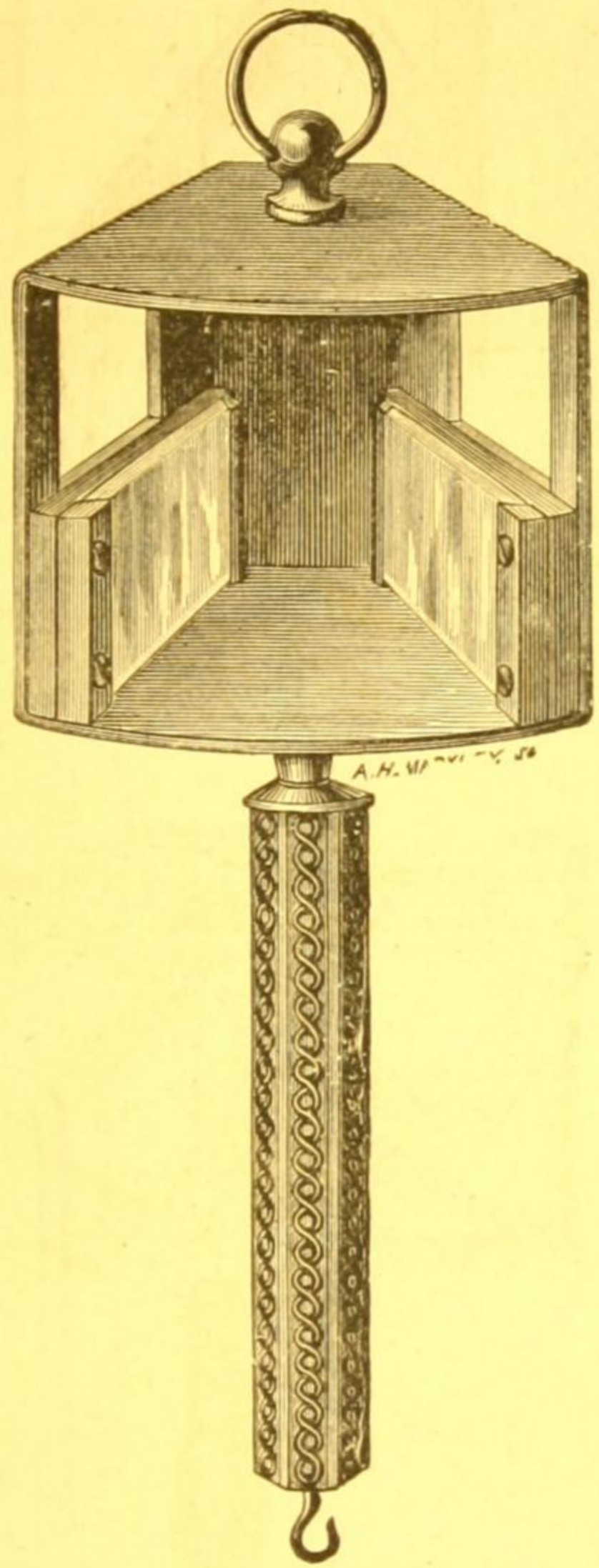
A 1658. LINTON'S HAND-LEVEL AND CLINOMETER, . . . . .	20.00
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A 1659. POCKET LEVELS, mounted in brass, 3 inches long, . . . . .	.70
A 1660. Do. do. do. 6 do. . . . .	1.50
A 1661. Do. do. do. 9 do. . . . .	2.20
A 1662. Do. do. do. 12 do. . . . .	3.00
A 1663. Ground Level Bulbs, 2 to 6 inches long, from . . . . .	.50 cts. to 2.50
A 1664. Unground do. do. do. from . . . . .	.12 cts. to .50
A 1665. Round Pocket Level, in case, mounted in brass, 2 $\frac{3}{4}$ inches diameter, . . . . .	2.00

Price  
diagonally across, \$12.00  
er of the four sides can be  
ke the inclination of the



A 1668.



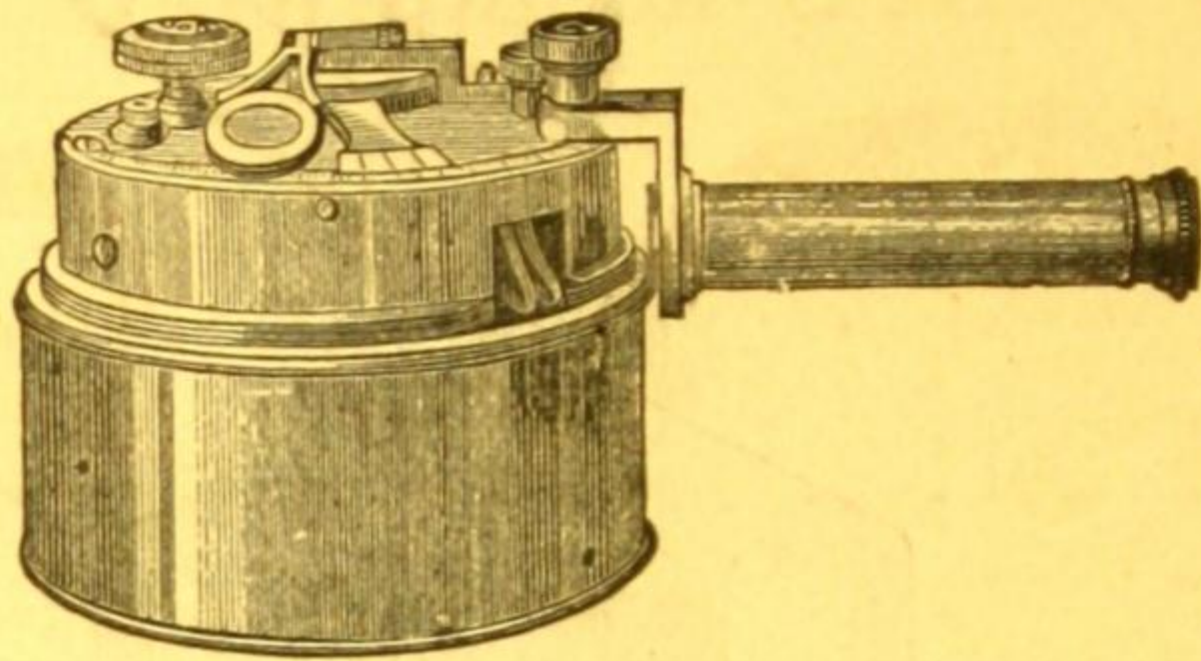
A 1672.



A 1673.

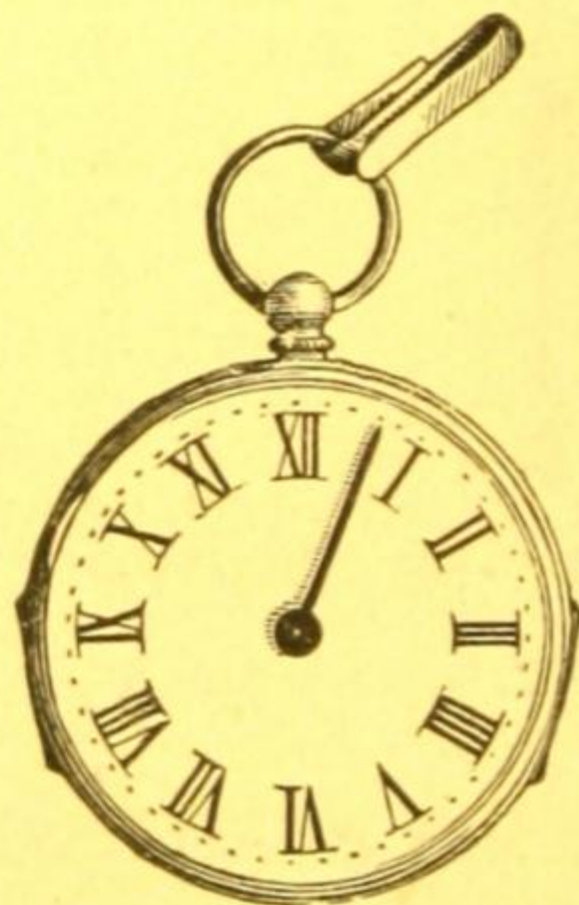
No.	DESCRIPTION	PRICE
A 1668.	CROSS STAFF HEAD, for turning right angles, in case, $2\frac{3}{4}$ inches, .	\$3.00
A 1669.	Do. do. do. do. do. 3 inches, .	3.50
A 1670.	Do. do. with magnetic compass, 3 inches, needle $1\frac{3}{4}$ inch, .	6.50
A 1671.	Do. do. with vertical axis and divided circle, to take angles $3\frac{3}{8}$ inch, .	12.00
A 1672.	REFLECTING HAND MIRROR, for turning right angles, .	7.50
A 1673.	RECTANGULAR PRISM, for right angles, $2\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{5}{8}$ inches, in morocco case, .	5.00
A 1674.	SURVEYOR'S ANGLE MIRROR, for right angles, with a small plumb-bob. Size of instrument when packed, $3\frac{3}{4} \times 2 \times 1\frac{3}{4}$ inches, .	8.50
A 1675.	DOUBLE PRISM, to take angles of $90^\circ$ and $45^\circ$ , in morocco case, .	10.00

20.00  
70  
1.50  
2.20  
3.00  
50 cts. to 2.50  
12 cts. to .50  
inches diameter, 2.00

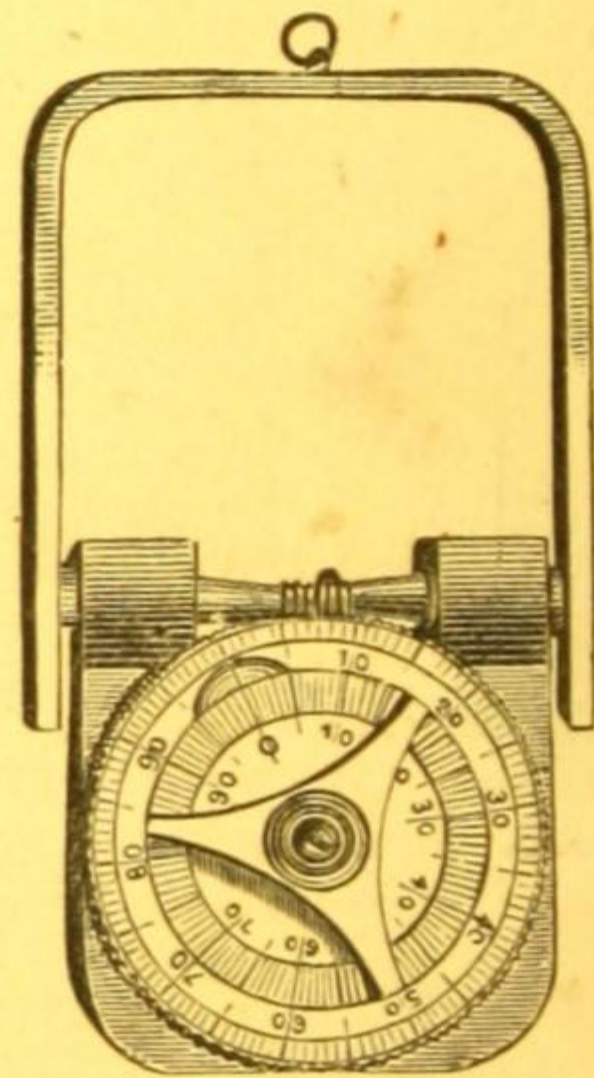


A 1680.

No.	PRICE
A 1680. POCKET SEXTANT, divided on silver, with telescope and tangent adjusting screw, etc., in leather sling case, . . . . .	\$42.50
A 1681. Pocket Altazimuth, for travelers and military surveyers, . . . . .	50.00



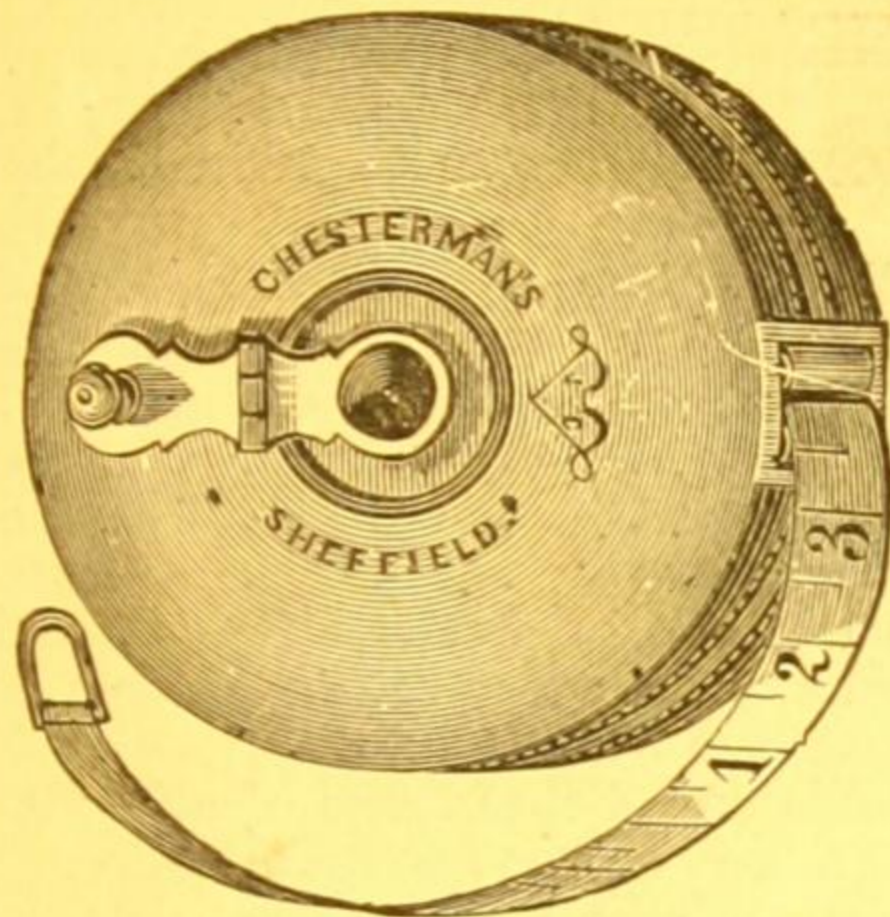
A 1685.



