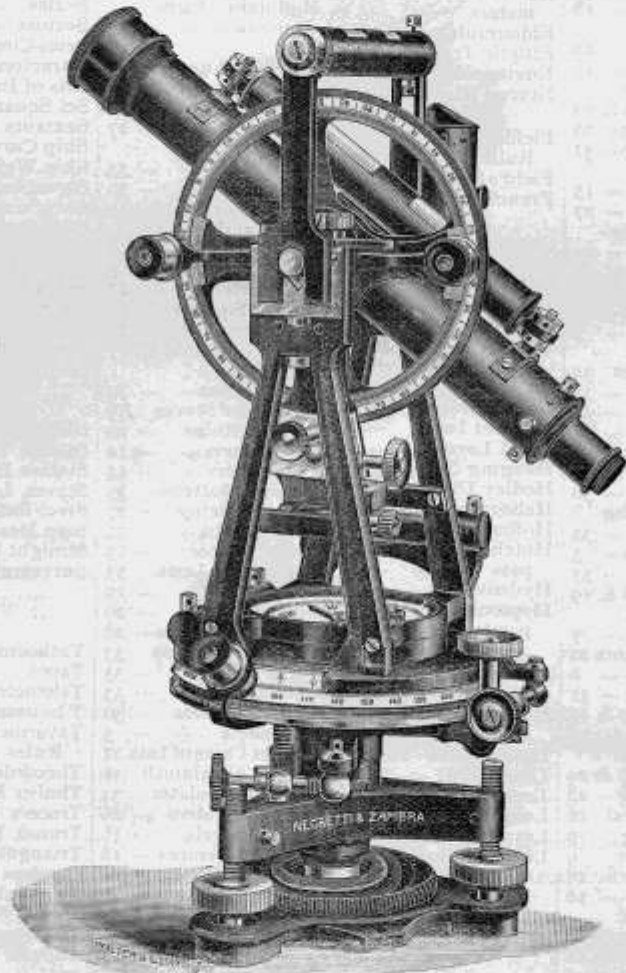


REFERENCE



DEC 29 1942

PRICE LIST
OF
Mathematical & Surveying Instruments,
THEODOLITES, LEVELS, CIRCUMFERENTERS, COMPASSES, Etc.



NEGRETTI & ZAMBRA,
Opticians and Scientific Instrument Makers,

By Appointment to Her Majesty The Queen. H.R.H. The Prince of Wales.

38 HOLBORN VIADUCT, E.C.

Branches: 45 CORNHILL, E.C.; 122 REGENT STREET, LONDON.

PHOTOGRAPHIC STUDIO, CRYSTAL PALACE, SYDENHAM.

51629

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2

Y.—PATTERN THEODOLITES.

1.	4 inch Theodolite divided on silver, reading to 1 minute, with parallel plates, and tripod stand, &c. complete	...	21	0	0
2.	5 inch ditto ditto	...	25	0	0
3.	6 inch ditto ditto reading to 20 seconds	...	28	0	0

TRANSIT THEODOLITES.

4.	3 inch Transit Theodolite, divided on silver, reading to 1 minute with parallel plates and tripod stand, &c., complete	22	10	0
5.	4 inch ditto ditto	26	0	0
6.	5 inch ditto ditto	28	0	0
7.	5 inch ditto reading to 30 seconds, with diagonal eye-piece, illuminated axis, lamp and other Astronomical Appendages	31	0	0
8.	6 inch Transit Theodolite reading to 20 seconds, with parallel plates and Tripod Stand, &c., complete	33	0	0
9.	6 inch ditto, reading to 10 seconds, with diagonal eye-piece, illuminated axis, lamp and other astronomical appendages	36	10	0

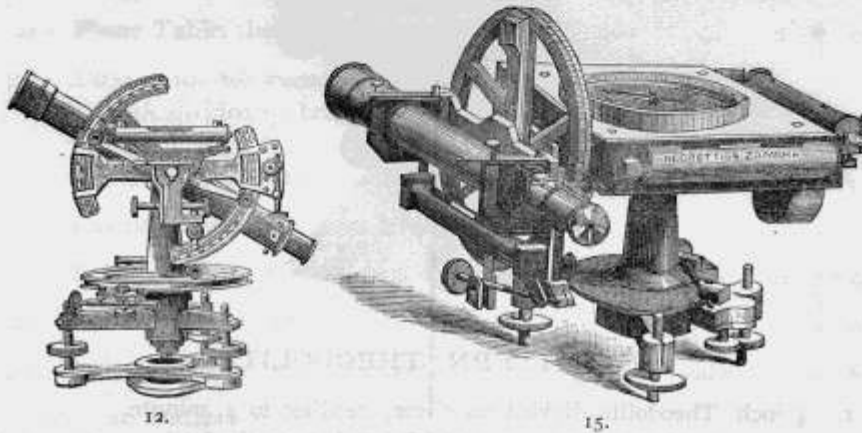
The above Theodolites can be mounted with 3 Levelling Screws and improved Locking Plates as shown on title

page ~~at an extra cost of 15s.~~
without extra charge.

ALTAZIMUTH INSTRUMENTS.

10. **Improved Altitude and Azimuth Instrument**, 7 inch illuminated axis, with lamp. The vertical and horizontal circles are divided on silver, reading to 10 seconds, improved magnifying readers to the divided circles, inverting, erecting and diagonal eye-pieces, tangent screw adjustment, levels, locking plates, with tripod stand and mahogany cabinet for the instrument, with lock and key 50 0 0
11. Ditto ditto 8-inch, complete as above 60 0 0

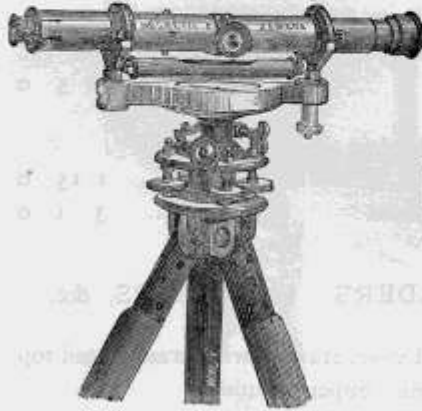
EVEREST & UNDERGROUND THEODOLITES.



12. **Everest's Theodolite**, 5 inch, divided on silver, reading to 30 seconds, with triangular locking plates 25 0 0
13. 6 inch ditto reading to 20 seconds 30 0 0
14. 7 inch ditto reading to 10 seconds 36 0 0
15. **Under-ground Theodolite** for Mining, Surveying, or Military Service. Combining in one instrument, the conveniences of a Y or Dumpy Level, Circumferenter, and a Theodolite. On the top of the vertical axis of the instrument is a Compass with divided ring reading by verniers. On two sides of this compass are Spirit Levels with the usual adjustments for Azimuth observations. Attached to the limb of the instrument is a vertical divided circle, upon which is a Telescope with Rackwork adjustment mounted in reversing and adjusting Ys. A Spirit Level is placed upon the Telescope similar to a Theodolite. Vertical angles are obtained and read off on the vertical divided circle by two arms and a vernier scale attached to the axis of the Telescope.
Clamps and tangent screws are attached to the horizontal and the vertical movements. Complete with Tripod stand and mahogany box 22 0 0

Dumpy or Gravatt's Levels, without Compasses :—

49.	10-inch	ditto	ditto	...	12	10	0
47.	12-inch	ditto	ditto	...	13	5	0
48.	14-inch	ditto	ditto	...	14	0	0



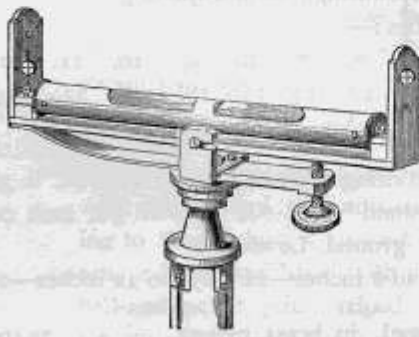
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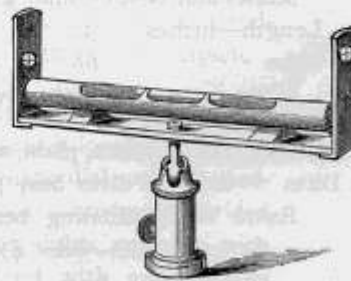
51.

