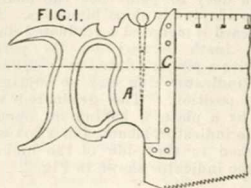


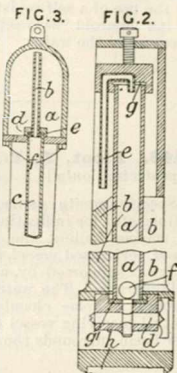
2509. **Johnson, J. H.**, [Gorham, J.]. Sept. 30.



Squares.—The shoulders of the handle A of a hand-saw are at right angles to the back of the saw, and so form a square. The edges of the shoulders are protected by metal angle-pieces C.

2520. **Long, J.**, and **Long, J.** Oct. 1.

Sounding-apparatus.—The depth is measured by the amount of liquid which is forced into an open air-vessel against the pressure of the contained air. The glass tube a, Fig. 2, is held in a case b by means of rubber washers g, g', forced towards each other by the screw shown. The cock f being closed, water will enter the tube by the bent pipe c as the instrument is lowered in the sea, and after drawing up, the height at which the float f stands is read off on a divided scale attached to the case. The water is then removed by the cock f. A cup h may contain grease for picking up samples of the bottom. Fig. 3 shows the upper part of an instrument for use at greater depths. By the small aperture d liquid enters an air-chamber of such capacity in relation to the tube c that no liquid will enter the pipe b until a depth (in water) of 15 fathoms is reached. A nut e and washers make an airtight joint between the pipes b, c, and the cover is removably attached by studs f.

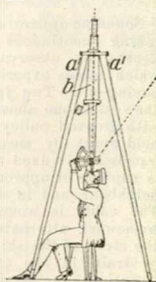


2551. **Beckers, L.**, [a communication]. Oct. 5. [Provisional protection only.]

Stereoscopes; graphoscopes.—For exhibiting stereoscopic and other pictures, an endless belt is arranged to be operated within a case, and is provided with a series of frames or slides to receive the pictures in a position perpendicular to the face of the belt. The pictures are secured in the slides by elastic bands and notches formed in the ends of the grooved portions of the slides.

2555. **Cavendy, E.** Oct. 5.

Plumbing-instruments; sextants.—An artificial zenith is obtained by hanging a tube b, fitted with cross-wires and the necessary lenses, in a tripod a'. The zenith angle of a planet &c. can then be taken with a sextant in the way shown.

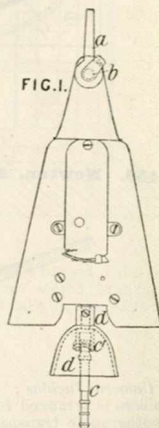


2560. **Brooman, R. A.**, [Garella, —]. Oct. 6. Drawings to Specification.

Graphoscopes for viewing panoramic photographs. The picture is mounted by hooks or otherwise in a hollow semicylindrical case, the radius of which is equal to the focal length of the lens with which the photograph was taken. A lens of the same focal length for examining the picture is mounted on a vertical pivot in the axis of the case.

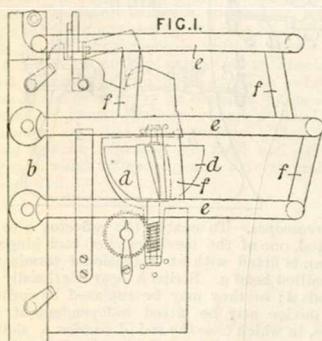
2583. **Massey, T.**, and **Savage, T.** Oct. 8.

Logs.—The rotator is fixed to a rod c connected by a universal joint c' to the axis of the counting apparatus. A shield d, to prevent clogging of the joint, is mounted upon the rotating axis. The log line is attached to an eye a secured by a bolt b locked from rotation by a projection.





2661. **Massey, T., and Savage, T.** Oct. 17.



Sounding-apparatus.—Relates to Massey's sounding-instrument, in which the depth is registered by the rotation of a screw *d*, and consists in fitting a protective cage or guard, which comprises rings *e* riveted to the leaded bar *b* and connected by bars *f*. The middle ring *e* may be omitted, and a web of stout wire woven between the two remaining rings. In both cases, the cage is left open at top and bottom.

2666. **Schmidt, J.** Oct. 19. *Drawings to Specification.*

Pyrometers.—Iron bars are inserted through freclay tubes into a cementation furnace, and are taken out from time to time to ascertain the condition of the articles undergoing treatment.

2676. **Garvey, B.** Oct. 19. [*Provisional protection only.*]

Bearings, instruments for determining; gyroscopic apparatus.—An instrument for obtaining a normal plane or base, independent of the earth's motion, for use in geodesy, navigation, or astronomy, consists of a "wheel" of any shape, size or material, revolving on a hollow shaft supported on hollow gimbals, rings, or universal joints, so as to move independently of the position of the frame. The wheel is kept revolving by electrical means or by the discharge through diagonal openings of steam, air, or gas passed through the gimbals. The wheel may be suspended on a vertical pipe from the gimbals so as to revolve horizontally.

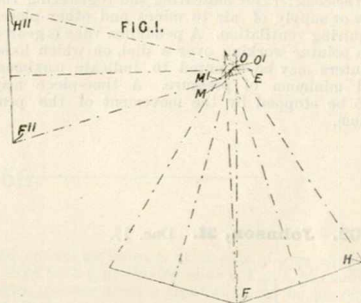
2747. **Feloj, P.** Oct. 29. [*Provisional protection only.*]

Reflectors are made of small pieces of looking-glass, coloured or not, mounted in tin, copper, iron, zinc, &c.

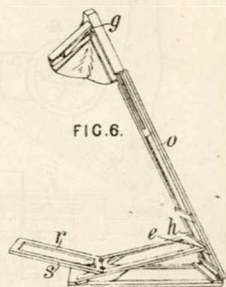
2823. **Pepper, J. H.** Nov. 7. [*Provisional protection only.*]

Magic-lantern apparatus.—A rotating wheel-of-life is illuminated by a lantern, in front of which a slotted disc is rotated.

2827. **Hardie, W.** Nov. 9. [*Provisional protection only.*]

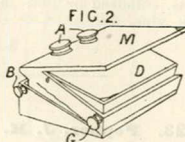


Stereoscopes, reflecting. The stereographs *F, H* are placed slightly inclined to one another as shown diagrammatically by Fig. 1. Two mirrors *M, O* and *M', O'* are differently inclined opposite the two eyes of the observer, situated at *E*, so that the two images are virtually superposed at *F^{II}, H^{II}*. Fig. 6 shows a folding form of the instrument. The stereographs, which may be bound in book form, are placed on the frame *r, s, h, c*. The mirrors are mounted in a hood *g* on a hinged upright *o*. The eye-pieces may be fitted with lenses and prisms.

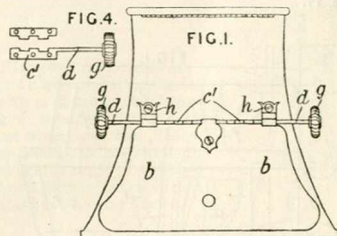


2871. **Donas, J. B.** Nov. 16. [*Provisional protection only.*]

Stereoscopes.—The lenses A are fixed in the top M of a desk-like box which can be raised and lowered by buttons B, G. The transparent slide is placed at D and is seen by reflection in a mirror on the bottom of the case. Paper slides may be slid over the mirror for viewing.



2940. **Sands, C.** Nov. 24.



Stereoscopes.—To enable the reflector *b* to be adjusted, one of the members *c'* of each hinge of the flap is fitted with an extension *d* terminated by a milled head *g*. Strips *h* bear frictionally on the rods *d*; or they may be replaced by springs. The device may be fitted independent of the hinges, in which case the rod *d* carries a slotted plate engaging with a pin on the back of the reflector.

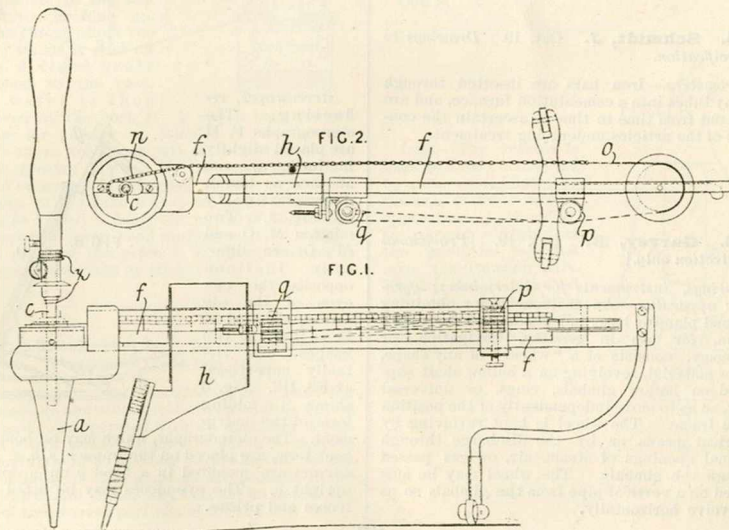
2914. **Keightley, B.** Nov. 19. [*Provisional protection only.*]

Anemometers for indicating and registering the flow or supply of air to mines and other places requiring ventilation. A pendulum vane is geared to a pointer working over a dial, on which loose pointers may be mounted to indicate maximum and minimum of pressure. A time-piece may also be stopped by the movement of the pendulum.

3034. **Pershhouse, H.** Dec. 8. [*Provisional protection only.*]

Stereoscopes.—The lenses are mounted in laterally-sliding pieces to facilitate cleaning.

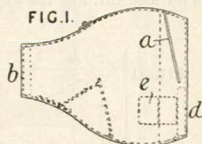
3102. **Johnson, H.** Dec. 17.



Instruments for drawing curves.—Figs. 1 and 2 show in elevation and plan respectively an instrument for drawing spirals in which the pencil holder travels along a radius bar as the latter is rotated. The pencil holder *h*, adapted to travel along a bar *f*, is connected by a cord *o* to a chain *n* which, as the instrument is turned about the axis *a*, winds up on the axis *c* or on specially shaped blocks mounted upon it. The relative motion of the pencil may be modified by passing the cord *o* around pulleys *g* and *p* fixed to the holder and bar *f* respectively. The cord gearing may be replaced by rack and pinion gearing, in which interchangeable driving pinions are employed.

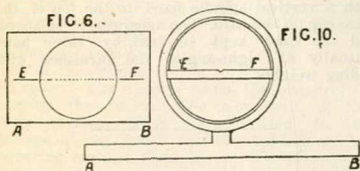
3148. Nunn, W. Dec. 23.

Stereoscopes.—A slide placed at *a* can be seen directly through lenses *b*, or indirectly through lenses *d* opposite an adjustable reflector. A right-angled prism *e* is fixed in front of each lens *d* to transpose the picture laterally. The lenses may be mounted in elastic or telescopic collars to prevent injury to the eye. In a modification, the stereoscope is mounted on a standard which slides in the pedestal of a table.



A.D. 1858.

