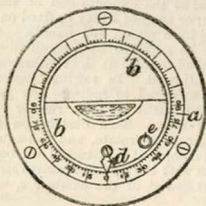


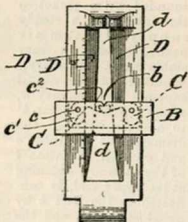
- 11,578. **Shepherd, G., and Holman, H. F.** Aug. 25.



Clinometers; levels.—Relates to sighting-arrangements for guns, applicable for determining slopes &c. A graduated ring *a* is fixed by a plate to the breech of the gun &c., and carries a movable ring *b* which supports a spirit level. The ring *b* is provided with a pointer *d* and handle *e*. The ring *b* is turned for any desired elevation, and the breech lowered until the spirit level is horizontal. The apparatus may be fitted to a field carriage to determine the slope of the ground.

- 11,602. **Walker, H. C., and Heffer, H. C.** Aug. 26.

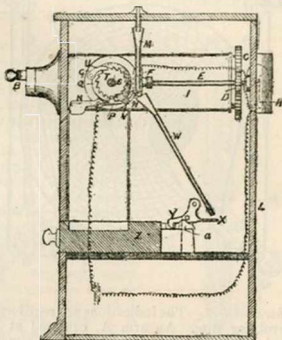
Range-finders in connection with gun sights. The back sight is provided with two levers *C* pivoted at *c* and weighted at *c'*, of which the horizontal arms *c* block the aperture *b* in the slide *B* when the back sight is not vertical. *D, D* are plates attached to the back of the leaf and with a tapering space *d* between them. By holding the leaf horizontal the distance of a man or other object of known height may be inferred by observing his apparent height between the plates *D, D*. The range-finding plates may be fitted separate from the back sight, and may have a magnifying-glass.



- 11,621. **Simpson, W. S., and Oliver, W. S.** Aug. 26.

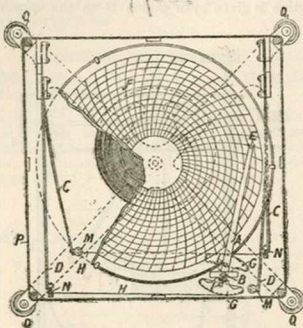
Kaleidoscopes.—The apparatus is intended for displaying kaleidoscopic effects, and may be coin-fired or not, as desired; it may also be combined,

if desired, with apparatus for the automatic sale of goods. The Figure shows an arrangement of the mechanism to be worked by hand. The rotary motion is given by a pinion *D* on the spindle *E*



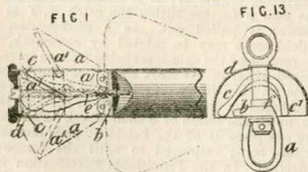
geared with a toothed wheel *C* on the rotating part; *E* is geared with the driving-shaft *S* by means of bevel-wheels *F, G*. When coin mechanism is not used, the body of the kaleidoscope is pivoted on a stand so as to be adjustable at any required angle for getting the best light, but in the arrangement shown in the Figure the disc *Q* on the driving-shaft is normally locked by a tooth *P* on the coin-lever *N*. On the insertion of a coin, which falls into the pivoted shoot *M*, the lever *N* is depressed and the shaft *S* may be rotated until the projection *V* tilts the shoot *M* and discharges the coin. So long as the coin remains in the shoot *M* the circuit of an electric lamp *H* for displaying the kaleidoscopic effects is completed. After the coin has passed down the shoot *W* it may be utilized to release the catch *X, Y* of a goods-delivering drawer *Z*; it is finally discharged by the cam *a* further tilting the catch *X, Y* as the drawer is pulled out. In a modification, the kaleidoscope may be rotated by clockwork, the movement of the coin-lever being utilized to free a locked wheel in the clock train, and also to complete an electric circuit; the coin is in this case discharged by the further tilting of the coin lever &c. under the action of a snail-wheel. Preferably the eye-piece *B* of the kaleidoscope is binocular, prisms being employed to split the image by reflection. In the Provisional Specification it is stated that the kaleidoscope may be turned by springs, clockwork, or electric power, and that views or advertisements may be exhibited round the edge of the field.

- 11,808. Thompson, W. P., [Draper, D.].
Aug. 31.



Thermometers.—The indications are registered on a revolving disc. An arm A, centered at B, is turned by the flexions of two pairs of bimetallic strips C, D fixed at one end. The arm carries a pen E which marks a card F rotated by clockwork. The turning-pin of the arm carries two segments G, round which are taken fine wires H connecting the separate strips of each pair. To prevent slipping upon the segments the wires are wrapped upon pins I thereon. The leverage of the strips is adjusted by screws N, and the tension of the wires is adjusted by pins M. The card shows temperature by concentric circles, and weeks and days by radial lines curved to the path of the pen E. The whole is enclosed in a flat perforated case P resting upon spiral springs Q.

- 11,964. Heath, G. W., [Walters, W. M., partly]. Sept. 3.

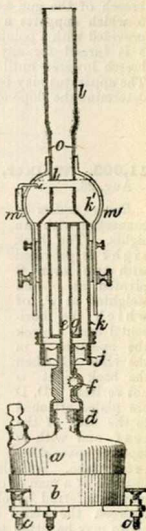


Logs.—The pitch of the helical vanes of the rotator is arranged to give a falsely high rate of speed, but two radial vanes a, a, Fig. 1, pivoted to the partition b are provided in addition which may be adjusted to project to any required extent and so reduce the speed so far as is necessary. To

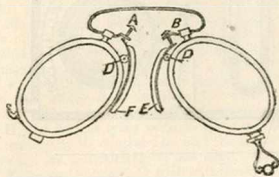
admit of the adjustment, the blades are slotted at a', a' and receive pins c, c, projecting from a nut d, travelling on a screw e. In some cases the slots a' are arranged at the opposite end of the vanes to that shown; or the nut d may be fixed on a toothed rack moved by a pinion and handle. Again, the vanes may be adjusted by a scroll disc, or they may be linked to the nut d, or otherwise capable of being adjusted. In towing-logs an alarm, Fig. 13, is arranged to indicate any jamming or irregular movement of the rotator relative to the towing-rope. Such obstruction will cause the towing-rope to rotate, and consequently the shackle a to which it is attached on board. The cam b turns with the shackle against a spring f and, striking the end c' of the hammer c, sounds the bell d.

- 11,985. Harcourt, A. G. V. Sept. 3.

Photometers, standard lamps for. The lamp consists of a vessel a, similar to that employed in a spirit lamp, placed in a stand b with levelling-screws c, a plumb-line being used to obtain a correct vertical. A cap d fitted with an ordinary wick-raising appliance f carries the wick-tube e which is surrounded by a jacket g through which a steady supply of warm air passes, causing a very stable flame. A gallery j mounted on the cap d supports the chimney k, which is contracted at k' to a mean between the diameters of the tubes e and g. An extension l of the chimney, widening at its upper end, is connected to the part k by metal straps m, and the opening between the parts l, k can be adjusted by screws or by gauging-collars of various sizes. When the top of the flame is visible in the slot o of the extension l, a standard light of one half, one, one and half, &c. candles is given off from the lamp according to the adjustment of the opening between l and k. The oil burnt is preferably "Pentane," which volatilizes and burns with a bright steady flame without charring the wick.

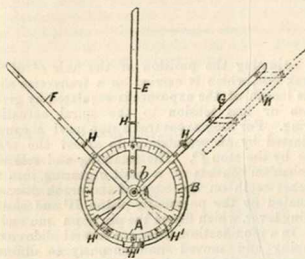


12,337. Bloor, T. Sept. 12.



Eyeglasses.—The nose-pieces E, F are pivoted at D so that the distance between them can be varied by screws A, B applied to their upper ends.

12,601. Leportier, T. Sept. 17.



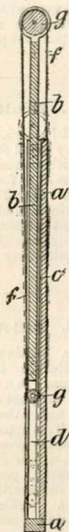
Angle-measuring instruments; bearings, instruments for determining; course correctors.—Relates to portable apparatus for measuring angles, specially adapted for laying down on a chart a vessel's true position at sea. The apparatus is gimbal-mounted and provided with a heavy weight to steady it; it consists of a graduated ring A or equivalent turning on a central pivot *b* over a bed-plate B. To the ring A is fixed an arm E, and sights H, H' are carried by the arm and back plate or ring. On the central pivot also work two arms F, G with corresponding sights. When three known points are in sight, the vessel's position can be determined by sighting the three points with the arms E, F, G, then transferring the instrument to the chart and placing the arms to cut the known points. The centre of the instrument, which may be marked by a style pushed through the hollow spindle *b*, then shows the position of the ship. Where only two known points are visible, the central arm E is set to the ship's head, and then placed on the chart lying along the ship's course. A parallel ruler K is fitted to the arm G to facilitate the moving of the instrument so as to keep the arm E parallel to

itself. Shadow pins may also be fitted to the pivot *b*, and a sight H on one of the arms F or G for correcting the course &c.

12,668. Lyall, E. Sept. 19.

Surveying-instruments.

—Relates to extensible linear measures, such, for example, as a levelling-staff, the object being to make the extended scale read continuously from the fixed portion when the staff is only partly extended. The fixed portion of the scale is marked on the part *a*, which has a groove *c* at the back and side grooves *d* to allow of a part *b* sliding freely; any equivalent for the grooves may be employed. The part *b* carries two rollers *g, g*, one at each end, round which passes a length of measuring-tape *f*, or an equivalent, fixed at one point to the top of the part *a*; on this tape the extended scale is measured, and will read continuously from the end of the scale on *a* whatever the position of the extended part *b*. A binding-screw or the like is provided to fix the part *b* in any required position.



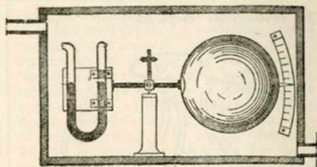
12,880. Reynolds, W. J. Sept. 22.

Compasses, magnetic.—Relates to a method of producing metal plates for compass cards, or other purposes. A disc of glass is painted to correspond with a compass card, and a raised edge of putty is applied all round. Hydrofluoric acid is then poured in to eat away the portions not painted. The glass is then washed and the paint removed, and the raised surface is roughened. This is coated with blacklead, and the plate introduced in a bath of sulphate of copper. The plate is then coated by electrolysis with the required thickness of copper, and a plate of copper suitable for a compass dial is thus produced.

12,963. Siegert, A., and Dürr, W. Sept. 24.

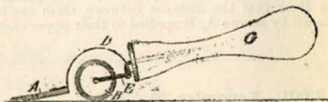
Specific gravity estimating apparatus for measuring the density of gases. Consists of a balanced beam

carrying at one end a large sealed globe, and at the other end a U tube containing mercury &c. This is enclosed in a case which is filled with the gas to be tested. The position of equilibrium of a pointer carried by the globe indicates the density on a graduated arc. The inner limb of the U tube has its end closed and contains air; the expansion and contraction of this air render the readings independent of temperature and pressure.



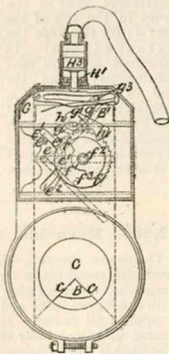
12,964. Boulton, A. J., [Perles, F., and Liska, F.]. Sept. 24.

Parallel rulers.—The straight-edge A is connected by metal strips D, bent into a semicircular form, with a strong wire E, which is bent up at the middle so as to form a tang for securing the handle G. The roller B is centered loosely on the ends of the wire E, and may be covered by some ink-absorbent material, such as several thicknesses of blotting-paper. Slight modifications in details of construction may be made.



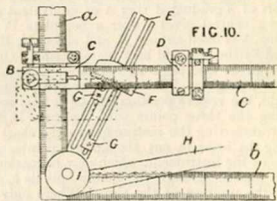
13,186. Elliot, J. M. Sept. 29.

Lenses, fittings for. Relates to diaphragms and shutters for photographic and other lenses. This apparatus consists generally of a pair of reciprocating perforated slides with actuating, regulating, retaining, and releasing mechanism, which may be used as a shutter for long or rapid exposures, or as an adjustable lens diaphragm. The shutter may work in the diaphragm slit or be placed in front of the lens. The two reciprocating slides B and C are actuated by a pin e which is fixed on a transverse moving slide E^1 and slides freely in slots inclined in opposite directions in the slides. A crank-pin e^1 on the disc f works in a curved slot e^2, e^3 in the transverse slide E^1 . The disc f is actuated by a spiral spring connected to its axle f^2 . The regulating-mechanism consists of two parts, one for regulating the size of the maximum aperture of the shutter, and the other for regulating the length of the exposure. The maximum size of the aperture is determined by the stroke of the transverse slide E^1 , and this can be regulated



by adjusting the position of the axle f^2 of the crank disc, which is carried on a transverse slide. The length of the exposure is regulated by giving more or less tension to the spiral actuating-spring. For long exposures a stop pawl h can be adjusted by an eccentric g^1 to arrest the crank disc by the stop f^2 . The retaining and releasing mechanism consists of a pawl g gearing into the ratchet teeth on the edge of the crank disc, and actuated by the pneumatic piston H^1 and slotted spring lever, which fits on the pin g^3 on one end of g . In a modification, there are several slides overlapping and moved simultaneously to different extents by suitably-inclined slots.

13,313. Boorman, J. A. Oct. 1.

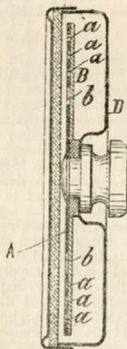


Angle-measuring instruments for ascertaining the angle of a line passing through a point at a given distance from vertical and horizontal planes, and

especially for use in making bevel and mitre wheels. The Figure shows an instrument for getting the angles of bevel-wheels for shafts at right-angles and the sectional dimensions of their teeth. The arms *a*, *b* of a quadrant are graduated to any suitable scale. A reading-slide *B* on the arm *a* carries a graduated straight-edge *c* parallel to the arm *b*, and this straight-edge carries a reading-slide *D*. Both slides are provided with vernier screws. There are two pivoted radial arms *E* and *H*, the former lying beneath the quadrant arc and reading by its central line, and the latter lying above the arc and reading by one edge. Upon the arm *E* are two coursers *G* with pointers coincident with the central line, and a slide *F* with graduations on its inner edge which is at right-angles to the central arm. These graduations give the faces and flanks, each graduation corresponding to an eighth of an inch in pitch. The slides *C*, *D* are set to the radii of the wheels obtained from the ordinary tables, using eighth pitches. The arm *E* is turned till one of the coursers *G* fits in the angle between *C* and *D*, when it is fixed by the milled headed screw *I*. The arm then reads the angles of the pitch cones. With the slide *F* and the arm *H* are determined the angles of the top of the teeth and the bottom of the interdental spaces. By the slide *F* also and the straight-edge *c* the greatest diameter of the blank is ascertained.

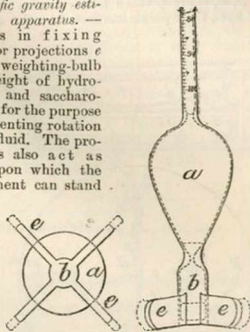
13,332. Decoudun, J. Oct. 1.

Photometers for photographic use. Varyingly translucent plates are brought in front of the image on the ground-glass plate of the camera, and the image, which is at first simply blurred, gradually becomes a uniform dark tint; the intensity of the light is then estimated by the plate used. The Figure shows a method of carrying the invention into effect, which is simply given as an example. An opaque disc *A* has small holes *a*, *a*, *a* and larger holes *b* perforated in it radially. The disc is then covered by segments *B* of gradually decreasing translucency. The disc *A* can be rotated close to the ground-glass plate by the thumb-piece *C*, only one line of perforations being visible at a time through slits in the back and front of the case *D*. When the light through the small holes is nearly obscured, while that in the larger is still visible, the intensity is read off by a reference number or letter on the disc showing through an aperture in the back of the case *D*.



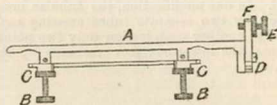
14,169. Hicks, J. J. Oct. 18.

Specific gravity estimating apparatus.—Consists in fixing wings or projections *e* to the weighting-bulb *b* or weight of hydrometers and saccharometers for the purpose of preventing rotation in the fluid. The projections also act as feet upon which the instrument can stand.



when removed from the fluid. By lengthening the projections as indicated in dotted lines, they serve to protect the floating bulb *a* from injury when the hydrometer &c. is laid on its side.

14,171. Steward, J. H. Oct. 19.



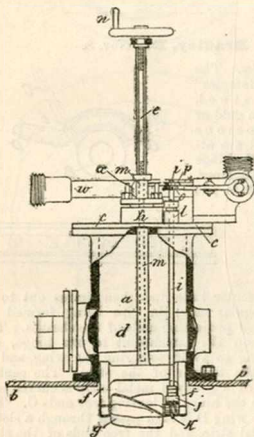
Magic-lanterns.—A slide-runner *A* is mounted adjustably on the stage by means of screws *B*, *B* and lock-nuts *C*, *C*. On the stage or the runner an adjustable stop *E* is pivoted with a lock-nut *F* for fixing it in position; when panoramic slides are used the stop may be turned out of the way on its pivot *D*. For existing lanterns the adjustments are mounted on a framework attached to the ordinary slide stage by screws or the like.

14,216. Crampton, P. J. R. Oct. 19.

Levels.—Relates to electric apparatus for automatically discharging a ship's guns at the instant that the ship is on an even keel. Fig. 1 shows a part-sectional elevation, and Fig. 2 a plan of one form of the apparatus. *a* is a cross-frame, carrying the four contact-points *b*¹, *b*², *b*³, *b*⁴, of which the points *b*¹, *b*² are connected by the wire *c* and the points *b*³, *b*⁴ are connected by the wire *d*. The frame *a* is kept parallel with the plane of the horizon by plungers *i*, floating on mercury in the vessel *k*, which is in the form of a tubular cross. Above

four last are wound up together in a box and insulated so as to compensate for each other's changes of temperature. It is further arranged that $C + R$ should be nearly equal to S in resistance. In the diagram, Fig. 4, when a balance is obtained in the bridge by shifting the contacts b, b' , $z + S' + 8b' = z + S' + B' + C' + z + R = R' + z + C + 7b = R' + z + C + B + S + z$ nearly, where z is the resistance of each of the wires connecting the coils R to the plates 1, 2, 3. . . . Hence $R' = S' - C + 8b' - 7b$. By proper arrangements the quantity $S' - C$ may be made a constant, so that the change of temperature will be proportional to the movement of the contacts b, b' on the bridge wire.

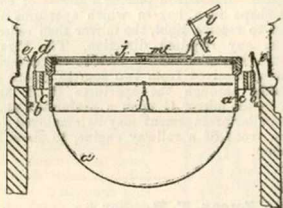
14,741. Amour, J. H. Oct. 29.



Logs.—The rotator g is carried by a forked bracket f at the end of a hollow internally-threaded rod m . This rod and the spindle i , which receives motion from the rotator by worm gear j, k , pass through stuffing-boxes h, l respectively on a plate c , which closes the end of the chamber a . A hole is made in the side of the hull b of the ship, and the chamber a is fitted over this so that the rotator &c. can be pushed forward, when required, into the water by means of the screw e and hand-wheel n . A cock d is provided, through a port in which the rotator &c. can pass freely when in the position shown in the Figure; if, however, it be desired to remove the plate c and its attachments, the bracket f &c. is drawn back through the cock d , and the latter then turned so as to close the chamber a and prevent water from leaking into the vessel. The spindle i may operate a counter

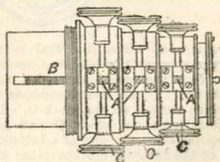
directly, but if registration is desired at any distance from the rotator a pneumatic or electric indicator is employed. In the former case a double cam o, p is fitted to the spindle i , which operates valves, alternately connecting the pipe w with the engine condenser or other vacuum-producer, and with the air; the pipe w communicates with a cylinder having a spring piston, the consequent reciprocations of which drive the counter. The electric indicator may be operated by a single cam on the spindle i , which makes and breaks circuit at each revolution for an electromagnet. The core of the magnet is thus caused to reciprocate and work the counter.

14,783. Dobbie, J. C. Oct. 31.



Compasses, magnetic.—In mariners' compasses the gimbals b, c , in which the bowl a is swung, are suspended by chains d from springs e secured to the binnacle. When there is only one gimbal ring it is attached to bow springs disposed horizontally. The triangular mirrors k, l , pivoted to each other, are swung in a fork at the end of an arm m pivoted at the centre of the glass j . The arm m is turned till the normal reflection of the object is seen on the centre line of one mirror, when its azimuth is read from the reflected scale in the other mirror.

14,809. Wrench, A. Oct. 31.



Magic-lantern.—Relates to the objective tube, and consists in making it telescopic with several joints, each being adjusted by pinions A, A gear into racks B, B on the next tube. The Figure shows the tube when at its shortest length, each

steadier and the liquid with which the diaphragm chamber is filled is sustained at the proper height. The movements of the flexible diaphragm are communicated by a bell-crank lever and other

FIG. 2.

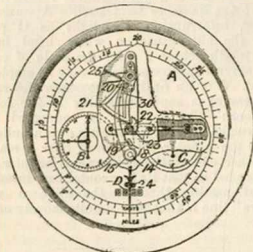
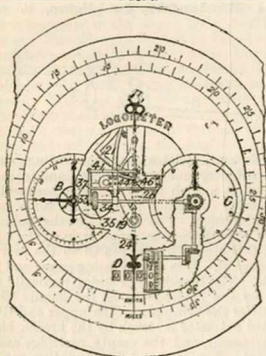


FIG. 4.

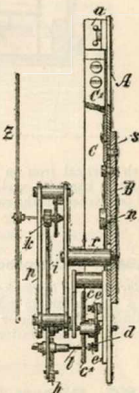


connections to the shaft 14, Fig. 2, carrying an adjustable curved arm 19 actuating the scroll sector and wheel 21 and 22. The point of contact of the arm 19 with the small wheel 20 on the sector, is adjustable by means of a screw 30 and the contact is maintained by a spring 25. The scroll gear is provided to allow of the speed indicator being graduated in equal divisions, the pointer 24 being fixed on the axis 23 of the scroll-wheel 22 and traversing the large dial A. B is the dial of a chronometer which drives a friction disc 33 at uniform speed. On the axis 23, Fig. 4, is fixed a pinion 46 gearing with a toothed sector 44 connected by a link 41 with a sliding frame which carries a friction-wheel 34 on the disc 33 fitted with antifriction wheels 35 around its periphery. The wheel 34 turns a spindle which is bevel-gear with the index spindle of the dial C showing fractions of a knot run, and also with a

counter D having special Geneva-stop wheel indicating which shows the total number of knots. As the flexible diaphragm moves with changing speed of the vessel, the pointer 24 swings round and shows the speed of the vessel. At the same time the wheel 34 is moved more or less from the centre of the disc 33, and drives the indicator C and register D at a corresponding speed so as to show the total distance run.

15,513. Sudmann, J. Nov. 12.