49. **Best Y Level**, with 12-inch Achromatic Telescope and rackwork adjustment, Compass, tangent screw adjustment, parallel plates, in case, with tripod stand ... 17 17 0
50. Ditto, with 18-inch Telescope ... 22 0 0
51. **Negretti & Zambra's Improved Ordnance Pattern 15-inch Best Y Level**, aluminium ring Compass, tangent screw and clamp on limb, parallel plates, mahogany tripod stand and box with strap ... 18 10 0

The above Levels can be mounted with 3 Levelling Screws and improved Locking Plates at an extra cost of 15s. without extra charge.



54.

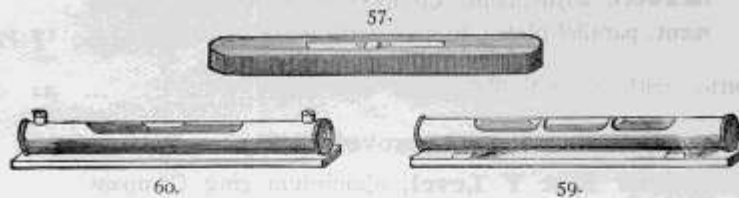


55.

52. **8-inch Drainage Level**, with Compass, rackwork adjusting telescope, Cross Level, parallel plates, in mahogany case and tripod stand 7 10 0
53. Ditto, without Compass 6 6 0
54. **Drainage Level, Ordnance Pattern**, best mounted, with plain sights, spring adjustments to level, in mahogany box, with tripod stand 5 5 0
55. **Drainage Level**, of Brass, with plain sights, ball-and-socket joint 1 15 0
56. Ditto ditto with Tripod Stand 3 3 0

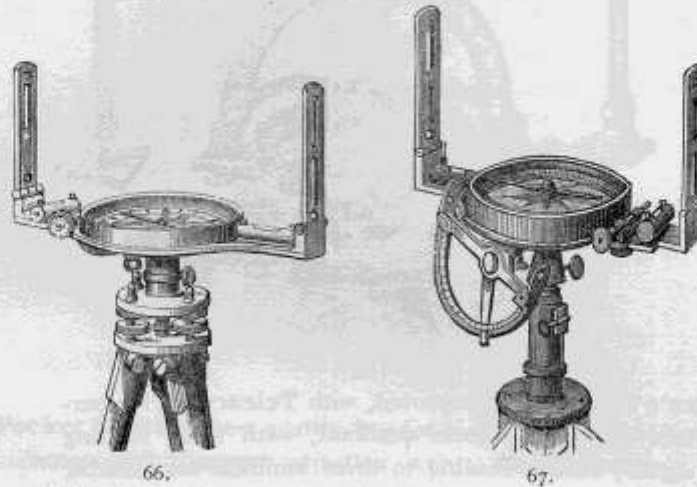
HAND LEVELS, FOR BUILDERS, ENGINEERS, &c.

57. **Spirit Levels**, mounted in polished wood frames, with brass plated top and brass-tipped at bottom. Superior finish.
- | | | | | | | |
|---------|--------|-----|---------|---------|---------|---------|
| Length— | inches | ... | 8 | 10 | 12 | 14 |
| Price | ... | ... | 3s. 6d. | 4s. 6d. | 5s. 6d. | 6s. 6d. |
58. Ditto brass-plated top and bottom 4s. 6d. 6s. 7s. 8s.

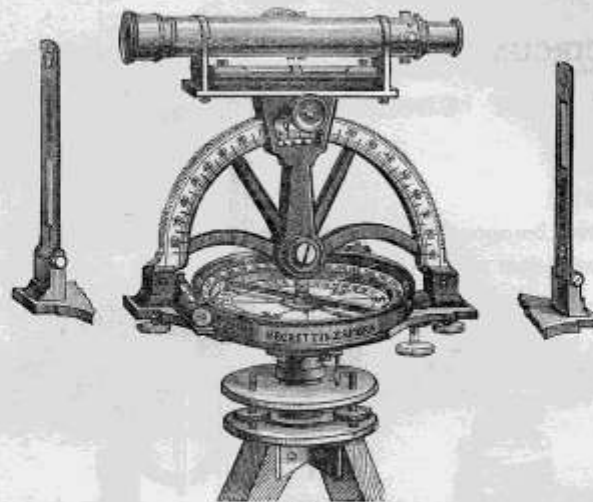


59. **Spirit Levels**, plain brass mountings
- | | | | | | | | |
|---------|--------|-----|---------|---------|-----|---------|---------|
| Length— | inches | 4. | 5. | 6. | 8. | 10. | 12. |
| Price | ... | 2s. | 2s. 6d. | 3s. 6d. | 5s. | 6s. 6d. | 8s. 6d. |
60. **Spirit Levels**, bronzed brass mountings, with adjusting screws and Best Ground Tubes :—
- | | | | | | | | | | | | |
|---------|--------|-----|-----|------|------|------|------|------|------|------|------|
| Length— | inches | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. |
| Price | ... | 6/- | 8/- | 10/- | 12/- | 14/- | 16/- | 18/- | 20/- | 22/- | 24/- |
- If with divided tubes, extra.*
61. **Spirit Level Tubes**, plain, according to diameter per inch 2d. to 3d.
62. Ditto ditto ditto best ground per inch 6d.
Extra for graduating best ground Levels :—
2 to 4 inches—6d. 4½ to 8 inches—1s. 8½ to 12 inches—2s.
63. **Circular Pocket Spirit Level**, in brass mount 7s. 6d.

**CIRCUMFERENTERS, MINER'S DIALS,
CROSS SIGHTS, &c.**

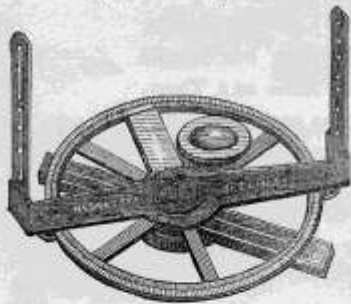


- | | | |
|-----|--|---------|
| 64. | Circumferenter , or Miner's Dial, 4-inch Ordnance Pattern , divided and figured on raised ring to 360° , and also the quarters figured below to 90° , folding sights, ball-and-socket joint with clamping screws, bar needle and agate centre, the dial lettered the same as a Theodolite, with tripod stand jointed. In two cases complete | 7 7 0 |
| 65. | Circumferenter , 5-inch, with rackwork adjustment and vernier to dial, bar needle, folding sights, ball-and-socket joint, divided cover for vertical angles, with tripod stand jointed, in two cases complete | 9 9 0 |
| 66. | Circumferenter , 6-inch, with rackwork adjustment and vernier to dial, bar needle, folding sights, divided cover for hypo. and base, cross levels, jointed tripod stand with extra points for use at half length, and ball-and-socket joint with plummet, &c., in two cases complete | 15 15 0 |
| 67. | Circumferenter , 6-inch, or Hedley's inclining dial, improved form, folding sights, two spirit levels, bar needle with agate centre, rack adjustment to dial, vernier reading to three minutes, tangent screw adjustment, divided arc for hypo. and base, with plain sights, complete with ball-and-socket joint, tripod stand with extra points for use at half length, &c., in two cases complete | 17 17 0 |

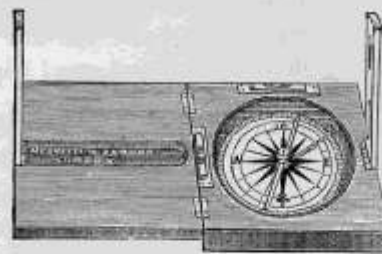


68.

68. **Lean's Dial**, 6-inch, improved, with **Telescope**, for surface surveying, centre quadrant, with level, shifting sights; vernier reading to three minutes, bar needle, cross levels, rackwork adjustments, arc divided on one side 90° each way and on reverse for hypo. and base, jointed tripod stand with extra points, &c. ... 18 18 0



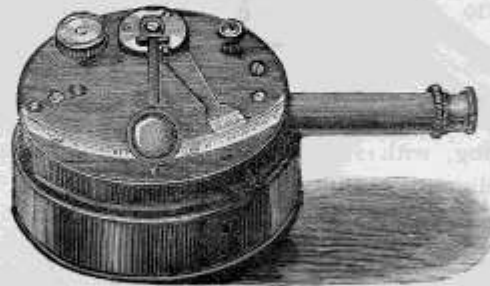
69.



72.