3. Brun, L. J. A. Jan. 1.

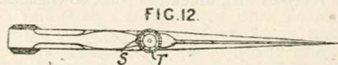
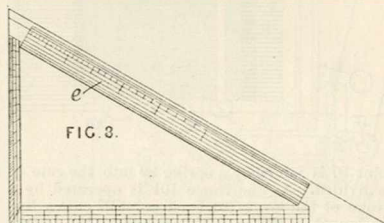


Protractors.—To facilitate the plotting of geographical from magnetic bearings, a protractor in which the scale can be adjusted with respect to the ruling edge is employed. In the form shown in Fig. 6 the zero diameter of a circular scale is set to an angle, equal to the magnetic declination, with a line *E, F* drawn parallel to the ruling edges *A, B*. Fig. 10 shows another form. A circular protractor may also be fitted with an adjustable diameter secured by a nut to a central boss.

39. Church, W. Jan. 9.

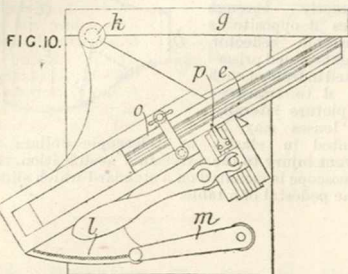
Compasses; squares; protractors; dividing-engines.—The head of the fine-adjustment screw *r*, of a pair of compasses, Fig. 12, is graduated to

read against an index *s*. One side of a set-square is fitted with a graduated slide *e*, Fig. 8, to enable angles greater than a right-angle to be set out. Fig. 10 is a plan of an engine for dividing the scale or slide *e* shown in Fig. 8. The slide is

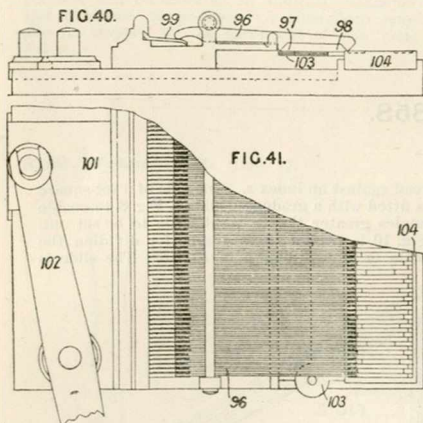


clamped in a holder *o* free to turn about a centre *k*. Each division is cut by a hand-operated graver *p*, after first adjusting the holder by engaging a pin on an arm *m* with one of a series of holes *l*. The end of the slide *e* is kept against a guide *g*.

Fig. 40 is a plan, and Fig. 41 is a side elevation, of a dividing-engine for rules. All the lines are cut simultaneously by a number of tools 96 mounted on a frame 101, like the keys of a piano. The rule



103 to be divided is fixed alongside a pattern 104 cut transversely with a number of recesses to engage the outer ends 98 of the graters. When the end 98 is in one of these recesses, the cutting-



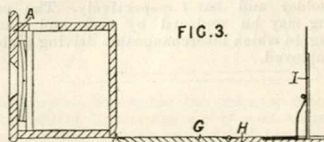
point 97 is forced by a spring 99 into the rule to be divided. As the frame 101 is operated by a stroke of the lever 101, each point 97 cuts a line the length of which is determined by the length of the recesses with which the point 98 engages.

115. Hermagis, H. Jan. 21. [Provisional protection only.]

Stereoscopes.—Spherical lenses, either simple or achromatic, with parallel surfaces, are adapted to stereoscopes in which no prism is used, so as to

compel the eyes to be placed at such a distance from the optical lenses, as to allow the view to be more easily taken in, with less strain to the eyes, and give a larger picture, without distortion and with greater colour effects due to the refraction.

228. Mathieu, F. Feb. 8.

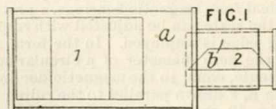


Stereoscopes, folding. The lenses are mounted in a box A hinged to a strip G to which also a second strip H is hinged. In a groove in the latter strip a slide-holder I is adapted to slide. The instrument can be folded up when not in use.

262. Keatinge, W. Feb. 11. [Provisional protection only.]

Compasses, magnetic.—In order to prevent any deviation in ships' compasses due to local attraction, a square plate, having a small weighted wire suspended from each side, is fixed to one end of a horizontal spindle, the opposite end of which is connected by universal joints or otherwise with a vertical spindle fixed to the top of the brass cap on the card. The apparatus is balanced, and the card kept in trim, by three bars, mutually at right-angles and furnished with sliding weights.

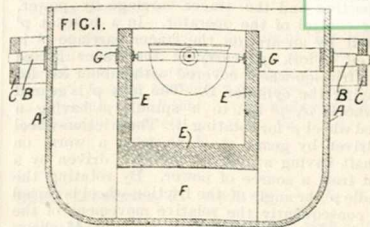
309. Newton, W. E., [Caselli, G.] Feb. 18.



Telescopes; optical instruments.—Fig. 1 shows a combination of erecting-prisms adapted to give an image of an object which is rotated through any desired angle about the axis of the instrument. The first prism is mounted in a tube a, on which the tube b containing the second prism 2 is adapted to rotate. The combination may be employed for erecting the image in telescopes &c.

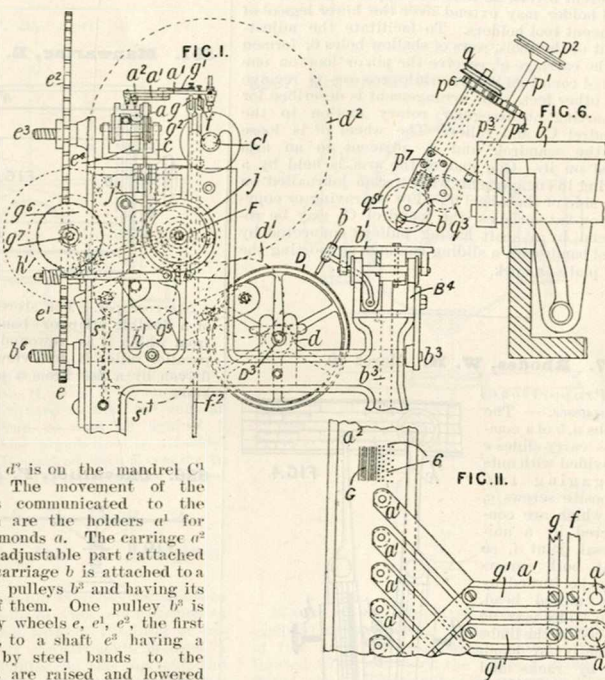
323. Cook, J. E. Feb. 19.

Binnacles.—In order to neutralize local attraction, the bowl A of the binnacle is made of iron or steel and fitted internally with a non-conducting cylinder E (which carries the compass), made up of pieces of cork or of layers of cork and silk joined together by shellac. The cylinder may be secured to a wooden block F in the base of the bowl, or it may be supported by gimbals. The ring carrying the bowl A is supported by gimbals on the top of two standards fixed to a suitable base. Two other standards, connected by an arched or curved bar for carrying a lamp, may be employed.



488. Roberts, R. March 11.

Pantographs for engraving or copying designs upon flat or curved surfaces. Fig. 1 shows a machine for copying or producing a design on a roller from a pattern placed on a cylinder D. The tracer *b* is on a carriage *b*¹ running on rails *B*¹ of the framing. The movement of the tracer over the various parts of the pattern is effected by rotating the cylinder D and moving the carriage *b*¹. The movement of the cylinder D is communicated to the roller by gear-wheels *d*, *d*¹, *d*², the first of which is changeable for varying the relative movement of the cylinder



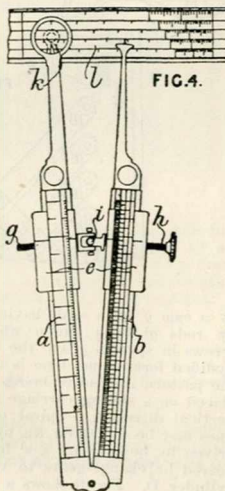
and roller. The wheel *d*¹ is on the mandrel *C*¹ carrying the roller. The movement of the tracer carriage *b*¹ is communicated to the carriage *a*², on which are the holders *a*¹ for engraving tools or diamonds *a*. The carriage *a*² runs on rollers on the adjustable part attached to the framing. The carriage *b* is attached to a steel band passed over pulleys *b*² and having its ends attached to one of them. One pulley *b*² is on a shaft *b*³ geared by wheels *e*, *e*¹, *e*², the first of which is changeable, to a shaft *e*³ having a pulley *e*⁴ connected by steel bands to the carriage *a*². The tools are raised and lowered by a bar *f* connected by rods *f*¹ to a weighted treadle. A device for producing original patterns comprises a lever *j*¹ connected at one end with the carriage *a*² and at the other end engaging a face cam *j* on a shaft *F* geared to a shaft *g*¹ driven by wheels *h*, *h*¹ from the wheel *d*². A variable longitudinal movement is imparted to the shaft *F* by a screw nut thereon geared to a wheel on the shaft *g*¹, and a cam or eccentric bearing against the end of the nut, and mounted on a shaft driven by worm-gear from the shaft *g*². Dots and broken lines may be produced

by a cam *g*² on a shaft having arms connected by rods *g*² to a bar *g* which bears against screws in springs *g*¹ on the tool holders *a*¹. A modified form of machine is described in which the pattern instead of being on a roller *D* is placed on a sliding carriage moving in a nearly vertical direction. Spiral or other shade &c. lines may be engraved &c. by means of a shaft driven by bevel-gears *s*, *s*¹ from the shaft *b*³ and geared by change-gears to the shaft *D*³ of the cylinder *D*. Fig. 6 shows a means for moving

the pattern and the tracer carriage by power, under control of the operator. In a bracket p^b pivoted by an arm on the tracer carriage b^1 is pivoted a fork p^c carrying the tracer b and also a friction-wheel covered with rubber &c. for engaging the cylinder D. The fork p^c is geared by wheels p^d , p^e &c. to a spindle p^1 having a milled wheel p^2 for rotating it. The friction-wheel is driven by gears q^d , q^e &c. from a worm on a shaft having a grooved pulley q driven by a band from a source of power. By rotating the spindle p^1 the angle of the friction-wheel is varied and consequently the relative movement of the cylinder D and the carriage b^1 . Fig. 11 shows a plan of part of the carriage a^2 and with some of the tool holders a^1 and the supporting bars f , g . The two legs a^1 , a^2 of each holder a are formed at different levels, so that the upper leg a^2 of one tool holder may extend over the lower legs a^1 of adjacent tool holders. To facilitate the adjustment of the tools, rows of shallow holes h , formed in the carriage a^2 , receive the pin or foot on one arm of each tool holder, while grooves G receive the other feet. An arrangement is described for imparting an irregular rotary motion to the mandrel C¹ and roller. The wheel d^2 is loose on the mandrel, and is adjacent to an arm fixed on it. One end of the arm is held by a spring in engagement with a cam journalled on one side of the wheel d^2 . For engraving or copying on flat surfaces, the mandrel C¹ may be replaced by a shaft having pulleys connected by steel bands with a sliding carriage supporting the flat plate or work.