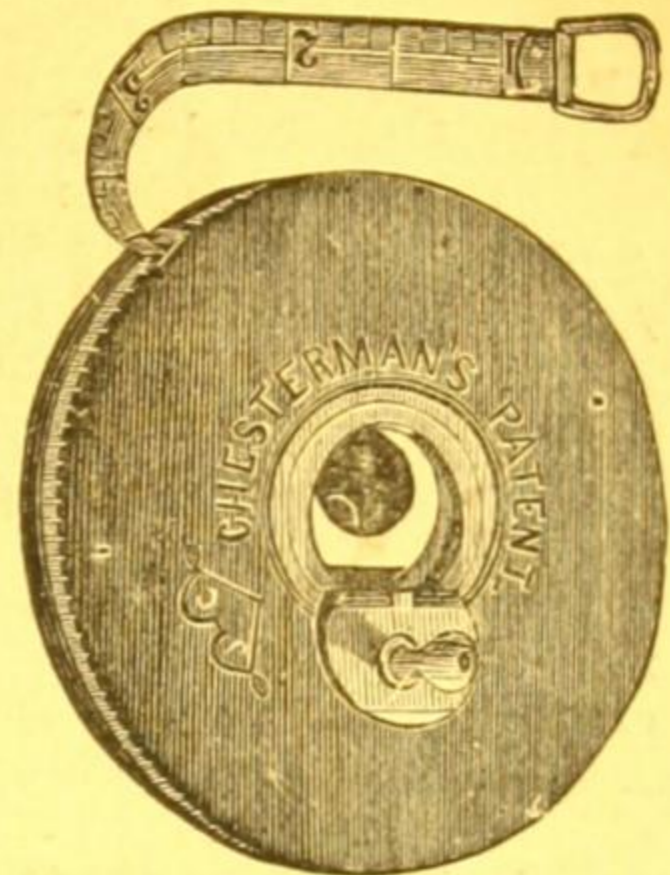
A 1688.

A 1685. PEDOMETER, watch pattern, German silver case, registering distance walked up to 12 miles, . . . . .	4.50
A 1686. PEDOMETER, watch pattern, German silver case, dial, with 2 hands, registering distance up to 100 miles, . . . . .	6.00
A 1687. PEDOMETER, watch pattern, German silver case, with 3 hands, registering up to 1,000 miles, . . . . .	10.00
A 1688. ODOMETER, for measuring distances traveled by carriage, in leather case, with strap, . . . . .	15.00

# TAPE MEASURES.



A 1697.



A 1712.

No.		PRICE.
A 1695.	Best Linen Tape Measure, in strong leather case, 50 feet long, each,	\$1.50
A 1696.	Do. do. do. do. 100 do. do.	2.50

## CHESTERMAN'S METALLIC TAPE MEASURES.

These tapes are made of linen thread interwoven with fine brass wire, not so liable to stretch as the usual linen tape, and better calculated to withstand the effect of moisture. They are in substantial leather cases.

A 1697.	Metallic Tape Measure, 24 feet long, in 10ths or 12ths, each,	1.80
A 1698.	Do. do. 33 do. do. do. do.	2.10
A 1699.	Do. do. 40 do. do. do. do.	2.35
A 1700.	Do. do. 50 do. do. do. do.	2.50
A 1701.	Same as A 1700, but in case with Flush Handle,	3.25
A 1702.	Metallic Tape Measure, 66 feet long, in 10ths or 12ths, each,	3.00
A 1703.	Do. do. 70 do. do. do. do.	3.25
A 1704.	Do. do. 75 do. do. do. do.	3.30
A 1705.	Do. do. 80 do. do. do. do.	4.00
A 1706.	Do. do. 100 do. do. do. do.	4.50
A 1707.	Same as A 1706, but in case with Flush Handle,	5.00
A 1708.	Metallic Tape Measure, 50 feet long, divided in centimeters and meters on one side, and 10ths of a foot on the other, each,	3.75
A 1709.	Same as A 1708, but 100 feet in length, each,	6.00

Chesterman's Metallic Tapes furnished without boxes at the following prices; 50 feet, each, \$1.75; 66 feet, \$2.25; 100 feet, \$3.25.

## CHESTERMAN'S STEEL TAPE MEASURES.

Steel Tape Measures; all steel, to wind up in a box, same as linen measures, the most accurate, durable, and portable measures.

A 1712.	Steel Tape Measure, 10 feet long, in 10ths or 12ths, in German silver case, each,	3.25
A 1713.	Steel Tape Measure, 10 feet long, tape divided on one side to 12ths, and on the other to centimeters and millimeters,	3.50
A 1714.	Steel Tape Measure, 25 feet long, in 10ths or 12ths, each,	5.00
A 1715.	Do. do. 33 do. do. do. do.	5.75
A 1716.	Do. do. 40 do. do. do. do.	6.50
A 1717.	Do. do. 50 do. do. do. do.	7.00
A 1718.	Same as A 1717, but extra wide and heavy,	13.00
A 1719.	Steel Tape Measure, 66 feet long, in 10ths or 12ths, each,	9.00
A 1720.	Do. do. 75 do. do. do. do.	11.00
A 1721.	Do. do. 100 do. do. do. do.	14.00

Price  
scope and tangent \$42.50  
urveyers, . . . 50.00

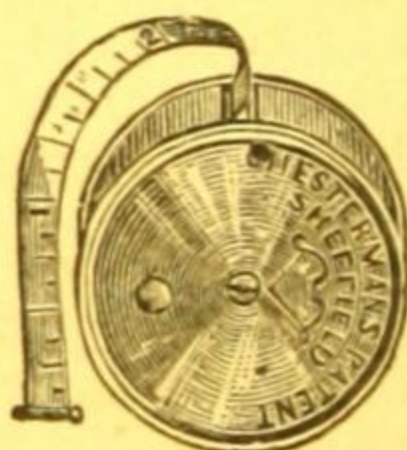


A 1638.  
registering dis- 4.50  
se, dial, with 2 6.00  
e, with 3 hands, 10.00  
riage, in leather 15.00

## TAPE MEASURES.

No:	PRICE.
A 1725. Steel Standard Measure, from 100 to 1,000 feet, with graduations at every 50 feet :	
A 1726. Tape 100 feet, with Reel, Handle, and Stop, . . . . .	\$10.50
A 1727. Each additional 100 feet, . . . . .	5.50
A 1728. Large Brass Handles, to unship, each, . . . . .	1.50
A 1729. Clamping Handle, each, . . . . .	1.80
A 1730. Small Brass Clamp, to fasten on tape, . . . . .	.75
A 1731. Every extra graduation and figuring, each, . . . . .	.25
The above tapes are made without joints and of precise U. S. standard; usually made about 300 feet in length, with graduations at every 10 feet, the last 10 feet with graduations at every foot, and the last foot into 10ths.	
A 1732. Steel Tape Measure, 50 feet long, divided into 10ths of a foot on one side, and millimeters and meters on the reverse side, each, .	8.50
A 1733. Steel Tape Measure, 100 feet long, divided in 10ths and meters, each, . . . . .	16.00
A 1734. Steel Tape Measure, 20 meters long, divided in millimeters and meters, each, . . . . .	9.00

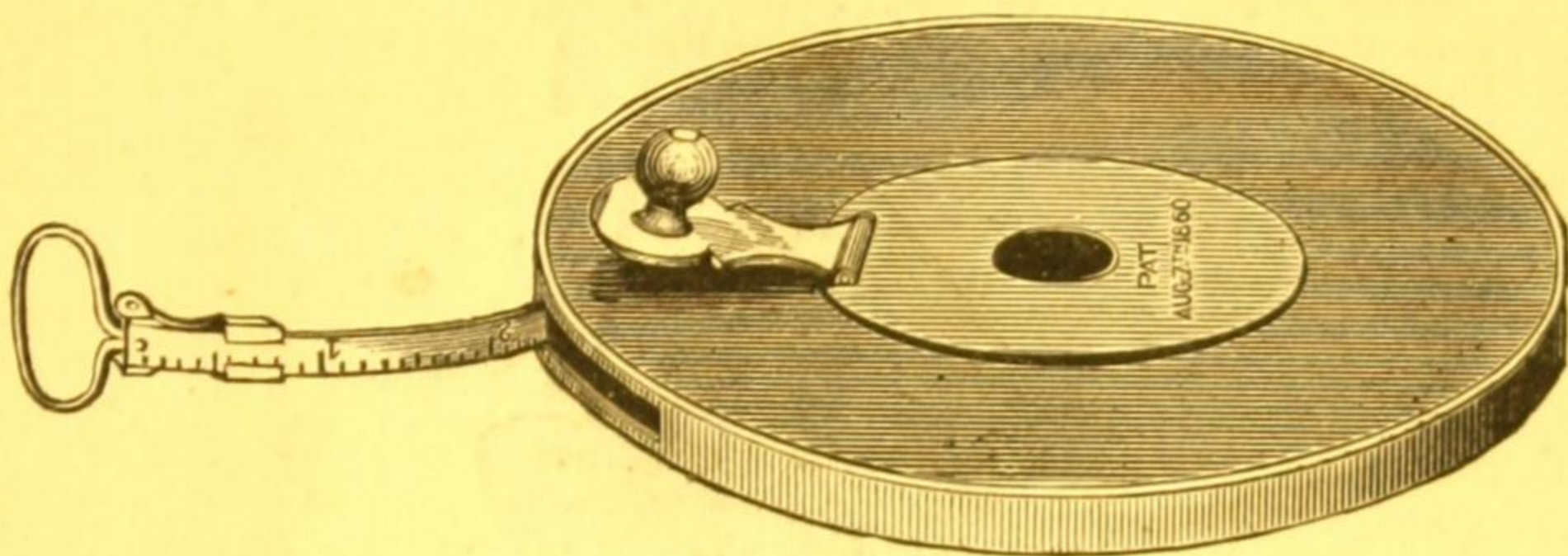
## POCKET TAPE MEASURES.



A 1735.

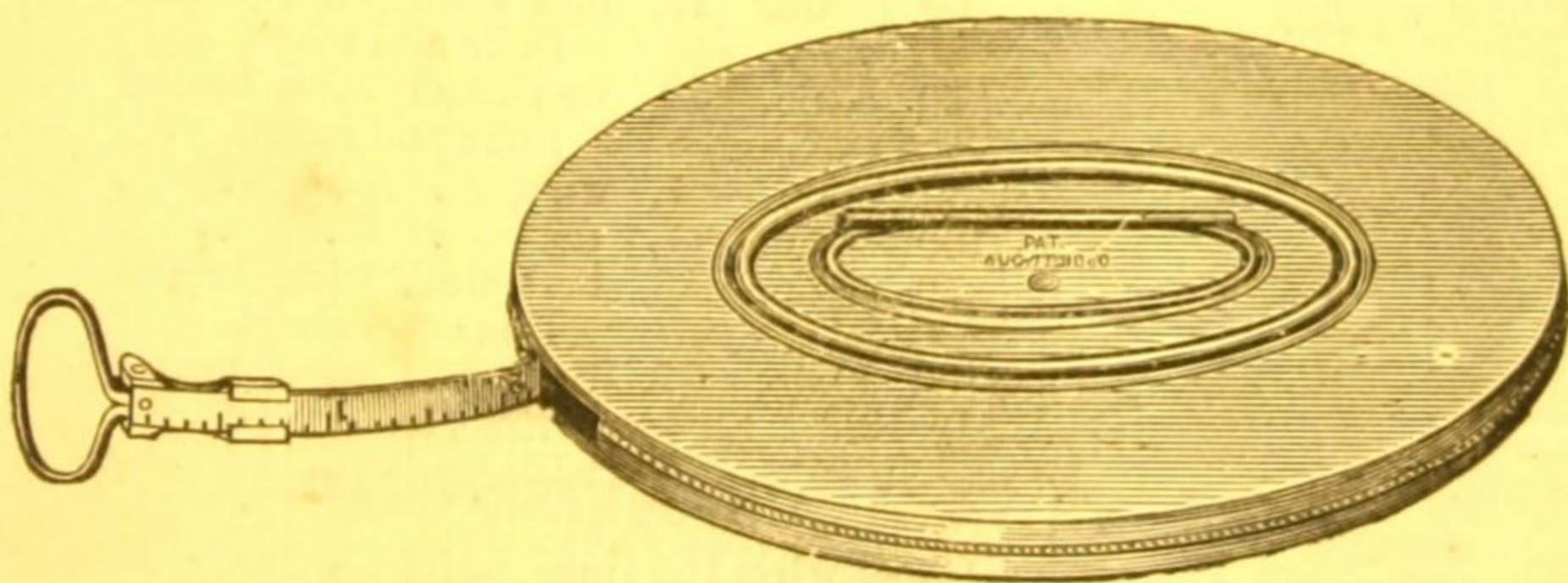
A 1735. Steel Tape Measure, 3 feet long, in German silver case, with spring and stop, tape divided into 10ths or 12ths of a foot, . . . . .	1.50
A 1736. Steel Tape Measure, 4 feet long, in German silver case, with spring and stop, tape divided into 10ths or 12ths of a foot, . . . . .	2.00
A 1737. Steel Tape Measure, 5 feet long, in German silver case, with spring and stop, tape divided into 10ths or 12ths of a foot, . . . . .	2.25
A 1738. Steel Tape Measure, 6 feet long, in German silver case, with spring and stop, tape divided into 10ths or 12ths of a foot, . . . . .	2.50
A 1739. Steel Tape Measure, 3 feet long, tape divided on one side to 12ths of a foot, and the other side to centimeters and millimeters, . . . . .	1.75
A 1740. Steel Tape Measure, 4 feet long, tape divided on one side to 12ths of a foot, and the other side to centimeters and millimeters, . . . . .	2.25
A 1741. Steel Tape Measure, 5 feet long, tape divided on one side to 12ths of a foot, and the other side to centimeters and millimeters, . . . . .	2.50
A 1742. Steel Tape Measure, 6 feet long, tape divided on one side to 12ths of a foot, and the other side to centimeters and millimeters, . . . . .	2.75
A 1743. Linen Tape Measure, 3 feet long, in silver-plated cases, with spring and stop, . . . . .	.50
A 1744. Linen Tape Measure, 5 feet long, in silver-plated cases, with spring and stop, . . . . .	.75
A 1745. Linen Tape Measure, 6 feet long, in silver-plated cases, with spring and stop, . . . . .	1.00

PAINES PATENT STANDARD STEEL TAPES.



A 1746.

No.									PRICE.
A 1746.	Standard Steel Tapes, in japanned case, 25 feet long, 10ths or 12ths,								\$3.50
A 1747.	Do.	do.	do.	do.	33	do.	do.	do.	4.50
A 1748.	Do.	do.	do.	do.	50	do.	do.	do.	6.00
A 1749.	Do.	do.	do.	do.	66	do.	do.	do.	8.00
A 1750.	Do.	do.	do.	do.	75	do.	do.	do.	10.00
A 1751.	Do.	do.	do.	do.	100	do.	do.	do.	12.00



A 1752.