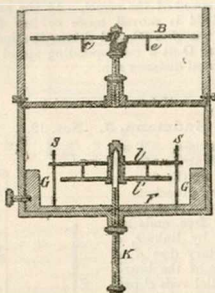
Thermometers.—Two compound strips C, C' are fixed at the top to two lateral brackets a projecting from a board A. Their free ends are connected by links e, e' with a rotary disc d at the bottom of the board. Two parallel rods c' projecting from the disc hub embrace a pin l projecting from the tail of a toothed sector i which is pivoted in a frame p on a post r. The sector gears with a pinion k the arbor of which bears the dial hand Z. The joint pins at the inner end of the links e, e' can be adjusted in radial slots in the disc by a second disc with cross-slots; and the pin l can be adjusted in a slot of the sector by a screw h. The magnification given by the index can thus be varied. The board A is pivoted at n on a fixed board B, from which the post r carrying the frame p projects. By this arrangement with an eccentric s for turning the board A the index can be set without disturbing the working parts.



15,591. Sirtetx, L. Nov. 14.

Compasses, magnetic.—Relates to a means of correcting deviations. The card B is provided with three parallel magnetic bars set on edge, one placed diametrically, and the other two, c, e, at equal distances on either side. A second double card l, l' is mounted below, the two parts being united by three similar magnetic bars set edgewise. In addition to these, the upper card l carries four pairs of thin magnetic bars set respectively on either side of four diameters symmetrically arranged. This compensating-arrangement is capable of vertical adjustment by means of the screw rod K and of a slight rotation limited by the stops S, S on a non-magnetic cross-bar F. The ends of the bar F are fitted with soft iron blocks G, G, and the cards l, l' are

adjusted so that their poles are opposite these blocks, the supporting-bar F being placed transversely to the length of the ship. Where there is

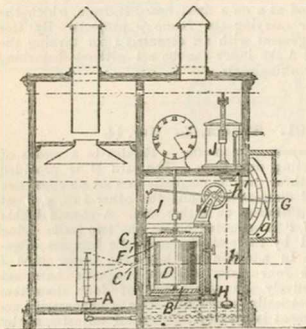


much vertical iron on the ship, a second non-magnetic bar with vertical soft iron strips at its end is pivoted on the rod K and adjusted fore and aft.

15,844. Phillipsbourne, C. Nov. 18.

Barometers; thermometers.—Consists in mounting a barometer, an ordinary thermometer, and a minimum thermometer upon the same slab of porcelain or other material.

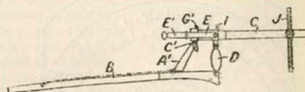
15,907. Gibbons, G. B. A., and McEwen, C. J. Nov. 19.



Photometers for gas power. A standard burner A is arranged in front of a brass plate C with

slot C' for admitting rays to the chamber B, lined with black velvet. The light after passing through a second slit in a brass plate F', with flanges to keep off reflected light, falls on sensitive paper wrapped around the clockwork-revolved drum D and causes a photographic record of the height of the flame to be traced. A horizontal cross-wire, interrupting the light as it passes through the slit, causes a white band in the diagram which acts as a reference scale of candle power; several such cross-wires may be employed, if desired. J is an ordinary governor. A record of the pressure is kept, preferably in the following manner:—The float H is connected to a counterweight by a cord k passing over a pulley h', by which the pointer g is moved over a scale G. At the other end of the pointer a triangular wire I is suspended so that its horizontal base intercepts the light passing through the slit; a white "pressure" line is thus left simultaneously on the diagram.

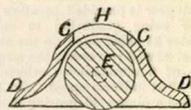
15,951. Nordenfelt, T., [Matern, B. von]. Nov. 19.



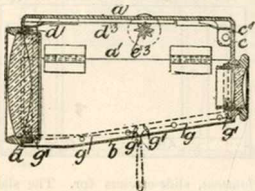
Range-finders.—Relates to a range-finding gun for use with infantry and machine-guns, and intended to be fired at a high angle so that there will be an appreciable difference in elevation for a small difference in range. The distance of the point of impact is read from the range strip of the sight. The gun C is hinged by the pin C' to the arm A' on the board B. D is the elevating-screw and I, J the sights. The breech block slides vertically and is raised by the bridle-piece E, the handle E' of which carries the firing-pin. The upper end G' of the pivoted extractor is struck by the breech block during its ascent, and the empty cartridge case is thrown out. The gun and its mounting can be folded up for removal.

16,598. Hall, F. J. Dec. 2.

Parallel rulers.—A ruler E is journaled in the ends of a cylindrical shell C, C, preferably of the section shown, having projecting edges D, D, which may be graduated if desired. An aperture H may be made near either end, and the roller graduated beneath to show the distance moved between each pair of lines ruled.



17,107. Cardwell, W. A. Dec. 12.

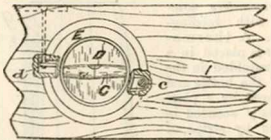


Opera, field, and marine glasses.—The framework is constructed so as to fold up when not in use, and occupy less space. The Figure shows the arrangement in section. The top a is rigid, and has side flanges a' . The end c , carrying the eye-pieces, is hinged to the top in such a manner that it will be firmly held both in its vertical and horizontal position. The end d carrying the object glasses is similarly hinged to a focussing-slide, which is traversed in the top a by a rack d' and pinion e' . The sides are formed by flaps hinged to the flange a' , and the bottom is formed by a piece of flexible material b . The whole can thus be folded into a flat form, having the thickness of the flanges a' . When required for use (after opening out the flaps) the lenses are turned into position by pulling a cord g , which is led through eyes g' on one flap and out through the flexible bottom b . Modifications are obtained by making the sides flexible, and having the bottom b either flexible or rigid.

17,227. Haddan, H. J., [Guaracino, H.]. Dec. 14.

Rulers are covered with blotting-paper or other absorbent material, or may be entirely composed of such material, laid on in layers removable when necessary. Advertisements may be printed on the several layers.

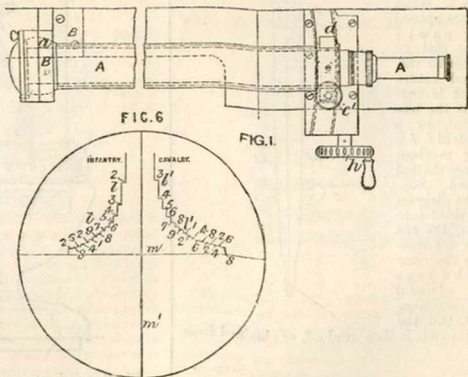
17,503. Cook, G. Dec. 20.



Levels.—The bubble-tube of spirit levels is made spindle-shaped and is placed across a hole through the block, so that the latter may be used on any face. The Figure shows the tube C mounted diametrically in a metal ring and protected by glasses D fitting rabbets round the ring. The bubble-tube ring is confined laterally by fixed conical rings E, but has a little play about a pivot c on one side, so that it can be adjusted by a screw d on the other. Another tube similarly mounted at right-angles to the tube C enables the block to be used for plumbing.

17,580. Andrews, H., and Norton, J. A. Dec. 21.

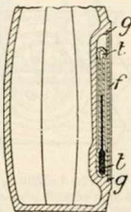
Range-finders.—Graduated scales l, n , for infantry and cavalry respectively, are engraved or photographed, together with the crossed sighting-lines m, m' , on a disc of glass placed in the focus of the eye-piece of the sighting-telescope. The horizontal line m serves as the base of the range-finder. The telescope is shown in Fig. 1 in side elevation and attached to the gun. The telescope A is carried at its forward end by a ball-and-socket or other universal joint a on the bracket B, while its rear end is provided with a worm-wheel segment d into



which gears an endless screw operated by the hand-wheel *h*. A second wheel *c'* provides for lateral adjustments. Suitable scales are provided for use when adjusting the telescope horizontally and vertically. Means are provided for adjusting the focus of the telescope without displacing the range-finding scales and sighting-lines.

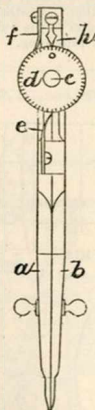
17,743. Hughes, G., [Gire & Co.]. Dec. 24.
Amended.

Thermometers combined with feeding-bottles. A thermometer *t* is placed in a recess moulded in the side of the bottle and is covered by a plate of glass *f* secured in position by strips of vulcanized rubber &c. *g*. The suitable temperature for using the food may be marked.

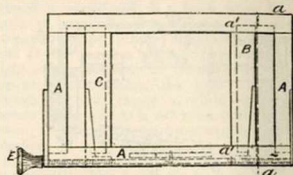


17,962. Bagshaw, W. Dec. 31.

Dividers for measuring the average length of the ordinates of steam-engine indicator diagrams. A dial *d* is mounted on the pivot *c* of the legs *a, b*. When the legs are opened a spring pawl *e* turns the dial an equal angular distance, and return movement is prevented, as the legs are closed, by a spring detent *f, h* is an index to show the distance the dial has moved. Supposing the diagram to be divided into ten parts, the ten ordinates are measured by the compasses, the legs being closed between each measurement, and the average ordinate is then read off, or obtained from the dial.

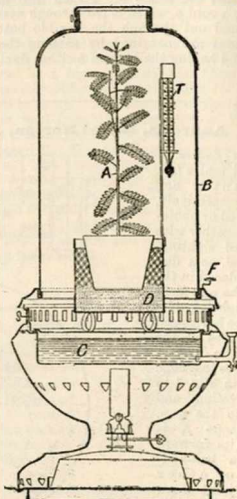


18,001. Baynes, W. M. Dec. 31.



Magic-lanterns, slide-carriers for. The slide is held centrally in the carrier by sliding-pieces moved simultaneously by a screw. In the Figure, *A* is a rectangular frame of wood or metal, the top and bottom rails *a', a* of which are grooved to receive the ends of the pieces *B, C*, which are fitted at the bottom with nuts to take the screwed spindle *E*, which is carried in bearings in the frame. The screw is right-handed at one end and left-handed at the other, so that by turning it by means of the knob shown the pieces *B, C* are made to approach or recede.

18,026. Nowack, J. F., and Bahlsen, E.
Dec. 31.

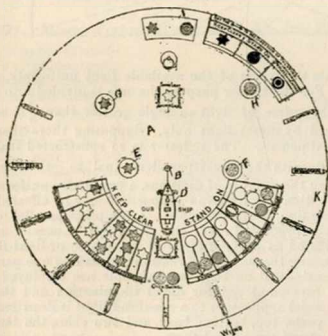


Weather indicators.—A certain sensitive tropical plant (*Abrus precatorius*) *A* is placed in a glass

ase B, the temperature being kept above 18° R. by a water bath C. The pot is placed on a bed of D, and the plant is shielded from direct sunlight by a blind. Suitable perforated ventilating-rings are provided at the top and bottom of the case. The case is fitted with a thermometer T and a magnetic needle F. It is stated that the leaves of the plant are opened, closed, or otherwise affected by the weather forty-eight hours before the corresponding change takes place. Earthquakes are announced by the bending of branches, and thunderstorms by irregularity of the leaflets. The branches also tend to set in the magnetic meridian, or at right-angles to the magnetic meridian.

A.D. 1888.

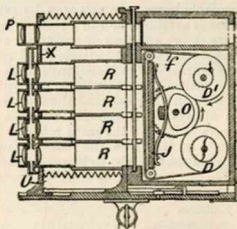
362. Broughton, V. L. D. Jan. 9.



Course indicators.—The instrument is adapted to show the rule of the road at sea in special cases. A card or disc A, on which may be painted various special signals, is capable of turning about a pivot B over a plate K, so that the position of the wind arrow on K in regard to the diagram D, representing a ship, corresponds with the direction of the wind with regard to the vessel on which the observer is placed. Certain symbols on the plate K, the shapes of which (a star, circle, or circle with band) indicate the manoeuvre to be performed, appear through apertures E, G, I, H, F in the disc A,

and these symbols are of various colours. If, then, the disc A be adjusted correctly according to the direction of the wind, and a light observed in a certain direction corresponds in colour with the symbol in the aperture in the same direction, the shape of that symbol will show whether the ship is to "stand on," "keep clear," or "proceed with caution."

423. Le Prince, L. A. A. Jan. 10.

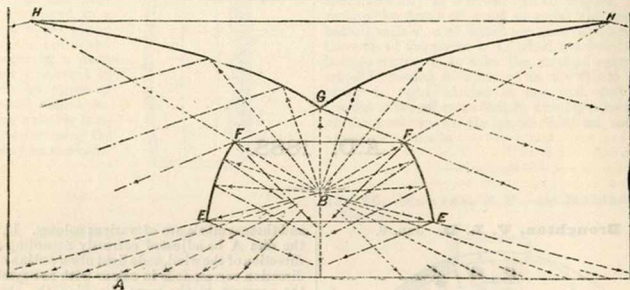


Magic-lanterns for zoetrope pictures. The invention includes a camera, as shown, for taking photographs of successive positions of moving bodies, and a similarly-constructed apparatus for throwing the successive pictures on a screen as in the magic-lantern. In the camera a number of similar lenses L, L, say 16; throw their images on

strips f of sensitized paper carried on the rollers D, D' of two roller slides, which are fed alternately by the mechanism of the camera. Before exposure each film is clamped by a panel J forced up by a cam O . Extension tubes R, R are fixed on the lens tubes to exclude side lights. The instantaneous shutters consist of two rotary sectors which are moved forward by segmental wheels and brought back in rapid succession by springs; the shutters are connected by a suitable train of gear so that the exposures are made for

each lens in the proper succession. In the lantern or zoetrope there is a similar series of shutters; the transparencies are fixed on suitable bands which are moved forward in a similar manner to the strips in the camera. The pictures are thus thrown on the screen in the same order as that in which they were photographed. A stand attachment is fixed to the camera with joints to allow the camera to be directed in any required direction. Focussing-lenses P are fixed on the top of the camera.

435. Defries, W. Jan. 11.



Reflectors.—The object of the invention is to distribute the whole of the available light uniformly or in a given proportion over the area to be illuminated. For the former purpose the area is divided into n preferably equal parts, and if any of these subtends at the source of light an angle greater than $\frac{1}{n}$ th of the total beam available, it is arranged to be illuminated by direct light only. Supposing there then remain m portions, the total beam is divided into m equal pencils. The reflector is so constructed that it directs upon each area a pencil of light which together with the direct pencil is equal to $\frac{1}{m}$ th of the whole available beam. In this way, by suitably increasing the number of divisions, a practically-uniform distribution is attained, and in a similar manner a distribution in any given proportion may be effected. The Figure shows a section of a reflector constructed according to this principle. A is a plane parallel to the area, divided as above indicated and receiving direct and reflected rays; the area itself is usually so distant that direct and reflected rays alike may be considered as emanating from the source of light B . In order to utilize the whole light, without unduly increasing the size of the reflector or making one part interfere with another, additional reflectors $E F, E F$, constructed on the same principle, are employed; these can always be introduced between the extreme rays employed for direct illumination and the extreme rays falling on the main reflector $H G H$. A special application to a masthead light is described and shown. In this case the reflector consists of five parts, top, bottom, back, and two sides, the last being so arranged that the light reflected from the back passes out behind them.

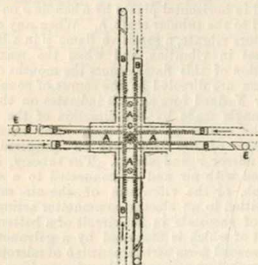
483. Reynolds, A. W., and Reynolds, F. S., [trading as Reynolds & Son]. Jan. 12.

Compasses, magnetic.—Relates to a means for adjusting the centre pin of sighting-devices and dispensing with permanent centres fixed on the glass cover. The pin C is carried by a pinion gearing into four similar rack-bars B, B working in

grooved plates A, A . The end of the pin has a square head for a key by which the pinion is turned, and the racked bars moved simultaneously outwards or inwards so as to bring the feet E at their ends against the compass verge. The pin will then be exactly central.

(For Drawing see next page.)

483.

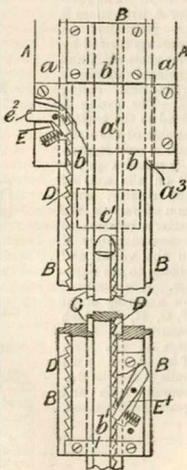


640. Sinclair, J. Jan. 14. Drawings to Specification.

Thermometers.—In thermostatic apparatus for incubators and foster-mothers, a thermometer is used into which wires are fused in the bulb at the graduations 104° , 105° , and 107° respectively. As the mercury rises, it closes various circuits controlling a damper in various ways. When the 107° graduation is reached, the circuit of an electric bell or other alarm is closed.

907. Barr, F., and Watson, T. P. Jan. 20.

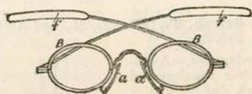
Tripod stands for photographic cameras. Each leg is in two, three, or more parts A, B, C, tongued and grooved so as to slide one on the other. The upper sections consist of pairs of bars a, a, b, b connected by cross-pieces a', b' which also form stops; the lowest section C is solid and has a stop plate c' . The middle and lowest sections have racks D, D' with which engage pawls E, E'. The pawl E is disengaged by operating the push-piece e^2 , but the pawl E' is automatically disengaged on closing up the stand by striking against the curved part a^3 .



1204. Walker, H. C., and Heffer, R. Jan. 26. Drawings to Specification.

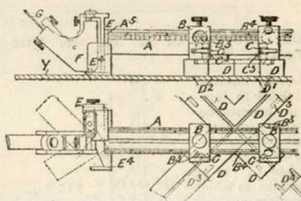
Range-finders.—Two plates are placed inside the body of a telescope transversely to the axis and with horizontal parallel edges between which the object is viewed. The distance between the edges of the plate is adjustable by a sleeve or other appliance sliding longitudinally along the body of the telescope and operated by inclined planes or other device. A secondary adjusting-screw is connected to the sliding sleeve to vary the distance between the plates to suit the different heights of cavalry, infantry, &c. When applied to a binocular field glass the same screw operates both sets of plates.

1213. Leighton, J. L. Jan. 26.



Spectacles and eyeglasses.—The spectacle or eyeglass frame B is fitted with two voltaic couples a, a' of suitable metals. The copper and zinc of the opposite pairs are connected by a fine wire on the bridge. The pairs have an absorbent material saturated with chloride of zinc, and dried. The plates are suitably shaped and attached to the frame. Similar plates may be adapted to the arms f, f .

1423. Smith, T. Jan. 31.

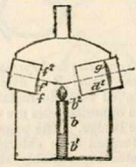


Ellipsographs.—The glass for oval picture frames, the oval holes in picture mounts, templates used in making oval picture frames, oval and circular designs, &c. are cut or marked out as follows:—On a graduated trammel bar A, adjustable in length, slide two sockets B, B' carrying pins C flattened at their lower ends so as to work in grooves in a trammel plate D capable of extension by extra pieces D^2, D^1 . The sockets B, B' may be coupled by a bar B^1 ; they cannot turn on, but may be clamped to the bar A, and they have pointers B^2 to enable them to be set on the bar A and springs C^2 to keep the grooved pins C in their

sockets. For cutting and bevelling mounts, the cutter G may be held in a vertical or adjustable inclined position in a case F pivoted like a castor in a frame E which is carried by a bracket on the bar A and rests on the cardboard &c. Y to be cut. A projection E' on the frame E serves as a push-piece by which to operate the trammel, the blade automatically keeping in position when properly fixed. For cutting glass or marking out designs a glazier's diamond or a pen is used fitted in a slightly-modified holder or end fitting which has adjustments to counteract the effect of uneven surfaces and springs to give a uniform pressure on the diamond or pen. The trammel plate may be fixed to the work by projections D², by suction cups, cement, &c. By using only one of the sockets B and pins C a circle can be cut or marked out.

1635. Crane, F., [*Pincoffs, M., and Korolanyi, A.*] Feb. 3.

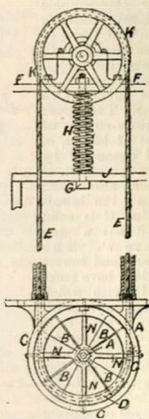
Magic-lanterns.—A concave mirror *f* is engraved as a clock dial or with a design or an advertisement, and in front of it work the clock hands *f*¹, *f*² or a moving design or advertisement. The mirror is illuminated by a candle *b* kept at the top of a socket *b*¹ by a spring *b*², and the image of the reflector is projected on a screen by a lens *g* in a focussing-tube *d*¹. In place of the candle a lamp adapted to maintain the light at a constant level may be employed.



deck or bridge of a vessel. The resonators are rotated in horizontal planes by a handle *x* on a disc *v* fixed to the tubular shaft *h*. When any of the resonators vibrate, a sensitive flame *p* in a lantern *q* is set in vibration, and when the maximum elongation of this flame occurs the mouths of the receivers are directed to the source of sound. A pointer *Y* fixed fore and aft indicates on the disc *v* the angle made by the direction of the sound with the course of the vessel. The maximum elongation of the flame may be measured by a rotary mirror *r* and scale *l*. The tubes *f*, *h* may be filled with air and be connected to a sphygmograph, or the vibrations of the air may be transmitted to an electric commutator acting on a series of rheostats in the circuit of a battery, the current of which is measured by a galvanometer. In the second form carbon pencils *b* of microphones are mounted on a sounding-board *a*, and are in the circuit of a battery *e* including a galvanometer *f* and, when desired, a telephonic receiver *g*. The sounding-board &c. is rotated about the axis *c* until the maximum sound is indicated or heard. This occurs when the direction of a sound is perpendicular to the board *a*. Several of the above apparatus may be combined, in which case they are fixed and may form the sides of a square or other polygon. The deflections of the galvanometer may be graphically registered, or a siphon or other recorder may be used instead of the galvanometer.

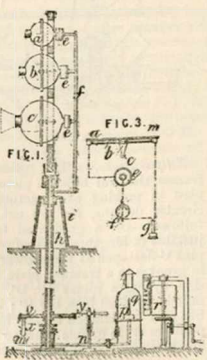
1789. Potter, R. Feb. 7.

Logs.—The rotor A with vanes B is journaled in bearings carried by the arms N, N and enclosed within a cylindrical casing C. The casing is fixed to the bottom or side of the strip, and a cord E, passing round a pulley D on the axis of the rotor, communicates the latter's rotation to a second pulley K in the vessel and thence to the register. K is mounted on a spring stand F, G, H, J, which ensures the tightness of the cord. The cord and pulleys may be dispensed with and gearing substituted.



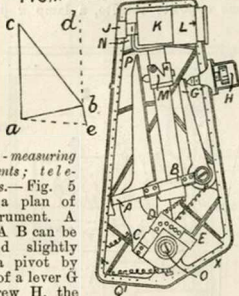
1700. Goyon, C. M. M. de, Duc de Feltre. Feb. 4.

Sounds, locating.—Relates to topophone apparatus for localizing or determining the direction of sounds, and consists of (1) an apparatus in which resonators are employed, Fig. 1; and (2) electrical apparatus in which microphones are used, Fig. 3. In the first apparatus, one or more resonators or receivers *a*, *b*, *c*, communicating through diaphragm chambers *e* with tubes *f*, *h*, *m*, *n*, are mounted in a bearing *i* fixed upon the



1794. **Watkin, H. S. S.** Feb. 7.

FIG. 1. FIG. 5.