567. Rhodes, W. H. March 19.

Proportional compasses.—The limbs a , b of a compass carry slides e provided with nuts engaging two opposite screws g , h , which are connected by a universal joint i , so that both screws may be turned by one milled head. The slides may be moved on the limbs directly by hand, or by racks and pinions. The limb a is provided with a flat spring k to hold a divided scale l . The limbs carry several uniform graduations in either direction, to read to marks on the slides e . By use of the slides e and the scale l , operations of multi-

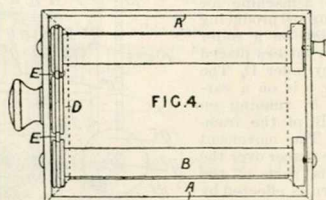


plication, division, proportion, and square root can be conveniently performed, and particularly the calculations of proportion in connection with spinning.

590. Brooman, R. A., [a communication].
March 22. [Provisional protection only.]

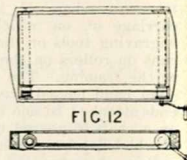
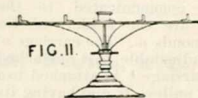
Stereoscopes.—An endless band is arranged in a box or case so that it may be rotated from outside the box, and is provided with slides or frames, arranged perpendicular to its face, which are made to hold stereoscopic views.

591. Manwaring, E. J. March 22.



Stereoscopes.—The stereograms are in the form of a flexible strip or band wound on a roller, from which it is rewound on to a second and parallel roller B for viewing. The rollers are driven by a belt from a pulley D operated by a knob.

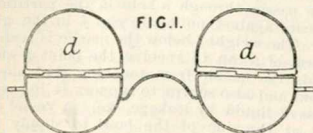
636. Chevallier, F. A. March 25.



Stereoscopes.—Stereoscopic pictures can be viewed through a coloured blind mounted on rollers, Fig. 12, so as to be wound from one roller to the other. The blind is differently coloured in different parts so as to produce varying effects.

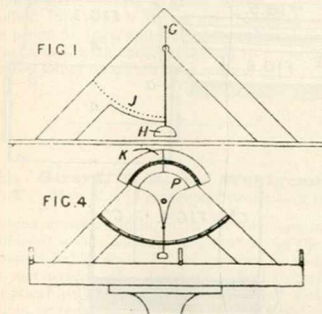
Bearings, determining.—Circular panoramic photographs, showing any particular locality for strategic or other military purposes, &c., may be viewed by placing the pictures on a table, Fig. 11, provided with a compass card so as to indicate the cardinal points.

647. Newman, J., and Newman, J. F. March 27.



Spectacles.—The eyes are made in halves hinged together. The upper half *d* may be glazed with coloured glass to form a shade; or with lenses to form, when the upper half is folded down on to the lower, spectacles for reading.

778. Lecornu, F. A. April 10.



Levels and plumbing-instruments; clinometers; squares.—A plumb-bob *H*, Fig. 1, is suspended from a point *G* of a square so that the angular value of an incline can be read off against a scale *J*. In Fig. 4, the plumb-line is attached to a pivoted sector *P* marked with a vernier to facilitate the reading of the angle against a fixed scale *K*.

793. Spiller, T. April 13. [Provisional protection only.]

Stereoscopes.—To enable stereoscopic slides to be conveyed to the point of view and returned to their places in the box without handling or exposure, a box with two compartments is used, a square drum being mounted on the top over the partition. The slides are connected together in a chain by a flexible material and are hooked at one end to guide lines or wires. The chain is folded and laid in one compartment of the box, and its other end is carried over the drum and hooked to guide lines or wires in the other compartment. By turning the drum, the slides are brought in turn under the lenses of the stereoscope. An indicator may be fixed outside the box to give the numbers and names of the pictures. The stereoscope may be swivelled to the box, which may be made adjustable in height.

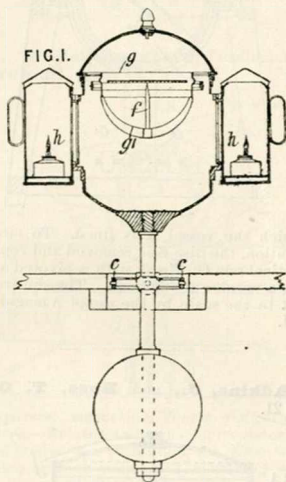
794. Dean, G. A. H. April 13. [Provisional protection only.]

Stereoscopes.—Consists in means for making the figures in stereoscopic slides movable. The figures are separately cut out and joined by "arms" passing through "passages" cut in the background to a "shaft" to which any desired motion may be given.

806. Gorham, J. April 14.

Chromatropes.—A blackened disc with a design cut out of it and a central hole larger than the top spindle is placed above the usual coloured discs of a chromatic top. To retard the disc with the design, as the top spins, a piece of string may be fixed to its periphery.

826. Brown, G. G. April 16.

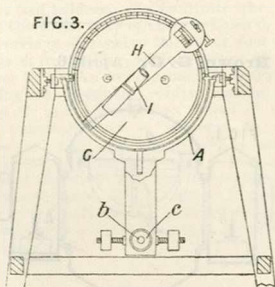
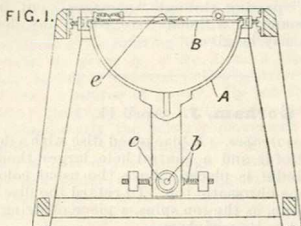


Binnacles are supported from the deck by gimbal bearings as at *c*. The compass cards are of talc or other transparent material and are lighted from below by the lamps *h*, glazed with fluted glass. The needle-supporting pointer *f* is fixed to a narrow band *g'* supported from a ring *g* instead of the usual hollow bowl. The ring is mounted on gimbals.

859. Clark, W., [a communication]. April 19.

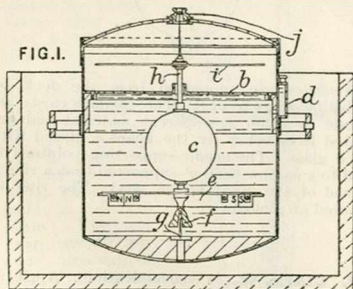
Longitude, latitude, and transit instruments.—Relates to apparatus for determining the altitude of the sun especially when the horizon is obscured.

hemispherical vessel A is mounted upon gimbals and adjusted by weights c on radial screws b until the disc B, which covers the vessel, is horizontal. A small central hole e admits a beam of sunlight which leaves a trace upon photographic paper



with which the vessel A is lined. To measure the elevation, the disc B is removed and replaced by a vertical arm G, Fig. 3, with a pivoted arm H carrying a vernier at each end. The sun trace is adjusted to the scale by the use of a magnifying system I.

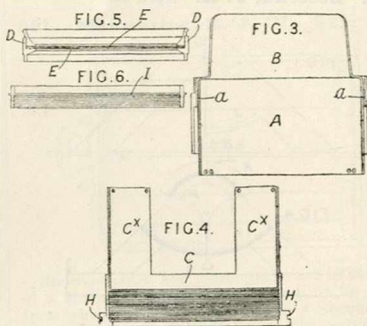
870. Adkins, J., and Buss, T. O. L.
April 21.



Compasses, magnetic.—In order to counteract vibration, the needle e of ships' compasses is suspended from a ball c floating in alcohol or other

suitable liquid. To the upper part of the ball is attached a spindle h carrying the card i. This spindle passes through a hole in the partition b and bears against an agate cap j in the glass cover. The weight f below the needle is made in the form of a cap to receive the point g, which prevents the needle from touching the sides of the bowl and also serves to support it in case of any loss of liquid by leakage, &c. A vessel d is placed at the side of the bowl to supply any trifling loss of liquid from evaporation &c. The card moves within a ring having the points of the compass marked on it in the reverse order.

887. Maugey, P., [partly a communication].
April 22.



Optical instruments.—Relates to lens stops made of elastic material, in which the aperture is varied by stretching the material. The upper part of the cylinder C, Fig. 4, is cut away, leaving only three lugs C'. These lugs pass through slots a in the cylinder A, Fig. 3; their ends project slightly beyond the end of the tapered extension B of the cylinder A and are fastened to a ring D, Fig. 5, which grips an elastic diaphragm E. The end of the cylinder A projects slightly beyond the end H of the cylinder C and is fixed to the internally and externally screwed ring I, Fig. 6, by which it may be attached to a camera. The size of the opening is regulated by pressing the piece B against the diaphragm by means of a rack and pinion, or otherwise.

1027. Coggan, G. B. May 7. [Provisional protection only.]

Stereoscopes.—The upper part of a wheeled box is glazed on top with ground or plain glass, and on two opposite sides stereoscopic lenses are placed so as to view a horizontal cylinder, covered with stereoscopic views, which is turned by a winch handle from outside. The lower part of the box may be used for conveying photographic apparatus.

1084. Warren, F. May 14. [Provisional protection only.]

Telescopes; tripod and like stands.—Relates to a method of mounting a telescope on a stand so that it may have horizontal, vertical and equatorial motions. A horizontal plate, No. 1, has at its centre a tube boss or pin upon which another plate, No. 2, rotates and gives a horizontal motion. Upon plate No. 2 a support is built, to which is attached a vertical plate, No. 3. The vertical movement is obtained by placing a fourth plate upon No. 3. A cradle is placed upon No. 4 for holding the instrument. The equatorial motion is obtained by attaching a plate, No. 5, to the plate No. 4; a sixth plate works upon it, and a cradle is attached to plate No. 6. The motions can be obtained by hand, worm gearing, or by friction rollers. Movable discs or plates similar to those described are placed below plate No. 1, for supporting it, and to these plates sockets are attached into which tubes are inserted which form props or legs, and the plates to which they are attached, with those attached to plate No. 1, form the joints on which they move.

1221. Girard, J. B., and Wohlgemuth, P. F. May 31. [Provisional protection only.]

Tripod stands.—Relates to the ornamentation of different woods, metals, &c., and fixing thereon an imperishable stain by the agency of metallic salts and oxides, the decoration being stated to be applicable to tripods and many other articles. Designs, letterpress, type printing, or writing are placed on the different woods or substances, "thus effectually acting in such a manner (by the instrumentality of light and shade on the surface) as to preserve uniformly the original ground forming the drawings, shapes, or configurations, as are sought to be reproduced from the influence of daylight or solar rays, at the same time modifying any colours that may be placed, or that may be existing thereon," such result being applicable to decorations on tripods, when the designs are fixed thereon. The process is completed by varnishing or French-polishing.

1231. Grant, A. G. June 1. [Provisional protection only.]

Tripod and like stands.—A stand or rest for a camera, theodolite, gun &c. comprises a table for supporting the article, such table being carried by a rod, sliding in a split ring or collar located in a boss to which three or more supporting legs are hinged. When the legs are folded up they form a cylinder. A rod fixed to each leg is connected to a collar through which the shaft passes. The rod carrying the table is secured in an adjusted position by means of a screw passing through the split ring.

1293. Irons, D. June 8.

Compasses, magnetic.

—To secure true pointing of the compass, the card, in addition to carrying the usual magnet *a*, Fig. 2, is fitted with two radial magnets *b, c*, each having the N. pole pointing to the west. These auxiliary magnets may be variously arranged; in Fig. 4, for example, four additional curved magnets *d, d', d'', d'''* are employed. The bowl in which the compass is suspended, as well as the lining of the binnacle, may be of iron.