69. **Graphometer or Surveyor's Dial**, $7\frac{1}{2}$ -inch divided circles, folding sights, compass with bar needle in trough and circular spirit level, ball-and-socket tripod stand, &c. In mahogany box ... 16 16 0
70. **Hanging Compass**, with clinometer, improved form for mining work ... 8 8 0
71. **Miner's Compass**, 4-inch, with folding sights, in mahogany case ... 1 15 0
72. Ditto, with metal dial, raised ring, spirit levels, &c. ... 3 0 0
73. **Pocket Mining Compass**, with double sights, round brass box, engine divided and engraved silvered dials, bar needle and stop ... £2 2 0 ... 2 10 0

POCKET SEXTANTS.



74.

- | | | | | | | | | |
|-----|--|-----|-----|-----|-----|---|----|---|
| 74. | Pocket Sextant , best quality, divided on silver, with Telescope and Tangent adjusting screw, &c. in leather sling case | ... | ... | ... | ... | 5 | 5 | 0 |
| 75. | Ditto, with Cover divided hypo. and base | ... | ... | ... | ... | 5 | 15 | 0 |
| 76. | Sounding Sextant , for Coast Surveys | ... | ... | ... | ... | 6 | 15 | 0 |

PRISMATIC & MILITARY SURVEYING COMPASSES.



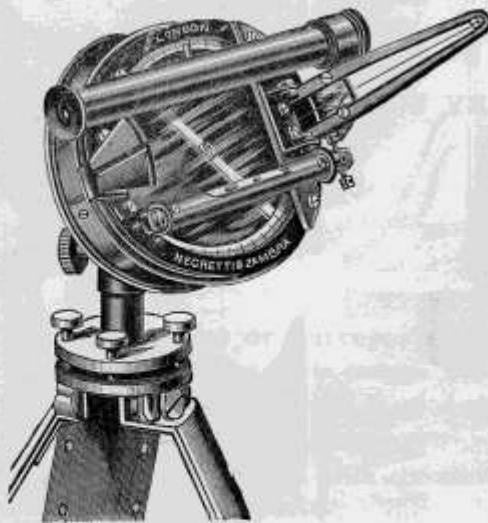
81.



83.

- | | | | | | |
|-----|---|----------|---------|----------|---------|
| 77. | Prismatic Compass (Kater's) , plain sights and card dial | 2½-inch, | 3-inch, | 3½-inch, | 4-inch, |
| | | £2 0 0 | £2 10 0 | £3 0 0 | £3 10 0 |

78. **Prismatic Compass**, 3-inch, with shades and mirror, card dial, in leather sling case 3 0 0
79. Ditto ditto 3½-inch 3 10 0
80. Ditto ditto 4-inch 3 17 6
81. **Prismatic Compass**, 3-inch, best engine divided Aluminium ring, with sun shades and Azimuth glass, in leather sling case 4 0 0
82. Ditto 3½-inch, ditto 4-inch, ditto 4½-inch, ditto 5-inch,
£4 5s. £4 10s. £5. £5 10s.
83. **Hutchinson's Prismatic Compass**, 3-inch, in leather sling case 2 10 0
84. Leather Case and Strap for Prismatic Compass 6s. to 10s.
85. **Stand** for Prismatic Compass, best mounted, *Ordnance pattern*, with ball-and-socket joint 2 0 0

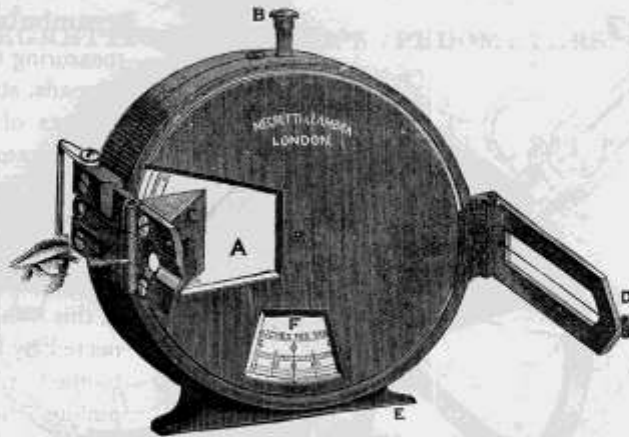


86.



86.

86. **Improved Telescopic Prismatic Compass**, with which both vertical and horizontal angles can be taken with speed and accuracy. With stand complete in mahogany box 12 12 0



87.

87. **Combined Altitude Instrument and Prismatic Compass.** Best mounted, with Aluminium divided ring, in leather sling case 5 10 0
88. **Improved Walking Stick Tripod Stand,** with Telescope Draw, vertical and horizontal motion to ball-and-socket head, 3-feet long when closed, for use with the Prismatic Compass or other small surveying instruments 2 5 0



89.

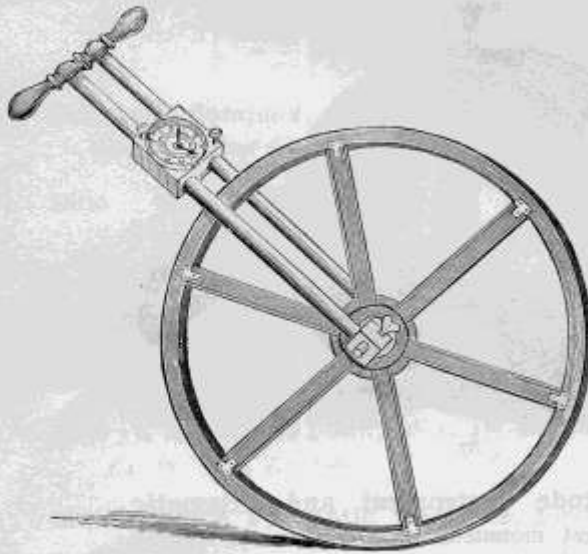


77.



92.

89. **Surveyor's Cross,** octagonal form 0 8 6 0 10 6
90. Ditto ditto with **Compass** 0 15 0 0 17 6
91. Ditto ditto (or Pantometre) large size, with *movable* head and divided circle, best construction 1 15 0
92. Ditto ditto with **Compass** 2 2 0
93. **Optical Square,** for showing right angles, in morocco case 1 1 0
94. Ditto ditto, with adjustment 1 15 0
95. **Dendrometer,** for ascertaining the height of trees, buildings, &c. 1 0 0

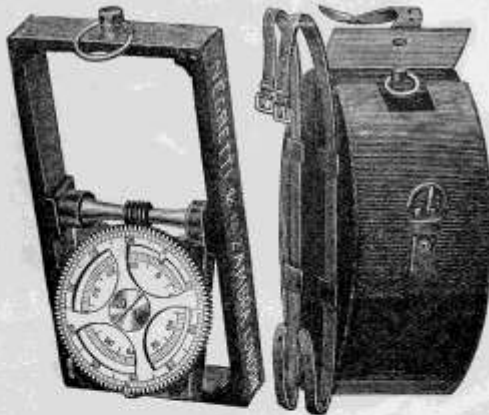


96.

Perambulator, for measuring the length of roads, streets, &c., consists of an accurately framed Mahogany Wheel, Brass Clamped, the circumference of which is ascertained; the axis of this Wheel is connected by a series of toothed wheels and pinions to a dial, upon which the number of revolutions of the Wheel are recorded. The divisions upon the

dial are English Measures; but any Foreign scale can be substituted to order.
96. Price, best mounted and finished £16 16 0

NEGRETTI & ZAMBRA'S IMPROVED TROCHEAMETER,
For measuring distances by the revolutions of a Carriage Wheel.



97.

The Instrument is fitted into a metal case, covered with leather, provided with straps for fixing to the axle box of the left side wheel and central with it. In this position the case revolves with the wheel, but the instrument inside remains pendent.

The recording portion of the Trocheameter consists of two graduated circular Dials. Each division upon

the outer dial represents one revolution of the carriage wheel, the entire circle being equal to 100 revolutions. The inner dial records the revolutions of the outer one, each division representing 100 revolutions of the carriage wheel. Hence it will be seen that when the outer dial has made a complete revolution, the index pointing on the inner dial will have moved one division. The total number of divisions on the inner dial will therefore indicate 9,900 revolutions of the carriage wheel.

97. Price in case £3 10 0

NEGRETTI & ZAMBRA'S Pedometers, &c.



99.