A 1752	Steel Tape Measure, leather case, flush handles, 33 ft. long, 10ths or 12ths,								5.50
A 1753.	Do.	do.	do.	do.	50	do.	do.	do.	8.00
A 1754.	Do.	do.	do.	do.	66	do.	do.	do.	10.00
A 1755.	Do.	do.	do.	do.	75	do.	do.	do.	12.00
A 1756.	Do.	do.	do.	do.	100	do.	do.	do.	15.00

EXTRAS TO PAINES PATENT STANDARD STEEL TAPES.

Handles, with graduated scale, per pair,	4.50
Pocket Thermometers,	1.50
Spring Balance and Level,	5.00

## ENGINEER'S AND SURVEYOR'S CHAINS.



A 1760.

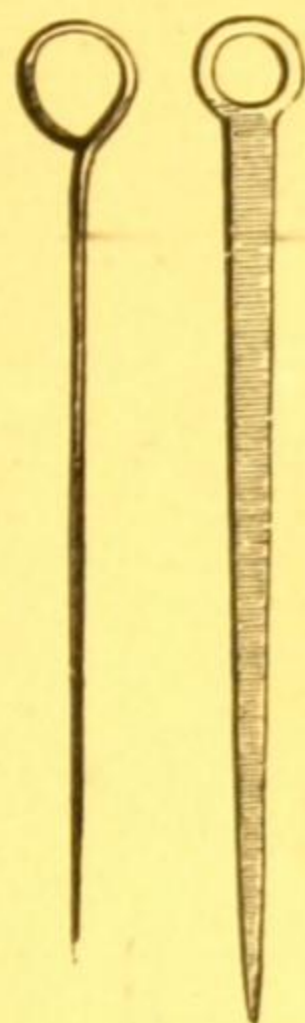
No.						PRICE.
A 1760.	Surveyor's Chain,	2 poles,	50 links,	No. 9,	wire oval rings,	\$2.00
A 1761.	Do.	2 do.	40 do.	8,	do.	2.75
A 1762.	Do.	2 do.	50 do.	8,	do.	2.75
A 1763.	Do.	2 do.	50 do.	7,	do.	3.75
A 1764.	Do.	4 do.	100 do.	9,	do.	3.50
A 1765.	Do.	4 do.	100 do.	8,	do.	4.50
A 1766.	Do.	4 do.	100 do.	7,	do.	5.50
A 1767.	Do.	4 do.	100 do.	12,	best steel wire, brazed links and rings,	10.00
A 1768.	Do.	2 do.	50 do.	12,	best steel wire, brazed links and rings,	5.50
A 1769.	Engineer's Chain,	50 feet,	50 do.	7,	wire,	4.00
A 1770.	Do.	100 do.	100 do.	7,	do.	6.00
A 1771.	Do.	50 do.	50 do.	12,	best steel wire, brazed links and rings,	6.00
A 1772.	Do.	100 do.	100 do.	12,	best steel wire, brazed links and rings,	11.50

## GRUMMAN'S VARA AND METER CHAINS.

A 1773.	66 feet,	No. 15,	tempered steel wire,	100 links,	weight 1½ lbs., with 10 extra links,	9.00
A 1774.	33 do.	15,	do.	50 do.	weight ¾ lbs., with 5 extra links,	5.00
A 1775.	100 do.	15,	do.	100 do.	weight 2 lbs., with 15 extra links,	11.50
A 1776.	50 do.	15,	do.	100 do.	weight 1 lb., with 10 extra links,	6.00
A 1777.	33 do.	12,	wire, 5 tallies, 5 extra links,	1½ lbs.,		5.50
A 1778.	66 do.	12,	do. 10 do. 10 do.	3 do.		10.00
A 1779.	150 do.	12,	do. 5 do. 5 do.	2½ do.		6.00
A 1780.	00 do.	12,	do. 10 do. 10 do.	4½ do.		11.50
A 1781.	Spring Balance,	to use with either of above chains,				2.00
A 1782.	50 feet,	No. 18,	tempered steel wire,	100 links,	no rings, with Spring Balance, Level, and Thermometer, weight ¾ lbs.,	15.00
A 1783.	10 Varas,	50 links,	No. 8,	refined iron wire,	each,	2.50
A 1784.	20 do.	100 do.	8,	do.	do.	4.00
A 1785.	10 do.	50 links,	brazed links and rings,	No. 12,	tempered steel wire,	5.50
A 1786.	20 do.	100 do.	do.	do.	do.	



### MARKING PINS.



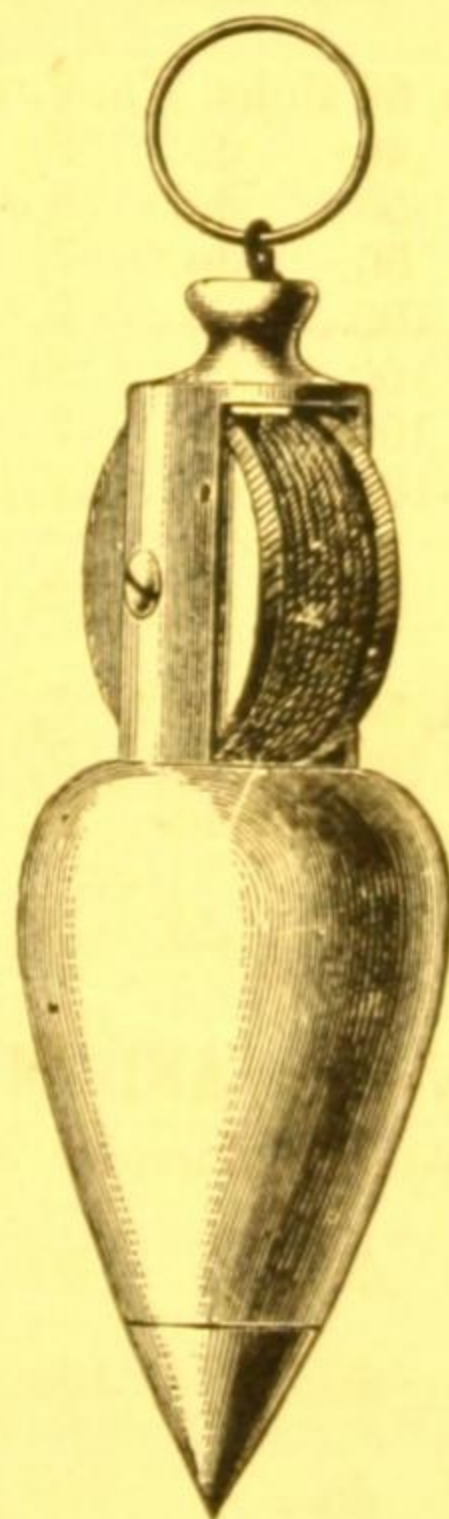
A 1793.

No.		PRICE.
A 1790.	MARKING PINS, No. 8 steel wire, 11 in a set, per set,	\$1.00
A 1791.	Do. No. 7 iron wire, 11 in a set, per set,	.75
A 1792.	Do. No. 6 steel wire, 11 in a set, per set,	2.00
A 1793.	Do. tempered steel, 15 inches long, $\frac{3}{4}$ inches wide, 11 in a set, per set,	7.50

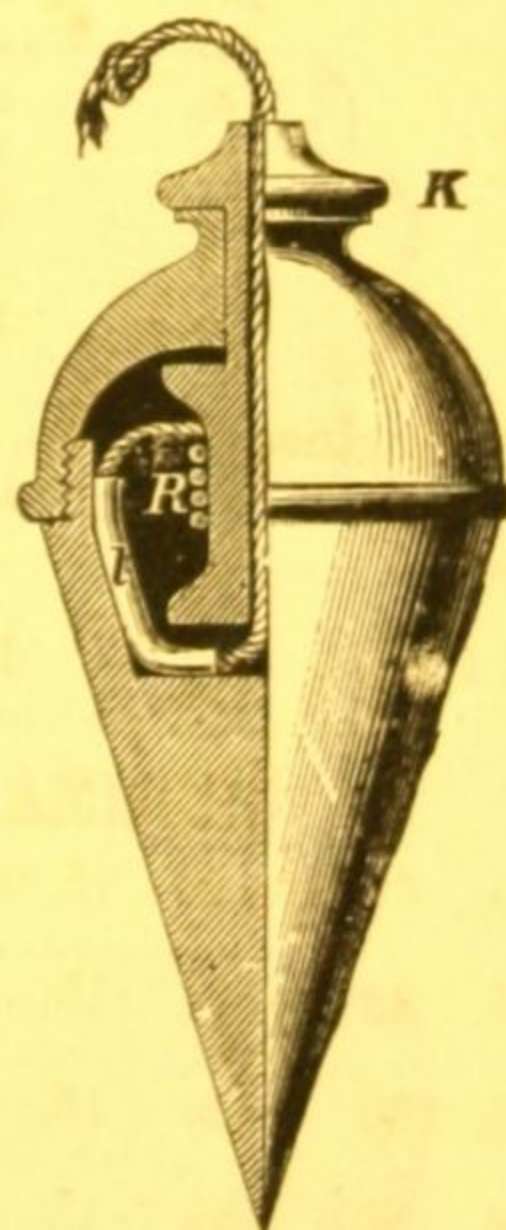
### PLUMB BOBS.



A 1795.



A 1797.



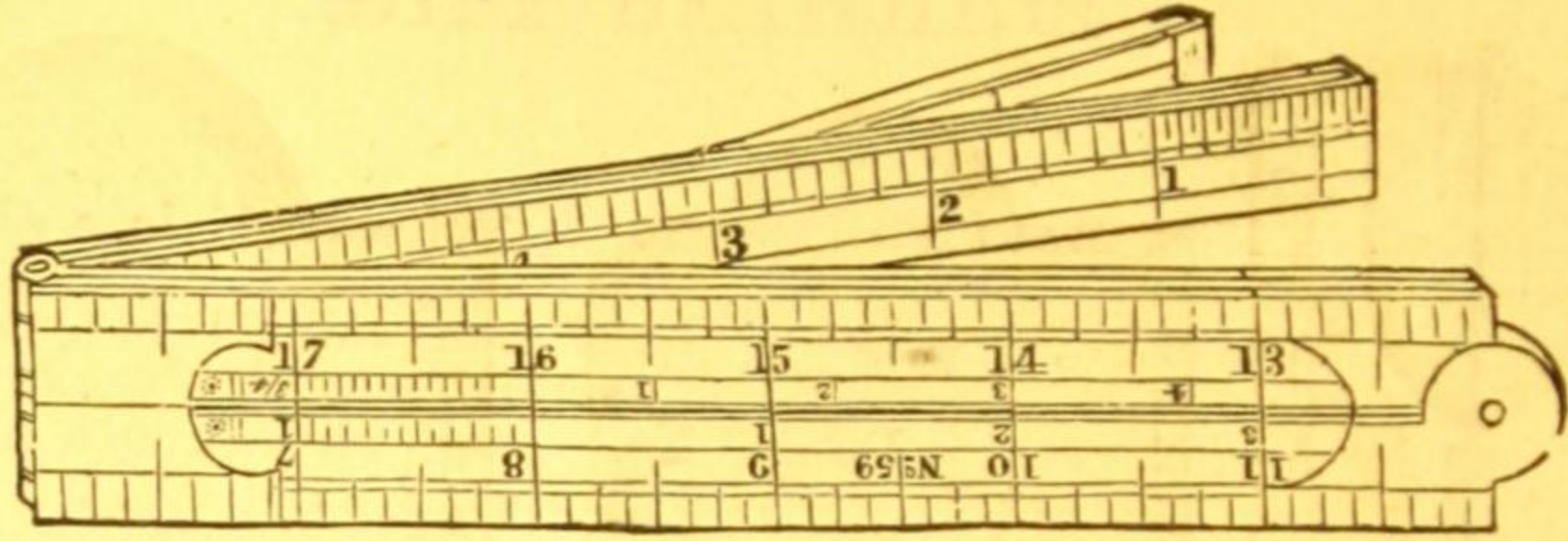
A 1799.

A 1795.	PLUMB BOB, of brass, with steel point and screw cap,	2.50
A 1796.	Do. of steel, do. do. do.	2.50
A 1797.	PATENT ADJUSTABLE PLUMB BOB (small), 8 ounce,	1.75
A 1798.	Do. do. (large), 13 do.	2.25
A 1799.	PATENT ADJUSTABLE PLUMB BOB, with concealed reel, around which the string is wound by turning the milled head on top. The friction upon the reel within will hold the bob at any desired point of the line,	2.50

Nos. A 1797 and A 1798 are constructed with a reel at the upper end, upon which the line may be kept, and by dropping the bob with a slight jerk, while the ring is held in the hand, any length of line may be reeled off. A spring, which has a bearing on the reel, will check and hold the bob firmly at any desired point of the line.