FIG. 2.

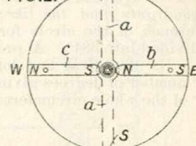
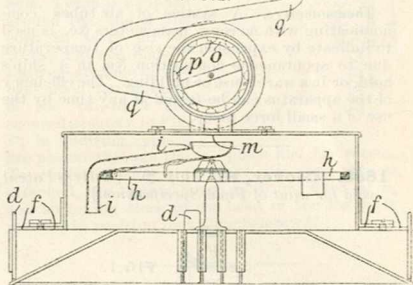


FIG. 4.



1352. Wedel-Jarlsberg, Ferdinand Julius, Baron of. June 15.

FIG. B.



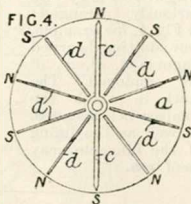
Compasses, magnetic; course indicators and recorders.—Relates to means for registering the steered course of a vessel and the time which it continues on each course. A revolving wheel *o*, driven by a clockwork device, has cavities *p*, which receive and deliver balls at regular intervals to a pipe *i*, mounted on a pivoted magnetic needle *h* from which pipe the balls fall into small chambers fixed round the circumference of a box, placed under the compass card. The chambers, which are preferably sixty-four in number, have glass doors *d*, and are covered by a metal plate *f*, divided in points and half points, but having the east on the left side of the north point. By numbering the balls, and putting them in the tube *q*, which supplies the wheel *o* in regular order, the numbers on the balls in each compartment will show the particular times at which the vessel was proceeding in the course indicated. The instrument may be used as a common compass when the lid *m* is made of glass and the needle is fixed under a compass card.

1471. **Fattorini, S.** June 30. [*Provisional protection only.*]

Protractors; compasses, magnetic; sextants, quadrants and the like; scales.—The circumference of the circle for measuring purposes is divided into 384°. A protractor may be divided on its "vertical and longitudinal surfaces by a "number of degrees giving the radii or diameter "of the whole circumference."

1659. **Marks, L. J.** July 23.

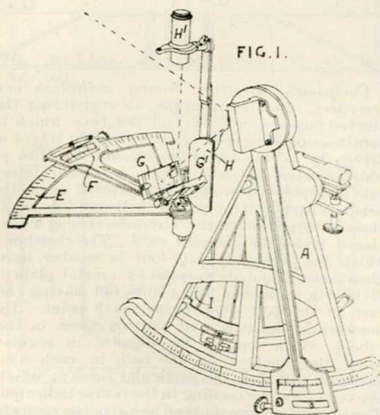
Compasses, magnetic.—For use in iron ships &c., compass cards are fitted with a number of auxiliary and radially arranged magnets *d* in addition to the usual magnets *c*. The compass may be enclosed by a concentric chamber filled with iron.



1682. **Hall, T.** July 26. [*Provisional protection only.*]

Thermometers.—A system of air tubes communicating with mercury manometers &c. is used to indicate by expansion the rise of temperature due to spontaneous combustion &c. in a ship's hold, or in a warehouse or building. The efficiency of the apparatus can be tested at any time by the use of a small force pump.

1688. **Glover, H.** July 26. [*Letters Patent void for want of Final Specification.*]

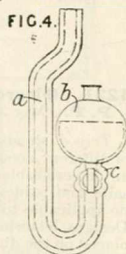


Sextants, quadrants, and the like.—Fig. 1 shows a modification of the sextant or quadrant adapted

for the determination of the angular separation of two celestial objects as well as their altitudes. The zenith distance may also be determined with a real or artificial horizon. To the front leg of the frame of a sextant of usual construction A, a divided arc E is fixed, in a plane at right-angles to that containing the main arc. An arm F, fitted with a mirror and mirror G, works in combination with a mirror G¹ attached, with an arm H carrying a telescope H¹, to the frame A. When the arm F is set to zero, the instrument is adapted, as shown, for the measurement of altitudes. By the adjustment of the arm F angular distances are determined. A second arc I of smaller radius is fixed at the back of the frame A. In practice, an altitude is determined by first bringing the object on to the cross wires, after setting the arms to zero, and then by an adjustment of the arc I to bring the bubble of the level into the centre. The angular separation can then be determined by an adjustment of the arm F.

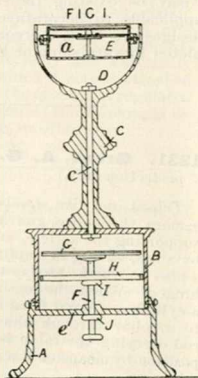
1739. **Cetti, E. J. M.** July 31.

Barometers.—Mercurial barometers which are intended to be portable are constructed with the glass tube *a*, cistern *b* and cock *c* in one piece. The plug of the cock is also of glass, and secured by a nut on its screwed end.



1814. **Newton, W. E.**, [a communication]. Aug. 9.

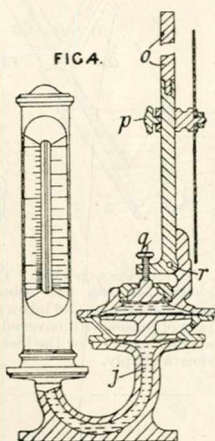
Compasses, magnetic.—The effects of local attraction on the needle *a* of a ship's compass are counteracted by vertically and rotatably adjustable magnets *G*, *H*, arranged in a box *B*. The upper magnet *G* is secured to the end of a screwed spindle *F* which engages screwed holes in the other magnet *H*, the head *e* of the base, and locking nuts *I*, *J*. The box *B* is secured by a bolt *c* to the pillar *C* and the bowl *D* in which the compass box *E* is gimballed. The magnets



may be used in pairs connected together by cross-bars engaging the spindle F. A central magnet may be arranged centrally between the two magnets of each pair. The compensating magnets may be arranged above instead of below the needle.

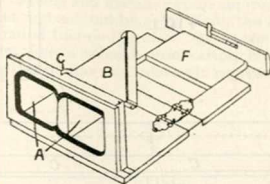
1837. Fogg, J. Aug. 12.

Anemometers.—Wind pressure is measured by a hydrostatic pressure gauge. The bent lever *o* centered at *r* carries an iron sheet against which the wind impinges. Pressure is conveyed by the screw *q* to a piston and thence by liquid *j* and another piston to the gauge. Each side of the pistons in contact with the liquid is protected by a thin rubber sheet. The sizes of the pistons are so chosen that the pressure transmitted may be increased or decreased in suitable ratio.



1866. Chappuis, P. E. Aug. 16.

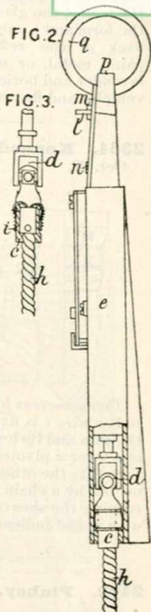
FIG. 2.



Stereoscopes.—Fig. 2 shows a stereoscope constructed of hinged flaps which fold up into the shape of a book. The carrier *F* is made to slide in grooves for focal adjustment. The partition *B* engages by a feather *C* with a slit in the lens frame *A*. In another form, the instrument folds up into the form of a paint-box with a sliding lid. For exhibition purposes, stereographs are placed in carriers attached at intervals to an endless band of leather, and from which they are automatically discharged.

1958. Massey, E. Aug. 30.

Logs.—Relates to improvements in logs patented by the inventor, of the type in which a vaned rotator is connected to a floating indicator by a universal joint, and consists (1) in enclosing the universal joint inside the indicator case; (2) in a method of attaching the rotator cord to the joint; and (3) in securing the guard-plate of the rope ring. The indicator case *e* is lengthened so to enclose the universal joint *d*, the tail-piece *c* of which is journaled in an additional bridge and is thus prevented from oscillating. The cord *h* of the rotator is attached to the tail piece *c* by a hole through which the cord passes, and also a recess of larger diameter than the hole. Twine is wrapped around the end of the cord so as to fill the recess and the ends of the rope are then turned back upon the outside of the tail-piece and secured as shown in Fig. 3; in addition, pins *i* are passed through the tail-piece and the recess. To secure the ring *q*, to which the drag rope is attached, the spring guard plate *m*, fixed at *n*, and springing close to the head of the log *p*, is secured in position by a thumb-screw *l*.



2131. Tyssen, J. Sept. 22. [Provisional protection only.]

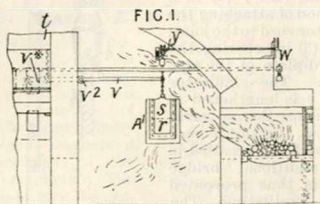
Logs.—A wheel, fitted inboard to the axis of a three-bladed screw, gears into a train of wheels, the last of which is caused to make one revolution when the speed of the vessel is ten knots.

2257. Vasserot, C. F., [Balencie, A. M.], Oct. 11.

Reflectors.—These are constructed by coating glass with a solution of a platinum or palladium salt mixed with a saturated solution of boric acid in essence of lavender, or collodion, and exposing the whole to a red heat in a muffle. The glass may then be removed and annealed, after which a coating of boric acid in essence of lavender or

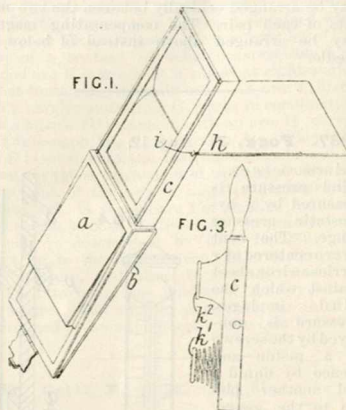
alcohol may be applied to the re-heated plate. By supporting the glass plate on a form contained in the muffle, the glass, on becoming soft, sinks into the form and a curved reflector is obtained. The back of the reflector may be protected by paint, metal, or other means. The essence of lavender and boric acid may be replaced by other vehicles and fluxes.

2364. Kennedy, R., and Armstrong, J. Oct. 22.



Thermometers for drying kilns. A long copper rod or wire *t* is fixed at its upper end in the top of the kiln and its lower end is attached to the end *e** of a lever *v* pivoted at *v*². An increase of temperature lifts the other end of the lever which is connected by a chain and weight to the sheave *y* thus turning the sheave and a pointer *w* in connection with it and indicating the temperature.

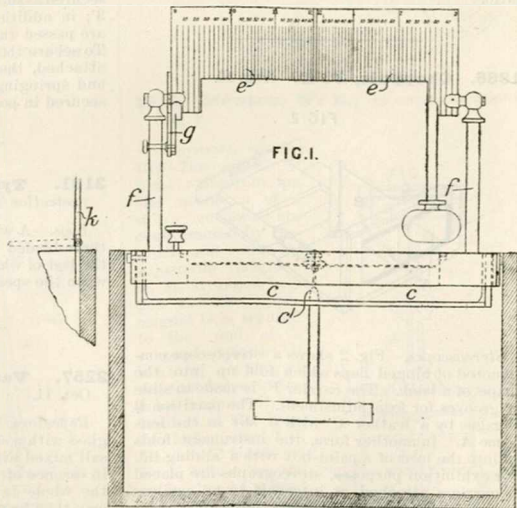
2391. Beau, A. P. A. Oct. 27.