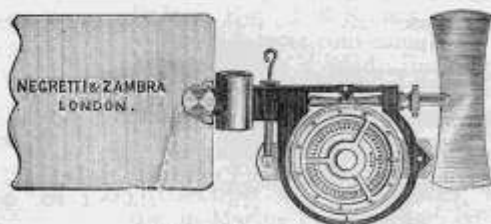
99.

Pedometer for measuring the distance travelled by a Pedestrian. It never requires winding, the first step of the Pedestrian sets the works in motion; which continue to act as long as he moves, and stop when he stops. The dial is divided into twelve divisions, which represent so many miles, but can be adapted to record kilometres or any other measure of distance.

PRICES.

98.	Pedometer , mounted in Nickel Plated Case	1	1	0
99.	Ditto, with best quality movement	2	2	0
100.	Ditto, best quality, fitted in Silver Case	2	15	0
101.	Pedometer , mounted in Nickel Plated Case, and fitted with keyless action for setting the hand	1	15	0
102.	Ditto, fitted in Silver Case	3	3	0
103.	Passometer, or Step Measurer in Nickel Plated Case	1	1	0
104.	Ditto in Silver Case	3	3	0
105.	Wealmefna Measuring Instrument in Nickel Plated Case	0	8	6
106.	Ditto in Silver Case	0	15	0
107.	Ditto in Gold Case	1	10	0

NEGRETTI & ZAMBRA'S CURRENT METERS.



108.

Current Meter, for ascertaining the tidal rate or flow of streams or rivers, in Miles, Furlongs, and Feet; or in Metres.

108. Price in mahogany box ... £6 6 | 0



110.

**STANDARD
AND
SURVEYING
ANEROIDS.**

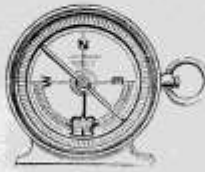
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|------|--|---------------|------------------|---------|
| 108. | Standard Aneroid , best quality movement, silvered metal dial about 5 inches diameter, fitted in cylindrical brass case and solid leather case and sling strap | ... | ... | 4 4 0 |
| 109. | Ditto, with curved thermometer on dial | ... | ... | 4 15 0 |
| 110. | Ditto, with an altitude scale, raised ring and revolving index :— | | | |
| | 10,000 feet | 15,000 feet | 20,000 feet | |
| | or 3,000 metres. | 5,000 metres. | or 6,000 metres. | |
| | £6 10 0 | £7 0 0 | £7 10 0 | |
| 111. | Mining Surveyor's Aneroid , with scale reading to 7,000 feet above sea level, and 2,000 feet below : in solid leather case and sling strap | ... | ... | 6 6 0 |
| 112. | Ditto, with vernier and magnifier attached to revolving ring | ... | ... | 8 8 0 |
| 113. | Negretti & Zambra's Mercurial Standard Mountain Barometer on Fortin's principle, reading to .002 of an inch with brass tripod and solid leather travelling case | ... | ... | 10 10 0 |
| 114. | Apparatus for determining elevations by the temperature of Boiling Point of Water (hypsometric apparatus) in leather sling case | ... | ... | 5 5 0 |
| 115. | Ditto, small size, in mahogany case | ... | ... | 3 0 0 |

CLINOMETERS.

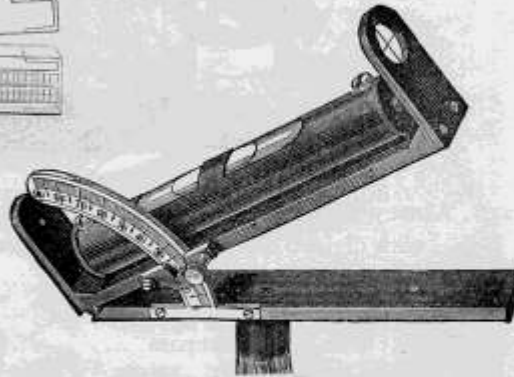
- | | | | | |
|------|--|-----|-----|--------|
| 116. | Clinometer , Boxwood, 6-inch, plain-jointed, without Sights or Compass | ... | ... | 1 1 0 |
| 117. | Ditto, ditto, with Spirit Level, Magnetic Compass, and Inclination Scale | ... | ... | 1 10 0 |
| 118. | Ditto, with two levels, best Bar Needle and Agate Centre Compass jointed in the lower limb | ... | ... | 2 15 0 |



118.

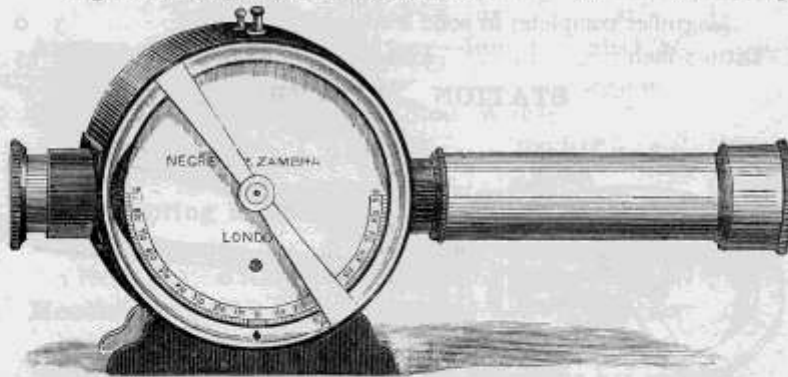


123.



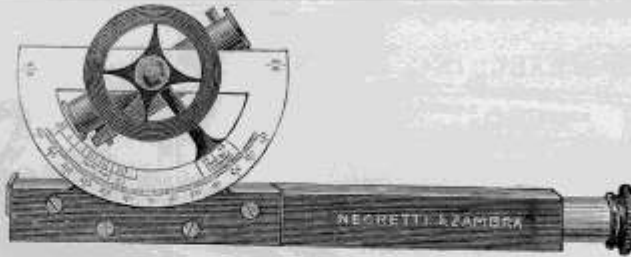
119.

- | | | | | |
|------|---|---|----|---|
| 119. | 4-inch Pocket Spirit Level, or Clinometer, brass frame, with sights and graduated arc for determining the inclination of strata, etc., with socket for staff, in mahogany box | 3 | 10 | 0 |
| 120. | Geological Compass, for ascertaining the dip or inclination of strata, hills, &c., graduated in degrees and inches per yard, in mahogany box, 4½-inches square | 0 | 18 | 6 |
| 121. | Ditto ditto, 3 inches | 0 | 16 | 0 |
| 122. | Ditto ditto, 2½ inches | 0 | 15 | 0 |
| 123. | Geological Compass, brass mounted, in morocco case | 0 | 15 | 0 |
| 124. | Ditto, watch shape, best gilt, enamel dial, bar needle, with sights in base, fitted in morocco case | 1 | 15 | 0 |



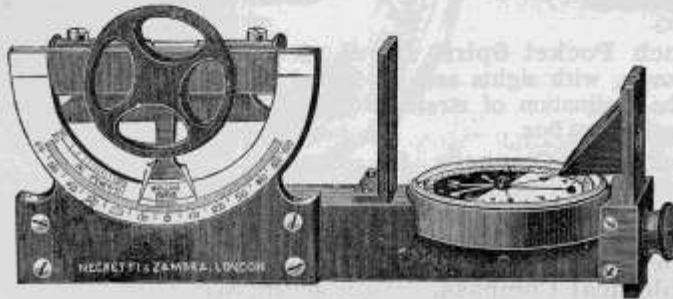
125.

- | | | | | |
|------|---|---|---|---|
| 125. | Pocket Alt-Azimuth Instrument, improved by Francis Galton, Esq., F.R.S., is a combined Compass and Clinometer. A most convenient and portable instrument for obtaining, in a ready manner, Angles, Levels, &c. The Telescope renders this instrument available for observing at a considerable distance from the Station, either Magnetic Bearings, Horizontal or Vertical Angles, &c., &c. Price in case | 6 | 6 | 0 |
| 126. | Hydroscope or Telemeter, a simple apparatus for use in Marine Forts, to estimate the distance of vessels and other objects | 5 | 0 | 0 |



127.