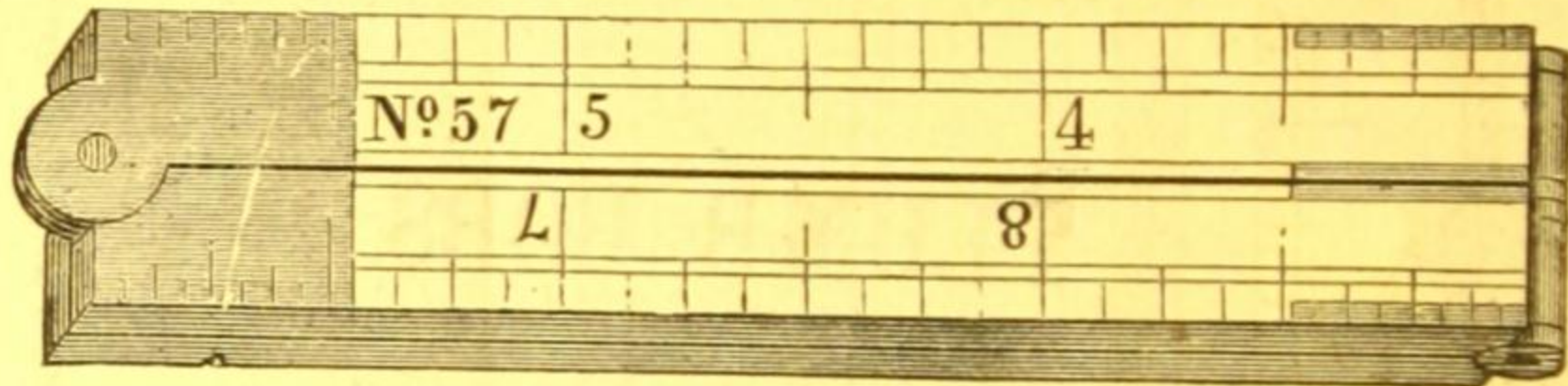
PRICE  
 rings, . . . \$2.00  
 . . . 2.75  
 . . . 2.75  
 . . . 3.75  
 . . . 3.50  
 . . . 4.50  
 . . . 5.50  
 wire, brazed  
 d rings, . . . 10.00  
 wire, brazed  
 d rings, . . . 5.50  
 . . . 4.00  
 . . . 6.00  
 wire, brazed  
 d rings, . . . 6.00  
 wire, brazed  
 d rings, . . . 11.50  
 CHAINS.  
 1 1/2 lbs., with  
 extra links, . . . 9.00  
 1 1/4 lbs., with  
 extra links, . . . 5.00  
 2 lbs., with  
 extra links, . . . 11.50  
 1 lb., with  
 extra links, . . . 6.00  
 . . . 5.50  
 . . . 10.00  
 . . . 6.00  
 . . . 11.50  
 . . . 2.00  
 rings, with  
 lbs., . . . 15.00  
 . . . 2.50  
 . . . 4.00  
 npered steel  
 ire, steel . . . 5.50

# POCKET RULES.



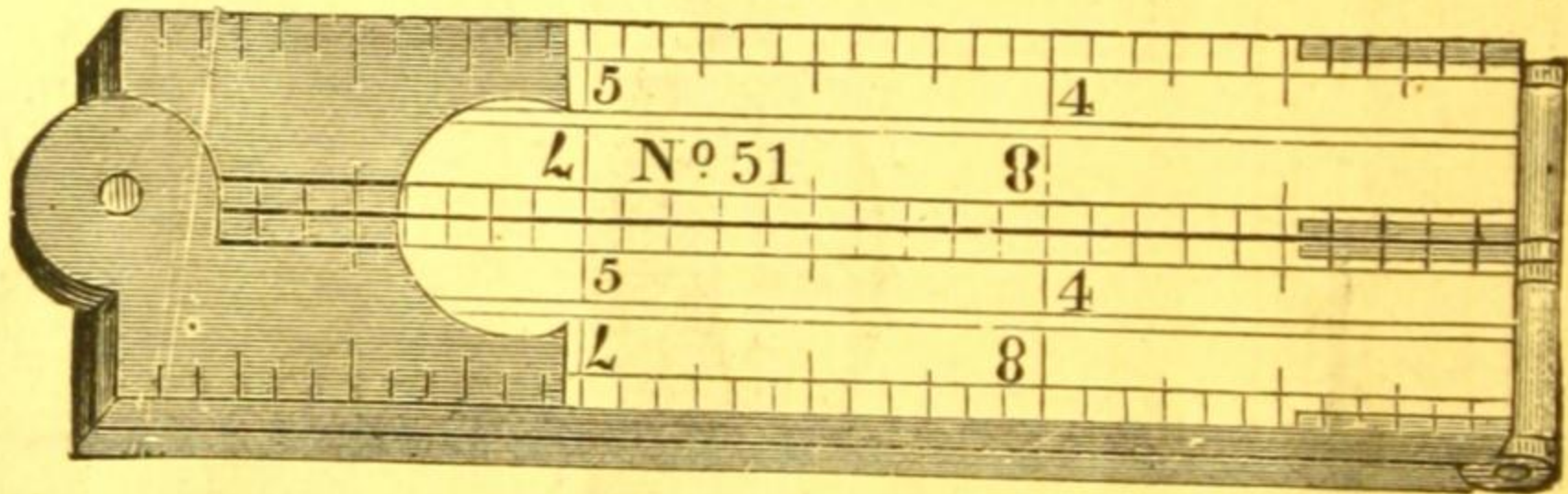
A 1810.

- | No.     |   | PRICE. |
|---------|---|--------|
| A 1810. | One Foot, four Fold, boxwood, each, . . . . . | \$0 25 |
| A 1811. | Do. do. do. brass edges, bound, . . . . .     | .75    |



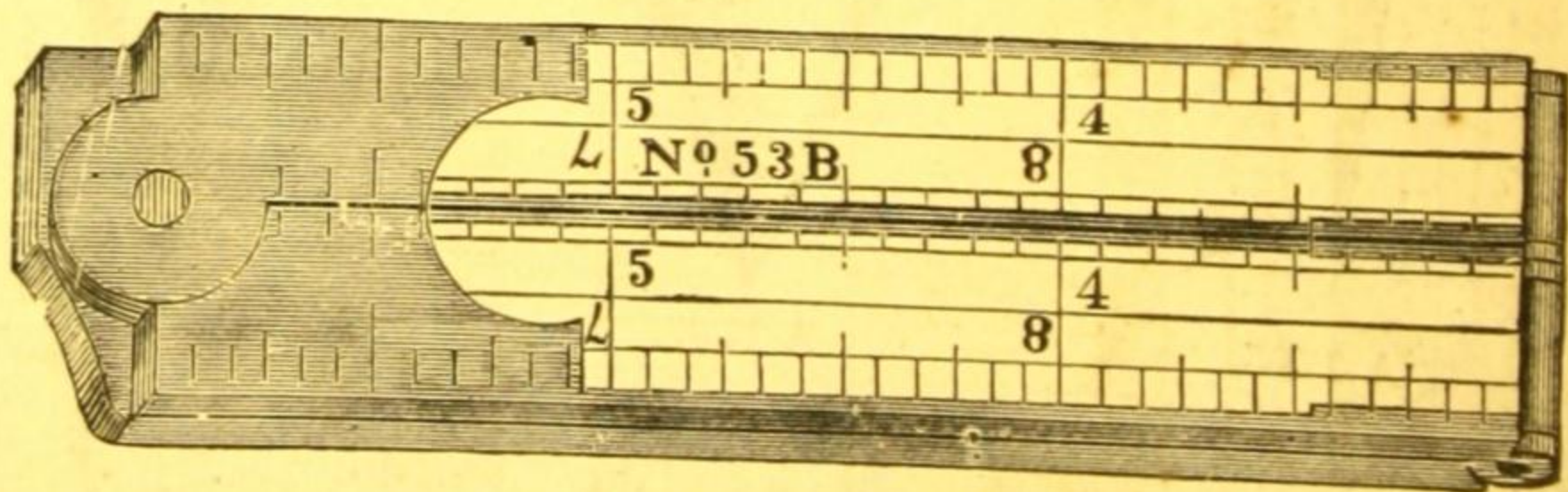
A 1812.

- |         |  |      |
|---------|--|------|
| A 1812. | One Foot, four Fold, ivory, brass mounted, . . . . . | 1.00 |
| A 1813. | Do. do. do. German silver mounted, . . . . .         | 1.25 |



A 1815.

- |         |  |      |
|---------|--|------|
| A 1814. | One Foot, four Fold, ivory, German silver mounted, graduated in 8ths, 10ths, 12ths, 16ths, and 100ths of a foot on edges of unbound, . . . . . | 2.25 |
| A 1815. | One Foot, four Fold, ivory, graduated in 8ths, 10ths, 12ths, and 16ths, with German silver edges, bound, . . . . .                             | 3.00 |

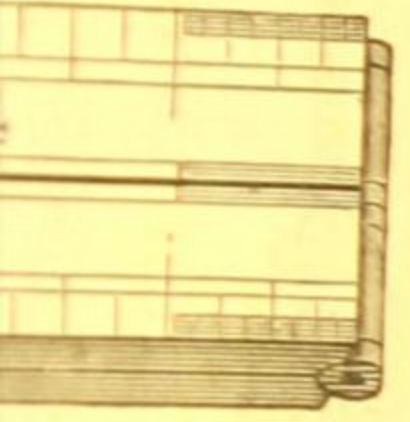
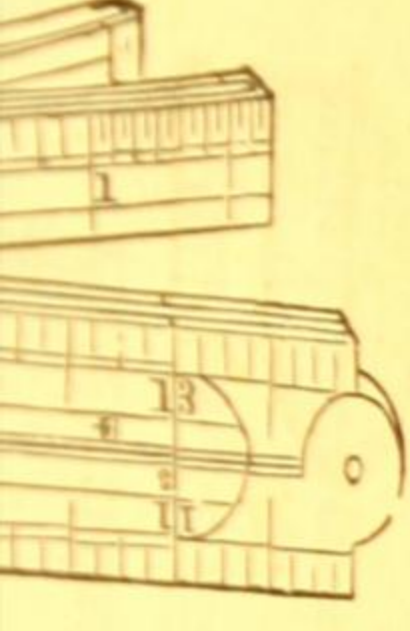


A 1816.

- |         |   |      |
|---------|---|------|
| A 1816. | One Foot, four Fold, ivory, Caliper, graduated in 8ths, 10ths, 12ths, and 16ths, . . . . .                                  | 3.00 |
| A 1817. | One Foot, four Fold, ivory, Caliper, graduated in 8ths, 10ths, 12ths, and 16ths, with German silver edges, bound, . . . . . | 4.00 |
| A 1818. | Two Feet, four Fold, boxwood, inside edges beveled with Drafting Scales, . . . . .  | 1.00 |

PHILADELPHIA.

ES.



Price  
\$0.25  
.75

1.00  
1.25

2.25  
3.00

hs, 10ths, 12ths, 3.00

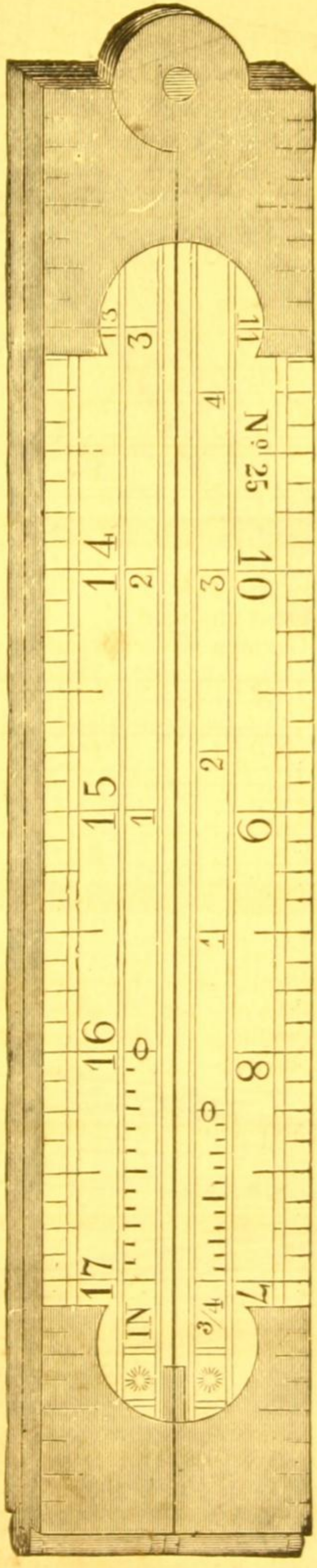
hs, 10ths, 12ths, 4.00

with Drafting 1.00

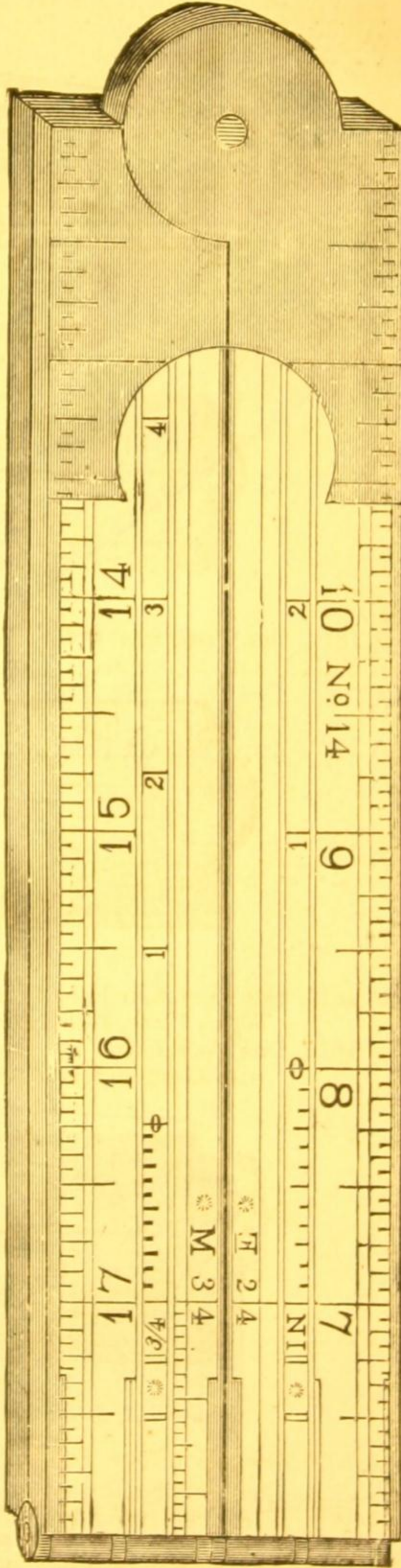
JAMES W. QUEEN & CO., PHILADELPHIA.



A 1818.