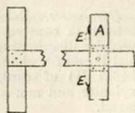


Angle-measuring instruments; telemeters.—Fig. 5

shows a plan of the instrument. A mirror A B can be turned slightly about a pivot by means of a lever G and screw H, the amount of the movement being read from a graduated arc at A. In front of the mirror A B a pair of mirrors C D, D E, at right-angles to each other, can be turned together about an axis O P by means of the arm O P. Traversing the drum K on the screw J turns the bar B M N about its pivot at B, which imparts its motion to the arm O P by means of the contact point on the movable collar M. The drum is spirally graduated, and is read by a rack on a band L which embraces it. The arm O P is graduated for setting the collar M. The mirror A, B is silvered only on one half, so that at the eye-pieces at X, Q' one object can be seen directly through it, and another by double reflection between A B and one of the mirrors C D, D E. When the drum K is at zero the mirrors C D, D E are equally inclined to the central position of the mirror A B. The instrument is used with a base $a b$, Fig. 1, approximately at right-angles to the line $a c$ which is to be measured. Observing first from a, b and c are made to coincide at one of the eye-pieces by adjusting the mirror A B. Observing then from b, a and c are brought into line at the other eye-piece by turning the mirrors C D, D E. The angle turned through being half $a c b$ the whole angle and the length $a c$ are shown by the drum K. If the angle $a c b$ is not at right-angles, a percentage indicated by the graduations I is added or deducted. The graduations on the arm O P represent different bases. The base $a b$ may be measured from a with a subsidiary base $b c$, the pairs of points c, b and c, e being successively aligned at the same eye-piece.

1819. **Lucas, E.** Feb. 7.

Squares.—Consists in providing the blade of a T-square with a sliding clamp A, which can be fixed in any position by a set-screw, so that the clamp bites against the other side of the board by means of springs E, E,



and thus steadies the square. If the T-square has a taper blade a spring projecting therefrom holds it firm in the groove of the sliding clamp.

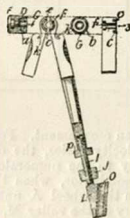
2152. **Ferguson, F. O.** Feb. 13.

Mathematical drawing-instruments.—A pencil case or, according to the Provisional Specification, a penholder is arranged to hold a pair of compasses, dividers, &c., and is marked with various scales on the outside. The holder may be telescopic.

2218. **Stevens, J.** Feb. 14.

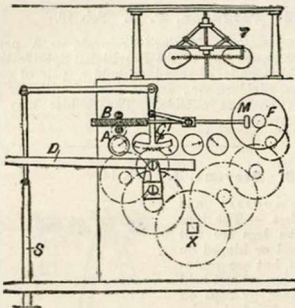
Compasses and dividers.—The tops

of the legs are not crossed or hinged on a pin, but are mutually opposed and held together by caps on the ends of the pin. The pin a occupies curved recesses f and one or both the caps F, G at its ends has a concentric flange b fitting the groove c . A sufficient amount of level e is given to allow the desired maximum of opening. The ends of a bent spring are fastened in the notches k and the centre of the spring carries the compass head. The holder L is attached by a stem I, which screws into a tapped hole in the leg and is locked by a set-nut P. The pencil or point is held in the socket o by a bevelled nut J, which is screwed down the stem I till it presses the pencil laterally. The stem I may be rigidly attached to the leg, and the holder L may screw upon it.

2309. **Richard, J., and Richard, F.** Feb. 15.

Anemometers; pyrometers.—Relates to integrating-apparatus based on the principle of the disc and roller, and its essential elements are shown in the Figure as applied to measuring the quantity of liquid passing through a sluice, but these elements remain the same in all the applications, among which anemometers and pyrometers are mentioned. The principal parts consist of a roller M in contact with a disc F (or preferably two discs driven at equal speeds in opposite directions). The axis of the roller has a worm B thereon gearing with a worm-wheel A, and the axis is capable of moving longitudinally under certain conditions. For determining products, the discs F are driven at a speed proportional to one factor, and the distance of the roller M relative to the centre of the discs is adjusted proportionally to the other factor. The

worm B then drives the wheel A at a speed proportional to the product of the two factors and the product is indicated by a counter driven by the wheel A, or by clockwork X to which the wheel A

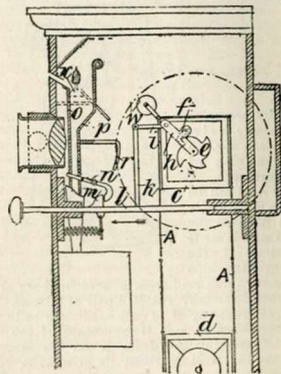


acts as an escapement. For determining quotients and velocity ratios, the discs are driven proportionately to the numerator, and the wheel A to the denominator, when the worm B will screw itself on the wheel A until the velocities of the periphery of the roller M, and of the part of the disc F against which it is in contact, become equal. The position of the roller relative to the centre of the disc then gives the required quotient or ratio. Where complex products and quotients of the form $(a \pm b)(c \pm d)$ or $\frac{(a \pm b)}{(c \pm d)}$, &c. are required, differential gear is employed to drive the discs, or the discs and wheel A. In many cases the movement of the roller may be graphically recorded by a style on the arm D resting on a drum revolved by clockwork. For anemometers &c., where electric currents pass intermittently and cause the rapid vibration of the armature of an electromagnet, the clockwork drives the disc uniformly by gearing from one end of its spring, and the wheel A by gearing from the other end of the spring, which latter gearing is controlled in its movement by an escapement connected with the armature of the electromagnet. In the case of pyrometers, the position of the roller M being determined by a compound metal strip or Bourdon tube, and the discs F driven uniformly, the counter controlled by the wheel A totalizes the temperatures.

2375. Edwards, E., [*Bach, C.*]. Feb. 16.

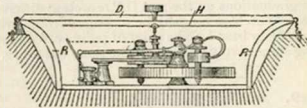
Stereoscopes.—Relates to coin-free apparatus for exhibiting stereoscopic and other views. The views &c. are mounted as an endless chain A passing round square rollers c, d, the upper of which carries a ratchet-wheel e on its axis; the lower is controlled by a weighted lever resting in turn on

pairs of a series of rollers arranged symmetrically about its axis so as to prevent vibration. The pictures are viewed through a lens or lenses as they come opposite thereto, a lamp x provided



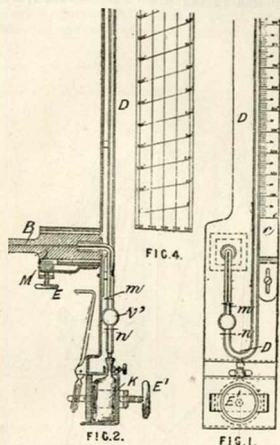
with suitable reflectors being used for illuminating. The movement of the band A is caused by a pawl f on the lever h, which is connected by link i and rod k with the push-rod l freed by the insertion of a coin. Normally the push-rod is locked by the catch n engaging with the projection m, but on a coin being inserted the catch is released. The coin falls down the shoot formed by the pivoted plates p and o, and depresses the forked end of the catch. The push-rod can now be worked until all the views have been displayed, when a roller v strikes the projection r on the plate p and thrusts the shoot back sufficiently to discharge the coin.

2526. Short, T. W., and Mason, W. J. [*trading as Short & Mason.*]. Feb. 20.



Barometers.—Relates to aneroid barometers and consists in constructing the reflector R (which is used for illuminating the graduations on the glass dial D and for showing clearly the position of the hands H) of card, clay, porcelain, opal glass, xylonite, and non-corrosive substances other than metal.

2673. Wiburgh, J. G. Feb. 22.



Thermometers; barometers.—The apparatus is based on the fact that if a volume V^1 of air at t° be forced into a bulb containing a volume V of air at T° and the whole quantity of air allowed to assume the temperature T° then

$$h = \frac{V^1}{V} H \left\{ 1 + a (T-t) \right\}$$

approximately, where H is the atmospheric pressure at the time, h the additional pressure necessary to drive in the volume V^1 of air, and a the coefficient of expansion of air. Hence, if h be measured by a manometer having an adjustable scale graduated for temperatures, the instrument becomes a thermometer. Moreover, if T and t are equal $h = \frac{V^1}{V} H$, and the instrument can be used

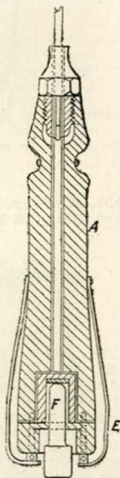
as a barometer. Figs. 1 and 2 show an example of the instrument, which may however be somewhat varied as to details. The bulb V (not shown) to be subjected to the temperature to be determined is connected by a fine tube B with the bulb V^1 of which the temperature is known, a bye-pass M allowing free communication with the outer air until the air in V has attained the temperature of its surroundings; the bye-pass M is then closed by turning the screw E , after which mercury is forced up from the point n to the point m by compressing an elastic reservoir K by the screw E^1 . The corresponding rise of the mercury in the manometer tube D is measured by the vertically-adjustable scale C , and as this rise is proportional to the difference of temperatures, this difference can at once be read off, the scale being graduated in temperatures. The scale C must be adjusted according to the prevailing barometric pressure, which may be

observed by an independent barometer, or by the instrument itself when the bulbs V, V^1 are at the same temperature. As the graduations of the scales vary slightly according to the pressure, a scale, such as is shown in Fig. 4, allowing for the normal range of atmospheric pressure, may be employed; this may either slide horizontally, or be wrapped on a revolving cylinder. A combination arrangement, including a third bulb to indicate the barometric pressure to save trouble in adjusting, may be used. The method of procedure is exactly similar when the instrument is used as a barometer, the bulbs V and V^1 in this case being kept at the same temperature, and the scale marked for pressures.

2703. Hargrave, F. Feb. 23.

Sounding-apparatus.

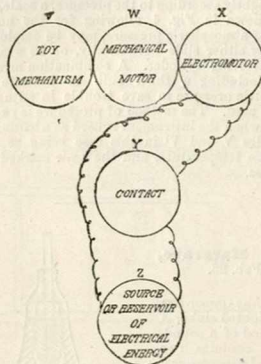
—A weighted sinker A at the end of a sounding-line contains two insulated wires from a battery on the vessel. One of the wires terminates in a bolt F at the bottom of the sinker, and the other in springs E at the side. When the bolt drags on the ground, the springs E make contact with the bolt, and complete the electric circuit, causing an alarm bell on the vessel to ring. The bottom of the bolt is cupped so as to bring away a sample of the bottom. Two other springs E are placed at right-angles to those shown.



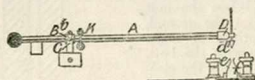
2924. Lorrain, J. G. Feb. 27.

Kaleidoscopes.—Consists in the use, in combination with a toy, such as a kaleidoscope, actuated by a mechanical motor, of an electromotor for automatically and periodically winding up the mechanical motor. V represents the toy mechanism. The mechanical motor W may consist of a wound-up spring, weight, or equivalent device. The electromotor X , contact-device Y , and transmitting-mechanism may be of the form described in Specification No. 10,785, A.D. 1887, the function of the contact-device being to periodically and automatically complete the circuit containing the electromotor and generator &c. Z for a

sufficient time to enable the motor to wind up the spring, weight, &c. of the mechanical motor.



2951. Niewsky, L., Humphreys, W. J. B., and Dale, H. F. Feb. 28.

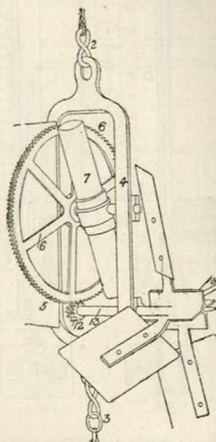


Thermometers.—An alarm thermometer A has a sliding device B, adjustable by a screw if required, and with knife-edges *b* resting on seats *c*; the knife-edges may be formed upon the thermometer, or upon a carriage in which the thermometer is placed. The position of the slider is adjusted so that when a certain temperature is reached the thermometer tilts and drives a wedge-shaped or other contact-piece *d'*, carried by a thimble D, between the contacts *e, f*, thus completing circuit for an alarm or alarms. To render the action more certain, a carriage K is provided which, when the thermometer is depressed, runs down its stem and forces the contact-piece firmly between *e* and *f*.

3017. Abel, C. D., [Kotliarewski, P.]. Feb. 28.

Anemometers; current meters.—Relates to apparatus for indicating the speed of flow of liquids or gases. The apparatus is carried by a frame 4 suspended by the loop 2 and a wire rope, and steadied by a weight attached to the loop 3. The vane spindle 13 is kept in the line of the current

by the tail fin 5, and its rotation is communicated by the pinion 12 and wheel 6 to the tube 7, from



end to end of which a weight falls. The speed is estimated by the sound of the falling weight, or the weight may be caused to complete a circuit for an electric indicator or recorder.

3021. Blakesley, T. H. Feb. 28.

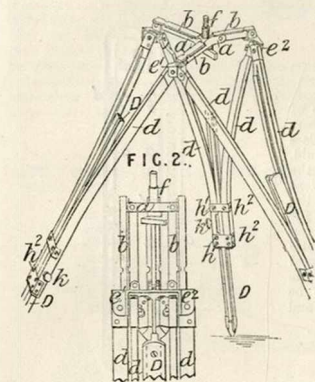
Barometers.—A fine tube of uniform bore, closed at one end and open at the other, contains a thread of mercury, say 10 inches in length, between which and the closed end is a cushion of air. Each end of the tube is provided with a hook by which it is alternately suspended with closed and open end downwards, the length between the mercury and the closed end being observed in both cases. The sum of these lengths, divided by their difference and multiplied by the length of the mercury thread (in inches) gives the atmospheric pressure in inches of mercury.

3196. Ramsden, J. W. March 2.

Tripod stands for photographic, surveying, and other purposes. The head consists of a centre piece *a* to which are jointed three arms *b*. To each arm is hinged an angle bracket *e, e'* and to these are jointed the split upper ends *d* of the legs as shown. When folded the arms *b* hang vertically as in Fig. 2. The lower parts D of the legs are

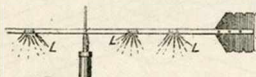
T-shaped and work in similarly-shaped spaces between the L-shaped upper parts, which are connected by plates and U-clasps h^1 , h^2 . Sufficient friction is given to hold the parts in any position

and in their place discs or slides are substituted. The Figures show a section and end elevation of one modification. The ordinary tube, with three



by springs adjusted by set-screws R. The camera &c. is fixed by the screw f . The stand may be folded or extended without fastening or loosening parts.

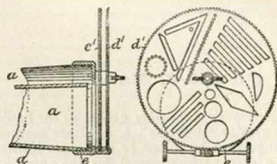
3412. Birkbeck, H., [Mattison, L. H.].
 March 6.



Wind vanes.—Consists in providing transparent receptacles L, L in the body of the vane in which water and phosphorus are placed, so as to be luminous at night. The direction of the vane is thus indicated, the two rear receptacles being placed close together, so that no confusion can arise with the single receptacle at the front of the vane.

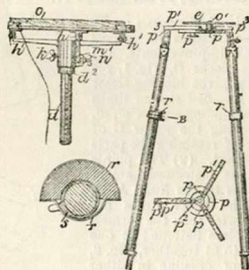
3657. Lovibond, J. W. March 9.

Kaleidoscopes.—The object of the invention is to render the patterns less uncertain and make them recoverable. For this purpose the ordinary tube with three mirrors is usually employed, though in some cases this may be modified, but



reflecting-mirrors a, a, a , is provided with an end cap e on which are mounted, to be turned by tangent screws, discs c^1, d^1 , one being a colour disc and the other a diaphragm with a number of devices cut out. In other modifications, the discs may be varied as to their movement and construction, and combinations of several colour and pattern discs may be employed. Binding-arrangements may also be provided, such as the wing nut shown, for fixing the discs in any required position.

3782. Taylor, F. March 12.

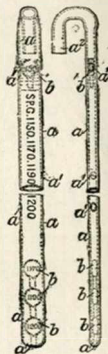


Tripod stands.—Relates to metal stands for cameras &c. consisting of a tripod base, on castors, in which slides a stem d having ratchet teeth and a spring catch or rack teeth and a pinion for adjustment. The table e is pivoted by lugs h^1 to a bracket having a socket fixed by a screw k or revolving on the shoulder d^2 of the stem d . An annular adjustment is obtained by quadrants pivoted at h and clamped by the screw n in the socket m^1 . The table may have a sliding part o and a clamp for fixing the camera. In another form, the table e rotates on a pin o^1 or in grooves in the tripod head p , which has three arms p^1 , hinged or sliding in grooves p^2 . Lugs p^3

on the arms p' , or the arms themselves, are pivoted between plates on the upper part of the three legs. The lower part of each leg lies in a hollow in the upper part, and is connected to it by bands r, r . On rotating the lower part the cam s causes the two parts to be firmly locked. The legs are provided with reversible tips for indoor or outdoor use.

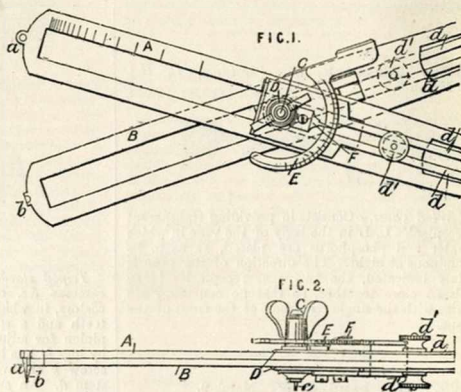
4139. Hicks, J. J. March 17.

Specific-gravity estimating apparatus for liquids. A series of specific-gravity "bubbles" b, b , either marked with numbers or distinguished by colour or shape, are introduced into a glass casing a with perforations a' for the admission of the liquid. The casing may be either a round or flattened tube, the "bubbles" being placed one above another, the lightest at the top, or it may be wide so that they may lie in bulb at the bottom, or a large bulb may be formed at the bottom for this purpose. The tube may also be formed open at the top and bottom, so as to act as a "pipette" for taking samples of the liquid, and a hollow or solid hook a^2 may be formed at the top. Enamel may cover part of the tube to render the "bubbles" more clearly visible. The casing may also be formed of three parallel glass rods connected at the top and bottom, the "bubbles" working in the space between.



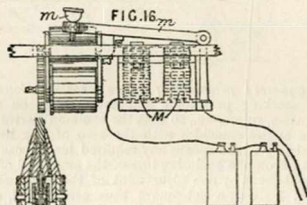
4163. Berger, J. H. March 17.

Proportional compasses; protractors. — Consists in various detailed improvements. (1) The slide blocks D, Fig. 1, for the central pivot binding-screw C, have extended slotted limbs d, d with binding-screws d', d' , thus relieving the screw C of the work of retaining the parts in adjustment. (2) The points a, b of the instrument are at right-angles to the limbs A, A, B, B. The latter limbs are rather shorter than the former, and the points flattened at one side so as to fit together, Fig. 2, or allow of opening in either direction. This method also prevents inaccuracy from wear. One of the points may be made adjustable. (3) The central pivot of the instrument is provided with a point c which may be screwed into the centre pin C. (4) The sliding block of the limb B is provided with a protractor scale E, and the sliding block of the limb A with a pointer F.



4212. Hicks, J. J., and Salt, T. P.
 March 19.

Thermometers.—The invention is more especially applicable to clinical thermometers, and consists in introducing a layer *b* of ruby or other coloured glass backed by enamel in the glass tube behind the bore *a*; by this means an ornamental appearance is given, while the scale, if marked on the glass, and the liquid in the bore are more clearly seen.


4272. Cooper, A. J., and Wigzell, E. E.
 March 20.


Sounding-apparatus.—

The movement of a piston against a spring under the increasing water pressure, as the sounder descends, operates at intervals a contact-maker, so that electric currents are intermittently sent through the recording-mechanism above, which may be of the kind described in Specification No. 7122, A.D. 1887. Appliances for bringing up samples of the bottom are attached. In the sounder shown in section, a piston *A* provided with cup-leathers *a*, *a* moves in a cylinder open to the water below. This piston, as the sounder descends, moves upwards, compressing the spring *B* and, by means of the projections *C* on the stem *C*,

reciprocates a lever *e* which is coupled to a similar one *e'*, which operates a contact-maker such as shown. A conductor *H* from the contact-maker runs up the centre of the cable which is protected by two layers of wire which are used to complete the circuit to the recording-mechanism on board the vessel. Various other methods of operating

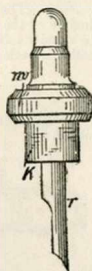
the contact-maker may be employed. One form of recording-mechanism is shown in Fig. 16, in which an armature *m* is drawn down by the electro-magnet *M* each time the circuit is made. This armature carries an ink punch which marks a moving paper band at intervals, double marks being made at, say, every ten fathoms to facilitate reading. Other forms may be employed. The sounding-line is wound on a winch, the barrel of which is in circuit with the outer wire of the line which carries the return current. The barrel is journalled in a metal bush as usual at one end, but in an insulated bearing at the other. The bracket supporting the journal is insulated and is in circuit with a metal bush surrounding the insulating-bush on the journal. This metal bush is connected up to the core of the line in order to complete the circuit. The sand-gripper is calyx-shaped, and on it rests a weight. When the sounder reaches the bottom, the cup is dragged along and collects a sample, and on being lifted the weight rests on the mouth of the cup, and so prevents the sample from being lost.

4405. Higgins, C. M. March 22.

Ruling-pens, filling.

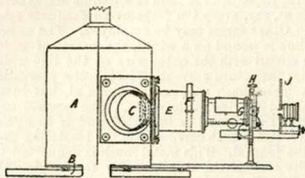
Relates to the construction of stoppers for ink bottles &c. combined with a quill or sponge &c. for filling ruling-pens, the heads of which are moulded from an easily-fusible composition. The head *m* is formed with a taper handle and is moulded around the plug *K*. This plug carries a quill *r* or a wire with a sponge or the like attached. Cork, soft wood, rubber, leather, or an equivalent substance may be used for the plugs *k* and the lining of the caps. The moulding-composition is preferably made from equal parts of resin and silica, but sulphur combined with a powdered material or any other solidifiable substance may be used.

FIG 7


4545. Hughes, W. C. March 24.

Lantern microscopes.—The body *A* is hexagonal or octagonal, and on three sides in succession a "Gilchrist" projector *C*, a lantern microscope, and an ordinary projector are placed; the whole resting on rollers swivels about the centre of a table *B*. A click ensures accurate centering. The triple condenser *E* of the lantern microscope has its lenses plano-convex, double convex, and meniscus, the combination being such that edge rays may not be lost. An alum cell *F* is

interposed in the path of the beam to absorb the calorific portion. The sub-stage fittings G are of standard size. A mechanical stage H is employed with lateral and vertical traversing-screws. The

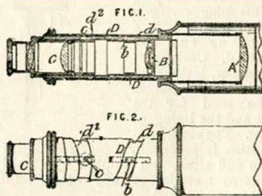


objectives J may be those of table microscopes, or of special curvatures for obtaining a flat field. The revolving diaphragm is brought up immediately behind the object. For packing, the base-board is made detachable.

4663. Le Patourel, J., and Hyams, S.
March 27. *Drawings to Specification.*

Barometers.—The instrument is constructed on the principle of the sphygmometer, but the end of the tube usually left open to the air terminates in a hermetically-sealed bulb.

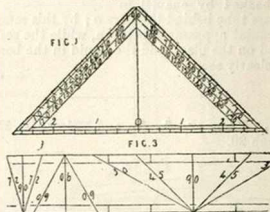
4835. Schröder, H. L. H., and Stuart, J.
March 29.



Telescopes.—Relates to the arrangement and construction of the eye-piece, erecting-lens, &c. The rays from the object glass, which is of the ordinary achromatized form, pass first to the collecting-lens A, Fig. 1, and then to an achromatized erecting-lens B; after this they pass to the eye-piece C having two lenses, preferably plano-convex and convexo-plane respectively, the second being achromatic. The lens B can be traversed to alter the magnifying power, and the lenses C to focus the image, and these adjustments are obtained simultaneously in the following manner:—The lenses are mounted in independent tubes and are provided with blocks or rollers *b, c*

working in cam-grooves *d, d^2* in the outer rotary tube D, Figs. 1 and 2. The groove *d* is helical, while the groove *d^2* is so curved as to give the necessary focussing-adjustment for the different positions of B.