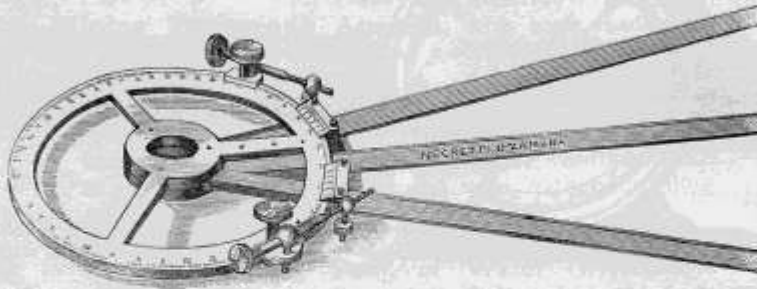
- | | | | | | | |
|------|---------------------------------|---|-----|-----|-----|--------|
| 127. | Abney's Reflecting Level | 5-inch, Improved form | | | | |
| | | with divided arc to show gradients, etc., in case | ... | ... | ... | 1 18 0 |
| 128. | Ditto, with Compass | | ... | ... | ... | 2 2 0 |
| 129. | Ditto, 7-inch | | ... | ... | ... | 3 10 0 |
| 130. | Ditto, ditto, with Compass | | ... | ... | ... | 4 0 0 |



131.

- | | | | | | | |
|------|----------------------|---|-----|-----|-----|--------|
| 131. | Abney's Level | 5-inch, with Prismatic Compass and | | | | |
| | | Magnifier complete, in solid leather sling case | ... | ... | ... | 3 0 0 |
| 132. | Ditto 7-inch | | ... | ... | ... | 4 15 0 |

STATION POINTERS.



134.

- | | | | | | | |
|------|--|--|-----|-----|-----|---------|
| 133. | Station Pointers for Hydrographical Surveys, | | | | | |
| | | 6 inch, plain, divided on Brass, with 12 inch arms | ... | ... | ... | 7 0 0 |
| 134. | Ditto, best, with Silver divided Circles and verniers, tangent | | | | | |
| | | screw adjustments, with arms lengthening to 18 inches, | | | | |
| | | in mahogany case | ... | ... | ... | 10 0 0 |
| 135. | Ditto, 7 inch, with arms lengthening to 24 inches | | ... | ... | ... | 13 0 0 |
| 136. | Ditto, 8 inch, with arms lengthening to 30 inches | | ... | ... | ... | 15 15 0 |

LAND MEASURING CHAINS, TAPE MEASURES, etc.



137.



141.



142.

137. **Land Chain**, Iron Wire, best quality, with three oval rings, brass swivel handles and tallies, and 10 arrows
- | | | | |
|----------|----------|-----------|-----------|
| 50 feet, | 66 feet, | 100 feet, | 20 metre, |
| 10/- | 12/6 | 15/- | 12/6 |
- If galvanized 5/- each.
138. **Land Chain**, Stout Steel Wire, best quality, with 10 arrows:—
- | | | | |
|----------|----------|-----------|-----------|
| 50 feet, | 66 feet, | 100 feet, | 20 metre, |
| 17/6 | 21/- | 25/ | 21/- |
139. **Arrows**, set of ten, 15 inches long—Iron, 1/-, Steel, 2/- per set.
140. **Standard Chain**, best stout Steel Wire—
- | | | |
|----------|----------|-----------|
| 50 feet, | 66 feet, | 100 feet, |
| £4 10s. | £6 6s. | £8 10s. |
141. **Pocket Spring Measures** in German silver cases, with spring stop, steel tapes divided in inches and metres
- 3 feet 3/-; 6 feet 4/6; 9 feet 6/-; 12 feet 7/6.
142. **Measuring Tapes**, best quality woven linen, superior in accuracy and durability to any woven tape hitherto manufactured, fitted in leather cases, marked in feet and inches on one side, and metres and centimetres on the other side.
- | | | | | |
|----------|----------|----------|----------|-----------|
| 25 feet, | 33 feet, | 50 feet, | 66 feet, | 100 feet, |
| 5/6 | 6/3 | 7/9 | 10/- | 12/6. |
143. **Measuring Tapes**, with Steel Tapes in leather cases. These may be depended upon as Standards and are the most perfect Tapes that can be made.
- | | |
|---------------------------------------|--|
| 33 feet and equivalent metres, 16/6 | 66 feet and equivalent metres, 45/- |
| 50 feet „ „ 28/- | 100 feet „ „ 68/6 |

144. **Tapes**, linen, 2nd quality, in brown leather case, with folding handle, marked in feet on one side and metres on the other.

33-feet,	50-feet,	66-feet,	100-feet,
3/-	4/-	5/-	6/6

145. **Timber Measuring Tapes**, best quality linen, marked girth one side, and feet, inches, and halves the other.

3-feet,	6-feet,	9-feet,	12-feet,
3/6	6/-	9/-	12/-

Metallic and other special Tapes supplied to order.

146. **Steel Band Chains**, coiled on a Steel X, etched feet one side and decimetres the other.

33-feet,	50-feet,	66-feet,	100-feet,
15/-	21/-	26/6	40/-

147. Ditto etched feet, inches and eighths one side and millimetres the other.

33-feet,	50-feet,	66-feet,	100-feet,
20/-	27/6	35/-	50/-

LEVELLING STAVES, POLES, &c.

148. **Sopwith's Station Staff**, 14 ft., varnished paper scale . . . each 1 15 0 per pair 3 10 0

149. Ditto ditto best Painted scale, sliding in three lengths, put together with brass screws, mountings and springs each 2 10 0 per pair 5 0 0

150. Ditto ditto, Metrically divided, same price as above.

151. **Roger Field's Station Staff** . . . each 2 15 0 per pair 5 10 0

Any other special pattern Staves prepared to order.

152. **Papers for Levelling Staves**, 14 ft., per set 0 3 0

153. **Triangular Iron Plate**, to stand a staff upon . . . 0 3 6

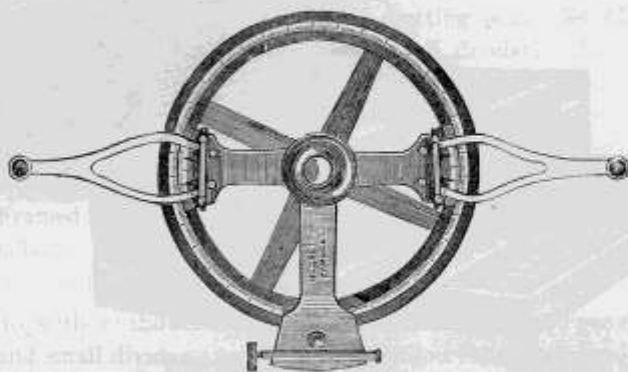
154. **Pickets, or Ranging Poles**, with iron shoes painted in three colours, per dozen—

6 ft.	8 ft.	10 ft.
35/-	40/-	70/-

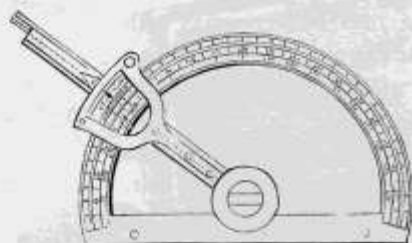


149.

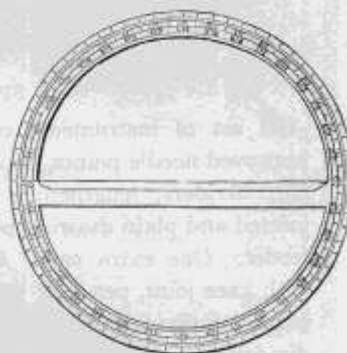
PROTRACTORS.



156.



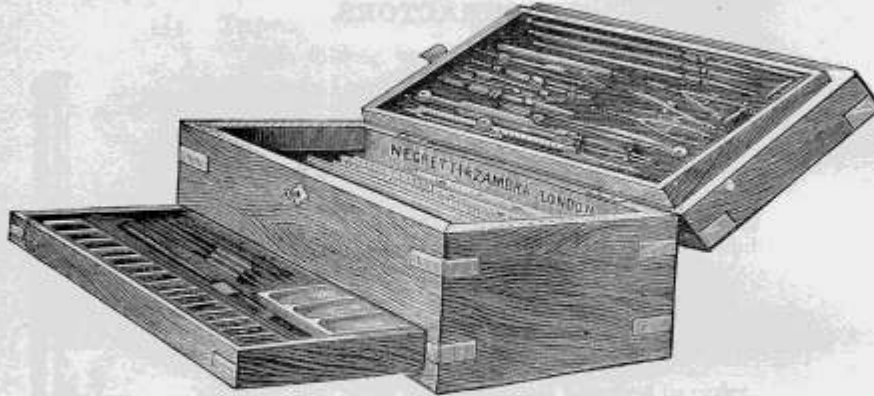
162.