Stereoscopes, pocket. The lens frame *c* is enclosed between two album-like covers *a, b*. A screen *h* may be slid into a groove *i*. FIG. 3 shows a pair of lenses with covered spring mounts *k*¹, *k*² on a hand frame *c*; or the lens frame may slide into a sheath simply.

2479. Pinhey, R. E., and Wood, J. Nov. 5.

Compasses, magnetic. — Relates to the combination with a compass of apparatus for determining the geographical meridian and thus the magnetic declination. The bowl *c*, containing the compass card and needle, is mounted in a ring carried by gimbals. The ring supports, by standards *f*, a cross-shaped frame *e*, the arms of which are graduated with a time scale, to be used in conjunction with a shadow cast by the sun. The frame *e* is rotated about an axis parallel with one of its arms by an arm and scale *g* to adjust it to the latitude of the place where the observation is taken. When this has been done, an indicator *k* is brought into line with the ship's head. The bowl *c* and its attachments are then rotated on the pin *c*¹ until the shadow of the stem of the frame *e* indicates on the time scale the local time. The axis of the frame is then in the meridian, and the angle which it makes with the needle gives the magnetic declination.



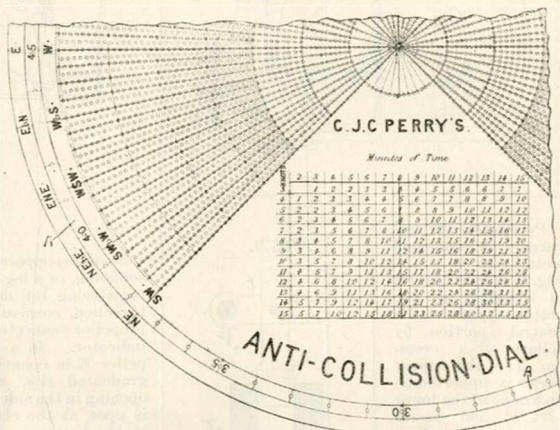
2531. **Maberly, F. H.** Nov. 11. *Drawings to Specification.*

Sounding-apparatus consists of a lazy-tongs

device, weighted so as to be drawn out and having its uppermost pair of links fitted with a scale to indicate the depth.

2575. **Perry, C. J. C.** Nov. 16.

Bearings and courses, determining and plotting.—The Figure is a plan of a dial by means of which the relative courses of approaching ships can be determined graphically from two observations, with a short time interval, from one ship, of the bearings and distances of the other. The periphery of the disc or dial is marked with the compass points and subdivisions, which are extended to the centre as radial lines of perforations, along which miles and tenths may be set off. A circle A—the “minute” circle—is divided into sixty equal parts and employed for marking off the time between two observations. In the unoccupied quadrant a table is given of sea miles travelled by a ship with a given knot speed, in a given number of minutes. In use, an observation of the bearing and distance of an approaching ship is taken and set out by a peg along the corresponding radial line on the dial. After the lapse of a certain time, a second observation is taken and set out in a similar way from a pin representing



the second position of the observing ship, for which purpose a graduated parallel ruler is employed. Models of ships are then placed over the pegs to indicate the relative positions and courses of the two ships.

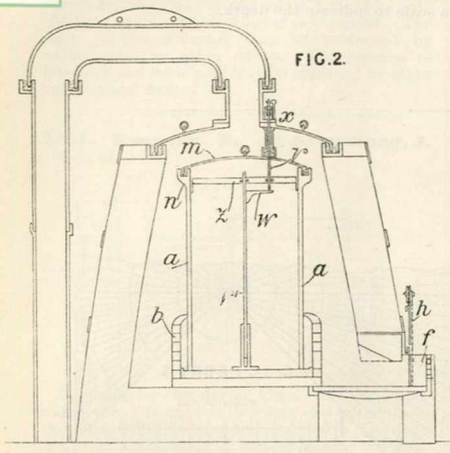
2644. **Swan, H.** Nov. 20. [*Provisional protection only.*]

Stereoscopes; opera glasses &c.—The lens frame of a stereoscope is made focally adjustable by pins adapted to slide in cloth-lined holes in the frame of the slide carrier. Opera glasses may be

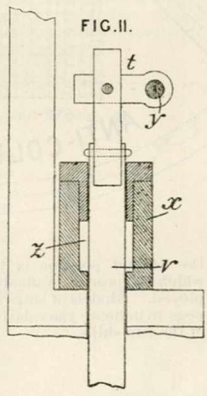
focussed in the same way. The lenses of a stereoscope may be separated by a piece of ribbed glass. Louvred reflectors may be used. A stand on the lazy-tongs principle may be employed. The parts of the instrument may be hinged together for portability.



2744. Adcock, H. Dec. 1.



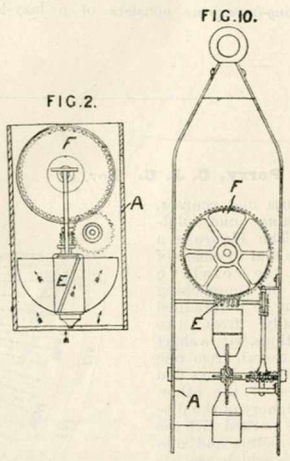
Pyrometers for furnaces. A compound metal bar *v*, *w*, *v'*, Fig. 2, is held upright in a socket at the bottom, and at its central portion by collars on a cross-bar *z*; the upper part *v* is supported on an arm *w* of the lower part *v'* and passes through a stuffing-box *x* containing asbestos in the spaces *z*, as shown in Fig. 11. The changes in the length of the bar *v* move the lever *t* and so turn the axis *y*, which carries a pointer moving over a graduated scale.



2763. Tooke, M. Dec. 3. [Provisional protection only.]

Clinometers &c.—For measuring the angles of inclination of the human figure, for use in tracing out garments, an instrument of rectangular form, having a dial face, is employed. The dial is semicircular, and divided into 32 parts, which are subdivided into halves and quarters, the main divisions being numbered consecutively from the centre to each side. The dial is furnished with a pointer or pendulum.

2386. Friend, J. W. Dec. 16.



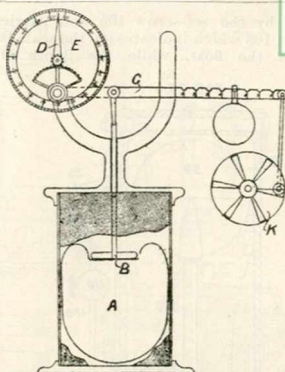
Sounding-apparatus; logs.—A lead for deep-sea sounding, or a log, is provided with apparatus for registering the depth of water or the distance travelled, consisting of a fan, vane wheel, or propeller connected by worm-gearing to a suitable indicator. In a sounding-lead, Fig. 2, a propeller *F* is connected with a wheel *E* having a graduated rim, which is visible through an opening in the side of the casing *A*. The casing is open at the ends and has the lead attached to the bottom end. In a log, Fig. 10, the vane wheel *E*, placed with its axis horizontal, is connected by worm gearing with a wheel *F*, the spindle of which carries the index of a graduated dial. The whole is enclosed in a casing *A* having inlet and outlet opening for the water. Metal blades are fixed obliquely on the casing to keep the instrument submerged.

2909. Maclellan, R. Dec. 20. [Provisional protection only.]

Stereoscopes.—The instrument, which is in the form of a box, is fitted at one end with an openwork four-sided prismatic drum, by means of which a chain of stereographs is passed in front of the lenses. A second pair of lenses is mounted on the top of the box, by means of which the stereographs can be seen by a second person, reflected in a mirror.

2975. Taylor, W., and Grimshaw,
W. D. Dec. 29.

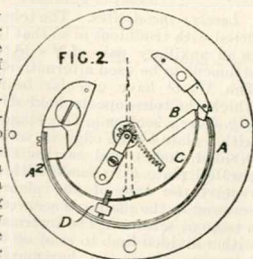
Thermometers.—A quantity of air is confined in a bag A, which, as it expands, raises, through a piston B, a rod C, the movement of which is indicated on a dial E and which may operate a bell or other alarm, or may actuate a register K, for the admission of air &c. to a room. The pointer D may be operated by rack-and-pinion gear.



A.D. 1859.

104. May, C. N. Jan. 13.

Pyrometers.—Relates to an instrument for measuring the temperature of cooking ovens by means of the expansion of a compound bar of two metals; or instead of using a compound bar, a single metal ring of \perp section may be used. The compound bar A A², consists of two semicircular strips of metal, one, for instance, brass and the other steel. One end A² is fixed, and the other presses against the short end of a lever B, the outer end of which has a toothed segment which gears into a pinion carrying



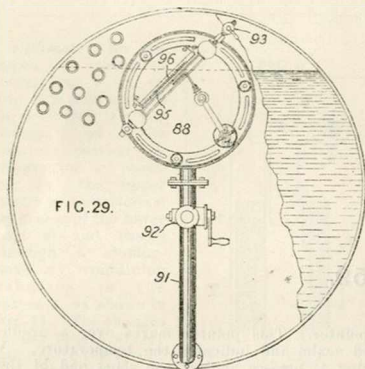
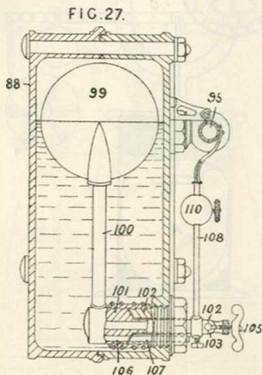
a pointer. This pointer moves over a graduated scale, and indicates the temperature. A spring C presses against the short end of the lever B and keeps it in contact with the bar A A². Connected to the spring is a regulating-screw D.

137. Montgomery, J. Jan. 17.

Specific-gravity estimating-apparatus.—Figs. 27 and 29 show a combined hydrometer, low-water alarm, and water-level indicator. The casing 88 attached to a boiler is connected to its water space by the pipe 91, and to its steam space by the pipe 93. The glass tube 95 communicating at each end with the inside of the casing 88 indicates the water level in connection with the scale 96. Within the casing is a hollow float 99 connected by the hollow inclined arm 100 to the pivot 101 mounted within the sheath 102. Any water which may enter the float runs out through the channel 103 in the pivot, which is adjusted



endways by the set-screw 105 and carries an index arm 108 which indicates on the scale 96 the height of the float, while the depth of its



immersion is shown by a hydrometric scale carried by the arm 108, and its buoyancy is adjusted by shifting the weight 110.

231. Woodcock, I. Jan. 25. [Provisional protection only.]

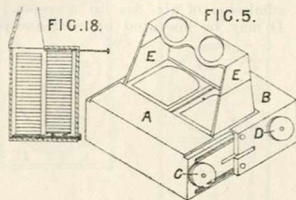
Barometers; thermometers.—Dials are formed of paper, cardboard, or the like, and enamelled.