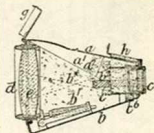
5111. Barrodale, T. H. April 6.



Squares; protractors; rulers; scales.—Consists in marking protractor and linear scales on set-squares, rulers, &c., so that the common vertex of the angles coincides with the zero of the linear scale, by which means any required length can be set off on an enclosing line of the angle and of its supplement by one adjustment of the instrument. Fig. 1 shows a set-square thus constructed, and Fig. 3 a ruler with various angles radiating from different points.

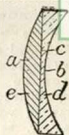
5176. Cardwell, W. A. April 7.

Opera, field, and marine glasses.—Relates to improvements on the invention described in Specification No. 17,107, A.D. 1887. The instrument is constructed to fold up into smaller compass when not in use. The top *a* and bottom *b* are hinged to the eye-piece *c*. The sides are formed by overlapping flanges *a^1, b^1*, and a connecting-web *b^c*. The flanges engage each other by slots and pins *a^2, b^2*. The objectives *d* are hinged either to top or bottom, and are held upright by a spring-lever *e*. When folded up, the casing is completed by a hinged front *g*, and a rear one *h* with spring catches. The latter cover may be on a double hinge so as to lie flat on the casing when turned back. The focussing is effected either by a screw *f* with a milled head *f^c* or a worm and worm-wheel. In modifications, the two parts of the casing are hinged to the front instead of the rear of the eye-pieces, and the cover *h* is replaced by leather flaps attached to the casing, and to crossed arms from the flanges *a^1, b^1*. Further, the casing may be curved, to fit better in pockets.



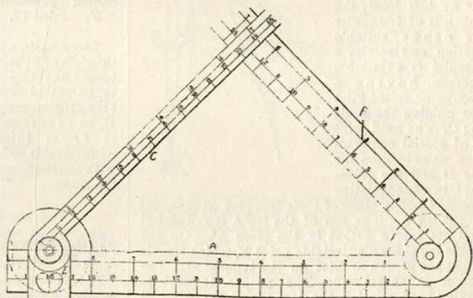
5194. Schröder, H. L. H., and Stuart, J. April 7.

Lenses.—Consists in combining a plano-convex lens *a* of high refractive but low dispersive power, and a plano-concave lens *b* of low refractive, but the same or higher dispersive power. The two lenses are cemented together at the surface *c*, which may be very slightly curved if desired. By this construction an achromatic lens producing a real image may be obtained with the surfaces *e*, *d* concentric or very nearly so and having a large flat field. Such lenses may be employed singly or in combination.



5297. MacLellan, J. A. April 10.

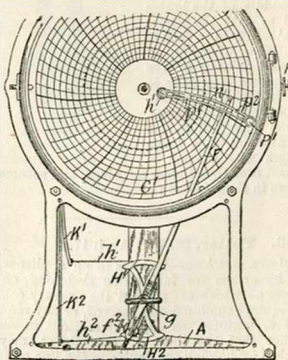
Departure rules.—Relates to an instrument for determining distances—for example, on board ship, where the distance of an object on shore is required. At one end of a graduated rule *A* is pivoted an arm *B*, while a second arm *C* is pivoted to a sliding piece *E*, all the movable parts being fitted with clamping-screws. The rule *A* is placed parallel to the keel of the vessel and the arm *B* adjusted to the bearing of the distant point. The ship is then kept on a straight course at a known speed for a certain time, after which the arm *C* is adjusted to the new bearing and the piece *E* moved to read on the scale of *A* the distance travelled by the ship. The point of intersection of the arms then gives the distance of the distant object from the two points of observation, and by turning the arm *C* at right-angles to the rule *A* and making it cut the same point on *B* the distance of the ship from the distant object when abreast of it may be read off. Compass dials may be fitted at the joints of the arms for taking the bearings of the distant object.



5312. Thompson, W. P., [Draper, D.].

April 10.

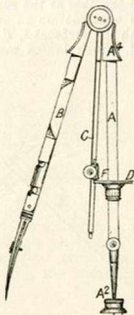
Thermometers.—Relates to self-registering alarm thermometers. The diagram is traced on a card *C*¹, rotated by clockwork and ruled for temperatures and time, by the arm *F* mounted loosely on a spindle *g*, but gripped between regulating-screws *f*² on a bracket mounted on the spindle. Two quadrants *H*¹, *H*² are attached adjustably to the spindle by set-screws, and are connected with bimetallic strips *K*¹, *K*² by wires *h*¹, *h*², the strips being reversely arranged so as to tend to rotate the arm *F* in the same direction. The terminals of an electric alarm are connected with the binding-posts *P*¹, circuit being completed by the arm *F* coming in contact with platinum points on the adjustable stops *p*¹, *p*². These stops can be fixed by set-screws beneath at any required point in the slotted plate *n*, which is curved into an arc, having its centre at the spindle *g*. When the front of the case of the apparatus is open the slotted arc is turned back out of the way of the arm, and when closed the adjusting set-screws are inaccessible, so that tampering with the apparatus is prevented.



5640. **Bennett, J. F., Mann, W. G., and Spencer, L.** April 12.

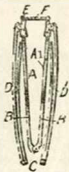
Mathematical drawing-instruments.—

Relates to compass-like instruments for drawing volutes, ellipses, &c. as described in Specification No. 9876, A.D. 1884. The leg A is non-revolving and attached to the foot A' by ball joint; the shank is of triangular or other suitable section and carries a templet D adjustable thereon, having a groove or raised fillet for guiding the guide leg C. The head joint is of special construction so as to keep the leg B and the guide-leg C in a fixed relative position, but to allow of their free play with regard to the leg A. The top of the leg A is cylindrical and fits into a socket in the piece A'. On the guide-leg C is an adjustable point F, which travels along the groove or fillet on the templet D. The action is as follows:—The proper templet D having been selected, the legs B and C are set at the required angle and the guide point F moved round the groove or fillet, when the pen or pencil on B traces the required curve.



5652. **Dixon, S.** April 17.

Spectacles.—Consists in forming a hinge C, preferably a knife hinge, in the middle of the bridge B, B so that the glasses A, A' will fold in face to face. The wings D, D' are also jointed in the well known way so as to fold in, either as shown, or between the glasses. A loop F pivoted to one side near one wing hinge engages with a hook E formed near the other wing hinge, and secures the frames in their folded position.



5688. **Fuller, H. F.** April 17.

Colours, matching.—Relates to an appliance, for use by artists for facilitating sketching, on the surface of which are painted the primary colours, all required combinations thereof, or any required tints or textures, in adjacent sections in such a manner that the tints of any object may be matched by holding the device in the line of sight,

and turning it about until the required section comes in line with the tint to be matched. Each section is marked with a letter so that a pencil sketch may be marked therefrom, and the colours filled in at leisure. The device has marked thereon an index specification of the colours, and of the means for producing them. Any suitable form may be given to the device, a handy shape being a flat tablet or card, which may be open in the middle, along the edges of both sides of which the tints are marked.

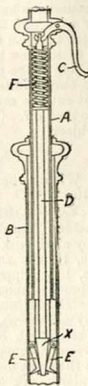
5690. **Arnold, J.** April 17.

Thermometers.—Consists of a spring tongs-like clip A to be fitted over the thermometer B, so as to protect it from injury without interfering with the reading of the scale.



5770. **Townshend, E., and Thompson, T. H.** April 18.

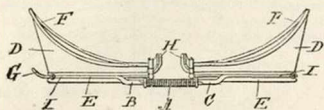
Stands.—Relates to telescopic standards for lamps and other articles. To the lower end of the sliding tube A are hinged three grippers E, while on the upper end is a collar in which is pivoted a lever C, which operates a rod D with a conical plug X at its lower end. The standard is adjusted by pressing inwards the lever C, which lifts the rod D and raises the plug X clear of the grippers E, leaving the tube A free to slide in the standard B. On releasing the lever C the spring F depresses the rod D, thereby causing the plug X to force the grippers against the standard B and secure the tube A in position.



6059. **Paxton, G., and Curry, W.,** [trading as Pickard & Curry]. April 24.

Goggles.—Consists in constructing goggles as pince-nez. The cups D, D, with plaquets F, F for

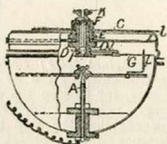
holding the glasses accurately before the eyes, are furnished with nose-pieces H and are connected



by a spring bridge A, B, C attached to the frames I which pass round the front E of each cup. G is a cord loop.

6076. Gross, A. April 24.

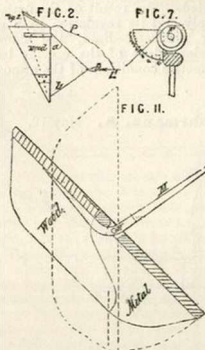
Compasses, magnetic, alarms for. The bowl is insulated from the binnacle and the pivot A from the bowl, but both bowl and pivot are in the circuit of an electric alarm. A fork C rests on a platinum wire *l* running round the top of the bowl and connects the bowl with a central hub formed of three pieces D, E, F, which screw together and clamp the glass and fork. From the bottom of D two gold wires G diverge. Their divergence may be varied by moving a sliding hand, for which purpose a pinion and rack I, J are actuated by a knob K at the top of the hub. A bent platinum wire L projects upwards from the magnets between the wires G. The central hub is turned till the wires G are equidistant from the course to be steered, and the knob K is turned till the wires are separated, according to the deviation to be indicated. If the ship deviates too much the wire L touches one of the wires G and the alarm is sounded. A disconnecting-switch is put in some convenient part of the circuit.



6134. James, S. H. April 25. *Amended.*

Sounding-apparatus.—The sinker may be in various forms, the essential feature being that it should act like a kite, taking up a position with the towing-line at a definite angle to the horizon. Fig. 2 shows a convenient form, the lower part having a shoe of iron so as to be heavier than the upper, which may be of wood. The line is attached at *a* and *b* and connected with the main line L by a comparatively weak connection *s*. When the sinker strikes the bottom, the jerk breaks *s* and the sinker is then drawn along by the previously slack connection P; the altered position causes it to rise to the surface. Fig. 11 shows another form of sinker adapted to continuous sounding. The line is attached to the bent bar M pivoted at H. When the sinker strikes the bottom it tilts into the position shown in dotted lines, then again sets itself and bumps once more on the bottom, and so on. Two of the sinkers may be employed, a large one for sinking the line, and a

small one at the extreme end for bumping on the bottom. The sudden jerk of the sinker on the



bottom having broken the connection necessary to its "kite" action, the tension on the line immediately diminishes; by attaching the line to a dynamometer an alarm may be caused to sound, the necessary movement, such for instance as the closing of bellows connected with a whistle, being obtained from the dynamometer. The iron shoe on the sinker may be indented to take a sample of the bottom. The line is led from a winch (preferably a screw-threaded drum round the threads of which the line is wound and prevented from slipping by a close-fitting cap), over a pulley F, Fig. 7, adjacent to which is a quadrant graduated in sines. The product of the length of the line run out, shown by a counter connected with the winch, and the sine of the angle made by the line with the horizon gives the depth.

6383. Havill, G. April 30.

Rulers.—To prevent pencils, rulers, and like articles from rolling off sloping desks and the like, they are fitted with clips as shown. The ends of such a clip may engage a piece of india-rubber or ink-eraser or other article. The clip may be used alone, and it may be of any shape.

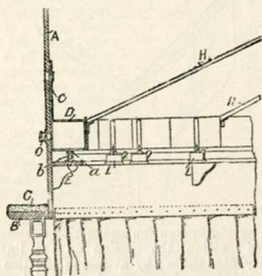


6923. Methven, J. May 9.

Photometers.—The air supplied to photometric lamps is dried on its way to the lamp by being forced by a fan or other motor over or through trays containing desiccating-material, such as quicklime broken into small pieces. The lamp must be so arranged that the external undried air cannot come into contact with the flame. The

desiccated air supply is controlled by a regulating cock or valve. The gas or vapour supply may be similarly dried. The result of the desiccation of the air supply and its regulation by a cock is a constant or standard light, the flame being rendered independent of the varying barometric and thermometric conditions of the atmosphere.

7067. Fuhrmann, A. May 12.

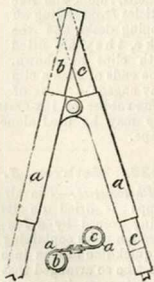


Stereoscopes for exhibiting panoramic views. The spectators sit round the outside of a circular casing A provided with eye-pieces O. Inside the casing a ring of stereoscope boxes D connected by a circular rail a travels round over rollers b on a circular shelf E. All the views thus pass before each spectator. The motion is intermittent so that time is given for inspection. The boxes are connected by rods H to a sleeve on a central pillar, where the actuating-mechanism is placed. Behind the boxes lamps L are placed to illuminate the transparencies. The names of the views appear on boards c through slots in the casing A.

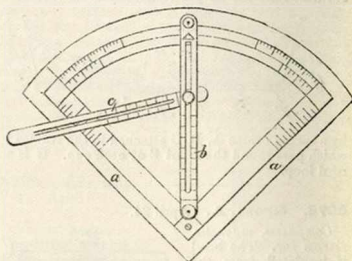
7105. Cooper, W. C. May 12.

Compasses, drawing.
—Two tubes a, a of bent sheet metal are hinged together, the tubes being on opposite sides of the hinge plates, so that the pencil b and pointed rod c can cross one another as the hinge is opened. As the pencil b is cut down the rod c can be drawn back to keep the legs even.

Proportional compasses.—By using two pencils sharpened at both ends proportional compasses are obtained.

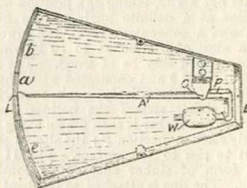


7110. Barton, W. May 12.



Departure rules; course indicators.—Relates to instruments for use by ships' masters, pilots, and others, for finding the distance a ship will pass from a point on land, for checking the course, and for enabling the ship to pass at any required distance from an object. In one form the instrument consists of a quadrant a having a pivoted radius arm b, on which slides and turns a second arm c. The sides of the quadrant and the arms are graduated in distances to scale. The sliding arm is pushed out on the radius bar to the known distance of a fixed object. If the radius bar is set to the angle between the ship's course and the bearing of the object the zero radius of the quadrant reads on the sliding arm when at right-angles the distance at which the ship passes the object. *Vice versa*, the distance of passing being given, the required course may be found. To check the course, the sliding arm kept perpendicular to the zero radius of the quadrant is brought back the distance sailed since a previous observation. If the course has been kept the angle read by the radius bar will be that simultaneously observed. The quadrant may be replaced by a single fixed bar parallel to the lubber line and the angle be got by sighting.

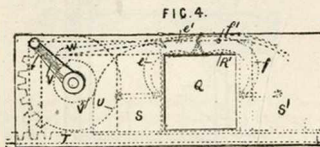
7124. Hall, B. G. May 14.



Clinometers.—Consists in the application of a counterbalanced index arm or pointer for measuring vertical angles. The index arm A is pivoted at C and has a pointer a at right-angles to it, parallel to the pivot C. The extension P of the

arm A is bent round and carries an adjustable weight W for bringing the arm A accurately horizontal. The distant object is observed through sights E and L, and the position of the index a on the scale b, e gives the required angle.

7348. Hughes, W. C. May 17.



Magic-lanterns.—The slide stage is carried by a part which telescopes into the main body, and the objectives are fitted to a flexible concertina-like extension. The footboard is hinged in the middle. The condensers are rectangular or square in order to obtain as large a field as possible. For changing the views a double slide carrier is employed, moved, so as to bring either aperture Q into position, by the handle V through the segmental wheel U and rack T. A cam V¹ is attached to the spindle of the wheel U, which operates the lever W and closes the shutters S, S¹, during the change of the slide, by means of the intergearing toggles e, f pivoted at e¹, f¹.

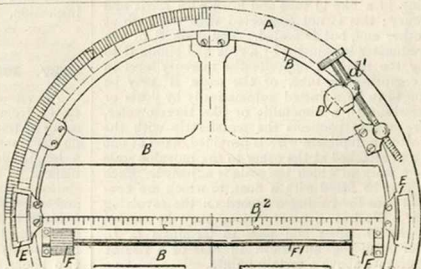
7357. Crampton, T. P. C. May 17.



Thermometers.—Either the whole thermometer is coated with a thick electrolytic deposit, leaving only a reading window, or the bulb only is thus coated and the stem protected by a slotted tube C of ebonite or metal cemented on. This casing may be strengthened by a rigid ring E between the bulb and stem parts. The stem end may be loaded so as to strike first in case of falling. To further

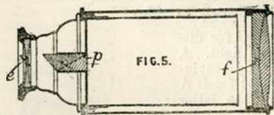
7596. Fletcher, J. May 23.

Protractors.—The instrument consists of an outside graduated ring A, within which turns the piece B, having a diametric straight edge, fitted with interchangeable scales B¹. Verniers E, E are fitted to either side of the piece B, and for fine adjustment the ring A and piece B may be connected by a clamp D and screw d¹. Two rollers F, F¹, attached to a common axis F¹,



lessen the danger of falling, india-rubber rings may be passed over the stem.

7399. Leigh, H. H., [La Cour, P.]. May 18.



Telescopes for observing signals which are transmitted according to the Morse code by a lamp apparatus. Wide and narrow slits corresponding to the dashes and dots of the code are formed in a band drawn in front of a lamp by rollers and gearing &c. The light passes through the slits and a lens, and is dispersed by prisms into a series of overlapping spectra. A certain portion only of the transmitted rays is visible to a distant observer, and these when viewed by the naked eye appear like a light spot, but when viewed through the telescope a full-sized image of the slits is visible. For this purpose the telescope is fitted with prisms p which may be placed inside or outside the object glass f. The apparatus may be used for military and marine signalling, for indicating a ship's course or a definite direction.

7411. Horn, A. May 19. Drawings to Specification.

Saccharometers.—Beside the ordinary scale of specific gravities a second scale is provided showing corresponding percentage weights of sugar.

7476. Lysaght, G. J. May 19.

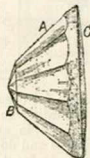
Tripod stands.—Consists in the combination with a walking-stick, artists' tripod, or the like of an attached case 2 with compartments 3 for holding sundries. The case may be rolled round the stick &c. and secured by a strap 4 or a stud.



are also provided so that the apparatus may be moved parallel to itself.

7695. Coad, T. May 25.

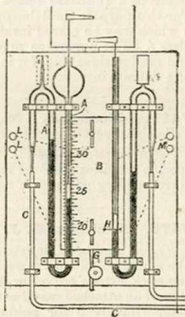
Lenses for distributing light. A coned body is cut into straight facets A and B, the latter being at a greater angle to the axis than the former. The base is slightly convex. The rim C may be fitted into a metal collar.



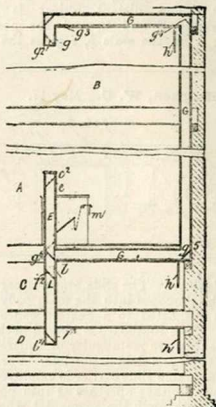
7884. Trotter, A. P. May 30.

Thermometers.—

Relates to means for indicating at a distance the readings of thermometers and other instruments where the indicator and transmitter are connected by a tube containing fluid or by a wire; the object is to avoid errors arising from the means of connection being exposed to varying temperatures. The bulb is connected by a fine tube C with a U tube A partially filled with mercury, the bulb, fine tube, and up to the mercury in the tube A being filled with alcohol or other liquid. By the side of the tube C runs an exactly similar tube, ending in a like U tube and filled with spirit and mercury; this is not connected with the bulb at its other end, but is sealed. The scale B of the thermometer is adjusted by a rack and pinion G to bring the mark H opposite the mercury level in the compensating-tube, or the scale B may be arranged to be adjusted automatically by floats or otherwise. In a bimetallic or like thermometer, where a wire connects the metal strip with the indicator, a duplicate wire is provided, fixed at one end and attached at the other to the movable scale or to a mark to which the scale is adjusted. Each tube may be fitted with a float, to which are connected pens for tracing a record on the revolving drum. Electric contact-wires may be sealed into the U tubes and pass to terminals L, L, M for sounding an alarm in case of a rise of temperature above a certain point.



7987. Farr, G. C. May 31.

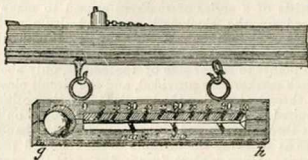


Reflectors.—Relates to room-to-room observers for use in factories, houses, ships, &c. The various rooms B, C, D are connected to the room A, in which the manager or captain sits, by tubes E, G, L furnished, if necessary, with mirrors $e^2, g^2, g^3, g^4, g^5, P, P^2, P^3, \&c.$, the last of each set of mirrors being placed before openings g, l, P^2 in the tube, which receive the reflection from the mirrors h, h and communicate them to the inspector through the opening e . Some of the mirrors, e.g. P^2, g^5 , are pivoted so that they can be turned back when they would interfere with the passage of light to the reflectors of another room, and they are under the control of the inspector by means of arrangements m similar to bell-pulls. The mirrors h are capable of vertical and horizontal adjustment in a similar manner, so that any part of the room under inspection may be observed, and they may, if desired, be convex, so as to include a larger field. A magnifying-glass may be fitted into the opening e for the sake of closer inspection.

8027. Mitchell, C. T. June 1.

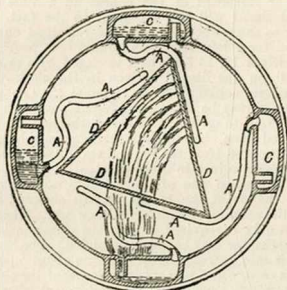
Thermometers.—In order to read the thermometer from behind, the back is perforated by a series of transverse slots corresponding to divisions on the front scale, or the whole tube is exposed by a longitudinal slot along which graduations are marked by notches, pins, or bridges. The Figure shows notches at every 10th degree on one side and every 30th on the other. The wooden carrier is made in halves united by screws g, h . A self-registering thermometer set by gravity is suspended horizontally from a bar, such as a window sash, by two hooks, one fixed and the other suspended by a

chain which passes through a hole in the sash, and is hooked on a pin on the upper side. To set the



thermometer the chain is unhooked and let down. The chain instead of hooking may be attached to a hinged bar, slide, or drum.

8068. Simpson, W. S. June 1.



Kaleidoscopes.—Relates to a kaleidoscope object which may be used in connection with coin-free apparatus, such as that described in Specification No. 11,621, A.D. 1887. The Provisional Specification also refers to the use of the kaleidoscope in connection with advertisements and the delivery of goods, sweets, &c. Perforated tubes A, A are connected with reservoirs C, C containing liquid; when the apparatus is placed in the position shown with reference to the mirrors D, D, D and rotated, the liquid issues from each of the perforated tubes in turn, descends in the form of a cascade, &c., and flows into the reservoir below.

8381. Lynam, P. J. June 8. *Drawings to Specification.*

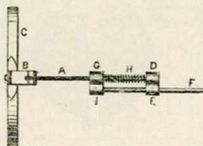
Range-finders.—Instruments connected by a cord forming a base line are mounted on swivels so that the cord, when tightened, brings them approximately to the required relative adjustment to the base line.