158.

155. **Circular Protractor**, Brass, 6 inch, with Tangent Screw adjustment and screw to vernier, in mahogany case ... 4 15 0
156. Ditto ditto, best, divided on silver, with folding arms ... 6 6 0
157. Ditto ditto 8-inch 8 8 0
158. **Circular Protractors**, Brass, engine divided and engraved, in case
- | | | | | | |
|---------|---------|---------|---------|---------|-----------|
| 3 ins., | 6 ins., | 7 ins., | 8 ins., | 9 ins., | 12 ins., |
| 10/6 | 21/- | 26/6 | 31/6 | 37/- | 56/- each |
159. Ditto ditto in Electrum—
- | | | | | | |
|------|------|------|------|------|------|
| 12/6 | 26/6 | 33/6 | 42/- | 50/- | 75/- |
|------|------|------|------|------|------|
160. **Semi-Circular Ditto**, 6 inch, without case, Brass—11/6;
161. Ditto ditto in Electrum—15/-
162. **Ditto**, brass, 6 inch, figured to 360°, with vernier reading to 1 minute with clamp screw, and magnifying glass in mahogany case 3 3 0

MATHEMATICAL, DRAWING INSTRUMENTS.



163.

163. **Magazine Case of Drawing Instruments**, all of very highest quality in Electrum, and fitted in polished walnut or oak case with German silver caps and corners with lock and key.

SPECIFICATION.

One full set of instruments consisting of 6 inch compass with improved needle points, double jointed, pen and pencil points, hair dividers, lengthening bar, bow pen and bow pencil, jointed and plain drawing pens and pricker, knife, key and feeder. One extra small *half* set of instruments, compass with knee joint, pen and pencil points and lengthening bar. extra hair divider. Three extra dividers, assorted sizes. One divider with sheath. One beam compass, needle pointed. One triangular compass. Two sets of three each spring bows needle pointed. One each road pen and road pencil. Six extra drawing pens assorted. One each 6-inch and 9-inch proportional compasses. One bordering pen. One dotting pen with wheels in ivory box. Two extra small bows (1 each pen and pencil). Two opisometers (one with graduated scale) Tracer. Curved drawing pen. Engineer's pen. One pen with adjustable screw at end of handle. One universal bow. One pillar compass. One napier compass. One revolving spring bow. One whole and half compass. One tubular compass. One set of ten ivory plotting scales with ten offsets. One each ivory sector, protractor, and parallel rule. One rolling parallel rule with divided ivory edges. Framed mahogany angles and curves. One transparent circular protractor. One transparent semi-circular ditto. Full set of colours, brushes, palettes, saucers, Indiarubber, drawing pins, horn centres, pencils, &c., &c., packed in tray in base of case

52 0 0

164. Ditto, including one full set of instruments, proportional compass with adjustment. Beam compass. Jointed and plain drawing pens. Two extra small pens. Pricker. Tracer. Road pen and pencil. Dotting pen. Set of three spring bows. Two extra small dividers. Map meter. Set of six ivory plotting scales and offsets. Ivory protractor, sector, and parallel rule. Twelve inch ebony rolling parallel rule with divided ivory edges. Six inch semi-circular protractor. Colours, brushes, palettes. Framed mahogany angles and curves, &c., &c., fitted in polished walnut case with German silver caps and corners, with lock and key 25 0 0
165. Ditto, without the semi-circular protractor, extra small pens and small dividers, and with plain proportional compass, rolling parallel rule with plain edges and vulcanite angles 20 0 0
166. Ditto, without the beam compass or ivory parallel rule and with boxwood plotting scales and offsets 15 15 0



167.

167. **Set of Electrum Drawing Instruments**, consisting of best double-jointed and needle-pointed compass, with pen and pencil points, lengthening bar, hair dividers, bow pen and bow pencil, set of three best spring bows, proportional compass, jointed and plain drawing pens, dotting and road pens, needle holder, and set of best colours, brushes, &c., fitted in extra finished case with German silver caps and corners, &c., 10 10 0
168. Ditto, without the dotting and road pens and proportional compass 8 8 0

169. Ditto, consisting of best double-jointed and needle pointed compass, with pen and pencil points, lengthening bar, hair dividers, bow pen and bow pencil, set of three best spring bows, jointed and plain drawing pens, needle holder, ivory protractor, sector and parallel rule, set of best colours, brushes, &c., fitted in brass bound case, with lock and key 7 7 0
170. Ditto, without the needle holder, colours, brushes, &c. ... 6 6 0
171. Ditto, best finished sector-joint compass, with pen and pencil points, lengthening bar, and hair dividers, bow pen and bow pencil, set of three best spring bows, jointed and plain drawing pens, needle holder, ivory protractor, sector and parallel rule, with set of best colours, brushes, &c., fitted in brass bound case, with lock and key 5 15 0
172. Ditto, without the set of colours, brushes, &c. 5 5 0
173. Ditto in oak or mahogany case (not brass bound) 4 4 0



175.



179.

174. Ditto, consisting of compass, with knee-joint dividers, set of three spring bows and plain drawing pen, boxwood protractor and sector, and ebony parallel rule, fitted in oak or mahogany case with lock and key 3 3 0
175. Ditto, consisting of sector-joint compass, with pen and pencil points, lengthening bar, hair dividers, bow pen and bow pencil, jointed and plain drawing pens, boxwood protractor and sector, and ebony parallel rule, fitted in oak or mahogany case, with lock and key 2 10 0
176. Ditto, consisting of compass, with knee-joint, and pen and pencil points, lengthening bar, dividers, bow pen and bow pencil, jointed and plain drawing pens, boxwood protractor, sector and ebony parallel rule, fitted in mahogany case with lock and key 2 2 0
177. **Set of Brass Instruments**, consisting of sector-joint compass, with pen and pencil points, lengthening bar, dividers, bow pen and pencil, jointed drawing pen, ebony parallel rule, and boxwood protractor, fitted in mahogany case, with lock and key 1 10 0
178. Ditto, consisting of brass compass, with pen and pencil points, lengthening bar, bow pen and bow pencil, drawing pen, ebony parallel rule and boxwood protractor, fitted in mahogany case 1 1 0

179. **Pocket Set**, consisting of best double-jointed and needle-pointed Electrum compass, with pen and pencil points, lengthening bar, hair dividers, bow pen and bow pencil, jointed and plain drawing pens, ivory protractor, sector, and parallel rule, fitted in morocco case ... 4 10 0
180. Ditto, consisting of small sector-jointed Electrum compass with pen and pencil points, lengthening bar, hair dividers, jointed drawing pen, and ivory protractor, fitted in morocco case ... 3 0 0
181. **Half-Set of Instruments**, consisting of brass compass, with pen and pencil points, drawing pen and boxwood scale, in polished mahogany case ... 0 10 6
182. Ditto, with extra bow pen and bow pencil, and ebony parallel rule ... 0 16 6
183. Ditto, consisting of brass compass, with pen and pencil points, boxwood scale and pencil, in pull-off case ... 0 6 6
184. Ditto, with extra dividers and feeder ... 0 8 6



184.

185. **Half-Sets of Instruments**, fitted in cardboard cases :—
Electrum Instruments—35/-, 17/6, 15/-, 13/6 and 10/- each.
Brass Instruments—12/6 and 9/- each.

Cases of Instruments as used in Public Schools.

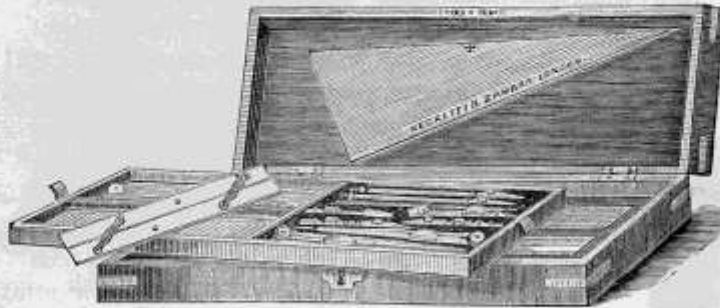
186. **Sandhurst College Set** consisting of 6-inch compass with pen and pencil points, divider, bow pen, drawing pen, key, and ivory sketching protractor, in mahogany case :—
Electrum instruments, £2 5 0. Brass Ditto, 2 0 0



187.