288. Purssglove, T. P. Feb. 1. [Provisional protection only.]

Barometers.—A mercury reservoir has depending from it a straight or zig-zag tube, which

may be about 31 inches in length, and terminates in a flexible bag, which, through suitable mechanism, indicates the atmospheric pressure. In this form it may be used as a walking-stick.

296. Allen, E. E. Feb. 2.

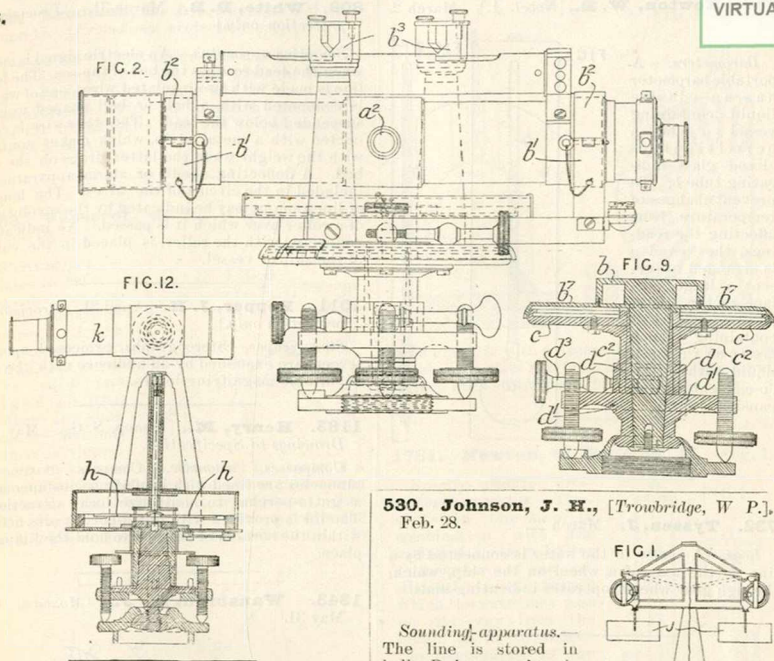


Stereoscopes, collapsible. The stereographs are mounted on an endless band wound from one roller C to another D. One half of the casing A is made to telescope into the other B. The frame E for the lenses is made to fold down. The top of the lens frame is made to slide up and down, it may be by rack work, for focussing. The folding of the lens frame may be effected in various ways as by making the side supports of wire or of lazy-tongs. The frame in which the rollers are mounted may also be made of lazy-tongs. Fig. 18 shows a magazine for stereographs. The latter are arranged in two piles. Each one for inspection is pushed from the top of the back pile to the top of the front one. Simultaneously the bottom one of the front pile may be pushed to the bottom of the back one.

326. Adie, P. Feb. 4.

Levels; theodolites.—The telescope of a level is fitted with trunnions a^2 so that it can be mounted in an auxiliary pair of Y's b^1 to enable the instrument to be used alternatively as a theodolite. The Y's b^1 have circular bearing surfaces on which the telescope is held down by straps b^2 . Fig. 9 is a section. The stage-plate b is fitted with a plate b^1 the edge of which overhangs the divided limb c and carries the verniers. The parallel plate d^1 is made with a conical hole to receive the axle of the plate b . A collar b^2 screwed to the plate c is secured to the boss d by a tangent screw d^2 . The instrument may be fitted with a divided limb to read off the motion of the telescope about the horizontal axis. In the instrument shown by Fig. 12, the ends of the suspended compass magnet h are fitted with verniers which read against a divided limb carried by the telescope k .

(For Figures see next page.)



452. Swaisland, H. Feb. 18. [*Provisional protection only.*]

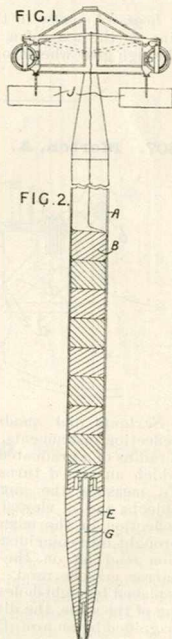
Sextants; compasses, magnetic.—A magnetic needle is combined with a box sextant, being placed at or near the top plate. The arm carrying the magnifying lens is jointed, so that the compass cord or the sextant vernier may be viewed with it. The needle may be fixed by a stop or check while a reading is taken.

516. Peover, G. Feb. 25. [*Provisional protection only.*]

Kaleidoscopes.—The objects to be reflected are arranged round a spindle mounted horizontally in a box on which the tube of the instrument is secured. The spindle rests in horizontal or vertical slots in the end of the tube, so that the objects may be moved laterally or vertically under the eye-piece. A pair of glass prisms may be fitted to the object end of the reflecting-tube. The reflecting-tube may be mounted in the box so as to be capable of rotation. Prisms may be adapted to the eye-piece end of the instrument, so that more than one person can see the objects at once. The apparatus is termed a "chromeidoscope."

530. Johnson, J. H., [*Troubridge, W P.*], Feb. 28.

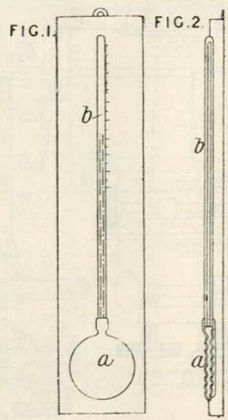
Sounding-apparatus.—The line is stored in balls B in a casing A, the lower end of which is fitted with the lead E. One end of the line is fixed to the ship and the other to a bolt G with a hollow nose which becomes detached from the tube A and weight when the store of string becomes exhausted. The bolt G with the registering apparatus returns to the surface. The registering apparatus preferred is "Saxton's current indicator," in which the revolutions of fans J are recorded during the descent of the tube A but not during the ascent of the bolt G by which the apparatus is detached from the tube A.





556. **Newton, W. E.**, [Nobel, A.]. March 2.

Barometers.—A portable barometer has an elastic liquid - containing vessel *a* and a hermitically-closed glass indicating tube *b*. To prevent changes of temperature from affecting the readings, the vessel *a* is arranged to present a large surface to the atmosphere without containing much mercury; or a liquid with a low co-efficient of expansion is used.



808. **White, D. B.** March 31. [Provisional protection only.]

Sounding-apparatus.—An electric signal is made when the lead reaches the bed of the sea. The lead line is made with two insulated wires, one of which is connected with a ball or bell shaped weight suspended below the lead. The other wire is connected with a metal strip, which makes contact with the weight when the latter drags on the sea bed. A deflecting needle or alarm apparatus is included in the circuit of the wires. The length of line run out may be indicated by the revolutions of a roller over which it is passed. An indicator, connected with the roller, is placed in the cabin of the ship or vessel.

1011. **Pepper, J. H.** April 21. [Provisional protection only.]

Stereoscopes.—Stereographs, projected upon a screen, are examined by an audience with the aid of suitable magnifying-lenses.

1183. **Henry, M.**, [Bishop, S. C.]. May 11. Drawings to Specification.

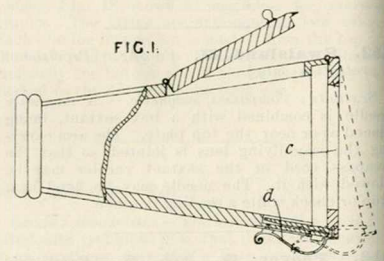
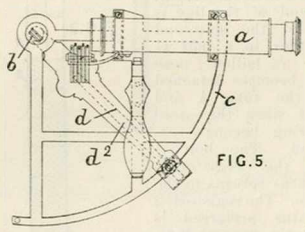
Compasses, magnetic.—Compass boxes or binnacles are lined with insulating substance such as gutta-percha "to neutralize local attraction." The lid is provided with gutta-percha pins fitting within the corners of the box to hold the lining in place.

732. **Tyssen, J.** March 22.

Logs.—A screw in the water is connected by a line to the axis of a wheel on the ship, which, through gear wheels, operates indicating-dials.

1343. **Wansbrough, J.**, [Moxham, E.]. May 31.

807. **Morton, A.** March 31.



Sextants and quadrants.—Relates to single reflection instruments. A telescope *a* is fixed on a radius of a graduated arc *c* about the centre of which an arm *d* turns carrying a plane mirror *b*. To measure the angle between two distant objects, one is viewed directly and the other by reflection in the mirrors. The two images are brought into coincidence and the angular separation read off on the scale *c*. A second fixed mirror may be used. The telescope may also be replaced by sight-holes. To facilitate the reading of the scale, the divisions may be practically magnified by an arm *d*² pivoted near the free end of the arm *d*.

Stereoscopes.—The frame *c* for supporting the views is hinged so that it can be tilted, as shown in broken lines, to get rid of distortion in architectural subjects. The frame is retained in position by a spring catch *d*.

1450. **Jones, T. W.** June 16. Drawings to Specification.

Stereoscopes; lenses.—To obtain the dissimilarity of the retinal images necessary for the production of a stereoscopic effect by a single picture, a distorting-lens is used before one or both eyes. This is of the cylindrical type with a parabolic or cycloidal curvature. Such lenses may also be fitted to opera and field glasses, and to spectacles.

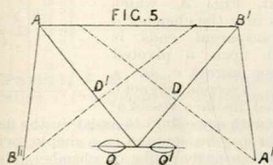
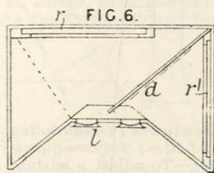


1462. **Brooman, R. A.**, [Duplay, C. M. C.].
June 17. [Provisional protection only.]

Pyrometers.—A pyrometer is in the form of an iron rod resting at one end on a piece of fusible metal contained in a tube and is used as a temperature indicator in a steam generator. When the metal melts, the rod is relaxed, and actuates an alarm.

1463. **Vasserot, C. F.**, [Corbin, H. A.].
June 17.

Stereoscopes.—Relates to reflecting-stereoscopes. In one form, the pictures, which are larger than usual, are separate and inclined to one another in such a manner that one of them is viewed directly by the eye, and the other by means of a mirror placed at the bisection of the angle between the views. Fig. 6 shows this arrangement. The pictures are placed in slots r, r' , one opposite the lens l , and the other opposite the reflector d . In

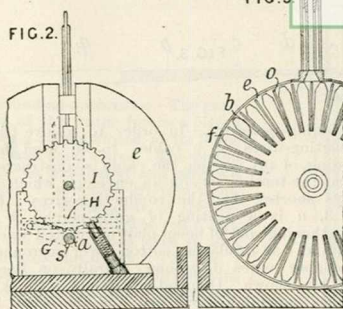


another form, shown diagrammatically in Fig. 5, both pictures are seen by reflection. The mirrors D, D' make equal angles with the axis of vision, and the pictures are placed at A', B' and A, B' . The case may be covered by rough glass or a removable opaque lid so as to regulate the light. By cutting out the partitions at the back of the pictures and closing the lid, transparent pictures may be shown. One of the pictures viewed in the instrument shown by Fig. 6 must be taken inverted.

1527. **Newton, W. E.**, [Perry, J. S.].
June 25.