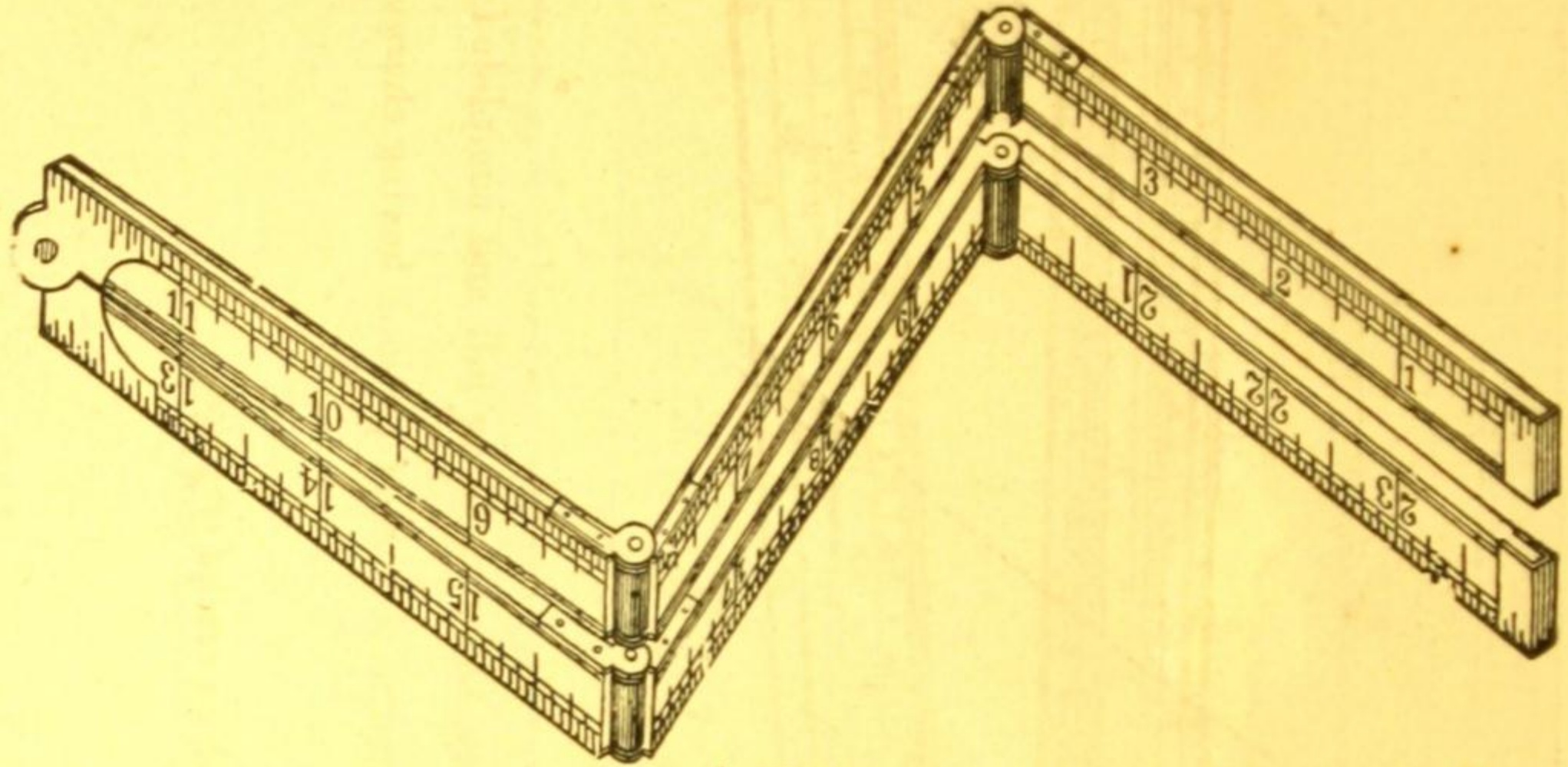


A 1819.



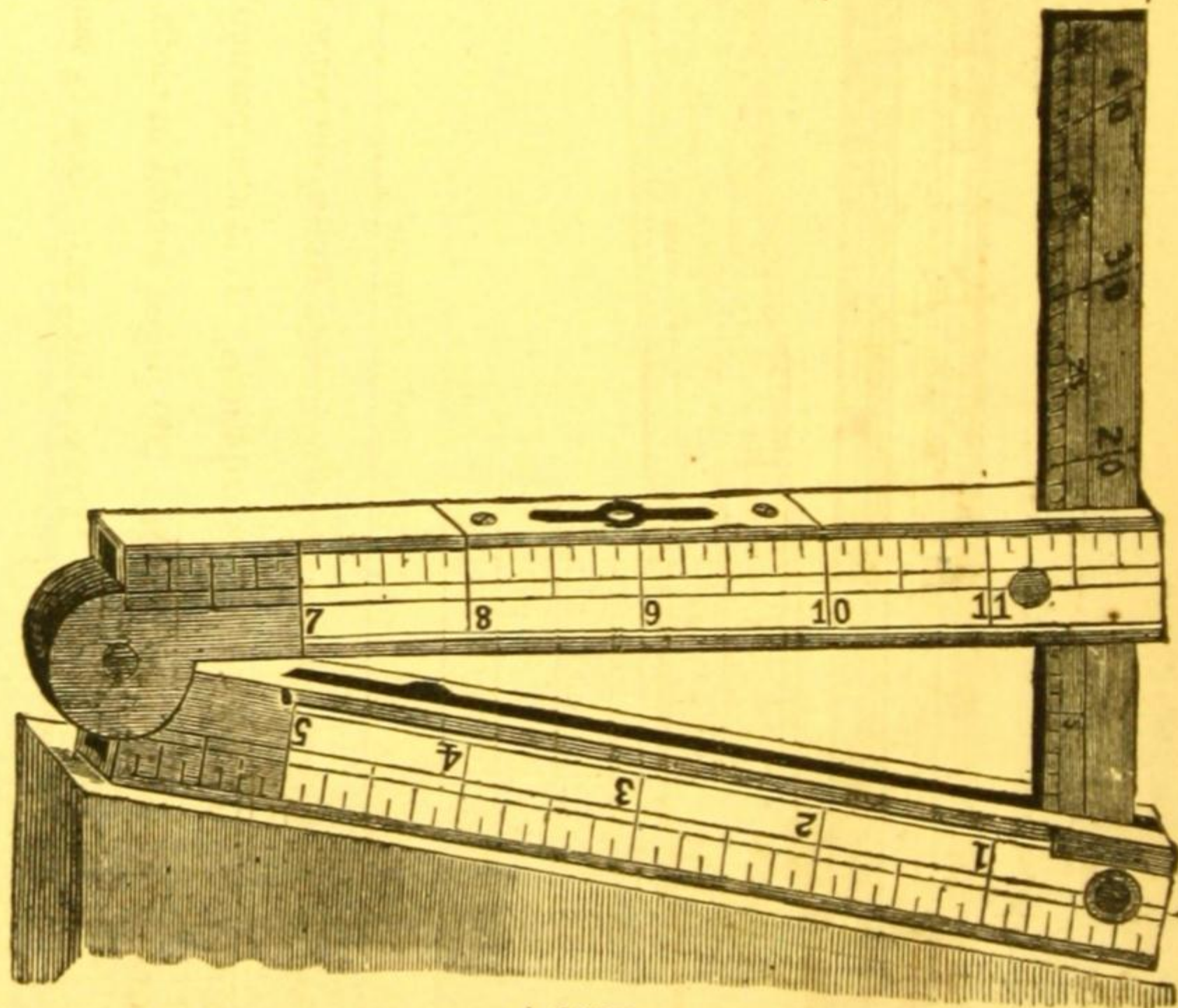
A 1820.

No.		PRICE
A 1821.	Two Feet, four Fold, boxwood, . . . . .	\$0.36
A 1822.	Do. do. do. brass bound, with Drafting Scales, . .	1.00
A 1823.	Do. do. ivory, German silver mounted, with 8ths, 10ths, and 16ths inches, and $\frac{1}{4}$ , $\frac{1}{8}$ , $\frac{3}{4}$ , and 1 inch Drafting Scales, . .	6.00
A 1824.	Two Feet, four Fold, ivory, same as No. 1111, German silver, bound, . .	7.50
A 1825.	Do. do. do. do. do. but extra broad and bound in German silver, . . . . .	9.00



A 1826.

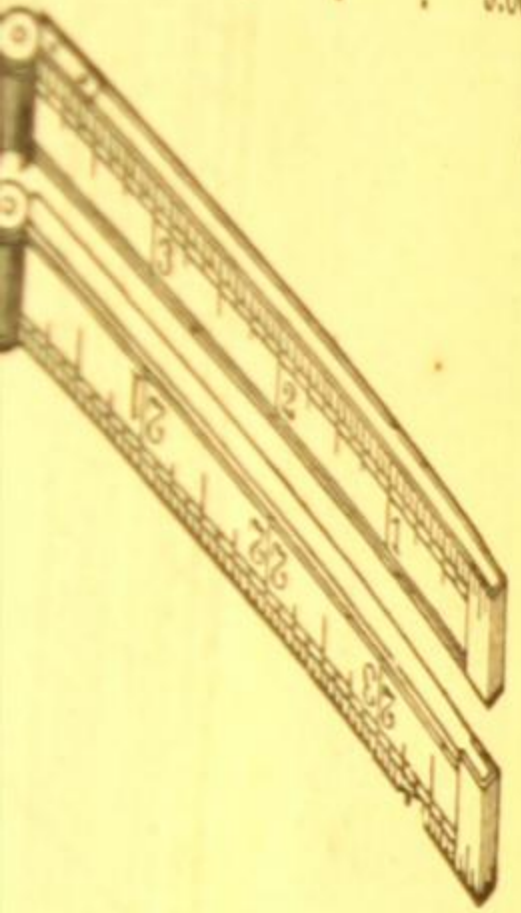
A 1826.	Two Feet, six Fold, boxwood, graduated 8ths, 10ths, 100ths, and 16ths, . . . . .	1.25
A 1827.	Two Feet, six Fold, ivory, graduated 8ths, 10ths, and 16ths inches, . .	6.00



A 1828.

A 1828. **Combination Rule, One Foot, two Fold, boxwood.** This is the most convenient and useful pocket-rule ever made; it combines in itself a Carpenter's Rule, Spirit Level, Square Plumb, Bevel, Indicator Brace, Scale, Draughting Scale of equal parts, T Square, Protractor, Right-angle Triangle, and with a straight edge can be used as a Parallel Ruler, all the parts of which, in their separate applica-

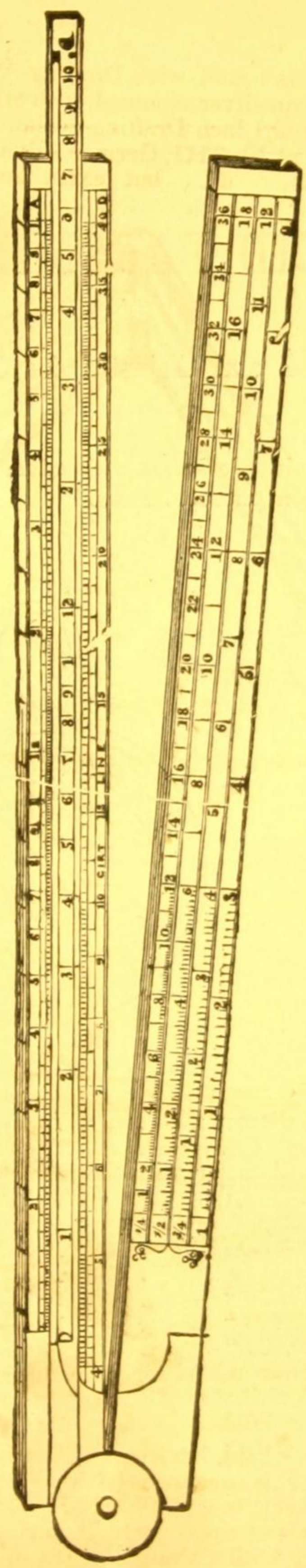
Price  
 with Drafting Scales, . . . \$0.36  
 mounted, with 8ths, 10ths, . . . 1.00  
 Drafting Scales, . . . 6.00  
 German silver, bound, . . . 7.50  
 but extra broad and . . . 9.00



10ths, 100ths, and . . . 1.25  
 and 16ths inches, . . . 6.00



is the most  
 combines in itself  
 level, Indicator  
 square, Protrac-



PRICE.  
 \$1.25

No. . . . .  
 A 1829. Two Feet, two Folds, boxwood Slide Rule, Gunter's, . . . . .  
 A 1830. Treatise on the Gunter's Slide and Engineer's Rules, showing their utility, and containing full and complete instructions enabling

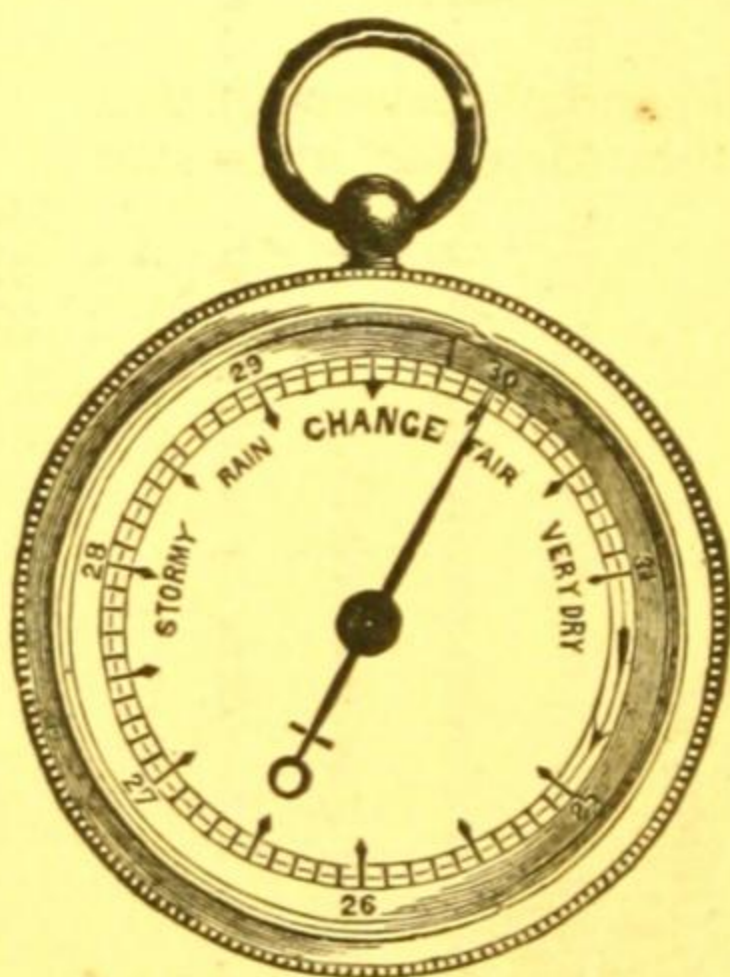
mechanics to make their own calculations. It is also particularly adapted to the use of persons having charge of cotton or woolen machinery, surveyors, and others. 200 pages, bound in cloth.

Price, \$1.00, net. Sent by mail, post-paid, on receipt of price.