8599. Palmer, W. June 12.

Squares.—Relates to T-squares with movable blades. The blade B and stock H are held together by a bolt S and nut D with a convex spring washer A pressing on the blade. The blade is slotted to the end so that it can be slipped off the bolt without removing the nut D. The friction of the washer is taken by a flat spring C instead of by the nut, so that the latter has no tendency to turn with the washer and blade.

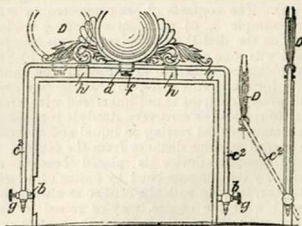


8621. Popplewell, W. W., [Bechtold, A. M.]. June 12.



Spectacles.—Relates to a method of attaching the wings. A guide-piece A, square in cross-section, is hinged at B to the lens or lens frame C, and carries at its end a collar D with an eye E projecting below. The wing F, which is curved at the end to pass round the ear, works freely through the eye E and carries at its end a collar I with eye G projecting above, and riding freely on the guide-piece A. Between the collar D and eye G a spring H is coiled round the guide A. The arrangement of the parts may be slightly varied.

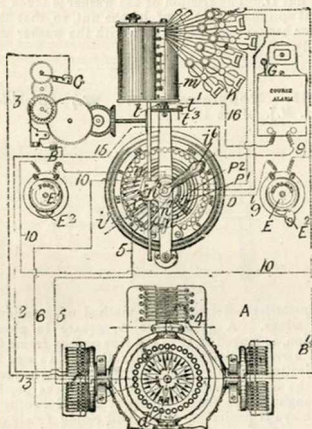
8726. Lowthime, D. A. June 14.



Graphoscopes.—A lens D in an ornamental setting slides by means of a socket *d*, with set-screw *f*, on the horizontal bar C of a wire frame

the legs c^1 of which slide through holes in pivots b bearing in the sides of the frame, or in metal plates attached to an ordinary wooden frame, and having set-screws g . The lens may be slid about and placed over any part of the picture or photograph, but is prevented from passing behind the frame by the stops h, h .

9293. Chase, H. A. June 26.

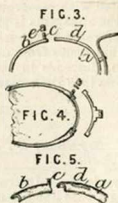


Compasses, magnetic; logs.—Relates to apparatus for indicating and recording the movements of a needle &c., specially designed for use with the magnetic compass. Round the card of the compass A, say at every point, are a series of insulated contacts d^1 and a continuous contact ring (not shown). The contacts d^1 are connected by wires (for example 5, 6) with corresponding contact-points on the dial D, and the continuous ring by a wire 4 with one pole of the battery B'. Flexible or rubbing contacts are provided at the gimbal joints for the circuit wires, so that the free movement of the compass is not interfered with, and in order to render the card very steady it is supported by an annular float resting in liquid and connected to the card at some distance from the centre. An electromagnetic device is placed beneath and carried by the compass bowl by means of which a metal bar, turning with the card so as always to be parallel with the needle, may be raised to make contact with the metal ring and the contact-point d^1 to which the needle is then pointing. The circuit wires 2, 3 for this electromagnetic device pass to the poles of the battery B, and one includes the clockwork contact-mechanism C. In this way a

current is sent at definite intervals, and the circuit closed for the battery B'. The recording-device may be of various forms; that shown in the Figure consists of a series of markers caused to make a record on the clockwork-revolved drum m by means of the magnets K. As the deviation of the compass will not generally be more than one or two points to either side of the course, only about 5 such markers are provided, and the circuit closed for these by bringing the handle p^1 into the position required. The drum is moved longitudinally on its axis through rack and pinion gear from the handle p^1 , so as to bring the markers to the required part. A series of five contact-fingers p^2 connect the corresponding contacts of the dial D with the 5 rings marked P², P¹, Course, St. 1, St. 2, and thence to the respective markers, these fingers moving with the handle p^1 , and a pointer r showing the position of the handle. Additional contacts n, n^1 may be provided at either side of the fingers p^2 , and connected to rings n^2, n^3 , and thence by conductors 9, 10 respectively to bells E, E¹ and drop-down signals E². Thus if the ship deviates more than 2 points port or starboard of the course an audible and visual signal will call attention to the fact. In order to show when the ship has remained on one course for a definite time an alarm G is provided, the circuit 15, 16 for which is closed by a projection t^1 on the disc p^2 (driven by the clockwork) coming in contact with a terminal t . The projection t^1 may be fixed at different points on the disc, so as to give the alarm at the end of any required time. Additional markers may be provided worked from the log and revolution counter. To prevent injury to the apparatus by turning the handle p^1 when one of the markers is in contact with the drum, the handle may be enclosed in a box the opening of which breaks circuit. When an alarm only is required in case the vessel deviates, the apparatus may be much simplified. The handle in this case moves a shield covering about 5 points of the card, which prevents the closing of the circuit between two rings round the card, except when the vessel has deviated.

9315. Henninger, F. A., and Fyfer, J. T. June 26.

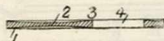
Spectacles and eyeglasses; reading-glasses.—Relates to a means for tightening the frames on the glasses without the necessity for the usual grinding. The part b , Figs. 3 and 5, is formed or fitted with a screw pin c and slides into the concave end of the part a , the screw being passed through the slot d . The surface at d is roughened to give a proper bite to the



nut e , which, when the frame has been drawn close round the lens, is screwed tight down. Fig. 4 shows a slightly - modified form of the invention.

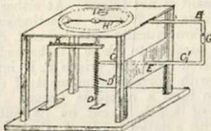
9442. Lansdell, W. J. June 28.

Squares; rulers; French curves; centrolineads.—Consists in constructing centrolineads, squares, rulers, French curves, and similar instruments with a raised rib round the drawing-edge and elsewhere if desired, so that the recessed surface between does not touch the paper. For instance, in the Figure, which shows a section of a set-square, a rib 1 runs round the edge, and a rib 3 round the central hole 4 as a support, the part 2 between being recessed.



9452. Horstmann, H. June 28.

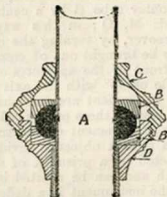
Barometers.—Relates to means for indicating measurements accurately on dials, applicable to gauges, barometers, and other instruments. Fig. 1 shows the principle of the apparatus as applied to a measuring-gauge. The piece G of which the length is to be determined is placed between the fixed and movable jaws B, C', the latter of which is attached to a slide E moving parallel with a screw spindle D into the thread D' of which an



extension of the rod C' extends. By this means the movement of the jaw C' is communicated in a magnified degree to the index H. K is a spring for returning the index to zero. In some cases, e.g., in a barometer or pressure gauge of the aneroid type, the movement of the driving part C' is not proportional to the quantity to be indicated, and to avoid irregular divisions on the dial the screw thread is formed of varying pitch. The screw spindle may be tubular and of varying pitch, so that by compressing it longitudinally the pitch may be adjusted. Other special adjustments may be made in the case of an aneroid barometer or pressure gauge. A second dial I is also provided, the spindle of the index being connected by a fine wire or hair to the spindle D so that the two spindles turn at any required relative speed.

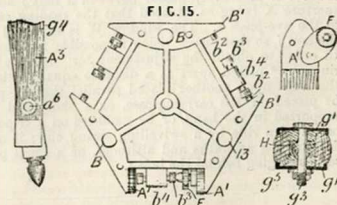
9501. Benson, W. A. S., Lovegrove, J., and Hinton, E., [trading as W. A. S. Benson & Co.]. June 29.

Stands.—Relates to an adjustable screw grip for lamp and other standards, and consists of a stuffing-box with an adjustable india-rubber washer. This washer is protected by two metal washers B, B, which are enclosed by the two parts C, D of the stuffing-box. The lower part D screws on to the base, while the upper part C is secured to D by a screw of, preferably, six threads to the inch, so that the sliding tube A is released by giving C a half-turn.

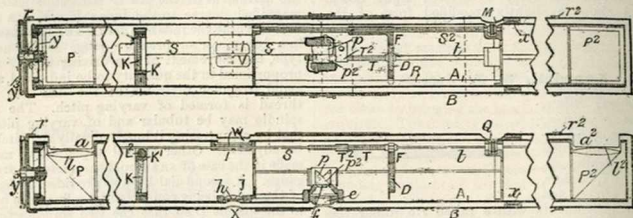


9518. Mavitta, W., [trading as W. H. Brown & Co.]. June 30.

Tripod stands.—Each leg is in three parts; the bottom part, which is solid, is pivoted at a^6 between two strips A^3 forming the middle part. It is held extended by a spring catch, and has a spike at each end, so that either end may rest on the ground; the middle part consists of two strips A^2 connected at one side by plates g^{11} , and at the top by a bolt g^2 which, with nut g^3 and plates g^1 , forms a clamp to connect the middle and top parts, H being a rubber &c. packing-piece. The strips A^1 forming the top part are connected below by a metal band, and on the inner side of one of the strips is a pivoted lever with a screwed socket for the set-screw F. The head B is shown in plan in Fig. 15. To fix the legs each lever carrying the screws F is turned aside and holes in the strips A^1 are sprung over the pivots b^2 ; the set-screws F are then adjusted, the legs being held between the lugs B^1 and the ends of the bolts b^2 , which are loose in the lugs b^1 . In a modification, the bolts b^2 are dispensed with, the set-screws F being made long enough to fill up the space between the strips A^1 .



9520. Barr, A., and Stroud, W. June 30.

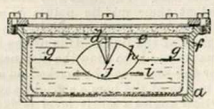


Telemeters; surveying-instruments; speed and direction of motion of distant objects, determining.—Relates to instruments for measuring distances and angles, specially applicable for range-finding, though the invention may be applied to instruments for contouring, taking vertical and horizontal angles, and other surveying operations, for determining the position of a boat relatively to a coast in hydrographical surveying operations &c., as well as for determining the movement of a distant object in direction and velocity, ascertaining the size of a distant object, &c. Various modifications are described, but the Figures show a type embodying the essential features. A tube A is carried within an outer tube B by a centre y at one end and a ring bearing x placed near the adjusting milled heads M, Q; in this way distortion of the parts during transport, adjustment, &c. is avoided; moreover, by turning the inner tube by means of the head y^2 , the various apertures in the tubes may be brought out of coincidence when the instrument is not in use. At either end of the tube A in front of the apertures a, a^2 are the reflecting-prisms P, P² (the reflecting-surfacing making an angle of 45° with the axis of the tube), combined achromatically with lenses l, l^2 . At the centre of the instrument are two small reflecting-prisms p, p^2 parallel to those at the ends, and cemented to the lens f ; these prisms reflect the rays of light received from the prisms P, P² into the eye-piece f, e . The arrangement of the small prisms is such that, with correct adjustment of the parts, the image of a distant object is divided between them so as to form a complete image. This adjustment is effected by a prism K of small angle the frame K of which is cut on its outer edge into worm teeth and can be rotated by a worm L² provided with a milled head. At the other side of the centre of the instrument is a deflecting-prism D of small angle carried by the frame F, which can be moved longitudinally in the tube on turning the screw S² by the milled head M. A scale S is attached to the nut T² through which passes a screw T capable of turning freely in the frame F but compelled to move longitudinally therewith; the continuation t of the screw T is rectangular in section and passes through a milled head Q so that it can slide therein, but must turn with it. By revolving Q the scale is adjusted with regard to the prism. When the distance of the object is practically infinite so that the rays therefrom are parallel, and the prisms K, D are moved to cause a perfect image in the eye-piece, the mark "infinity" on the scale should be brought opposite the index I. If now an object at a finite distance be observed, the image will appear broken, but the two halves may be brought into alignment by traversing the deflecting-prism F by turning the head M, and the required distance can then be read on the scale S, which is graduated in reciprocals. The scale may, if desired, be marked in angles subtended by the base length of the instrument at the distant point. The fixed index I is preferably placed between a lens j and a window W, the scale being transparent, the eye aperture X being so situated that the reading can be taken with one eye, while the other is applied to the eye-piece e . The window W is extended below the scale at V, and a small hole h made in the lens j , so that direct vision is possible for rapidly directing the instrument to the required object. In order to obtain the adjustment for "infinity" with facility, each instrument is provided with two rings r, r^2 placed apart at a distance equal to the base length. By observing from one instrument the rings upon another placed parallel thereto, parallel rays of light are obtained. The rings may be placed on the carrying-case, or a short rod substituted. When in use the apparatus may be supported in the hand, or be mounted on a tripod stand; or it may be attached to the nose-block or barrel of a rifle by a swivelling spring clip; it may also be carried on the table of a theodolite for determining azimuths and altitudes, or a small pendulum clinometer may be pivoted in the tube, the scale swinging behind the lens j .

9926. Bassnett, T. July 9.

Compasses, magnetic.—The card g is fixed to a float h pressed upwards by the containing-fluid against the centre d , which is carried by a bar e mounted on brackets f on the bowl a . j is an agate

or the like for the centre to bear upon. The needles *i* may be carried by the float or suspended

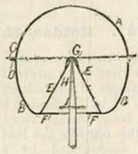


from the card. The centre of the agate, or both, may be carried by a spring to reduce the effect of sudden shocks.

10,053. Reynolds, W. J. July 10.

Compasses, magnetic.

—The card is formed by electrodeposition, as described in Specification No. 12,880, A.D. 1887, and covered on both sides with metal or like foil which is pressed between a hard flat surface and a soft yielding surface; by this means it is rendered flat on one side for pointing or otherwise marking the usual devices; the other side is indented. The card is fixed to a double cup-shaped float A, B having flanges C, D for connecting the two parts. The lower cup B is formed with a conical part E at the top of which is fixed the jewel by means of a cup G or otherwise. Flanges F, F project from the bottom of the cone and a disc I of about the diameter of the aperture between the flanges is fitted to the central pin H. This arrangement prevents the pin from being shaken off the jewel. In the Provisional Specification a means is described for preventing the heads of the screws used to attach the card to its frame, or for balancing purposes, from showing on the top of the card. This consists of a skeleton framework to which the card is attached.



10,101. Peichl, J. von. July 11.

Compasses, magnetic.

—Relates chiefly to means of compensating the quadrantal deviation. The compass may be either fluid or on gimbals. If the latter are used, in order to increase the stability, the central part of the card is cut out and a large heavy ring is suspended on the underside. The quadrantal corrector consists of two superposed rings of soft-iron bars *c, c'* mounted on two discs *c², c³*, which are placed round the lower and smaller part of the compass bowl. To equalize the power of the iron rings the upper bars are made smaller than the lower. The bars are 32 in number in each ring, of different lengths, but arranged symmetrically and radially round the centre, as shown in Fig. 3. The bars E, F, G, H are lengthened

inwards beyond the ellipse, to an extent, determined experimentally, sufficient to compensate an octantal

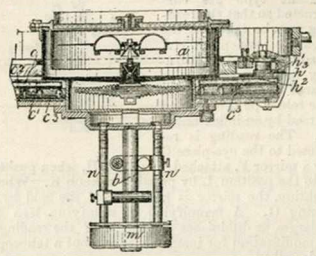
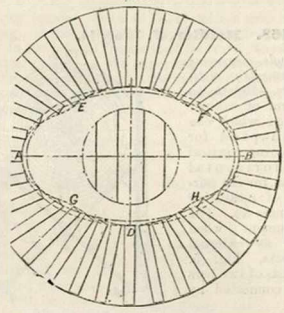


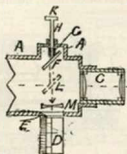
FIG. 3.



error arising from the true elliptical arrangement. To alter the amount of quadrantal force the correctors can be rotated in opposite directions by a pinion *h¹*, which gears with two curved racks *h², h³* attached to the discs *c², c³*. The force developed is shown by a scale. To correct the quadrantal deviation E, as well as that D, the correctors can be clamped together and turned as one. The quadrantal corrector can be applied, with equal bars for both rings, in the compass card plane, and then a sliding magnet is placed in a vertical tube *b* to paralyse the disturbing effects caused by motion of the gimbal ring. The whole compass bowl, or the upper part *a* only, can be turned slightly on releasing screws, not shown, in order to displace the lubber line and thereby correct the permanent deviation A. Two vertical guides *n* hanging from the bowl carry an adjustable weight *m* for regulating the stability. The usual semicircular and heeling-error correcting magnets and Flinders bar are provided.

10,203. **Lynam, P. J.** July 13.

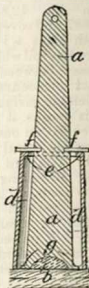
Range-finders of the sextant type are constructed so that the reading may be taken at the sighting eye-piece. A graduated reed D, turning with the reflector, is placed at an aperture in the telescope tube A, and is read by an index-finger E. The reading is reflected to the eye-piece C by a mirror F, attached to a stem H, when pushed into the position L by pressing a knob K. When sighting, the mirror is kept out of the field by a spring G. A magnifying or minifying lens M enlarges or diminishes the image of the readings. A modification for instruments without a telescope is described.



links a, a which are pivoted at the ends d, d to the bars e, e and at the ends f, f to pieces g sliding on the bars. The links a, a are equal, and are pivoted at their middle points b , whence it follows that the bars remain parallel to one another in all positions of the links. One of the bars has a scale h marked on it to show the distance between the bars, or the scale may be marked on a separate bar, fixed to one of the bars e at right-angles. For taking vertical angles a spirit level is fixed on one limb e and sights attached to one of the links a . For determining the angle subtended by a distant point at a base represented by the distance between e, e (with a view to finding the distance of the point) telescopic sights are used, one lying along one bar e , and the other pivoted at the end d of the other bar and working over a graduated arc fixed thereto.

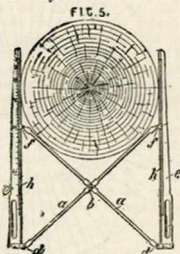
10,287. **Holden, H.** July 16.

Sounding-apparatus.—The object is to prevent the sample of the bottom taken up by the lead at b from being washed away. For this purpose the lead a is surrounded by a sleeve d , which during descent assumes the position shown in the Figure, f, f being stops to prevent it from rising further. As the lead is being drawn up, the sleeve slips down until the flange e comes in contact with the lead and flange g with the sleeve. The sample is thus protected from eddies.



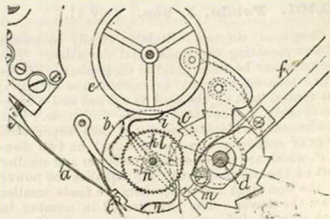
10,263. **Heidler, J.** July 14.

Angle-measuring instruments; telemeters.—Relates to a form of calliper gauge which can be adapted for measuring vertical or horizontal angles, for the purpose of measuring distances &c. The instrument when used as external callipers, Fig. 5, consists of two bars e, e connected by



10,299. **Wallace, N. W.,** [Scott, P.]. July 16.

Logs.—Relates to improvements on the electric apparatus described in Specification No. 3666, A.D. 1884, and consists in substituting a mechanical timer for the mercurial time glass used in the former invention, and in applying a means for showing for how long and at what time the rotator became fouled, if such accident should happen. Circuit is completed for the electric indicator by the spring a coming into contact with a wheel b driven by clockwork, e being the balance-wheel. The circuit is broken when either of the notches c, c come opposite the end of the spring, and the semi-rotation of the wheel is timed so that the current flows for, say, exactly half-a-minute. The clockwork is driven by a spring barrel on the arbor d , which is first sufficiently wound up by a single stroke of the pawl lever f . To ensure the starting being exactly correct, a spring brake i , carried by an arm k loose on the arbor of b , normally holds the balance-wheel e . The arm k is connected to

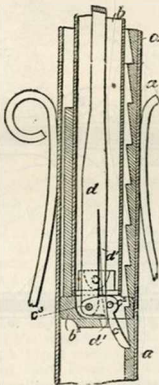




the arbor of *b* by a long coiled spring, and it is fixed to a ratchet-wheel *l* carrying projections *n*. When the pawl lever *f* is worked the pawl *m* strikes one of the teeth *n* and rotates the arm *k* and ratchet *l*, so that the brake *i* gives the starting impulse to the balance-wheel *e* and then remains in the position shown in dotted lines, until the wheel *b* comes round so as to relieve the torsion of the spring connection. A second spring brake *i* arrests the balance-wheel *e* when it reaches it. To show the time of the fouling of the log two clocks are employed, or one clock with two sets of hands and independent driving-mechanism is used. The balance-wheel of one clock is controlled by a spring brake having an arm resting on a locking-wheel with two notches therein, into which the arm can fall if the electric current ceases or becomes continuous. When, however, the current is rapidly intermittent the vibrating armature of an electromagnet continually throws up the arm and spring brake so that the movement of the clock is not interfered with.

10,368. Laws, R. W. July 17.

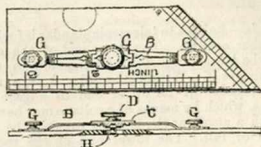
Stands.—The article to be supported is carried by a telescopic tube *b*, at the lower end of which is a bracket *b*² sliding in the outer tube *a*, whereon is fixed a rack. A pawl *c* is pivoted at *c*² to the bracket *b*², and is attached at *c*³ to a rod *d*. The lower end of this rod is split at *d*¹, forming a spring normally to press the pawl *c* into contact with the rack. By raising the rod *d* the pawl is drawn clear of the rack, when the article supported may be raised or lowered.



10,414. Hicks, J. J. July 18.

Thermometers.—Relates to the construction of metallic scales for brewers', bath, and like thermometers, which have to be subjected to boiling water, spirit, &c. The numbers and graduations are sunk very deep and filled in with vitreous enamel paste, such as black or coloured ground glass; the scale is then subjected to high temperature in a muffle, when the enamel melts and attaches itself.

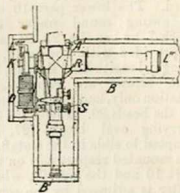
10,447. Parkes, W., and Wakeman, C. July 19.



Section-lining apparatus.—The apparatus is specially applicable to set-squares, but may be fitted to corresponding instruments with a curved edge, or to the T-square itself. A loose slide *B* working by short slots on the studs *G, G* carries a second slide *C* by which its play is adjusted as required, a vernier being employed for greater accuracy. On the slide *C* and passing through a slot in *B* and a hole *H* in the set-square is a screw stud *D* which can be pressed down so as to take a grip of the paper. After drawing a line the slide *B* is moved, say to the left, to the limit of its travel, the stud *D* is then pressed on the paper and the square moved in the same direction to the end of its travel; the second line may then be drawn and the same process repeated.

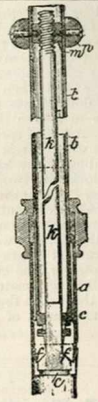
10,500. Bolton, T. July 20.

Telemeters.—The Figure shows a plan of half the apparatus. The cylindrical box *B* is fitted near each end with two cross-tubes. The tubes contain a combination of two telescopes at right-angles, mounted on trunnions *A*¹, the cross telescope on a carrier *R* having azimuthal motion effected by a screw *S*. The telescope *L*¹¹, *L*¹¹¹ has a sliding eye-piece *K* with cross-lines, which is moved by a micrometer screw turning with a graduated screw drum *D*. The telescope at the other end of the box *B* has its principal focus defined by cross-wires, or ruled lines, and an illuminated background of ground glass. When the cross telescopes are directed on the distant object, the eye-piece *E* is shifted till the intersection of its cross-lines coincide with the image of the focal point of the other cross telescope. The reading on the drum *D* then gives the distance.