Stereoscopes.—Stereographs O for successive exhibition, are stored in pockets b formed on the periphery of a cylinder e , which rotates in a casing or shield f , and the axle of which is fitted with a spur-wheel I . A shaft a , rotated by a handle placed outside the enclosing cabinet (not shown), carries a single tooth s to drive the cylinder e and bring each pocket in succession beneath a frame B . The shaft a is also connected

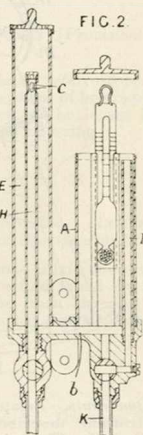
FIG. 2.



by a crank G with a frame H in vertical guides which, as it rises and falls, raises and then lowers in turn each stereograph for exhibition.

1781. **Newton, W. E.**, [Grice, J.]. Aug. 1.

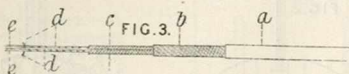
Specific-gravity estimating-apparatus.—Consists in the use, in combination with the casing of a steam boiler salinometer, of an additional vessel through which the water may pass on its way from the boiler, so as to reduce the temperature of the water below boiling point. The additional vessel E is fitted with a central pipe H leading from the boiler and formed with perforations c at its top. The overflowing water passes by way of a passage b to the salinometer case A , which is provided with an overflow pipe I , leading by a three-way cock to the waste pipe K , and having its upper level lower than that of the pipe H .



1805. **Maillard, N. D.** Aug. 5. [Provisional protection only.]

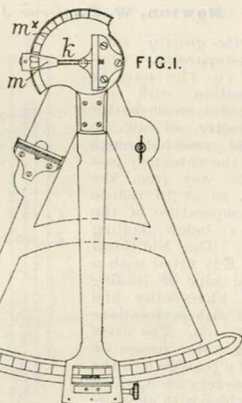
Course indicators.—The changes in the course of a ship are indicated on a dial on deck by hands mounted on a shaft connected by bevel gear with a vertical shaft fitted with a vane or vanes and immersed in the water. The direction of the vessel is also stated to be indicated by this means, as also the "true time of the ship." The invention may be applied to surveying-instruments by fitting a wheel to the vertical shaft instead of the vanes.

1812. **Drake, W. B.**, [Schneider, E.], Aug. 6.



Sounding-apparatus.—In order to relieve the conducting-wires of a cable, to be used for sounding, of any tension, the cable is constructed so that the tension acts on an envelope which is always shorter than the conducting-wires. In Fig. 3, *a* is a coating of gutta-percha, *b* a strengthening coat of hemp plait or twisted linen yarn, and *c* an insulating cotton cover surrounding copper wires *d*, wound spirally on linen yarns *e*, as shown. One end is fastened to Brook's deep-sea sounding-apparatus, and the other is wound on a roller in combination with an electro-magnet and galvanic battery.

2009. **Hedgecock, T.** Sept. 2.



Quadrants.—Relates to an improvement on the instrument described in Specification No. 727, A.D. 1855. The transparent glass *k*, instead of being fixed, is mounted on a pivoted arm *m*, working over a scale *m*'.

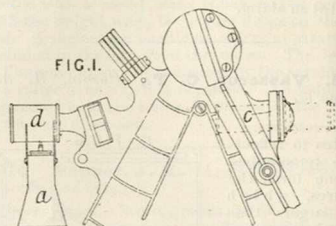
2020. **Swan, H.** Sept. 3. [Provisional protection only.]

Stereoscopes. are constructed with the two prisms or lenses of different magnifying powers, arranged in front of pictures in which the two views are of different sizes, corresponding with the different powers of the prisms or lenses. In some cases, one prism or lens only is employed, the large picture being then seen without the aid of a prism or lens.

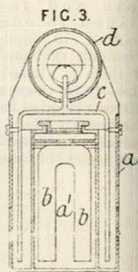
2050. **Small, T. O.** Sept. 8.

Stereoscopes.—A coloured reflector operated by a pulley or lever is used to illuminate the stereographs.

2056. **Gowland, G.** Sept. 8.

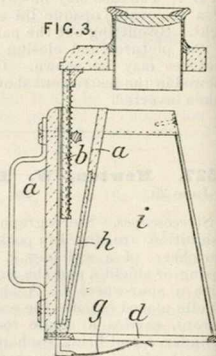


Sextants; quadrants; theodolites; horizons, artificial.—To adjust a sextant or other instrument when the horizon is not visible, a sight mounted upon a pendulum is used in conjunction with a fixed sight and the usual telescope *C*, Fig. 1. This oscillating V-sight, Fig. 3, which projects into the chamber *d* with transparent ends is mounted upon a pivoted horse-shoe magnet *c* in a casing *a*. A second magnet *b* is pivoted inside a vessel *a*' filled up with some fluid to assist in the damping. The sight may be mounted on a simple oscillating bar in a transparent tube or chamber filled with fluid. Sextants and the like may be fitted with a binocular telescope instead of the usual monocular one.



2112. **Beck, J.** Sept. 16.

Stereoscopes.—To admit light to the picture, the stereoscope is left entirely open in front and at the two sides, and a reflector of silvered glass is fixed to the back of the instrument; the dividing partition is made of ground glass. The body of the instrument is made in two parts *a*, *b*, the latter of which supports the lens frame, and the former the picture holder *d* and the reflector *h*.



The pictures are held by means of springs *g*, hinged so that they may be turned back, and thus allow the instrument to stand flat when not in use. The screen *i* is made of ground glass, to prevent a shadow being cast on the picture.

2231. **Millar, J.** Oct. 1. [*Provisional protection only.*]

Reflectors for diffusing artificial light are formed of a rectangular plate of metal, silvered glass, &c., which is divided by lines running across the face from corner to corner. The source of light is placed opposite the intersection of the lines.

2258. **Fisher, R., and Aspray, C.** Oct. 5. [*Provisional protection only.*]

Stereoscopes.—Two photographs of the same object, are taken with a single camera, but in different attitudes or positions, and in the stereoscope is provided a sliding shade by means of which the right or left hand picture is viewed alternately; by this arrangement the effect of motion or change of position is produced.

2297. **Parfitt, J. S.** Oct. 10. *Drawings to Specification.* [*Provisional protection only.*]

Logs and current meters.—The pressure of water against a disc is transmitted by a crank lever to a rod working against a spring. The movements of the rod are indicated by a pencil travelling over a clock-driven drum.

2426. **Laurent, P. M. A.** Oct. 24. [*Provisional protection only.*]

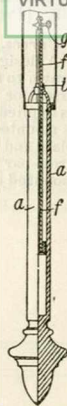
Lenses; telescopes.—Eyepieces are formed of glass cylinders either combined with one or more ordinary lenses, or formed with curved ends to constitute lenses.

2428. **Brooman, R. A.,** [*Boy, J.*]. Oct. 24. [*Provisional protection only.*]

Reflectors.—The reflector is formed of crystal or glass, with one surface, or part of it, silvered or gilded.

2489. **Spence, W.,** [*How, T. P.*].

Sounding-apparatus.—The pressure of the water forces a piston down a tube *a* closed at its lower end and open above. The piston rod *f* is graduated and carries a collar *i*, mounted friction-tight, which, on the descent of the piston, is forced along the rod *f*, but, on the ascent, rises with it and indicates the depth. The rod *f* is made hollow, and is fitted with a cock *g* to facilitate withdrawal.



2506. **Binckes, A.** Nov. 4. [*Provisional protection only.*]

Optical instruments: opera glasses; stereoscopes.—Lenses are mounted upon a system of levers by means of which the inclination of the lenses is adjusted simultaneously with the focussing.

2699. **Berger, J. B.** Nov. 29. [*Letters Patent void for want of Final Specification.*]

Course indicators.—The course is laid down on a spherical chart and its direction found by a quadrant, pivoted at its centre upon the north pole of the chart, and by a compass card similarly pivoted.

2745. **Curley, E. A.** Dec. 3. *Drawings to Specification.*

Barometers.—Consists in a floating vernier guided in the top of the barometer tube by a rod, and reading against a scale on the side of the tube.

2755. **Negretti, E. A. L., and Zambra, J. W.** Dec. 5. [*Provisional protection only.*]

Stereoscopes, folding. The stereoscope packs up into a box which may also enclose the stereographs. The lid forms the shield between the two lenses and also a support for the lens frame.



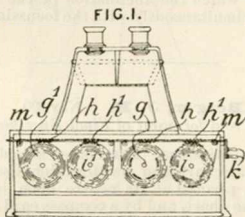
2796. Hughes, H., and Moore, J. Dec. 9. [*Provisional protection only.*]

Curves, figures, &c., reproducing; pantographs.—A design is followed by a tracing-lever and is drawn to the same or a reduced scale, on a cylindrical or flat surface. The invention is described as applied to a cylindrical surface. A cylinder is mounted on an axis provided with a dividing-plate and with end levers connected by a slotted cross-bar parallel to the axis. A pencil or tracer is mounted on a slide placed in front of the cylinder

and parallel to the axis, and is provided with a vertical slot. A pivoted rod extends across the machine parallel to the axis and supports a tracing-lever by a connecting-bar. The tracing-lever extends through the slotted slide and cross-bar, and its pointed end rests upon the design to be reproduced. To draw upon the whole surface of the cylinder, the connecting-bar to which the tracing-lever is jointed is shifted along the transverse rod, and is set to act on a fresh portion of the cylinder as controlled by the dividing-plate.

A.D. 1860.

58. Czugajewicz, P. Jan. 9.



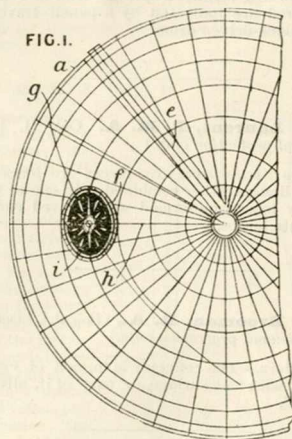
Stereoscopes.—The pictures are arranged on two bands each passing from one of a pair of rollers to the other. Fig. 1 shows one arrangement. The rollers g, g' are rotated by worms h, h' , and the rollers i, i' by worms h, h' of opposite pitch, on two horizontal rods fitted with handles k . The pictures pass over small rollers m in the positions shown. In another arrangement, the rollers are formed with intergearing wheels and are actuated by a central wheel. The casing may be hinged at the bottom and tilted to any angle by a rack and pinion, the opening being covered by a folding flexible material.

107. Smith, W. Jan. 14.

Magic-lantern apparatus.—Slides for magic-lanterns are made by mounting on glass, or between two glasses, or in a frame, a film of

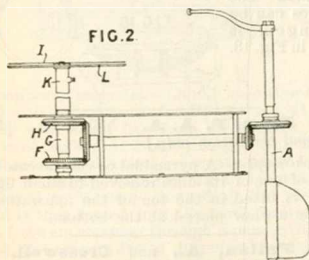
collodion to which a design has been transferred. Paper may be pasted round the edge of the glass, the film being attached to the paper by cement or varnish. When two sheets of glass are employed, their edges may be secured by a strip of paper pasted round them.