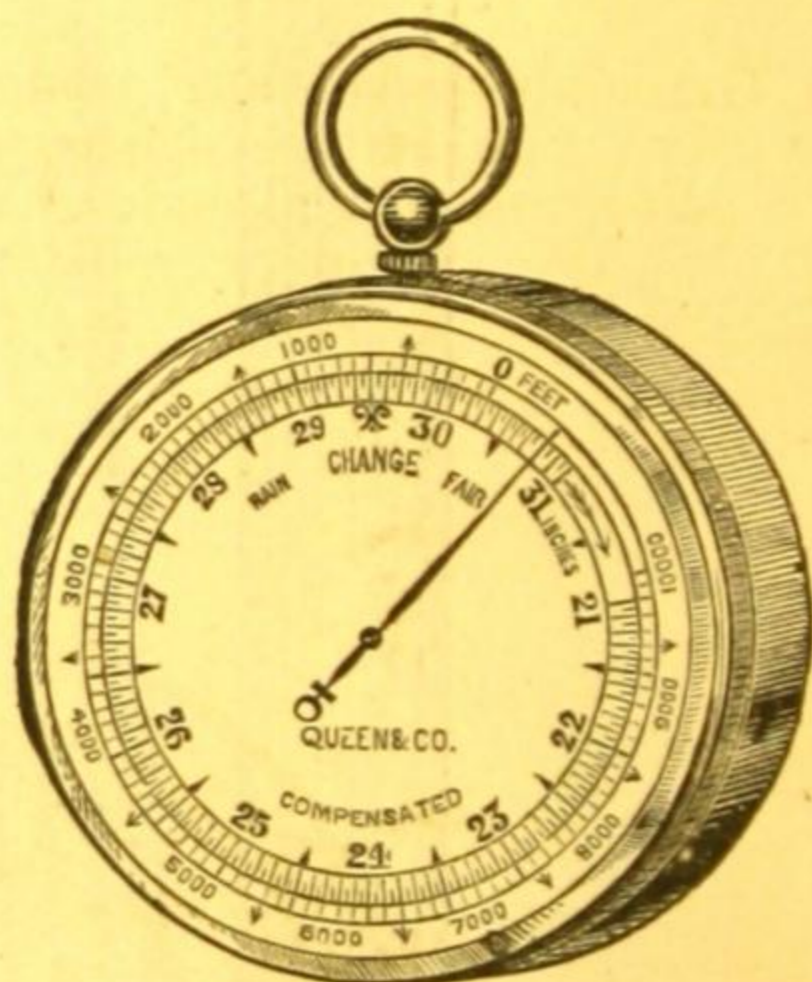
## VERY ACCURATE POCKET ANEROID BAROMETERS.

Compensated and Specially Tested and Adjusted for Engineers' Use

These Aneroids have movable altitude scales, with silver enameled dials, and are in morocco cases.



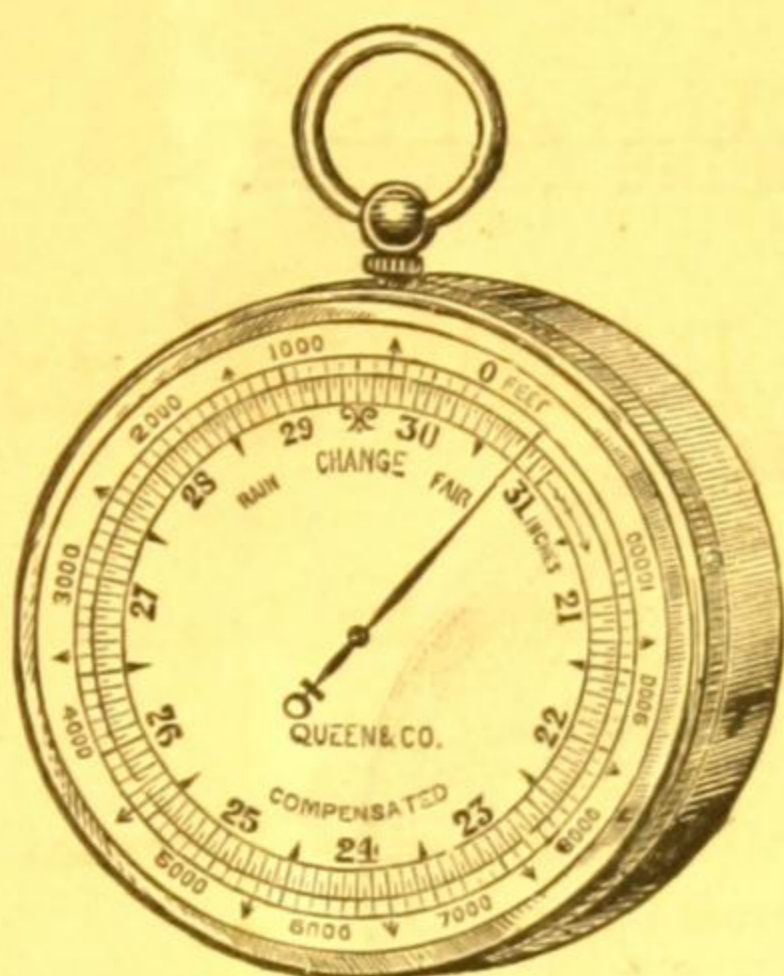
13500



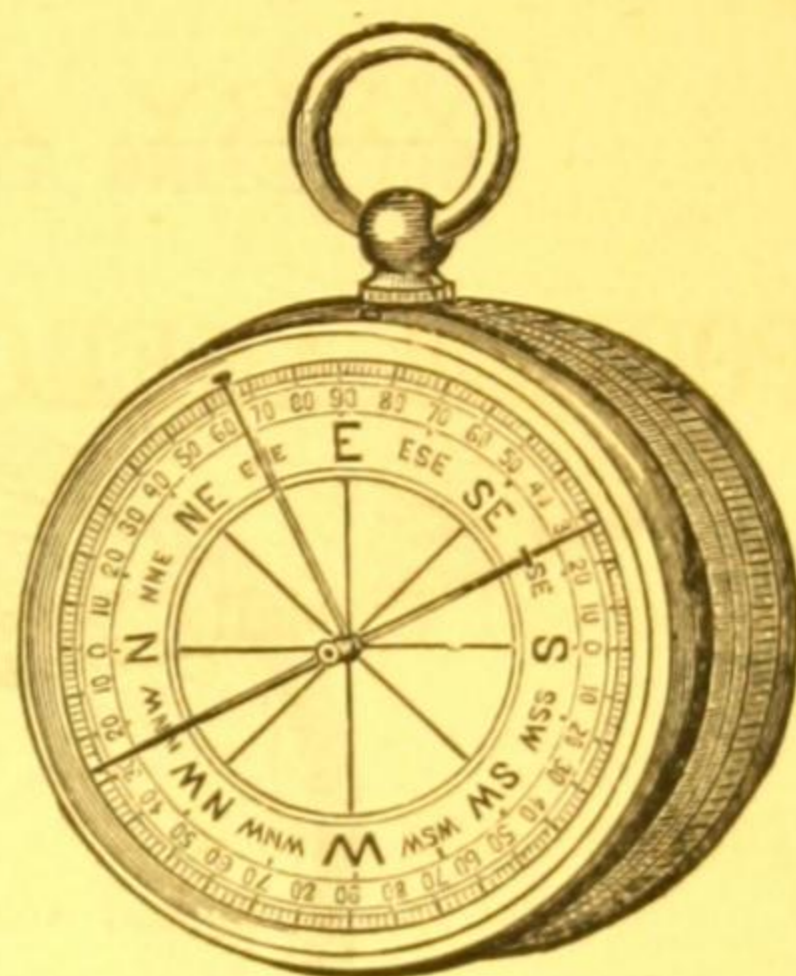
13505

13500.	PLAIN	POCKET	ANEROID,	1 $\frac{3}{4}$ in. diameter,	.	.	.	\$15 00
13501.	Do.	do.	do.	2 $\frac{1}{2}$ in.	.	.	.	17 00
13502.	Do.	do.	do.	1 $\frac{3}{4}$ in. diameter,	with	thermometer,	.	20 00
13503.	Do.	do.	do.	3 $\frac{1}{2}$ in.	do.	do.	.	21 00
13505.	POCKET	MOUNTAIN	ANEROID,	compensated for temperature,	1 $\frac{3}{4}$ in. diameter,	with	altitude scale to 3000 feet,	20 00
13506.	Do.	do.	do.	5000 feet,	.	.	.	20 00
13507.	Do.	do.	do.	10,000 "	.	.	.	21 00
13508.	Do.	do.	do.	15,000 "	.	.	.	24 00
13509.	Do.	do.	do.	20,000 "	.	.	.	27 00
13510.	POCKET	MOUNTAIN	ANEROID,	compensated for temperature,	same as 13505,	2 $\frac{1}{2}$ inches diameter,	with	altitude scale to 3000 feet,
13511.	Do.	do.	do.	5000 feet,	.	.	.	20 00
13512.	Do.	do.	do.	10,000 "	.	.	.	21 00
13513.	Do.	do.	do.	15,000 "	.	.	.	24 00
13514.	Do.	do.	do.	20,000 "	.	.	.	27 00

GEOLOGICAL ANEROIDS.

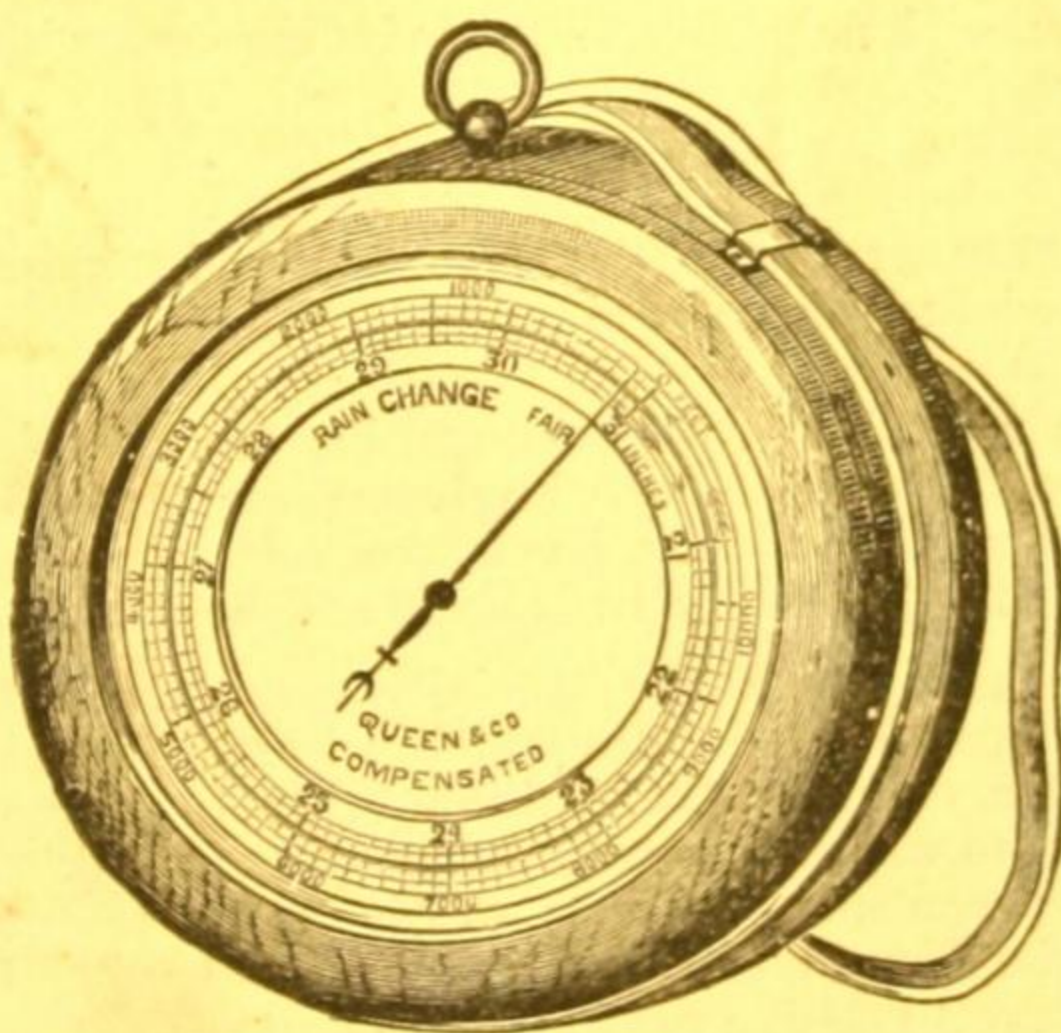


13515.  
Front.



13515.  
Back.

13515. GEOLOGICAL ANEROID, compensated for temperature, silvered metal dial, with needle compass at back, 2½ inches diameter, in leather sling case, with altitude scale to 5000 feet, . . . . \$30 00
13516. Do. do. 10,000 feet, . . . . 31 00
13517. Do. do. 15,000 " . . . . 33 50



13520.

13520. GEOLOGICAL ANEROID, compensated for temperature, with silvered metal dial, 5 in. diameter, in mahogany open face case, with leather strap, with altitude scale to 3,000 feet, . . . . 33 00
13521. Do. do. 5,000 " . . . . 33 00
13522. Do. do. 10,000 " . . . . 35 00
13523. Do. do. 15,000 " . . . . 37 00
13524. Do. do. with thermometer, altitude scale to 3000 feet 35 00
13525. Do. do. 5,000 feet, . . . . 35 00
13526. Do. do. 10,000 " . . . . 37 00
13527. Do. do. 15,000 " . . . . 39 00

TE  
METERS.

for Engineers' Use

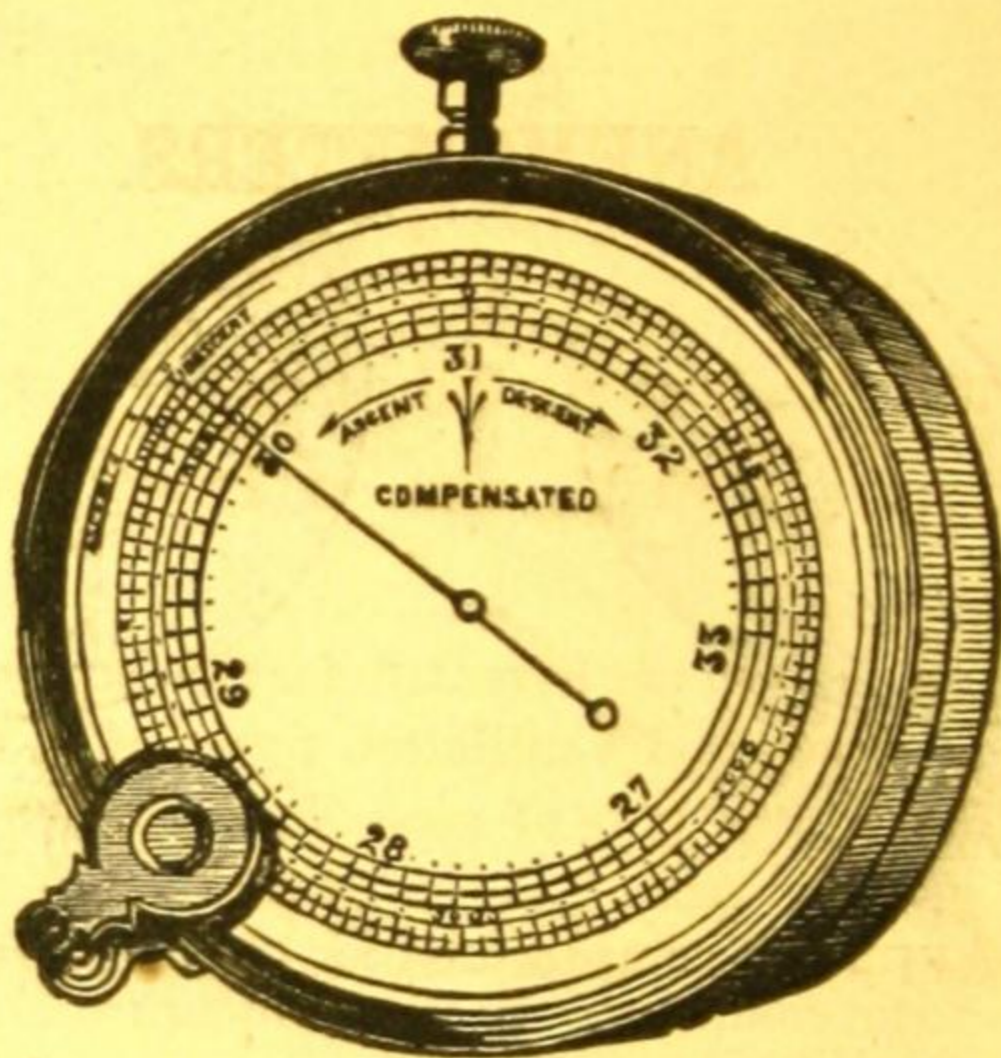
silver enameled



505

. \$12 00  
 . 17 00  
 . 20 00  
 . 21 00  
 . 20 00  
 . 20 00  
 . 21 00  
 . 24 00  
 . 27 00  
 . 20 00  
 . 20 00  
 . 21 00  
 . 24 00  
 . 27 00

## SURVEYING AND MINING ANEROIDS.



13530.