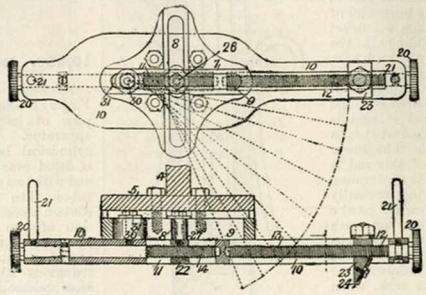
10,860. Norton, T., and Baker, F. R.
July 27.

Stands.—Relates to telescopic standards for lamps and other articles. The lower end of the extension tube *b* forms a piston *c* having slots to receive two wedges *f*. Within the tube *b* is a rod *k* screw-threaded at its upper end to engage with a nut *m*, which by means of a collar *n* may be turned through a small angle, thereby causing the rod *k* to rise or fall. The lower end of the rod *k* is shaped to engage with the wedges *f*. When this rod is raised it forces the serrated edges of the wedges into contact with the outer tube *a*, and the extension tube *b* is held firm; on lowering the rod *k* the wedges are released, and the tube *b* may be raised or lowered. In a modification, the wedges are operated by a collar and nut screwing upon the lower end of the rod *k*; and the nut *m* forms part of the tube *b*, the collar *n* being secured to the rod *k*.



10,950. Willmore, C. H. July 28.

Ellipsographs.—The apparatus is suspended above the cardboard &c. to be marked or cut from a bracket to which the upper part 4, 5 with the attached block 7, having slots 8, 9 at right-angles, is rigidly fixed. The lower part 10 can be swung round under the block 7 by handles 21, 21, and is provided with screws 13, 14 lying in longitudinal slots 11, 12. The screws are capable of rotation only, and can be turned by the heads 20. Pivots 26, 30, carrying oval blocks 27, 31 adapted to slide in the slots 8, 9, are mounted respectively on the part 10 and the nut 22, which latter is adjusted by the screw 14. The pivots have nuts and washers at their upper ends, the washers riding on the edges of the slots 8, 9. The cutter or marker 24 is mounted on a nut 23 travelling on the screw 13.



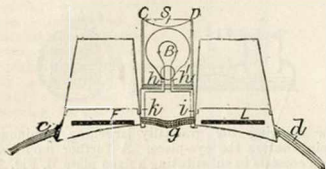
10,951. Molnar, P. July 28. *Drawings to Specification.*

Logs.—The pressure of the water in an open-mouthed vessel compresses air, to an amount shown by a pressure gauge, to indicate the speed of the vessel.

10,956. Smith, C., [Blüensdorf, R.]. July 28.

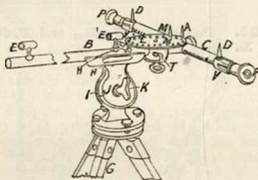
Spectacles combined with incandescent electric lamps. Relates to a combined electric lamp and spectacles for surgical and medical operations and observations. Between the metallic eye rings *F* and *L*, which are connected by an insulating horn bow *g*, is supported a capsule *C, D* containing an

incandescent lamp B supplied from a battery through the conductors *c, d*, rings F, L, metallic strips *i, k*, and leading-in wires *h, h'*. The front of the capsule may be provided with a lens S, and



the back is formed of insulating-material. The eye rings may be fitted with suitable spectacle glasses and shield tubes of blackened cardboard or other suitable material. When strong currents are employed the spectacles are made of ivory with the conducting-wires inlaid.

11,133. Gaws, F. Aug. 1.

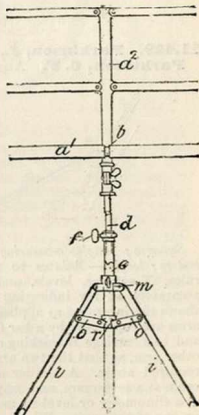


Telemeters; range-finders; clinometers.—Relates to an instrument which can be used to determine the distance of fixed or moving bodies for ranging-finding &c., the speed of moving bodies, the elevation of objects, &c. It consists of a tube B, on which are two eyelets or telescopes E, E' provided with cross-hairs, and a graduated crosshead C at right-angles having a central sighting-pin A and two adjustable sighting-pins D, D set at equal distances from A by screws F, accuracy being ensured by means of the verniers V. The apparatus is mounted on a tripod stand G, and can be levelled by means of spirit levels H, H', while angles of elevation can be taken by means of the altitude circle I and vernier J, the tube B being set at any required inclination and fixed by the screw K. To find the distance of an object moving at right-angles to the line E, E', the times when the object is in line with (1) E', D, (2) E, D, and (3) E, E', A are accurately noted by a chronometer, and by these the speed and distance can be calculated, but to save trouble tables are prepared from which the ranges and speeds can be read off. To determine the distance of a fixed object, the table L, provided with a series of holes in which sight-pins M can be placed, is employed. This table is revolved at uniform speed by clockwork T; and having adjusted it at a certain distance in

front of E', the time is observed of the transit of one of the pins M across the distant object. This observation is repeated to obtain an average reading and eliminate error as far as possible. The table M is then moved to an equal distance in front of E, and a similar operation performed. The range can be determined from the difference and sum of the times of transit observed from the two points. The details of the apparatus and its method of use may be varied.

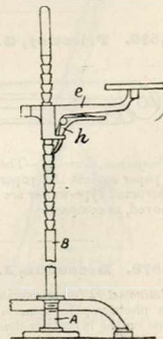
11,257. Deans, J. W., and Foster, A. M. Aug. 3.

Tripod stands for music stands, reading-desks, and the like. The rod *d* is adjusted within the hollow rod *e* by the screw *f*. Upon the rod *e* slide two collars *m, r*, of which the collar *m* may be adjusted by a screw &c. The legs *i* are jointed to lugs on the collar *m* and are connected by three pairs of links *o* to the collar *r*. The links are square at their inner ends, so that they can only turn to a certain extent with regard to the collar *r*.

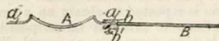


11,360. Pear-sall, W. B., and Watts, A. J. Aug. 7.

Stands.—Relates to an adjustable stand for use as a dentist's bracket stand, as a reading-desk support, easel, &c. A tripod base A supports a ratchet to toothed stem B, on which is adjusted a bracket *e*, capable of rotation, by a spring catch *h*.

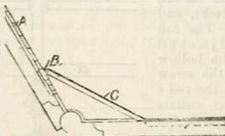


11,380. Mackenzie, C. Aug. 7.



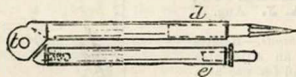
Spectacles.—Consists in making the bridge removable so that it can be renewed in case of breakage, or so that the spectacles may be made to fit, or be taken to pieces for packing. The Figure shows one method of attachment; the bridge A extends at a into a socket b on the bows B, and is secured by a screw b'. The method of attachment may be modified in many ways.

11,429. Parkinson, J., Faucett, S., and Parkinson, C. F. Aug. 8.



Squares; angle-measuring instruments; clinometers; levels.—Relates to means for enabling rules, T-squares, levels, and set-squares to be accurately set for indicating angles. The Figure shows the invention as applied to a rule. The two arms are connected by a bar C pivoted to one arm, and to a carriage B working over a slide A on the other arm, so that the two arms may be set at any required angle. A similar arrangement is applicable as a set-square, and may be made applicable as a clinometer or level by mounting a spirit tube on one of the arms. When applied to a T-square, the head is pivoted and connection made in the same way between the head and blade.

11,539. Priestley, G. F. Aug. 10.

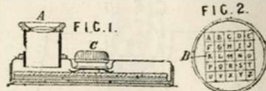


Compasses, drawing.—The guide-rods which hold the paper against the paper roller of a specially-constructed type-writer are adapted to serve, when removed, as compasses.

11,578. Decoudun, J. Aug. 10.

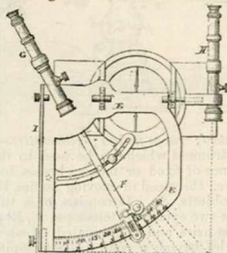
Actinometers for measuring the intensity of light in a photographic camera. Relates to improvements on the invention described in Specification

No. 13,332, A.D. 1887, and consists of applying a lens A, Fig. 1, so that the eye may be applied close to the instrument instead of being placed at a distance of about 10 inches. C is the milled head



for bringing the gradually-darkening luminous points before the eye-piece. A further modification consists in substituting a fixed plate B, Fig. 2, with reference letters or numbers cut through it for the rotary disc. The varying-translucent material is placed at the back and the whole mounted in a tube with eye-piece and lens. This tube is held before the focussing-screen and the time of exposure estimated by the least visible letter, some of the letters being entirely obscured. The lens and eye-piece are adjustable for focussing, and removable for use as an ordinary focussing eye-piece.

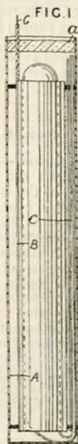
11,725. Faucette, J. B., and Fletcher, H. L. Aug. 14.



Telemeters.—A quadrant E with altazimuth motions carries a fixed tangent telescope H and a pivoted radial telescope G. The arc E is graduated from the tangent at right-angles to the tangent telescope H. The telescope G has a reading-arm F with tangent and clamping screw. The two telescopes are directed upon the same object, and the quadrant reading is taken. The length between the telescope forms the base, and the distance required is given by the quotient of the base squared by the reading. With elevated objects the inclination of the quadrant is also read on a vertical semicircle I. The tangent telescope of one instrument and the radial one of another may be used with the distance between them as base.

11,809. Maurice, A. H., Carr, L., and Owen, D. Aug. 16.

Gravity, measuring force of; altitudes, linear, measuring; weather indicators.—Relates to an apparatus for measuring electric potential, more particularly that of the earth and atmosphere, applicable also for measuring the attractive force of gravity, the height of mountains, &c., and as a barometer. The action of the device depends upon the fact that when a dielectric is polarized by the inductive action of an electrified body it increases in volume, or, if enclosed, causes an increase of pressure proportional to the rise of potential of the electrified body. The Figure shows one form of the apparatus. A cylindrical glass vessel A, closed at the top by a disc *a* and filled with dry air, contains a metal cylinder B provided with

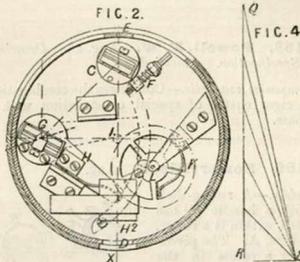


a pointed discharging-wire G; a pressure gauge is formed by a U tube one limb of which is of large sectional area and is placed inside the metal cylinder, while the narrow limb *c* is placed outside the cylinder, is open at the upper end, and is partly filled with glycerine. Any electrified body acting in such a way as to vary the potential of the outside of the containing-vessel will result in an alteration in the degree of polarization of the enclosed air and an increase or diminution of pressure, which will be indicated by the gauge. In modifications, two vessels may be partly filled with a liquid dielectric and partly with air, the open ends of a U tube dipping into the liquid; the two vessels may be suspended from a beam the movements of which are automatically recorded on a chart &c. As the earth's potential at any given place varies directly with the attraction of gravity, the electrometer affords a means of measuring the latter. As the potential diminishes with the diminution of the force of gravity, a measurement of the potential will afford an indication of the height. A rise of the earth's potential is followed by meteorological changes and usually by a fall of the barometer.

11,856. Farquharson, W. Aug. 16.

Range-finders.—An object can be observed directly through the sights D, E, Fig. 2, along the line X, or by reflection at the mirrors C, G, the former of which has a fine adjustment screw F for setting it accurately at 45° with the line X. The mirror G is pivoted on a central axis, and can be

revolved by the arm H, from the position shown in the Figure to that indicated by the dotted line. The range of observation by reflection is thus any angle up to 90° . On the top of the casing is a



scale and index, the latter mounted on a central axis geared through the pinion I, wheel K, pinion L, and sector H', carried by the arm H to the mirror G, this multiple gearing necessitating a large movement of the index for a slight rotation of the mirror. Fig. 4 shows the method of using the instrument. The distant point Q is observed directly from the point R, and a point S, on the line R, S, at right-angles to S, Q, by reflection. The distance R, S is known, say 25 yards, and the instrument is next moved to S, and R sighted directly. The index is then rotated over the scale until the distant object Q becomes visible by reflection, when the range may be read off on the scale. The scale is graduated empirically in multiples of the base. In a modification, an ordinary optical square may be employed in place of the mirrors, and the index geared with the sights, which are arranged to revolve.

11,869. Twigg, G. H. Aug. 17.

Compasses, drawing; scales.—Relates to combined compasses, pen and pencil holders, and scales. A tube *a* is arranged to receive a pen-carrier *e* at one end and a lead carrier *b* at the other; the latter may also be provided with an eraser *c*. A sleeve *h* slides on the tube *a*, and carries the compass leg *i*, which is connected to the slide by bulging outwardly the metal into eyelets which are passed through holes in the forked end *p* of the leg and riveted or



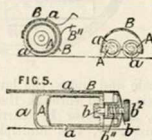
closed over. The leg is impressed with an inch and millimetre scale. A sheath, the blank of which is shown in Fig. 7, is provided to enclose the ends of the leg and pen or pencil.

12,153. Powell, F. W. Aug. 23. *Drawings to Specification. Amended.*

Compasses, magnetic.—Comprises the combination of a cigar cutter of special construction with a compass.

12,186. Somerville, J. Aug. 23.

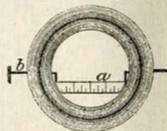
Rules.—A ruling-shell B with a handle B¹¹ has pivoted within it a roller, or rollers, A. The pivots b enter a recess in the roller, and may be fixed or screwed into the ends of the shell, or they may be arranged as shown in Fig. 5; in this case a spring b¹¹ keeps the pivot in place except when it is desired to remove the roller; the pivots can then be drawn back by the



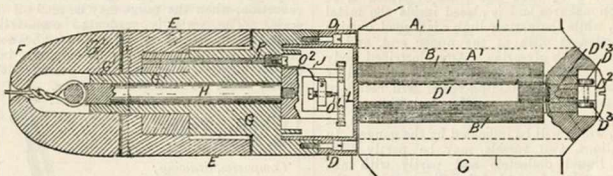
head b². In another form, the pivots are formed on the roller and held in slotted bearings in the shell by cross-pins. The roller A is covered with a layer of india-rubber a or the like, or by a roll of blotting-paper; it may be of wood or tubular metal, and in the latter case may be slit longitudinally and expanded by conical blocks so as to tighten the surrounding sheath.

12,222. Son, C. R. van. Aug. 24.

Range-finders.—A scale a, which can be turned out of the way by the button b when not required, is fitted behind or before (preferably the former) the object-glass of a telescope or opera or field glass. The scale is marked so that the distance of objects of known size can be determined when the glass is held at a known distance from the eye, by observing their apparent size on the scale. The strap by which the glass is carried is made of such a length that by holding the glass as far as possible from the eye the right distance for observation is attained.



12,242. Granville, W. P. Aug. 24.

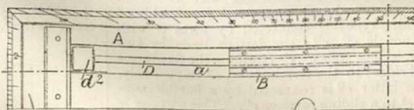


Logs.—Consists in the employment of an uninsulated metallic tow-line with an electric log, which should be of the type in which a revolving head rotates a magnet and produces alternating currents in a coil of wire for actuating the recorder. When existing logs are employed they must be modified (1) to reduce the resistance in the indicator and coil, and (2) to prevent or render harmless a permanent current between the wire and the sides of the ship by connecting them to plates of the same metal as the wire and ship's side respectively, the plates being in a box filled with sea water, situated between the ship's side and the recorder; or by connecting the wire to the ship's side and introducing a condenser of large capacity; or by connecting the terminals of the primary circuit of an induction coil to the ship's side and the wire, the recorder being in the secondary circuit. All the parts of the log exposed to the sea water must be of the same metal as the tow-line, or of some material that will not cause a current. The Figure shows a specially-constructed log. The battery is formed by a zinc cylinder E, the sea water, and the side of the ship. E is connected by a brass rod P and wire O² with a contact-point O¹, and the circuit is made and broken by the vibrations of an armature L, through the bracket J, the rod H, and the tow-line, the two latter being preferably of silicium bronze. The armature L is contained in a water-tight box fixed into a vulcanite body G with an attached tube G¹, also of vulcanite; the cover D has a brass rod D¹ attached, which forms a bearing for the rotating part A furnished with screw blades C. The part A is a vulcanite cylinder surrounding a tube A¹ of metal, and carries a horse-shoe magnet B, B by which the vibrations of the armature L are caused; it is secured by a pin D² with friction rollers D³, D³. The fore-part of the log is covered by a vulcanite cap F.

12,296. Lilley, G. C. Aug. 25.

Protractors.—The protractor is specially applicable to laying off the course of a ship upon a chart, and is constructed so that it can be moved in the direction of its length without lateral displacement and *vice versa*.

The protractor A has a long slot *a*, in which works a slide B, flush with the lower side of the body; this, when pressed firmly against the chart or other surface, allows of the protractor being moved in the direction of its length. When a lateral movement is also required, a spindle D is provided, fitted with rollers *d*², (one only shown), as in a common form of parallel ruler.

**12,798. Vigil, P., and Revueltas, J. N.**

Sept. 4.

Sounding-apparatus.—

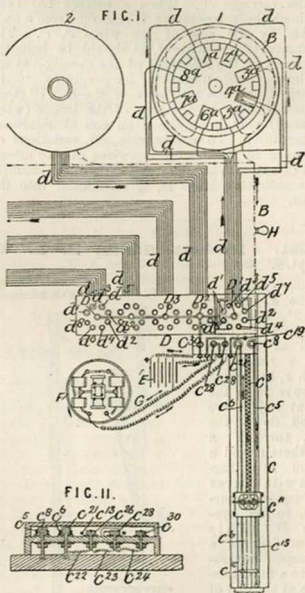
A vessel A with a conical cap D is fitted with a tube B of insulating-material and rendered heavy by shot *j*. Caps of conducting-material *d*, *d*¹ are fitted at either end of the tube, which is about half filled with mercury *e*, and the caps *d*, *d*¹ connected to conducting-wires *m*, *n* of the cable C. The various parts are properly supported and packed. This instrument is trailed below the ship, and on striking the bottom tilts on to its side, when the mercury electrically connecting the caps *d*, *d*¹ completes circuit for a battery on board ship, and a bell or like device is sounded.



which can be connected when desired with a mercury cup D¹ (or the corresponding cup of another group) by a U-shaped wire. D¹ is connected to the binding-screw *c*³⁰, and then to the positive

13,005. Grindley, W. H., and Hensley, W. S. Sept. 8.

Pyrometers.—The apparatus is on the principle of the Wheatstone bridge, and is adapted for determining the high temperature of ovens and the like. For this purpose coils of platinum or like metal are wound between the threads of a screw formed of earthenware or similar insulating-material, and then covered with a coating of clay, which is afterwards baked; the coating, resting on the threads of the screw, leaves room for expansion, but prevents the coils from touching one another and so short-circuiting. Fig. 1 shows part of the apparatus for determining the temperature in fire-ovens 1, 2, A number (say 8) of the above-mentioned coils 1^a, 2^a, 8^a are placed at different points of the oven, and each coil is connected by wires B, *d* with the switch-board D and Wheatstone bridge C. The wires *d* lead to mercury cups *d*¹, *d*⁸, any one of

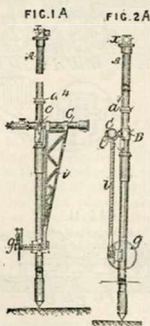


pole of the battery E. The negative pole of the battery leads to the binding-screw *c*²⁸. Fig. 11, and thence through a resistance coil *c*²² to the screw C²¹. The bridge-wires *c*⁸, *c*⁶ are connected at their ends by a pice *c*¹⁰ of practically no resistance, and their other

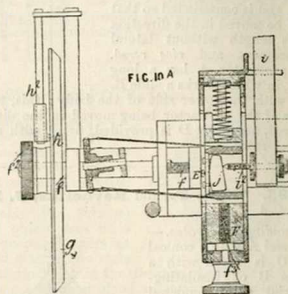
ends are attached to the screws c^{21} , c^8 respectively, c^8 being the screw to which the wire B is connected. A delicate galvanometer F (preferably of a reflecting-type) is connected by wires G with the terminals c^{25} , c^{19} ; the former leads by two equal resistance coils c^{23} , c^{24} (forming the fixed arms of the bridge) to the terminals c^{26} , c^{20} respectively, and the latter c^{19} is connected by a flexible conductor c^2 to a sliding carriage c^{11} . This carriage is provided at both sides with spring contact-pieces, either of which can be pressed down upon the wires c^5 , c^6 respectively; the wires c^5 , c^6 are of different thickness, and so of different resistance, to give a greater range of temperatures. The fixed arms of the bridge being the equal coils c^{23} , c^{24} , the adjustable arms are (1) from c^{20} through D^2 , D^1 , d^1 to the oven coil I^1 along B and c^5 (or c^6 and c^5) to the point of contact of c^5 or c^6 with the carriage, and (2) from this point of contact to c^{21} through the resistance coil c^{22} to c^{26} . The cross-circuit for the galvanometer passes from c^{25} through the galvanometer to c^{19} , and by the flexible wire c^2 to the carriage c^{11} . When a balance has been obtained the temperature is read off from a scale marked by the side of the wires c^5 , c^6 . The resistance of the wires c^5 , c^6 should be half the difference of the resistance of the oven coil at the maximum and minimum temperatures to be measured, and the resistance of the coil c^{22} equal to the resistance of the arm of the bridge (when balanced) containing the oven coil at minimum temperature. To compensate for variations of resistance in the connecting-wires due to alterations of external temperature, carbon, for example an incandescent lamp H, is introduced into the circuit.

13,021. Haskett - Smith, E. L. W.
Sept. 8.

Range finders.—A tube A, Figs. 1^A and 2^A, telescopic if required, is provided at the top with a reflecting-prism x , by which the rays from the distant object are turned down the tube, through a lens therein and a second reflecting-prism with convex and concave surfaces, to an eyepiece B. This system forms a telescope equivalent to a fixed telescope at the end of the tube A, and at right-angles thereto. A second telescope C, movable on pivots at c , is provided for taking the angle of inclination of lines drawn to the distant object from the extremities of the base. The two telescopes are placed side



by side, so that they can be used simultaneously like a binocular, and when the two images coincide the range may be at once read off on the adjustment devices. The tube A is provided with a

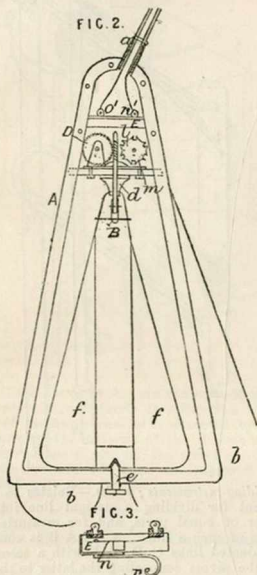


collar a^1 , having holes for bayonet points, so that it may be supported by rifles. The tubular masts of ships may, in some cases, be employed as base. Fig. 10^A shows adjusting-mechanism. The rod or girder i , by which the telescope C is adjusted, is under the control of a coarse and fine adjustment, consisting of two slides E and F placed at right-angles. The screw f , turned by the head f^2 , traverses the part F bodily to the right, and the projection f^1 , pressing against the piece J, moves the girder and roughly adjusts the telescope; the movement of the screw f is indicated by a pointer h , on a guide h^1 , working in a graduated spiral groove in the face of a disc g . Other equivalent means may be substituted. The fine adjustment is effected by turning the screw f^3 , and so traversing the slide F, the piece J moving the projection f^1 slowly to the right by its inclined surface. As the inclination of the surface J should vary, according to the distance indicated by the rough adjustment, it is mounted in a pivoted frame and adjusted automatically during the movement of the slide, by a cam arrangement not shown. In some cases the fine adjustment may be dispensed with.