187. **Military College (Woolwich) Set** consisting of 6-inch sector joint compass with pen and pencil points and lengthening bar, hair dividers, bow pen and bow pencil, 2 drawing pens, key, ivory protractor and sector, in mahogany case :—
Electrum Instruments, £3 10 0. Brass Ditto 2 17 6

188. **Royal School of Naval Architecture Set**, consisting of 6-inch compass with knee joint, pen and pencil points, lengthening bar, hair divider, bow pen and bow pencil, 2 drawing pens, key, ivory protractor, and ebony parallel rule, in mahogany case—Electrum Instruments ... 3 10 0



189.

189. **Addiscombe Cadets Set** of Drawing Instruments, consisting of 6-inch compass, with pen and pencil points, lengthening bar, hair dividers, bow pen and bow pencil, jointed and plain drawing pens, ivory red line protractor, sector and parallel rule, boxwood marquois scales and angle, in oak case:—
Electrum Instruments, £4 5 0. Brass ditto 3 7 6
190. **Coopers Hill Engineering College Set**, electrum instruments with 3 spring bows and 3 ivory rules, in walnut case 4 17 6
191. **Crystal Palace Engineering School Set**, consisting of 6 inch electrum best double jointed and needle pointed compass, with pen and pencil points, lengthening bar, hair dividers, spring bow pen, jointed drawing pen, boxwood protractor, set of best colours, brushes, &c., fitted in mahogany brass bound case ... 5 0 0
192. **Rugby Set** (for mechanical drawing) consisting of electrum divider, bow pencil, boxwood protractor, 2 vulcanite angles, pencils and ink eraser, in mahogany case 0 15 0




195.



199.

Dividers :—

	Brass.	Electrum.
193. 4 or 5 inch plain long joint	0 2 6	
194. Ditto superior quality	0 3 0	0 3 6
195. Ditto sector joint	0 4 0	0 5 0
196. 6-inch ditto	0 5 0	0 6 0
197. 9-inch ditto	0 11 6	0 12 6
198. One handed divider for chart work, fitted in case		0 7 0
199. Hair dividers, 4 or 5 inch, with spring point	0 6 0	0 7 6
200. Ditto, improved form	0 7 6	0 9 0
 201. Dividers, with sheath to pro- tect points, 3, 3½, or 4 inch		0 10 0
202. Pocket dividers, with turn in points	0 5 6	0 11 6



204.

Bows :—

203. Plain, with pen or pencil points	0 2 6	0 4 0
204. Ditto superior quality	0 4 0	0 5 0
205. Ditto improved pattern	0 5 0	0 6 0
206. Ditto double jointed	0 7 0	0 9 0
207. Ditto improved double-jointed and needle pointed		0 12 0



210.

208. **Spring Bows**, set of three
with plain points, pen,
pencil and dividers, fitted
in leather case

per set 8/6 12/- and 15/-

209. Ditto, extra large size 20/- and 25/-

210. Spring Bows, set of three,
with improved needle
points, in leather case 21/-

211. Universal Spring Bow,
combining pen, pencil, and divider, in one bow, fitted in
case 0 7 6

212. Ditto, superior quality, with needle points in case 0 17 6

Drawing Pens.



215.



217.

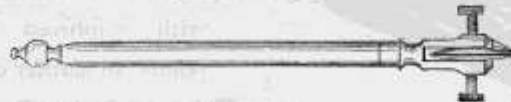


218.



220.

			Brass.	Electrum.
213.	Pen , with round ivory handle, fine steel	...	...	0 1 9
214.	Ditto, with square ivory handle, improved form	...	...	0 2 9
215.	Ditto, with turn-up nib, round ivory handle, best quality	... ..	£0 2 9	0 4 0
216.	Ditto, with square ivory handle	... ..	...	0 4 6
217.	Bordering pen, extra stout	... ..	...	0 5 6
218.	Road pen or pencil, ivory handle	... ..	...	0 7 6
219.	Dotting pen, with one wheel, ivory handle	... ..	...	0 5 0
220.	Ditto, with set of wheels, in ivory box on handle, or detached	... ..	...	0 8 6
221.	Curved pen for ornamental work	... ..	...	0 4 6
222.	Pen, with patent adjustment screw at end of handle	... ..	...	0 4 6
223.	Needle Holder , ivory handle, with clamp screw	... ..	...	0 2 0
224.	Tracer , steel, with ivory handle	... ..	...	0 2 0
225.	Set of 3 Pens , all to fit in one ivory handle, in morocco case	...	...	0 11 6
226.	Set of 6 ditto	ditto	ditto	0 18 6



227.

227.	Opisometers, or Map Meters , improved form	...	...	0 3 0
228.	Ditto, graduated into feet, inches, and tenths	...	...	0 15 6

	Brass.	Electrum.
229. Triangular Compass, ... ..	...	0 15 0
230. Ditto ditto with moveable bar ... ..	...	1 1 0
231. Elliptical or Trammel Compass	£1 15 0	2 10 0
232. Proportional Compass, electrum, 6 inch, divided in lines only	£0 8 6	0 12 6
233. Ditto, divided with four scales	£1 7 6	1 12 6
234. Ditto, with rackwork adjustment, divided with four scales		1 17 6
235. Ditto ditto 9 inch		2 12 6
236. Ditto, with tangent screw adjustment, 6-inch		2 2 0

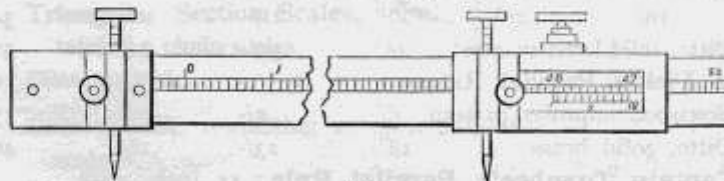
Morocco cases for ditto, 6-inch—3/-; 9-inch—4/6.



237. Napier Compass, electrum, with turn in ink and pencil points, in morocco case ...	1 5 0	1 15 0
238. Ditto with needle points	1 12 0	2 2 0
239. Pillar Compass, brass, in leather case ...		0 18 6
240. Ditto ditto electrum	1 7 6	1 15 0
241. Ditto ditto with lengthening bar ...	1 15 0	2 5 0



242. Whole and Half or Bisecting Compass ...	1 5 0
---	-------



243. Beam Compass, Mahogany 50-inch beam inlaid with holly, with vernier, ink and pencil points and clamping screws, in deal case	3 15 0
---	--------



246.

244. **Beam Compass**, plain, electrum, for any bar 0 12 6
245. Ditto, with tangent screw adjustment, and pen and pencil points in case 1 2 6
246. Ditto, with improved needle points 1 12 6
247. Ditto, ordnance pattern, divided 2 12 6
248. Ditto ditto with adjustment 3 10 0
249. Ditto, sliding tubular, with ink and pencil points £2 10 0 3 10 0
250. **Tubular Compass**, with ink and pencil points 2 0 0
251. Ditto with improved needle points 2 12 6

RULES AND SCALES.

Parallel Rules—



254.



255.

252. 6 inch ivory with German silver bars, 5/-
253. Plain ebony, brass mounted, best quality—
- | | 6 inch | 9 inch | 12 inch | 15 inch | 18 inch | 24 inch |
|--|--------|--------|---------|---------|---------|---------|
| | 1/- | 1/9 | 2/- | 2/6 | 3/6 | 6/- |
254. Rolling ebony, with brass wheels :—
- | | 6 inch | 7 inch | 8 inch | 10 inch | 12 inch | 17 inch |
|--|--------|--------|--------|---------|---------|---------|
| | 6/- | 7/- | 8/6 | 10/6 | 12/6 | 17/6 |
255. Ditto with brass bridge and divided ivory edges—
- | | 10 inch | 12 inch | 16 inch | 21 inch | 26 inch | 34 inch |
|--|---------|---------|---------|---------|---------|---------|
| | 10/- | 12/6 | 16/- | 21/- | 26/- | 34/- |
256. Ditto, solid brass in case 25/- 32/- 42/- 52/-
- Captain Field's Parallel Rules—**
257. Boxwood, improved pattern, 6/- 7/- 10/- 15/-
258. Ditto, solid brass 18/- 23/- 28/- 40/-
259. **Captain Toynbee's Parallel Rule**, 15 inch, with moveable brass plate and compass points, fitted with clamp screw 1 5 0
260. **Lieutenant Pigott's improved Parallel Rule**, 18-inch ebony with Electrum semi-circular protractor, fitted in mahogany case 2 12 6

MATHEMATICAL SCALES.