13530. SURVEYING ANEROID, 5 in. diameter, compensated for temperature, silvered metal dial, graduated to hundredths, and reading by vernier to single feet, with magnifier, in leather sling case, with altitude scale to 5,000 feet, . . . . . \$50 00
13531. Do do 10,000 feet, . . . . . 55 00
13532. Do do 15,000 " . . . . . 60 00
13534. MINING ANEROID, same as 13530, but arranged to register 2,000 feet below sea level to 4,000 above . . . . . 50 00

THE SURVEYING AND MINING ANEROID has been designed and constructed specially for the use of Surveyors and Engineers, for the purpose of readily ascertaining slight variations in gradients, levels, &c., and from its extreme sensitiveness will be found of considerable utility in Mining and Surveying work generally.

Besides extreme sensitiveness, the specialty claimed for this Instrument is an arrangement of the Scale of Altitudes which admits of subdivision 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 Instrument 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.

For Mining purposes the entire circle of the dial is graduated to represent 6 inches of the mercurial column, *i.e.*, from 27 inches to 33. This scale will register about 2000 feet *below* sea-level to 4000 feet *above*; the finest divisions, hundredths of the Altitude Scale, represent 10 feet measurements, which can be again subdivided by the Vernier Scale to *single feet*. The Vernier Scale is moved by a rack-work adjustment, and a magnifying lens which rotates on the outer circumference of the Instrument facilitates the reading of minute quantities.

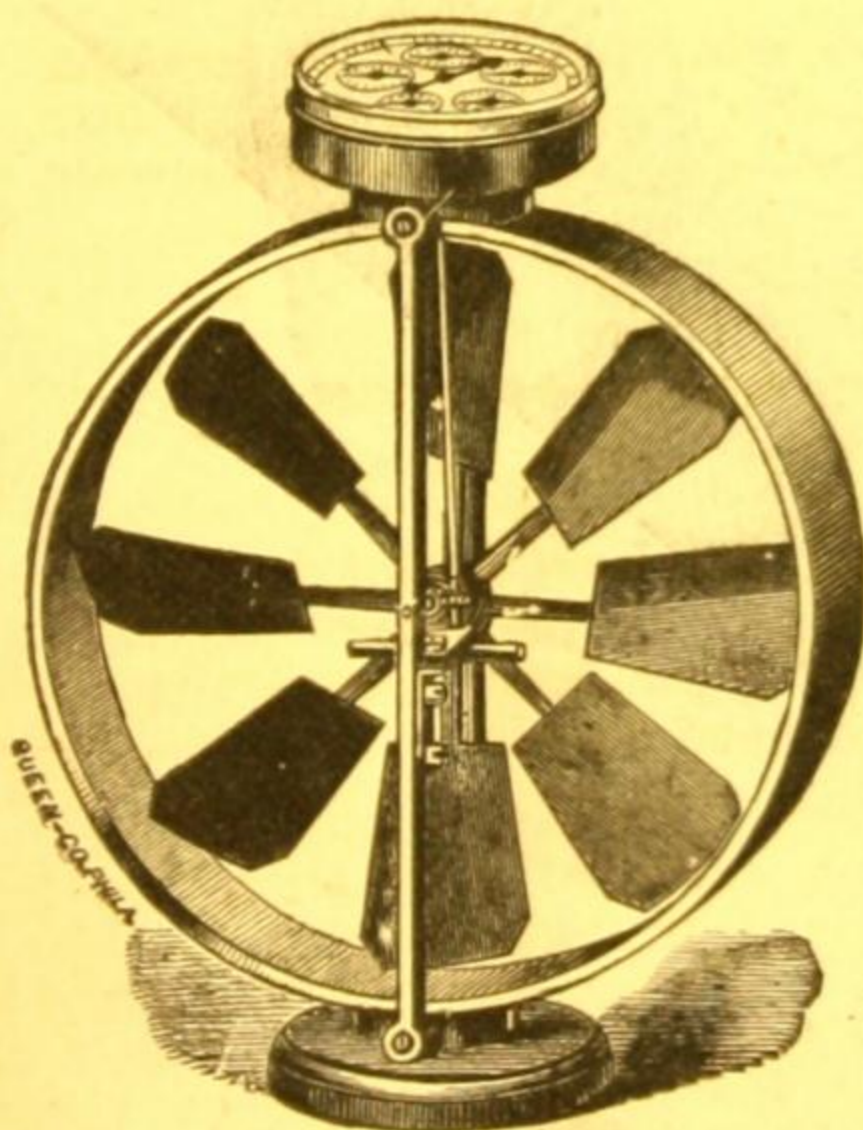
For Surface Surveying purposes, where it is not required to be used *below* sea-level, the Instrument is made with the scale divided from 25 to 31 inches, thus giving an Altitude Scale of 5000 feet above sea-level only, and with this open scale and the assistance of the Vernier, the same minute readings can be easily taken.



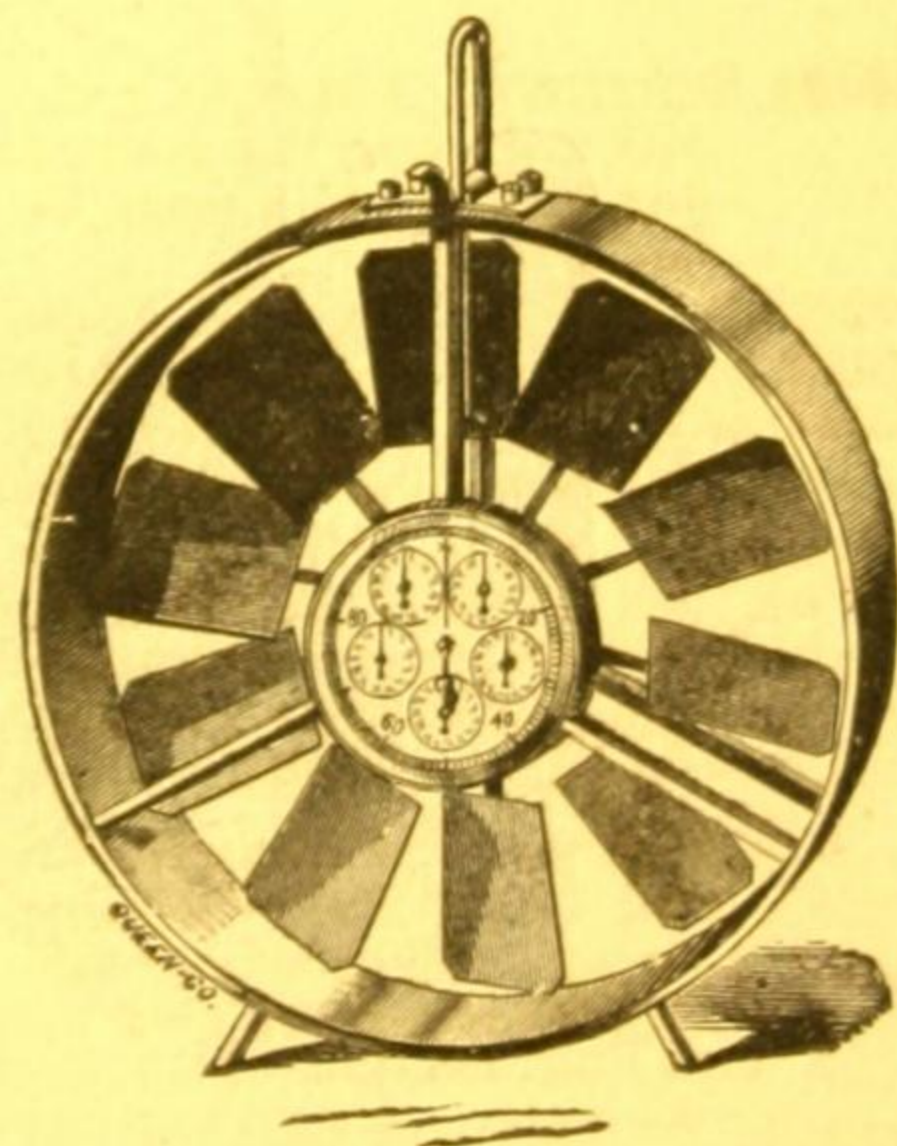
### ANEMOMETERS.

FOR MEASURING THE VELOCITY OF CURRENTS OF AIR IN COAL MINES, AND VENTILATORS, FLUES, ETC., OF PUBLIC BUILDINGS.

The Anemometer, an instrument invented for the purpose of measuring the rate at which air moves in mines and ventilation passages, is now an indispensable adjunct of the former, the mining laws of most States requiring that a certain number of cubic feet of air shall be passed to the air-ways, and the Anemometer furnishing the most convenient and satisfactory mode by which the amount of air passing can be determined.



No. 14,500.

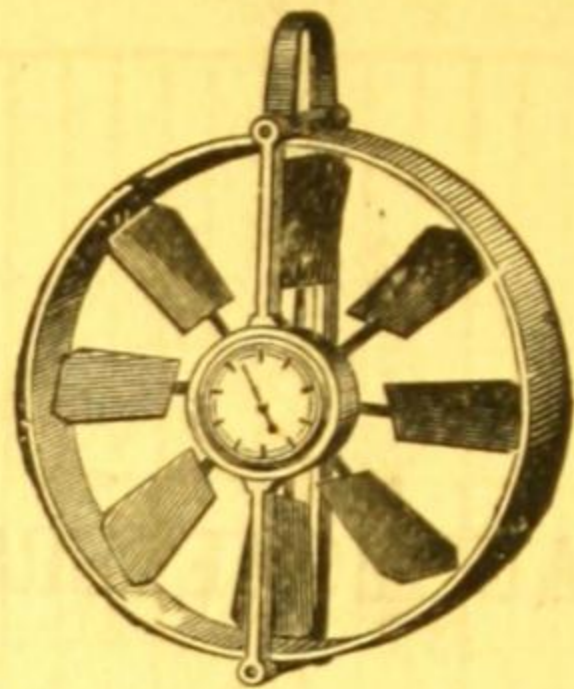


No. 14,505.

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|---------|--|---------|
| 14,500. | BIRAM'S ANEMOMETER, 6 inches diameter, reading to ten million feet, with disconnecter, Fig. 1, . . . . . | \$40 00 |
| 14,501. | BIRAM'S ANEMOMETER, 5 inches diameter, same as 14,500, . . . . .   | 39 00   |
| 14,502. | BIRAM'S ANEMOMETER, 4 inches diameter, same as 14,500, . . . . .   | 37 50   |
| 14,505. | BIRAM'S ANEMOMETER, 12 inches diameter, reading to ten million feet, with disconnecter, . . . . .        | 45 00   |
| 14,506. | BIRAM'S ANEMOMETER, 6 inches diameter, same as 14,505, . . . . .   | 40 00   |
| 14,507. | BIRAM'S ANEMOMETER, 4 inches diameter, same as 14,505, . . . . .   | 37 50   |

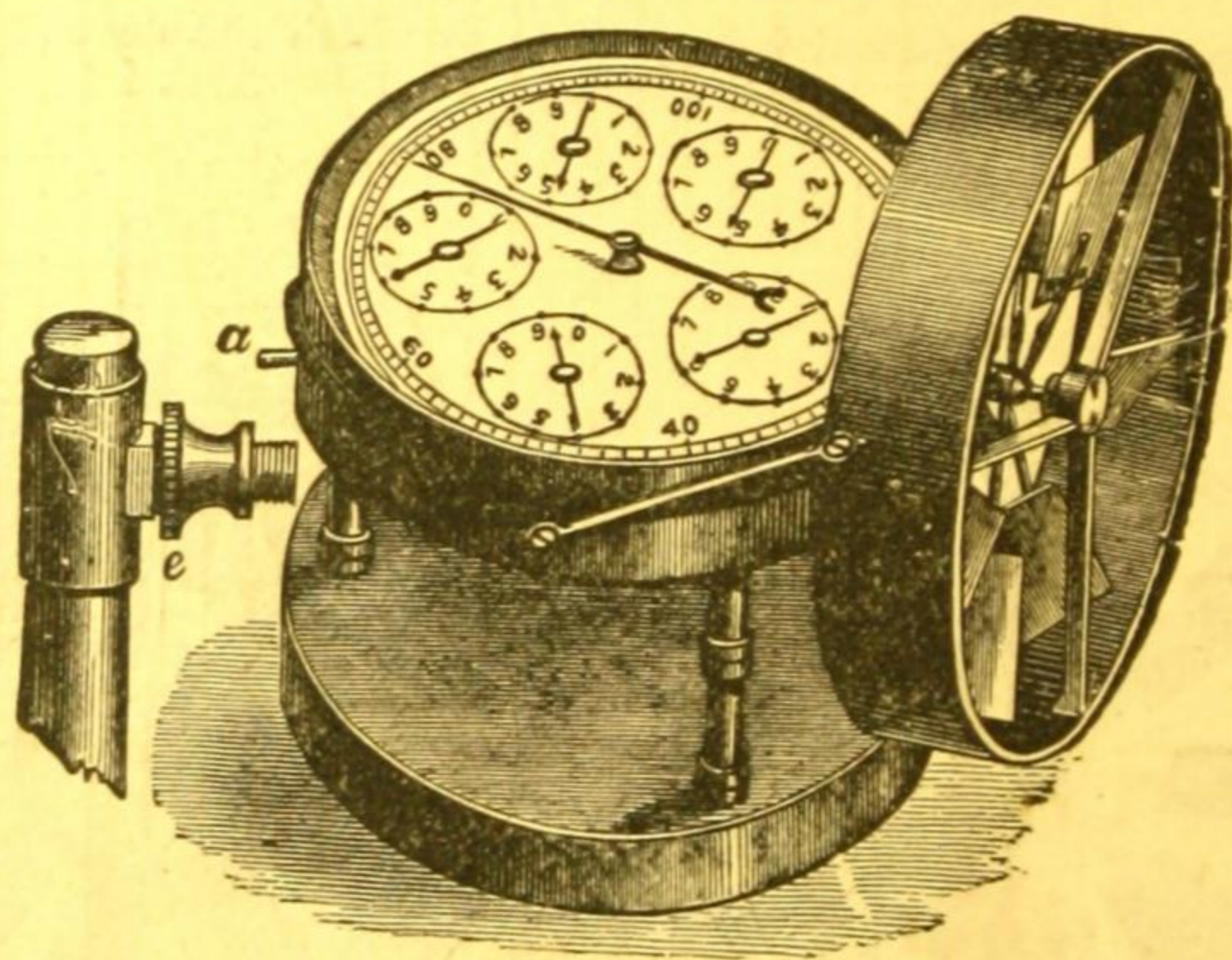
PHIA.  
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 h altitude scale  
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 . 55 00  
 . 60 00  
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 to be used below sea-  
 to 31 inches, thus giv-  
 h this open scale and  
 taken.