13,176. Goulson, J. Sept. 12.

Logs.—The rotator B, Fig. 2, with vanes f is mounted in bearings d , e (the latter adjustable) in a frame A provided with fins b , b and an inclined neck a , through which electric conductors pass into the cable. The wires are fixed to studs n^1 , n^1 on the top of a water-tight box E, Fig. 3, having a flexible diaphragm connected with a lever r and a circuit-closing device n . The rotator drives the worm l , and so the wheel D, on the spindle of which is a one-toothed wheel for driving the star-wheel l intermittently. The stud m is brought at each revolution against the lever r , and completes circuit for an electric indicator. In a modified

form, the rotator may be mounted in a tube close to the vessel's side and open at either end to the water, stop-cocks being provided at the ends. The

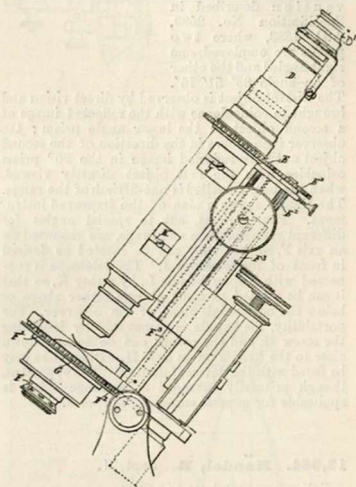


central part of the tube which carries the rotator is fixed in place by screw couplings. Either a mechanical or electrical indicator, or both, may be used in this case.

13,258. Swift, J. Sept. 13.

Microscopes.—Relates to petrological and other microscopes, and consists in means for revolving together the polarizing and analysing prisms. The tube *D*¹, carrying the analysing-prism, which is capable of independent rotation, is pivoted to the tube *D* on which is the toothed wheel *E* gearing with a wheel *E*¹ on a spindle *E*² of pinion wire. Below the stage is the polarizing-prism *F*, to which is attached a toothed wheel *F*¹ gearing with a wheel *F*² on a sleeve *F*³. The sleeve *F*³ is recessed so as to fit the pinion wire and be capable of sliding thereon. In this way the prisms must rotate together, while the longitudinal movement for focal adjustment is not interfered with. The following devices are also mentioned in the Specification. (1) A goniometer scale *G* and cross lines

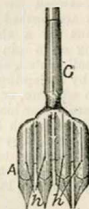
in the eye-piece for measuring the angles of crystals. (2) A slide *J* with lens and diaphragm of small aperture for showing optical pictures in minute



crystals. (3) A slide *K* with double convex lens for showing the optic rings round the axis of crystals. (4) A lens fitted to slide near the achromatic condenser for increasing the angle of the condenser.

13,310. Wood, J. Sept. 14.

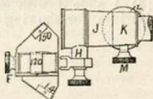
Ruling-pens.—The pen is designed for ruling parallel lines, such as those required for cash columns &c. A multiple holder *A* is provided to receive a series of nibs, which are of different shapes, according to the distance required between the lines. The nibs have small pins *h* sliding in slits in the holder, so that they may be interchanged or pushed upwards out of use. A broad nib may be used when a single dark line among finer ones is desired. The holder *A* may be formed with a barrel to fit over the stick of a penholder, or it may be arranged to fit the shank *C* of a penholder like an ordinary slip pen,



13,398. **Weldon, F.** Sept. 17.

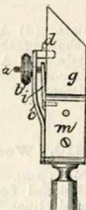
Telemeters.—Relates to improvements on the invention described in Specification No. 2589, A.D. 1883, where two prisms are employed, one right-angled and the other of an angle $88^{\circ} 51' 15''$.

The distant object is observed by direct vision and brought to coincidence with the reflected image of a second object in the lesser angle prism; the observer then moves in the direction of the second object until its reflected image in the 90° prism coincides with the first object directly viewed, when the base travelled is one-fiftieth of the range. The Figure shows a plan of the improved instrument. Four prisms, cut to special angles for different ratios of base and range, are mounted on an axis F, so that they can be rotated as desired in front of the telescope J. The telescope is connected with a long handle L, by a ring K, so that it can be rotated to sight objects either above or below the horizontal plane of the observer. For portability, the handle is removable by loosening the screw M, and the prisms can be turned down close to the handle on an axis H. Binoculars may be fitted with the device if desired. The apparatus, though primarily intended as a range-finder, is applicable for general surveying purposes.



13,664. **Händel, R.** Sept. 21.

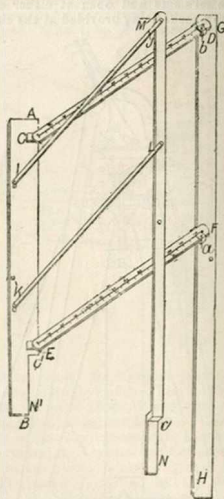
Ruling-pens.—Relates to pens for ruling the five lines of a musical staff, and generally to pens for ruling parallel lines at distances apart, which may be altered within slight limits. A number of ruling-pens *g* are attached side by side to a block *m* which is mounted on a handle. A comb or set of wedges *d* is fixed to a spring *c*, the teeth lying between the pens. The wedges are pushed in between the pens by a thumb-nut *b*, screwing on a pin *a*, attached to a small plate *i*, and are withdrawn by the spring *c*, the effect being to cause the pens to separate, or to approach. The pens themselves are either hinged to the block *m*, or mounted on springs which tend to force them together. When hinged, they require a second comb moving with the former to reduce the distance between them. The comb may also be carried as a slide moving along the handle.



13,868. **Ramsden, J. W.** Sept. 26. *Drawings to Specification.*

Tripod stands.—The legs are in two parts which slide on one another, and are split and held apart by a hinged strut.

13,893. **Reeves, E. A.** Sept. 26.



Dividing-instruments; scales.—Relates to an instrument for dividing a straight line into any number of equal parts, and for measuring any portion of such a line. A bar A B is connected by graduated links C D, E F with a second bar G H, the pivots connecting the latter to the links being swivelling pieces *a*, *b* in which the links can slide. A third bar M N is also connected by equal links I J, K L with A B, and is arranged to double close up over it so that the inside edges lie in the same plane, the part *c*, N fitting into the recess *c'*, N'. To divide a line into any number, say 56 equal parts, the bar G H is set with the swivels *a*, *b*, which act also as indices at the graduations 56 on the two scales, and the bars M N, G H are placed at the extremities of the line. The bar M N is then moved in succession to the graduations 1, 2, 3, and the points at which it cuts the given line are marked with a pencil. To measure the length of a given portion of line, the bars A B, G H are set at the extremities, the indices *a*, *b* being placed at 100. The bar M N is then moved to the end of the given portion, and if it then cuts the links at graduations, say, 64, the portion is $\frac{64}{100}$ of the whole line.

14,171. **Potter, E. T.** Oct. 2.

Magic-lanterns.—Instead of a series of slides, a continuous band D, on which are painted the scenes, or from which are stamped the letters of

an address &c., is drawn by clockwork H or otherwise from a spool K to a spool F between the lens

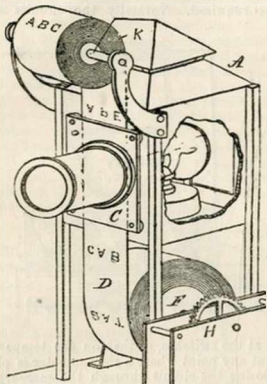
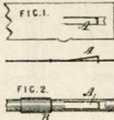


plate C and the body A. An opaque material may be employed for the strip D, where the words or parts of the scenes can be represented by simply stamping out the material of the slide so as to let the light shine direct on the screen; otherwise translucent material, such as prepared paper, collodion, &c., must be used.

14,253. Squire, W., and Beanland, J. R.
Oct. 4.

Compasses, drawing.—

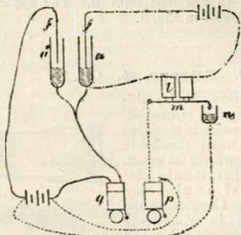
Relates to pencil holders in general, stated to be applicable to compass legs. The pencil is held by means of a spring tongue compressed by a sliding sleeve. The holder is formed by cutting out a blank, Fig. 1, with a tongue A, and bending it round into a tube as shown in Fig. 2. The sliding sleeve B forces the end of the tongue against the pencil, which is inserted in the tube.



14,633. Free, R., and Pierce, H. J.
Oct. 12.

Thermometers.—Alarm thermometers are constructed with two tubes a , a^x , rising from a common bulb (though not so shown) and containing two sliding wires f , f^x , which can be set to meet the mercury at any desired limiting temperatures. Electric connections are made with these wires and another fused through the bulb bottom. When the mercury falls below the minimum wire f ,

the circuit of a relay l is broken so that the armature m drops into contact with a mercury terminal n



and completes the circuit of an alarm p . When the mercury rises to the maximum wire f^x , the circuit of an alarm q is completed.

14,801. Inkpen, G. C. Oct. 15.

Tripod stands.—

A base-plate B, for carrying a camera or surveying-instrument and provided with levelling-screws b or a ball-and-socket joint, is secured by a centre screw d to the handle of a walking-stick H. The ferrule a of the stick screws into a folding tripod, the legs of



FIG. 1.

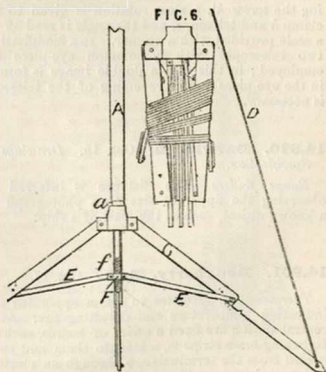


FIG. 6.

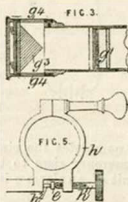
which are distended by rods E attached at their

inner ends to a nut F on the screw *f*. The extremities of the tripod legs are attached by guys D to the base-plate B. The apparatus is shown folded in Fig. 6.

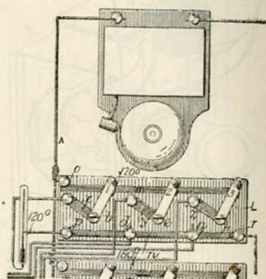
14,818. Kilgour, G. Oct. 15.

Telemeters; levels; altitudes, angular, measuring.

—A telescope is mounted on the usual theodolite head, in which, however, the adjustments for vertical angles are omitted, the telescope resting in Y-bearings placed towards either end and being always horizontal. Fig. 3 shows a section of the end of the telescope; *g*¹ is the object glass, and *g*² a prism for reflecting the rays received through the side windows *g*⁴. Direct vision is also possible through the end of the telescope at the sides of the reflector, but is seldom required. To determine the range of a distant object it is sighted by one reflector and brought accurately to the centre of the field of view. The telescope is then reversed in its bearings and the object sighted by the other reflector, the displacement in the field of view being measured by a micrometer. For measuring the angles of elevation of an object, the telescope is rotated in its bearings to approximately the correct angle, and clamped in the ring *h*, Fig. 5; the reflected image is then brought to the centre of the field of view by the fine adjustment, which consists of the screw *h*¹ and piston-rod *h*², between which an arm *e* of the stand is clamped. On turning the screw *h*¹, a slow rotation is given to the clamp *h* and telescope, and the angle is read off on a scale provided with a vernier. In a modification, two telescopes with a common eye-piece are employed; in this case a double image is formed in the eye-piece and no reversing of the telescope is necessary.

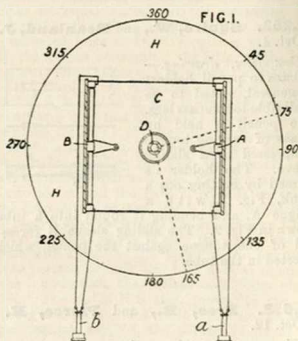


wires to the bulbs of corresponding thermometers, while wires pass from the terminals *p, d, g* and are melted into the glass of the thermometer at any degree required. Normally the circuits are all



closed at the switches, so that on the temperature rising at any point where a thermometer is placed, and closing the circuit through the mercury, the alarm bell will ring. The switches are then opened in order until the bell ceases, when the locality where the rise of temperature has taken place is determined.

14,943. Feltre, C. M. M. de Goyon, Duc de. Oct. 17.



Sounds, locating.—Relates to a topophone or apparatus for determining the direction of origin of sounds and applicable for marine signalling in foggy weather. Two or more microphones *A, B* are arranged in the circuits of telephones *a, b* at the opposite sides of a box *C* mounted on a vertical shaft *D*. The shaft *D* passes into a cabin &c.

14,820. Darwin, L. Oct. 15. *Drawings to Specification.*

Range finders.—The distance is inferred by observing the apparent size on a photograph of a known object, such as the mast of a ship.

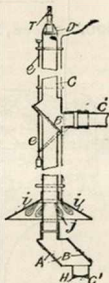
14,901. Dougherty, E. A. Oct. 17.

Thermometers.—Relates to alarm apparatus for indicating temperature and detecting fire. At a central station are fixed a series of boards, such as *L*, having brass strips *m, n* let into them and connected from the terminals *r, o* through an electric bell to a battery. To each board are pivoted at *b, e, h* a series of switches *x 1, y 2, z 3* connected by

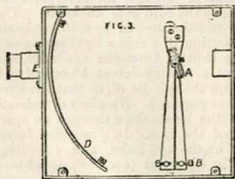
where it works on a footstep bearing above a table provided with a disc divided into degrees. The shaft is rotated by an index-finger turning above the graduated disc. The operation of the apparatus is as follows:—The telephones *a*, *b* are applied to the ears of the person receiving the signal. The box *C* is then rotated until the sounds received in each ear are of equal intensity, in which case the direction of the sound passes through the axis *D* in a plane parallel to the microphones. The direction of the sound is fully determined by turning the box *C* through a right-angle and noting the side from which the sound is greatest. A wind vane may be mounted on the shaft *D*, and the direction of the wind may be indicated on the graduated disc so that the effect of the wind may be taken into account.

15,428. Trapp, E. A. Oct. 26. [Complete Specification but no Letters Patent.]

Reflectors.—The apparatus is intended for observing the various rooms of a building from one room, a sunken vessel from a boat, &c. For the former purpose a main tube *C* is employed having several branch pipes such as *C'*, each of such pipes being provided with a reflector *B*, which can be turned back if desired by the weighted cord *e*, so as not to interfere with the reflected rays from pipes beyond. The end of the tube is fitted with a box having two reflectors *B*, *B* and a lens *H*, preferably double concave, so as to take a large field. If necessary, external mirrors may be employed to direct the rays to the reflectors *B*, *B*. The eyepiece *D* is fitted with a lens or a telescope *T*. A reflector *i* throws the light of illuminating lamps *j*, generally electric, upon the object to be observed when the latter is in a dark place. This arrangement, without the branch pipes, is applicable to observing sunken vessels.



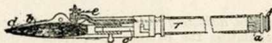
15,472. Watkin, H. S. S., and White, A. W. Oct. 27.



Clinometers.—The elevation of a distant object

is ascertained by the clinometer shown in Fig. 3, which is a modification of that described in Specification No. 217, A.D. 1884. The object is seen from the peep-hole *E* through the opposite aperture, a curved mirror *A* being carried on the pendulum *B* to reflect that part of the graduated curved scale *D* which corresponds to the elevation of the object. The graduations are shown in yards of range, so that the necessary allowance may be readily made when sighting a gun.

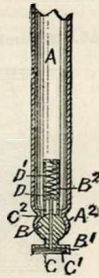
15,505. Harrison, J., and Livsey, J. E. Oct. 27.



Ruling-pens.—A drawing-pen is constructed with either a feeding-reservoir, or with a brush or other capillary substance between the blades, or both of them may be used. Various forms of reservoir are employed with a suitable ink-supply valve, and air valve where necessary, by which the flow may be rendered continuous or intermittent. The blades may also be dispensed with, and the brush used with a guide for ruling, and without the guide for writing. The reservoir again may be formed or placed in the handle, or may be attached by a clip, and it may be rigid or formed of flexible material, so that when twisted the ink is forced out. The Figure shows one form of the reservoir pen with brush. The brush *b* lies between the blades, and is held in position by a pin or peg *d*; it can be pushed forward or drawn back for thick or thin lines by moving its socketed handle on the rod *c*. *r* is the reservoir having the air port *a*, which can be closed by turning the head *f*, and the supply valve *e*. Where a reservoir is not employed the brush may be pivoted to swing out laterally for dipping in the ink.

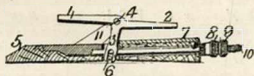
15,664. Smith, T. Oct. 31.

Ruling-pens.—Relates to handles described in reference to glass cutters, but stated to be applicable to ruling-pens. The handle *A* is provided with a socket *A'* for the ball *B* carrying the tube *B'* enclosing a spring *D'*. A piston *D* is pressed by the spring on the rod *C'* passing through the ball *B* and attached to the disc *C'* on which the cutter or diamond *C* is eccentrically mounted. A box or flange *B'* holds the disc *C'*. Or a flat spring may be used to exert pressure on the disc. When the tool is used the pressure of the cutter on the glass never exceeds that of the



indicating-tablets are raised in front of an aperture in the casing. Instead of employing a shutter in the line of sight, a shutter sliding over the lighting window of the case may be substituted. The coin is inserted through a^2 and runs down the sheet c which is pivoted at a^2 and held in normal position by a light spring. During the descent of the coin the shoot tilts slightly and a locking-arm c attached to it is drawn away from under the shutter b which, being free of the tension of the cord b^2 , moves under the influence of its spring or weight so as to bring the slit b^1 into the line of sight. The coin mechanism may be dispensed with.

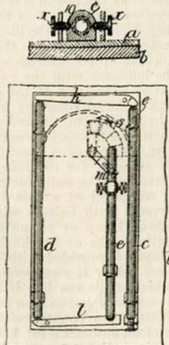
16,432. Lanchester, F. W. Nov. 13.



Rulers; section-lining apparatus.—The instrument is intended for section lining, shading, &c., and consists of a ruling-edge and a guide so connected that they can be moved forward alternately, step by step, by pressing upon opposite ends of a lever, the distance between the lines being regulated by a cam, wedge, or screw device. The Figure shows one form of the instrument, which may be variously modified. 5 is the ruling-edge, to which is fixed a bracket 11, carrying a three-armed lever 1, 2, 3, pivoted at 4. The screw rod 1 is rigidly attached to the ruler 5, and passes freely through the guide 7; at its end is a nut 8 and lock-nut 9 by which the "play" is adjusted. The forked end of the arm 3 engages a projecting pin 6 on the guide 7. By pressing alternately on the arms 1 and 2, the ruler 5 is held fixed and the guide 7 moved along the paper, and *vice versa*. The instrument can be adapted also for ruling radial lines at equal angular distances.

16,457. Brodie, G. G., and Prior, J. D. Nov. 13.

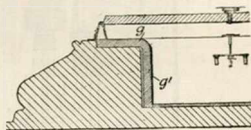
Thermometers for ovens. The changes in length of three bars c , d , e mounted on the oven door are transmitted by magnifying-levers k , l , m to an indicating-sector s , moving behind an aperture.



16,468. Phalp, O. Nov. 13. *Drawings to Specification.*

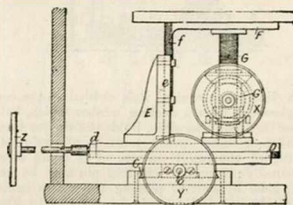
Compasses, magnetic.—A ship's binnacle is fitted with a glass top and can be used as a skylight and ventilator.

16,538. Comitti, L. Nov. 14.



Barometers.—Consists in forming the dial g and the lining g' of an aneroid barometer in one piece of porcelain or pottery.

16,556. Newton, H. C. Nov. 14.

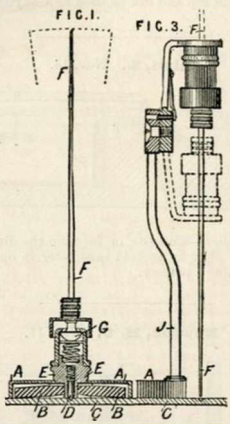


Magic-lanterns; lantern microscopes.—Relates to lamps for magic-lanterns, more particularly for lantern microscopes, and consists in a means of adjusting the lamp (especially when an electric-arc lamp is employed) accurately in the optical centre. For this purpose the lamp is mounted on the table F' carried by a screwed pillar G rigidly attached thereto and guided by the plate f sliding in guides e in the bracket E . The pillar G passes into a nut G' which is rotated by bevel or other gear from a milled head X . The horizontal adjustments along the optical axis and at right-angles thereto are obtained by means of slides D , C actuated similarly to the slide-rests of a lathe by means of milled heads Y , Z on screw spindles c , d . The upper slide D carries the supports of the table F . The invention is also applicable to pendant lamps.

16,663. Reynolds, W. J. Nov. 16.

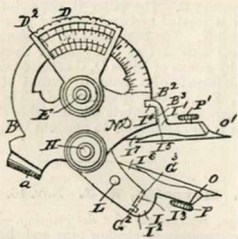
Bearings, instruments for determining.—Relates to the construction of shadow pins and the means of attaching the same or other like devices to the

compass glass. In Fig. 1 the shadow pin F is connected by a spring joint G with a boss E fixed to the ring A. In the boss E works a spring pin D



which clips into a central hole drilled in the compass glass C. B is a suction washer which, being pressed down on the glass, holds the device firmly in position. The spring joint G allows of the yielding of the pin F in case of it being struck accidentally; a similar yielding pin may be fixed to the glass by a screw passing through a central hole of the rim and secured by a nut. In Fig. 3 the shadow pin is shown reversible and supported by the standard J, fixed to the ring A. In this case the ring is attached eccentrically by its suction washer, and the pin F brought over the central hole in the glass.

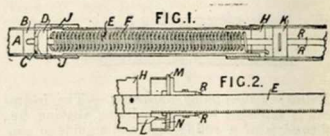
16,695. Green, T. Nov. 16.



Dividers.—A circular plate B, graduated on both

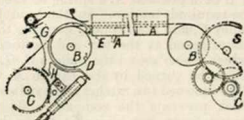
sides, has pivoted at its centre a double quadrant D, having reading-windows D², the edges of which are graduated as verniers. The quadrant gears on the front side with a toothed sector pivoted at the bottom of the plate B. Screws E, H pass through the pivots and carry clamping-screws. Legs I, I' carrying points O, O', adjustable by screws P, P', are secured to the toothed sector and plate B respectively, by screws L, N. The joints are made rigid by spurs I², I', bevels G², P, B², I², and pegs and notches G², P, I², B².

16,720. Cooper, A. J., and Wigzell, E. E. Nov. 17.