(Engine Divided)



261.

	Boxwood.	Ivory.
261. Plotting Scales , flat section, 6 inch graduated to any two scales not exceeding 60 divisions per inch each	0 1 6	0 6 6
262. Ditto, to 100 divisions per inch ... ..	...	0 7 6
263. Ditto, 12 inch, to 60 divisions,	0 2 3	0 10 0
264. Ditto, 12 inch, to 100 divisions ... ..	...	0 12 0
265. Set of Six , 12 inch Ditto. with offsets in Mahogany box	1 2 6	4 4 0
266. Set of Ten , Ditto. Ditto.	1 17 6	6 6 0
267. Offsets , 2 inch	0 0 8	0 2 6
268. Paper Scales , 18 inch each	...	0 1 0
269. Engineers' Scales , oval section, 6 inch, containing 8 scales from $\frac{1}{8}$ to 3 inches ...	0 1 9	0 6 9
270. Ditto 12 inch, ditto.	0 2 9	0 11 6
271. Ditto 18 inch, ditto.	0 5 0	1 10 0
272. Architects' Universal Scales , 6 inch, containing 17 scales	0 2 0	0 7 0
273. Ditto. 12 inch	0 3 0	0 12 6
274. Ditto. 18 inch	0 6 6	1 12 6
275. Triangular Section Scales , 6 inch, containing 6 chain scales	0 4 6	0 13 0
276. Ditto, 12 inch	0 6 6	2 0 0
277. Ditto. 6 inch, containing 12 open divided scales	0 4 6	0 13 0
278. Ditto, 12 inch	0 6 6	2 0 0
279. Marquis Scales , Set of 2 Boxwood Scales and 1 Angle in Mahogany Case ... ..	...	0 10 0
280. Ditto. Sandhurst Pattern ... ..	...	0 12 0

CURVES.



302.



308.

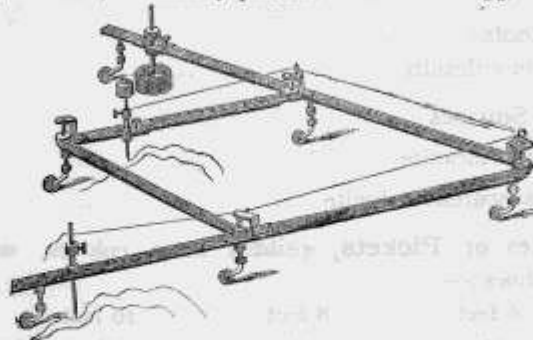
Cardboard. Pearwood. Vulcanite.

Railway Curves:—

302.	Set of 24 in mahogany case	...	10/6	17/6	27/6
303.	Set of 50	...	17/6	30/-	55/-
304.	Set of 100	...	32/6	55/-	100/-
305.	Set of 50 Metric	...	22/6	34/-	63/-

Ship Curves, French pattern:—

306.	Set of 9	...	...	7/-	16/-
307.	Set of 15	...	...	13/-	25/-
308.	Set of 40 in case, Admiralty pattern	...	...	35/-	75/-



311.

Pentagraph in Brass, of the best construction, for reducing or enlarging plans to any proportion:—

309.	18 inch	...	...	...	£6 10 0
310.	24 inch	...	...	...	7 10 0
311.	30 inch, Ordnance Pattern	...	...	...	9 10 0
312.	36 inch	...	...	...	10 10 0
313.	42 inch	...	...	...	11 10 0
314.	Pentagraph, Lancelwood, 18 inch in case	...	2 10 0	and	3 0 0

315.	Eidograph , 30 inch, improved form complete in case ...	12	12	0	
316.	Ditto, 36 inch	18	18	0	
317.	Centrolead , 30 inch or 42 inch, for perspective drawing, in ebony	1	5	0	
318.	Ditto, in electrum	1	10	0	
319.	Planimeters , Amsler's patent for computing areas, in brass	2	3	0	2 15 0
320.	Ditto, in electrum	5	10	0	3 8 0
321.	Integrator , Amsler's	18	0	0	
322.	Plane Table , simple form	8	8	0	
323.	Ditto, with telescope, fitted in Y's, parallel plates, semi- circle divided on brass, straight-edge, trough compass, 5 inch spirit level, 4 brass clamps, fitted in case with tripod stand, complete	20	0	0	
324.	Cavalry Sketching Board , with scales	1	15	0	
325.	Splines or Penning Battens , in red pine ... each	0	2	0	
326.	Ditto, set of 20, in lancewood, in case	1	10	0	
327.	Ship Weights , Admiralty pattern each	0	8	6	
Slopes and Batters :—					
328.	Set of 6 in vulcanite	0	4	6	
329.	Set of 8 ditto	0	7	6	
Pitches for Roofs :—					
330.	Set of 6 in vulcanite	0	5	0	
Lettering Set Squares :—					
331.	Set of 3 in vulcanite	0	3	0	
332.	Ditto, transparent xylonite	0	3	6	
Ranging Poles or Pickets , painted in 3 colours, with iron shoes :—					
333.	6 feet	8 feet	10 feet		
	35/-	42/-	56/- per dozen.		
334.	Offset Rods , 10 link each	0	3	6	
335.	Ditto, with hook and point	0	6	6	
Surveyors' Rods :—					
			Straight	Jointed	
336.	Lancewood, 5 feet long per pair	4/-		7/6	
337.	Ditto, improved form, with engraved figures	7/-		10/-	

MISCELLANEOUS INSTRUMENTS.

338.	Heliograph, Improved Portable Form , for military signalling, surveying, &c., per pair :—				
	3-inch	5-inch	8-inch	10-inch	
	£15	£20	£30	£37 10 0	
339.	Signalling Lamp , War Office pattern...	...	...	...	0 17 6
340.	Ditto ditto in copper and fitted in leather sling cases, with tripod stands	...	...	...	8 8 0
341.	Range Finder , Weldon's in case, with instructions for use				3 10 0
342.	Telemeter , Rochons, with rack adjustment, in case				7 7 0
343.	Ditto, larger size	...	...	...	8 8 0
344.	Mekometer and Optical Square , in leather cases, complete, best quality	...	...	...	20 0 0
345.	Camera Lucida , with clamping screws to the sliding tubes, regulating the size of the picture, 2 tinted modifiers, &c., in morocco case...	...	...	...	4 10 0

ENGINEERS' JOINTED POCKET RULES, &c.

346.	Jointed Rules , Boxwood, 2-feet, 2-fold	...	0 2 6	0 3 6
347.	Ditto ditto, best Boxwood, 2-feet, 4-fold and joint	...	0 4 6	0 8 6
348.	Pocket Rules , Boxwood, 1-foot folding	...	0 2 6	0 4 6
349.	Ditto, Ivory, 1-foot folding, German silver mounts	...	0 7 6	0 12 6
350.	Ditto ditto, 2-feet folding ditto	17s. 6d.	1 5 0	1 10 0
351.	Pocket Rules , Ivory, 4-fold, fully divided, with silver mounts for presentation	...	...	4 4 0
352.	Improved Engineers' Slide Rule , Rutledge's 4-fold Boxwood	...	...	0 12 6
353.	Ditto ditto Hawthorn's	...	...	0 15 0
354.	Rule or Gauge for Measuring Horses , to close up in the form of a walking stick	...	...	1 1 0
355.	Calliper Gauge , steel, to measure 6-inches, and equivalent millimetres	...	...	0 10 0
356.	Ditto for inside and outside measurements	...	...	0 12 6
357.	Boucher's Pocket Calculator , improved type with metal dials	...	...	1 15 0

Tavernier Gravet's Slide Rules :—

358.	10 inch boxwood	...	...	...	0 10 0
359.	Ditto, celluloid	0 12 6
360.	14 inch ditto	1 7 8
361.	Ditto ditto with bevel	1 12 6

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366.

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| 363. Ditto, containing 12 whole cakes of colours and brushes | | 0 10 6 |
| 364. Ditto, with lock and drawer box, containing saucers, brushes, pencils, &c. | | 0 18 6 |
| 365. Eighteen-Cake Water Colour Box, caddy lid, mahogany, with drawer, containing saucers, palettes, cut water glass, extra brushes, pencils, etc. | | 1 17 6 |
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