MES W. QUEEN & CO., PHILADELPHIA.



No. 14,508

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| 14,508. BIRAM'S ANEMOMETER, 6 inches diameter, reading to 1000 feet, with disconnecter,    | 25 06 |
| 14,509. BIRAM'S ANEMOMETER, 6 inches diameter, reading to 1000 feet, without disconnecter, | 22 50 |
| 14,510. BIRAM'S ANEMOMETER, 4 inches diameter, reading to 100 feet,                        | 20 00 |
| 14,511. BIRAM'S ANEMOMETER, same as above, with disconnecter,                              | 22 50 |

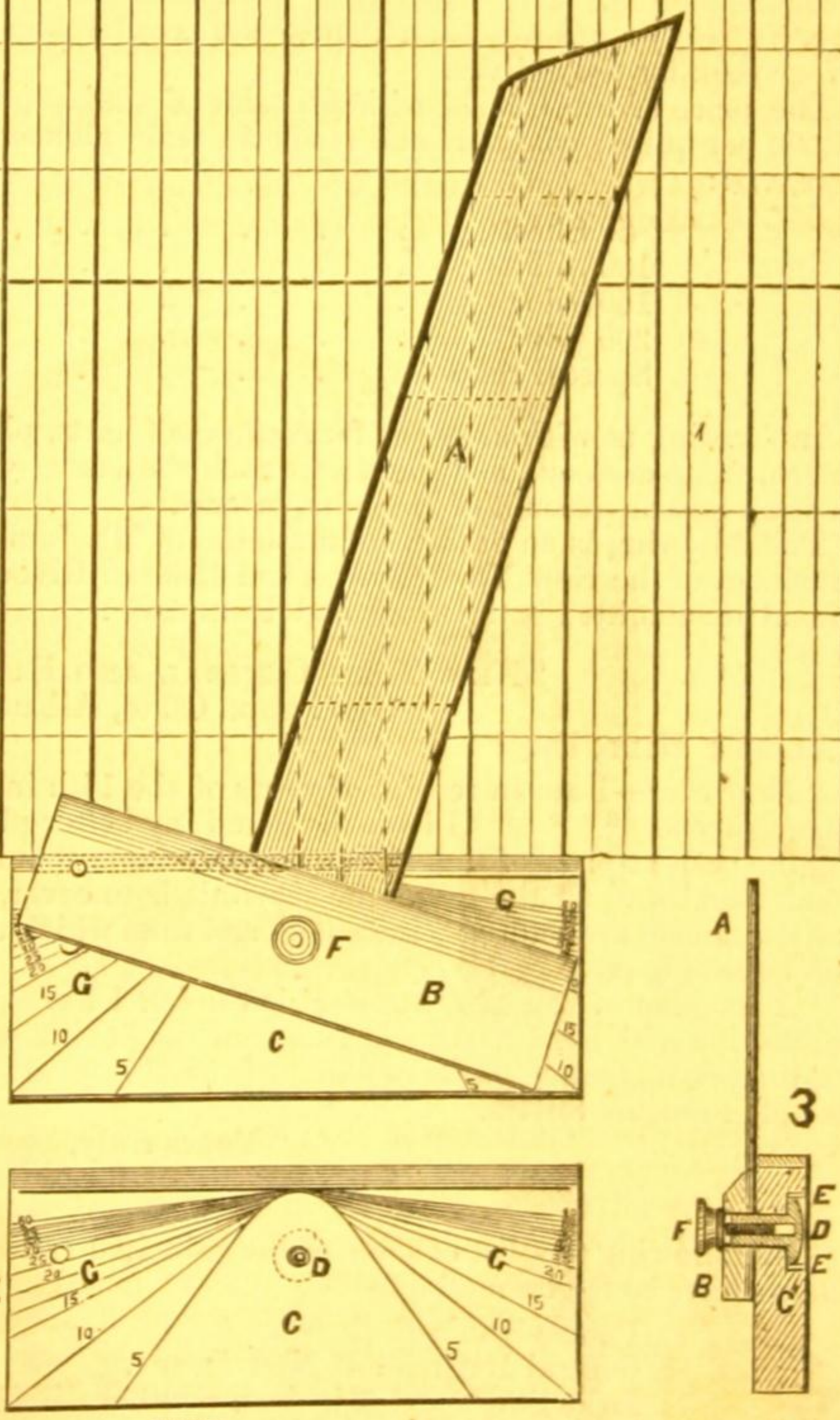


No. 14,515.

- |   |       |
|---|-------|
| 14,515. THE PORTABLE AIR METER, diameter of fan wheel $2\frac{3}{4}$ inches, with disconnecter, which is extensively used for testing the ventilation of HOSPITALS, SCHOOLS and PUBLIC BUILDINGS, forms also, an admirable Pocket Anemometer for tourists. The indications are obtained by the revolution of a series of fans (similar to those of Biram's Anemometer) acting first, upon a long hand capable of recording the velocity of fifty feet per minute on the large dial, divided to 100 feet, and then successively, by a train of wheels on the indices of five smaller dials, recording respectively, 100, 1,000, 10,000, 100,000 and 10,000,000 feet, or 1,893 miles, | 30 00 |
| 14,516. AIR METER, same as preceding, but reading only to 1,000 feet,   | 25 00 |
| 14,517. WATCH ANEMOMETER, very small and sensitive, outside dimensions $2\frac{3}{4}$ in. in white metal hunting case,  | 40 00 |
| 14,518. WATCH ANEMOMETER, same as above. in silver hunting case,  | 45 00 |

TIME TABLE No. ....

	12 P. M.	1 A. M.	2
CLEVELAND.....	0.0		
	2.5		
Case Ave .....	2.5		
Wilson Ave.....	3.5	1.0	
	5.0	1.5	
Glenville .....	5.0	1.8	
Coits .....	6.8		
COLLINWOOD.....	7.6	0.8	
	9.6	2.0	
Euclid.....	9.6		
	11.9	2.3	
Northwood.....	11.9		
	14.1	2.2	
Wickliff .....	14.1		
	18.6	4.5	
Willoughby .....	18.6		
	20.4	1.8	
Reynolds.....	20.4		
	22.9	2.5	
Mentor. ....	22.9		
	25.0	2.1	
HEISLEY.....	25.0		



1185.

The above cut represents, Fig. 1, the "Speed Protractor," as set at a speed angle of 25 miles per hour, and part of a Chart. Fig. 2 represents the lower head, C, with the speed scale, G, engraved on it. Fig. 3 is a cross section of the lower head, C, the upper and movable head, B, and part of the blade, A. The blade, A, is 42 inches long, made of hard rubber and backed with mahogany wood. The two heads, B and C, are made of steam-dried satin-wood and faced with ebony. Dimensions of lower head, C, 4x15 inches; of upper head, B, 2½x14½ inches. D, E, F, Fig. 3, represent

1000 feet, . . . 25 00  
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 . . . 45 00

## 1135. Hill's Railroad Time Charts.

The principal features of the Charts are:

1. The positively *mathematical correctness* of the spacing.
2. The *ease* with which the five minutes, half hour, and hour lines can be distinguished, as well as their perfect *clearness* and *cleanness*.
3. Their *enormous size* (28x50), admitting of larger hour-spaces than any chart at present in use.
4. The *excellence* of the *paper* on which they are printed, as well as its *peculiar tint*, rendering it peculiarly fit for night work, while its cardboard-like texture obviates the necessity for dampening and stretching, and the consequent distortion of the diagram.
5. Their *cheapness*, which enables us to furnish them to railroads in smaller quantities and at a lower price than they could be obtained by lithographic or any other process.

The "*Speed Protractor*," which is generally used with the Charts, needs hardly any recommendation. The *simplicity* of its *construction*, the *care* bestowed in its *manufacture*, its greater *accuracy* than that of the semicircular angle protractor, and its *low price*, speak for themselves.

The price of the Charts, without name of stations, station lines, and heading, is \$12.00 per quire; complete and ready for train plotting, the scale of prices is as follows, viz.:

50 Sheets,	:	.	.	.	.	.	.	\$50.00
100 do.	:	.	.	.	.	.	.	80.00
150 do.	:	.	.	.	.	.	.	110.00
200 do.	:	.	.	.	.	.	.	140.00
Speed Protractor,	.	.	.	.	.	.	.	10.00

In favoring us with an order for complete Charts, please send list of *stations* with intermediate *distances*, and *underscore* such stations as you may desire to have printed in *heavy type* on account of their importance.

The following is an extract from a letter of Mr. James Tillinghast, General Superintendent of the New York Central and Hudson River Railroad, to whose judgment Mr. Hill submitted both Charts and Protractor:

"NEW YORK CENTRAL AND HUDSON RIVER RAILROAD, }  
Gen'l Supt. Office, Albany, N. Y., Jan. 15th, 1876. }

"ALBERT HILL, ESQ.:

"*Dear Sir*:—I am in receipt of yours of the 14th inst., with sample of diagram of Chart sheets. \* \* \* I have not found any better plan to secure accuracy in forming the basis or proof of time tables, for the reason that it presents to the eye in a clear, condensed form, all the trains the schedule is to cover, and in such manner that the station figures are *accurately* indicated, and from which the figures for the printed form can be *readily copied*.

"Your plan of '*Speed Protractor*' is the *best* I have seen, and will be very useful in connection with the Charts, and I have no doubt that, with the facilities you mention for the production of charts *so accurately lined* as your process will produce, you will be able to secure orders. \* \* \*

"Yours truly,

"JAMES TILLINGHAST."

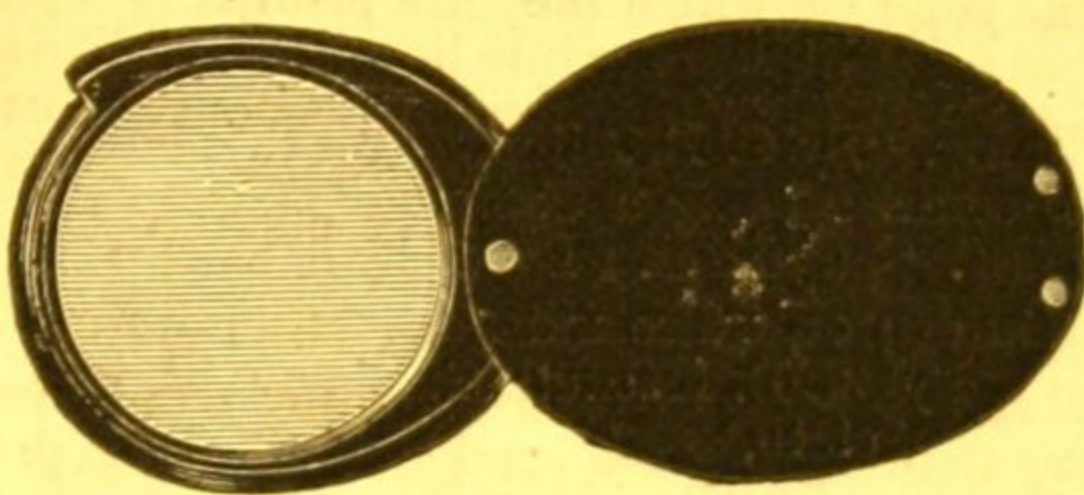
The following is a list of some of the principal railroad companies by which these Charts have so far been adopted:

Pennsylvania Railroad.  
Central Railroad of New Jersey.  
Lake Shore and Michigan Southern Railroad.  
Toledo, Wabash and Western Railway.  
Cleveland, Tuscarawas and Wheeling Railroad, etc., etc.

If desired, we will send by mail, postage paid, a Chart of any of the above-named roads, as a sample.

JAMES W. QUEEN & CO., PHILADELPHIA.

POCKET MAGNIFYING GLASSES.



1138.

No.								PRICE
1136.	Hard Rubber case and frame, round form,	1	double convex lens,	$\frac{3}{4}$ in. diam.				\$0.40
1137.	Do. do. do. do.	1	do.		1	do.		.60
1138.	Do. do. do. do.	1	do.		$1\frac{1}{4}$	do.		.75
1139.	Do. do. do. do.	1	do.		$1\frac{3}{4}$	do.		1.25
1140.	Do. do. do. do.	2	do.		1	do.		1.00
1141.	Do. do. do. do.	2	do.		$1\frac{1}{4}$	do.		1.50
1142.	Do. do. do. bellows form,	1	do.		$\frac{3}{4}$	do.		.60
1143.	Do. do. do. do.	1	do.		1	do.		.75
1144.	Horn case, German silver frame,	1	do.		$\frac{3}{4}$	do.		1.00
1145.	Hard Rubber case and frame,	2	do.		$\frac{3}{4}$	do.		1.00
1146.	Do. do. do. do.	2	do.		1	do.		1.25
1147.	Horn case, German silver frame,	2	do.		$\frac{3}{4}$	do.		1.50
1148.	Hard Rubber case and frame,	3	do.		$\frac{3}{4}$	do.		1.50
1149.	Do. do. do. do.	3	do.			do.		1.75
1150.	Horn case, German silver frame,	3	do.		$\frac{3}{4}$	do.		2.00

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CHAPTER XIV.  
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