Sounding-apparatus.—The instrument, which is of cylindrical shape, is fitted into an outer cylindrical case, having a water buffer or spring, or both, to deaden the shock on striking the bottom; it is fixed in the casing by means of a swivelling loop on the latter taking into the slotted end of the former. A long square rod E is fixed at one end to the piston D, B, with a saucer-shaped dermatine washer C between by which a tight joint is effected. The water entering through holes J forces the piston down the tube A, according to the pressure against the action of the spring F. On the rod E, on which are cut fine rack teeth, slides the indicator K, the details of which are shown in Fig. 2. A sliding part M, N, through which the rod passes, is normally forced upwards by a spring, so as to come into the teeth of the rack. As the piston is being pushed down by the pressure the part N is brought against a wedge-shaped piece L on the block H and the grip of the indicator released. As the pressure diminishes, on drawing up the instrument, the springs R, R carry the indicator with the rod, and when free of the wedge L, the grip of the piece M, N prevents any jerk from altering the position of the indicator. The position of the indicator after the sounding shows the pressure through a graduated slit in the case. By pressing down the part M the grip may be released for returning the indicator to zero. Details of the indicator may be varied. The line is composed of a thin core of hemp or cotton, covered with twisted wire strands, over which is woven hemp or cotton threads in a solution of gutta-percha or Stockholm tar. The winch employed is provided with brake gear, and the fairlead pulley is swung on a counterweighted lever which, while the line is running out, swings over to one side, but as soon as the sounder touches the bottom the counterweight pulls the lever down and an automatic catch holds it in this position, giving a signal for applying the brake.

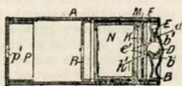
16,785. Adams, W. P. Nov. 19.



Magic-lanterns, slides for. Consists in constructing slides of flexible and transparent substance, such as gelatine, algin compounds, or celluloid, in square form or in strips. The strips prepared by photography may be wound from one roller to another on either side of the lantern stage, either by hand or mechanically. The Figure shows apparatus on the latter principle. The strip passes from the roller C over B and through a frame A in front of the objectives to the rollers B and C¹; the latter is driven by a spring barrel S. One revolution of the rollers corresponds to the length of a picture, and at each revolution of B the catch E on the lever G falls into a notch D and the teeth H into the teeth of the wheel C, thus locking the picture in position. A pneumatic device worked by squeezing an india-rubber ball frees the detent G and allows the slide to change, too rapid movement being prevented by a brake.

16,992. Rac, C. S. Nov. 22.

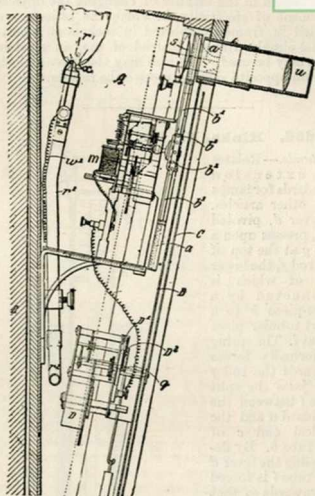
Microscopes.—In simple microscopes, a single spherical lens D is employed, which is held by the edges *b*, *b*¹ of a circular aperture in a cap B, and the edges *e*¹ of a similar aperture in a metal plate E, pushed down within the cap B. A projecting wire fills up the hole formed in the lens during manufacture and serves to steady it. A glass plate F, carrying the object, is next pushed down the cap against the lens, or two glass plates F and M, separated by a distance-piece K, having an aperture *b*¹, serving as a live-box, are used. The parts are then held in position by the tube N. The cap B, with its fittings, is placed in a (preferably square) body A having a cap P, with square aperture *p*¹, to act as a concentrator of light. Additional concentrators, such as R, may be introduced. The details of the apparatus may be somewhat varied.



17,007. Hook, H. Nov. 22. Drawings to Specification.

Kaleidoscopes.—Relates to apparatus for exhibiting moving figures, kaleidoscopes, and the like, which can be operated by the user after he has introduced a coin into the machine. The invention is described in connection with a dancing figure; but it is stated to be applicable also to kaleidoscopic apparatus.

17,326. Armstrong, A. W. Nov. 25.

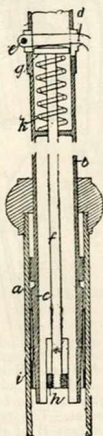


Magic-lanterns.—Relates to means for displaying pictorial and other advertisements in dark places or at night, and also for indicating the departure &c. of trains. The representation *a* is thrown on the clock face B of the case A, or on any other suitable surface, by means of a magic-lantern lens *u* in combination with a reflector, the light from the flame *r* being condensed on the object by a lens *s*. The objects *a* are changed automatically, being preferably mounted on radial arms *b*¹ on a shaft C, actuated by clockwork. The shaft C is arrested by a detent pinion in connection with the armature of the electromagnet *m*, and the shaft will be released to change an object each time the circuit of the electromagnet is made. The circuit is made at intervals by clockwork D, on the escapement pinion D¹ of which are a number of studs D² for making connection with the spring contact *g*. The frequency with which the objects are changed will thus depend on the number of projections on the pinion. The gas, which ascends by the pipe *r*², is automatically lighted by means of an ordinary electric lighter *x*, connected with an electromagnet by the wires *w*², the wires being in connection with the gas plug or valve, so that contact is made when the valve is opened. The circuit of the electromagnet *m* is also in connection with the valve, so that the objects will not be changed until the apparatus is lighted. A method is described for automatically extinguishing the light. The gas plug or valve is actuated by a spring which closes the valve, when an electrically and clock-controlled pawl engaging with a ratchet pinion on

the plug is withdrawn. A modification is described with regard to the manner of changing the objects by means of electricity, in which the objects are carried in frames supported in sockets on a horizontal circular frame. Instead of gas, an electric light may be used. The case may also have a clock face on opposite sides to receive the images.

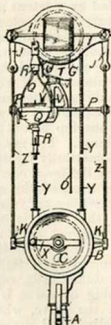
17,656. Hinks, J. Dec. 4.

Stands.—Relates to extension standards for lamps and other articles. A lever *d*, pivoted at *e*, presses upon a disc *g* at the top of the rod *f*, the lower end of which is connected by a cross-piece *h* to a short tubular piece slit at *i*. The spring *k* normally forces upwards the rod *f* and jams the split tube *i* between the standard *a* and the conical end *c* of the tube *b*. By depressing the lever *d* the tube *i* is forced downwards so that the tube *b* may be raised or lowered. The cone *c* may be situated on the end of the rod *f*, a split tube or expansible wires being formed on, or attached to, the lower end of the tube *b*.



17,711. Reynolds, W. J. Dec. 4.

Compasses, magnetic.—Relates to means for conveying a test compass to a place out of the magnetic influence of the ship, and then clamping its card in position for comparison with the ordinary compass. The Figure shows an arrangement for raising the test compass to a height above the deck. A pulley *G* is mounted in a frame *I*, supported from a cross-ropes between two masts; the arms *J* on the frame *I* are connected to ropes *Z*, which act as guides to the compass, and which



are fastened at their lower ends to eyes *K* on the head *B* of a pedestal *A*. A spring in the latter giving the required tension. In the head *B* is a second pulley *C*, and the frame *Q* carrying the test compass is attached at the top and bottom to a rope *Y*, which passes round the top and bottom to a pulley *C*, and is frictionally connected to a ratchet and pawl arrangement, which prevents the compass when raised from running down, but allows it to be hauled down by exerting sufficient force on the handle to overcome the friction. Rollers *P*, *P* embracing the guide-ropes steady the movement of the compass frame; shocks are prevented by spring buffers *R*, *R*, and violent oscillations by a flywheel device connected with the gimbals or by a bar on the compass working in liquid. When raised to its highest point, the lever *T* on the compass frame engages a spring catch *U*; time is then allowed for the card to get steady, and the cord *O* is pulled, setting free a spring device *V* and special clamp, which grips the card and holds it in position until the compass is again lowered. In a modification, the compass frame may be run down a rope passing over the stern of the vessel, and having a winged float at its end.

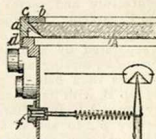
17,854. Lake, H. H., [Vermelren, N.]. Dec. 6.

Rulers.—A thin rectangular strip *M*, of porcelain, metal, or other suitable material, is fixed between two narrower strips *H*, *H* of wood, so that the projecting parts can be used as the ruling-edge, without danger of blotting the paper.



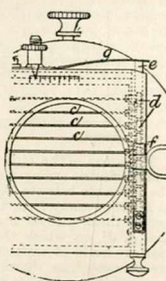
18,019. Lilley, G. C. Dec. 10.

Compasses, magnetic.—Relates to spirit or liquid compasses. The glass *A* has a bevelled edge, and is secured by a ring made in two portions *b*, *c* which can be attached to or removed from the compass bowl at *d* by screwing or otherwise, without disturbing the setting of the glass. The annular space *a*, which is invisible from outside the compass, is thus provided, and any air-bubbles in the liquid rise into this and cannot be seen. The rubber packing at *d*, when such is used, being out of contact with the liquid, does not discolour it. To allow of the bowl being entirely filled with liquid without fear of bursting from expansion, a spring relief valve *f* is employed.



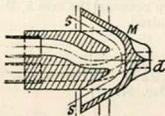
- 18,150. **Tourtin, E., and Parsy, L.** Dec. 12.

Magic - lanterns.—Relates to instantaneous shutters for photographic cameras, magic - lanterns, and projecting apparatus. The shutter, which may be in front, behind, or between the lenses, is of the venetian-blind type, the laths *c* being pivoted to the frame of the camera &c. On the pivots at one side are mounted pinions *d* which engage with a rack *e*. The rack is actuated to revolve the laths by an adjustable spring *g* when the spring catch *f*, which secures the rack, is disengaged by a pneumatic &c. arrangement.



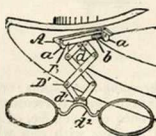
- 18,324. **Heys, W. E., [Schaeffer & Budenberg].** Dec. 15.

Logs.—Two tubes *d*, *s* leading from air chambers in the vessel end in a mouthpiece *M* under the bow, the tube *d* opening forwards, and the tube *s* backwards. The motion of the vessel through the water increases the pressure in one air vessel, and reduces it in the other. The speed is consequently shown by diaphragm gauges, having tubes from the air vessels opening on opposite sides of the diaphragm. The air vessels are placed below the water-line to prevent the possible withdrawal of the water within them when in a rough sea.

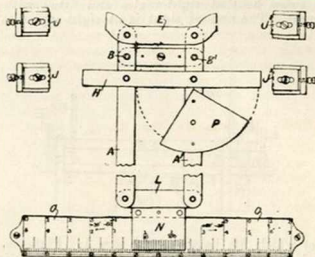


- 18,404. **Brownlow, W. H., and Warner, J. S.** Dec. 17.

Spectacles and eyeglasses, attaching to hats. A lug *d'* on the nose-piece *d''* of the eyeglasses or spectacles is connected by lazy-tongs *D'* to a lug *d* attached to a spindle *B*, mounted in lugs *a* fixed to or cast on a plate *A* attached to the underside of the brim or front part of the head gear. A coiled spring *b* holds the glasses at any desired point.

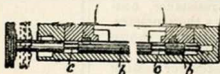


- 18,438. **Lancaster, E. B.** Dec. 18.



Angle-measuring instruments.—Relates to a micrometer gauge with angle-measuring devices. Two bars *A*, *A'* swivelling about pins *B*, *B'* are connected, as shown, by parallel links *E*, *H*, *L*, the last of which is ten times further from the pins than the other two. This link also carries a vernier *N* which travels over a scale *O*. An object to be measured is nipped between the ends of the links and two pairs of fixed blocks *J*, *J'*. A ten times magnified reading is given on the scale. For measuring angles, a quadrant *P* is fixed to the bar *A'*. The bars are turned till the link *H* and one radial edge of the quadrant lie on the faces of which the inclination is to be measured. The reading on the scale gives the sine of the angle through which the bars have been turned.

- 18,542. **Perken, E., Perken, F. L., and Rayment, A., [trading as Perken, Son, & Rayment], and North, C. G.** Dec. 19.

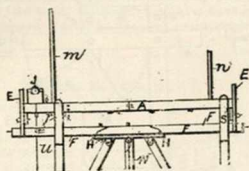


Microscopes.—Relates to focussing-apparatus for cameras which is stated to be applicable for microscopes. The rack pinion *b* has reduced portions *c* by which the pinion can be thrown in or out of gear on sliding the same longitudinally. The recessed portion or portions may be so arranged that the rack of one slide may be in gear while that of another is out of gear.

- 18,553. **Benson, C. A.** Dec. 19.

Telemeters.—Two parallel bars *A* turn together on trunnions in a fork *E*, *F*, having azimuthal motion on a tripod top *H*. At one end of these

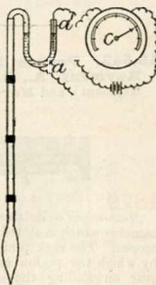
bars a telescope J is mounted on a vertical axis. A binocular telescope is provided which has one of its tubes bent at right-angles and fitted with a mirror. The line of sight is at right-angles to a



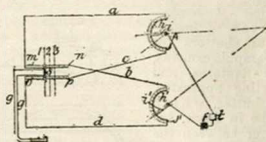
keel which fits between the bars A. Plates m, n marked with lines are carried by blocks sliding between the bars, and rods r, s are suspended from them. Plumb lines u, w hang from the two telescopes, the line w registering with a graduation on the bars A. Both telescopes are directed on an object the distance of which is measured, and the telescope J is clamped. Other distances are measured by similar triangles, and a tape measures the base line. The observer sights first with the clamped telescope, then moves a flank, till, at the same time, the lines on the plates m, n coincide with cross-wires in the bent tube, and the object coincides with a wire in the unbent tube.

18,752. Lorrain, J. G. Dec. 22.

[Thermometers.—Relates to means for indicating readings at a distance. An electric circuit includes a galvanometer, graduated for temperature as well as for electric units if desired, and a varying resistance, controlled by a thermometer. The invention is shown as applied to an air thermometer for testing grain. A change of volume of air alters the level of mercury in the U tube a , and so the length of a high-resistance wire a^1 ; the needle of the galvanometer C is thus more or less deflected. Greater sensitiveness is obtained by coiling the wire a^1 . In other forms, a mercury thermometer may be employed, or a Bourdon pressure chamber, a piston at the top of which presses together, with varying force, a series of carbon discs, included in the galvanometer circuit.

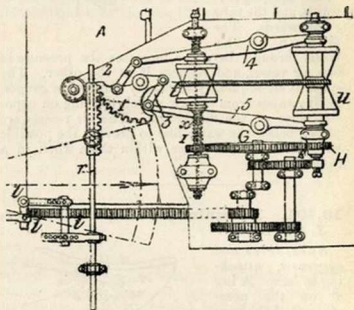


18,815. Lake, H. H., [Fiske, B. A.]. Dec. 24.



Telemeters.—The object is sighted from a base, and an electric arrangement is used to determine the difference between the angles, or the distance, at a station away from the sighting-points, or at one of them, without consulting the other. The arcs J, J' on which the sighting-telescopes i, i^1 turn are made of suitable electric resistance, and are connected, as shown, by wires a, b, c, d , with two parallel resistance bars m, n and o, p , along which, by a slider s , the terminals of a telephone wire g can be moved. A Wheatstone bridge is thus formed for the circuit of an electric battery f containing a contact-breaker t . The resistance ratios in the arms of the bridge depend on the arc readings h, h^1 of the telescopes and the position of the slider s on the bars. The slider is shifted from the centre of the bars till no sound is heard at the telephone, when the reading gives either the difference between the arcs h, h^1 or the actual distance required.

18,912. Villepigue, A. E. D. F. de. Dec. 27.



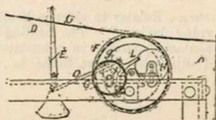
Surveying-instruments; clinometers.—The apparatus is designed to record graphically the gradients, difference of level, &c. of the ground, and consists of a carriage with one wheel, provided at either end with shafts so that it can be carried along by two men. The wheel runs on the ground, and is geared with a drum round which the diagram paper is stretched. A fixed pencil presses on the drum and draws a horizontal line, while the pencil for

tracing the diagram is mounted on a bracket carried at the end of the screw x . A pendulum is connected by adjustable links and lever l , l with a rack-bar r gearing with the toothed sector 1. With this sector the levers 4, 5, by which the relative size of two expansible pulleys t , u is regulated, are connected by links 2, 3. The pulley t communicates motion to the screw x which passes through a nut in the pinion I. Both the pinion I and the equal pinion H, driving the pulley u ,

receive motion from the wheel G, which is geared to the diagram drum. It follows that the screw x will be the recipient of a differential movement, which, so long as the carriage travels horizontally, viz., when the pulleys t , u are of equal circumference, produces no vertical displacement of the screw; when, however, the carriage passes on to an incline the pendulum will move the rack r , and, altering the relative size of the pulleys, cause the screw x and diagram pencil to rise or fall.

18,924. **Murphy, P. J.** Dec. 28.

Logs; sounding-apparatus.—The log line C is paid off from a drum on the left over a swing fork E and round a pulley F. The fork E is connected by a link O to a pawl L and pivoted arm X. The pawl normally engages a notch in a spring time-barrel H. The arm X carries a rubber-covered wheel G geared to a recorder. As the line starts running off, a ball D deflects the fork E, so that the pawl L is pulled away from the time-barrel H, and the wheel G is pushed into contact with the rotating spindle of the pulley F. The recorder is driven till the time-barrel has completed a revolution, when the pawl L re-enters the notch. The recorder is graduated to read in knots per hour. The time-barrel is put out of gear for use in sounding.



contact with the rotating spindle of the pulley F. The recorder is driven till the time-barrel has completed a revolution, when the pawl L re-enters the notch. The recorder is graduated to read in knots per hour. The time-barrel is put out of gear for use in sounding.

APPENDIX.

The first two of the following abridgments should be added to those appearing in the volume for A.D. 1877-83.

A.D. 1879.

2891. **Phelps, R.** July 16. *Drawings to Specification.*

Spectacles, cases for. Relates to cases for various articles, among which spectacles are mentioned, though the application of the invention to spectacle cases is not described. A telescopic match box is described, consisting of two elliptical tubular pieces fitting one in the other, the cap or lid being rigidly connected to the inner piece and attached by elastic bands to the outer piece.

A.D. 1881.

5233. **Lake, W. R.**, [Williams, J. S.]. Nov. 30. *Drawings to Specification.*

Thermometers.—Relates to electric heating-apparatus, and comprises "thermo regulating, indicating, "and governing devices." The heating-apparatus is automatically thrown into, and cut out of, the circuit by contact-apparatus in connection with a thermometer. Various arrangements of contacts, consisting of adjustable screws, floats, &c., are described and illustrated in the Specification.

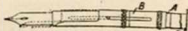
A.D. 1884.

217. **Watkin, H. S. S.** Jan. 1.

[The following paragraph should be added to the abridgment appearing on page 1.]

For measuring horizontal angles, the apparatus may be combined with a magnetic needle to which the scale is attached. The apparatus may also be used for ascertaining the dip of the magnetic needle.

641. **Gordon, A. McC.** Jan. 4.

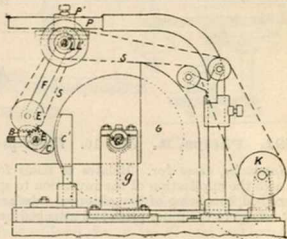


Ruling-pens.—An ordinary penholder has a guard B sliding on the barrel A, so that, in ruling lines, the ruler may be shielded from the pen. If preferred, the guard may be made stationary, and the pen carrier movable; or, instead of sliding, the guard may be attached to the barrel by a pin and turn on its axis when it is required to dip the pen in the ink.

7461. **Besson, H.**, and **Kent, E. N.** May 9.

Spectacles, grinding glasses of. A former or model is fixed to the same axis as the glass to be

ground, or to a parallel axis, and is arranged so as to guide either the glass or the grinder to produce a duplicated outline of the pattern. The glass and model are carried on a rocking frame, and the grinder and pattern-roller on a slide; or the rocking frame carries the grinder and roller, and the



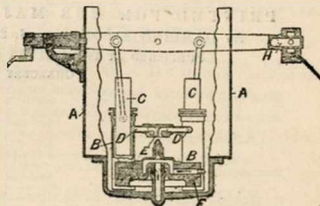
slide the glass and model. The axis on which the glass and model are mounted is supported on rocking arms carrying weights or springs which hold the pattern against the roller. The blank glass is held by two coincident spindles revolved by gear wheels worked from a parallel shaft fixed on the

rocking frame and actuated by a strap &c. from one of the centres of the frame. The glass is held between the spindles by india-rubber pads, or (if hollow) by cores of wood covered with felt &c. The grinder (of stone, emery, or other suitable material) is fixed to a movable headstock on a carriage on the bed-plate, and is rotated by a strap from the main shaft. The Figure shows a side view of a machine for grinding, shaping, or bevelling flat glass, such as spectacle glasses. The grinder G is carried on an axis G^1 in bearings g ; the glass B and pattern C are on the same axis Δ , and the roller C^1 bears against C; the axis A is carried by the rocking frame F on a rocking bar A^{11} supported on centres in the collar P^1 sliding on the bar P. Rotation of the glass is produced by gear-wheels E, strap S, pulley L on axis A^{11} , pulley L^1 , strap S^1 , and shaft K, which last is driven from the axis of the grinder.

A.D. 1886.

14,208. Tower, B. Nov. 4.

Gyroscopic apparatus.—Relates to self-levelling platforms for guns and other objects mounted on floating vessels. A framing A is mounted in gimbals, giving freedom of movement in two directions, at right-angles to each other. In this framing four vertical cylinders B are fixed, and are fitted with plungers C linked to the arms of the gimbals. Passages D from the upper parts of these cylinders are brought together with their mouths downwards at E, and are arranged symmetrically round the vertical axis of the framing. A reaction-wheel F rotates on a spherical bearing at the bottom of the framing, and its central cavity is supplied with liquid under pressure through a trunnion of the gimbal. If the framing is displaced, the jet of liquid issuing from the nozzle will play into one of the mouths, thereby increasing the pressure in one or more cylinders, causing a movement of the framing which rectifies the deviation. The reaction-wheel may be replaced by turbines or hydraulic engines.





1886 A.D.

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19	PHOTOGRAPHY.	98
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C.—1884—1888.

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D.—1889—1892. (In preparation.)

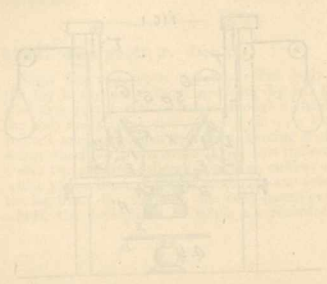
It is hoped that this Series may be published in 1898.

E.—1893—1897. (In preparation.)

The first sheets in the longer Classes are now being struck off, and may be seen in the Patent Office Library.

A.D. 1878

1878. Johnson, J. H. [Lett. N. 1878.]



Johnson's apparatus is designed for the purpose of measuring the force of attraction between two masses. It consists of a horizontal beam supported by a central pivot, with two pans suspended from its ends. The apparatus is mounted on a base which allows for the adjustment of the distance between the masses and the measurement of the resulting deflection of the beam. The diagram shows the various parts of the apparatus, including the beam, the pans, the pivot, and the base, and is accompanied by a detailed description of its operation and use.

A.D. 1888

1888. [Name of author, partially illegible]

The apparatus described in this paper is designed for the purpose of measuring the force of attraction between two masses. It consists of a horizontal beam supported by a central pivot, with two pans suspended from its ends. The apparatus is mounted on a base which allows for the adjustment of the distance between the masses and the measurement of the resulting deflection of the beam. The diagram shows the various parts of the apparatus, including the beam, the pans, the pivot, and the base, and is accompanied by a detailed description of its operation and use.

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