133. Berger, J. B. Jan. 18.

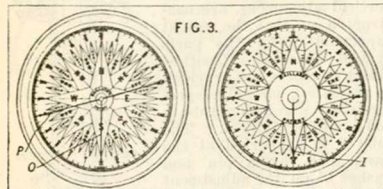


Bearings, instruments for determining.—Relates to improvements on the invention described in a Specification not quoted, but presumably No. 2639, A.D. 1859. In the present case, the compass disc *f* is movable, and is brought down to the ship's intended course *g* --- *i*, marked on the "spherometer" *a* instead of carrying up to the disc a line parallel with the ship's course. Assuming the vessel has reached the point *i*, over which the centre of the disc *f* is placed, the meridian *h* is first determined by the quadrant *e* and drawn on the sphere. By adjusting the disc *f* so that its north and south points coincide with the meridian *h*, the course to be steered can be read off.

135. Maillard, N. D. Jan. 18.



Course indicators.—Relates to "means for steering and indicating the course or direction of ships." The rudder *A* is geared to drive the bevel-wheels *F*, *H*, fast and loose on the shaft *G*, which carries a pointer *I*. The wheel *H* may be clutched to the hollow spindle *K* having the card *L* fixed at its upper end. A second dial is placed beside the first, and has a barrel spring and train of wheels for moving the time indi-

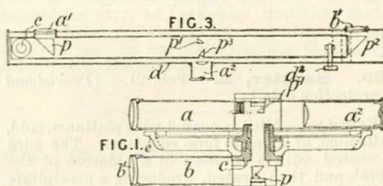


cator *O*, and a position *P* for marking latitude. It is stated that in the arrangement described it is possible "to ascertain the bearings of the sun and other heavenly bodies at all times, without making celestial observations, as one indicator on the dial shows the time and bearing of the sun at Greenwich, and the other the time and bearing of the sun at ship or other place."

340. Willington, H. Feb. 8. [Provisional protection only.]

Spectacles and eyeglasses.—To secure a firmer fit, the wings of spectacle frames are provided with loose "studs" which are covered with rubber or other frictional surfaces, or are perforated or roughened. The wings may be specially curved to press upon any desired part of the side of the head. Similar studs may be applied to eyeglasses, the bridge of which may be in the form of a ring. To prevent undue convergence of the eyes in reading, an "extra piece of metal that shall fall down the "line of the nose" is employed.

357. Adie, P. Feb. 10.



Angle-measuring instruments.—To determine angular distances, a telescope *a*, Fig. 1, is mounted to rotate on a hollow axle *c* at the centre of a graduated circle *e*. Beneath this circle is mounted a second telescope *b*, which is fitted with right-angled prisms *p*, *p*¹ to direct the light from its object-glass *b*¹ into the eyepiece *a*² of the upper telescope. Objects angularly separated can thus be viewed simultaneously and the angular distance between them measured on the scale *e*.

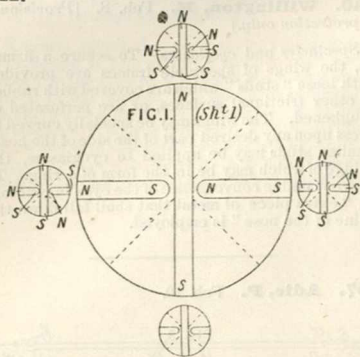
Telemeters.—A casing *d*, Fig. 3, is fitted with a single eye-piece *a*² and two objectives *a*¹, *b*¹, at a fixed distance apart. An inner tube, pivoted at *c*, carries prisms *p*, *p*¹, *p*², *p*³ by means of which an image is formed by each of the object-glasses in the eyepiece. The adjustment to bring the two images of a distant object into coincidence is effected by a screw *d*² which indicates the required distance against a scale.

442. Irons, D. Feb. 17.

Compasses, magnetic.—To counteract local attraction, a number of supplementary or "satellite" magnets are arranged in connection with the central compass card. One form is shown in Fig. 1, in which four satellite cards are used, fitted with magnets having their poles arranged as shown. Each card is mounted on a separate pivot. In a modification, the satellite magnets are curved and are arranged around the periphery of the compass card. Various dispositions of the principal magnets, mostly of a radial nature, are shown as being suitable for use with the satellites.

(For Figure see next page.)

442.



469. **Sautter, L.** Feb. 21. [Provisional protection only.]

Reflectors.—Mica is coated with platinum, gold, palladium, or silver to form reflectors. The mica is coated with a solution of a chloride of the metal, and then heated, producing a precipitate of the metal. To form faceted reflectors, sheets of the mica are fastened together with platinum wire.

479. **Symons, W.** Feb. 22. [Provisional protection only.]

Thermometers, registering. A horizontal C-shaped tube has a bulb at the end of one arm, mercury filling part of the arm and spirit occupying the bend and part of the other arm which terminates in an air bulb. A freely-sliding index is placed in the spirit in each arm.

537. **Desvignes, P. H.** Feb. 27.

Stereoscopes combined with zoetropes. Stereoscopic pairs of views are mounted on an inner rotating cylinder B, and are viewed through slots in an outer one A.



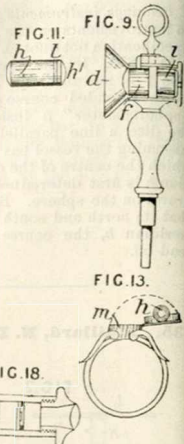
559. **Swan, H.** Feb. 29.

Stereoscopes.—The two stereographs are of different sizes and are viewed by lenses of different focal length, or one may be viewed without a lens. The mount for the pictures consists of a piece of cardboard bent troughwise, the larger picture being mounted on the inner face of the larger back flap, and the smaller on the outer face of a smaller front flap which has an opening opposite the larger lens.

801. **Dagron, A. P. P.** March 28.

Microscopes.—Relates to dwarf microscopes which may be applied to jewellery,

penholders, toys, &c. Fig. 9 shows the invention fitted to a watch key. The eye lens *d* is mounted in a tube which can be adjusted by a pin *f* sliding in a slot in the case. The picture or object is mounted at *i*. Fig. 11 shows a form in which the picture *l* is cemented between the two portions *h, h'* of the lens. For rings, the stone *m* opens on a hinge, the microscope *h* being fitted inside the cover. A double form, in which two pictures can be arranged, is shown in Fig. 18.



823. **Beau, P. A. A.** March 30. [Provisional protection only.]

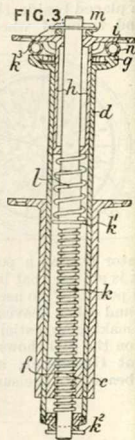
Graphoscopes.—A pyramidal or conical case has a part of one of its sides removed to admit light. A lens is fitted in the top of the apparatus to examine a view placed at the bottom.

862. **Pullan, A., and Cresswell, T.** April 4. Drawings to Specification.

Specific-gravity estimating apparatus.—A chamber to admit a salinometer is arranged in communication with the water space of a water gauge for a marine boiler.

1035. **Minasi, C.** April 25.

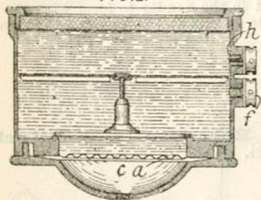
Adjustable pedestals.—Music stools, and other seats and stands having a revolving vertical adjustment, are constructed so that the weight supported locks the parts against rotation. Toothed clutch members are provided on plates *i, g* carried, respectively, by a rotating tube *h* and a sliding tube *d*. The tube *d* is supported at the lower end by a pin and washer *k²* on the adjustment screw *k*. The tube *h* is fitted on the upper squared end of the screw *k*, and retained by a pin and washer *k¹*, and is supported by a spring *l* coiled round the screw *k* above a collar *k²*, so that the clutch members are normally disengaged. The lower end of the screw *k* works freely in a bush in the end of the tube *d*, which slides within a tube *c*.



attached to the base of the music stool. The nut *f* of the screw *k* is fixed to the tube *c* by lugs, which pass through the slots in the tube *d*, and prevent rotation of the tube *d*. The seat is secured to the plate *i*. India-rubber springs or washers *m, n* are arranged between the parts *k, i, g*, to prevent noise.

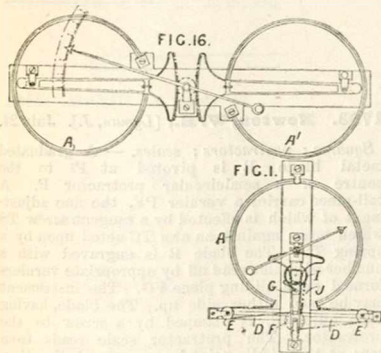
1042. West, J. G. April 25.

FIG. 2.



Compasses, magnetic.—Liquid compasses are fitted with arrangements for filling the bowl completely with liquid free from air bubbles. The bottom of the bowl is fitted with a flexible corrugated plate *a* and an outer concave cover *c* forming an air space. In filling, the air space is first exhausted by a pump, distending the plate *a*; liquid is then forced into the bowl through the inlet *f*, the air escaping through a passage *h*, after which the air is allowed to enter the chamber under the plate *c* so that the atmospheric pressure acts to force out any remaining bubbles in the bowl. The passages *f, h* are hermetically closed by screw plugs.

1185. Newton, W. E., [Richard, F.]. May 14.

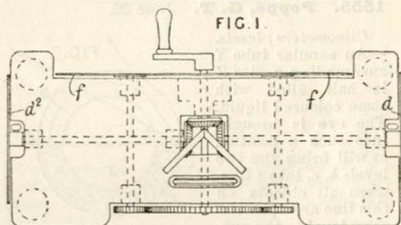


Barometers.—Relates (1) to transmitting-mechanism in aneroid barometers of the Bourdon-gauge type; and (2) to means for reinforcing the

operating-tube. As shown in Fig. 1, the free ends of the tube *A* are connected by chains *D*, which pass over pulleys *E* to a pulley *F* on the axle of which is mounted a sector *G* driving the pinion of the indicating-hand. The chain *D* is kept taut by a spring box *I*, connected by a chain *J* to axle of the pulley *F*. The tube *A* may be reinforced by an internal steel strip extending throughout the length of the tube. Fig. 16 shows a modification in which two tubes *A, A'* are used, the free end of each being directly connected to the sector which drives the indicator. In this form, no matter what the position of the instrument, the tendency of gravity acting on one tube to alter the indication of the instrument in one direction will be neutralized by the action of gravity on the second tube. Several other modifications are described embodying this principle of construction. In the case of single-tube forms, too, the driving-mechanism may be variously modified, chain gearing being replaced in some forms entirely by spur gearing. In one form, the tube is directly connected to the tube *A*.

1260. Shaw, W. T. May 22.

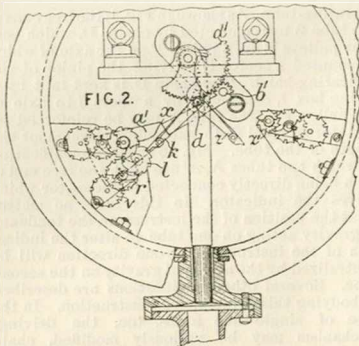
FIG. 1.



Stereoscopes.—Fig. 1 shows a plan of a Wheatstone's reflecting-stereoscope combined with a zoetrope. The stereoscopic pairs of views are mounted on discs *d, d^2* driven by spur gearing simultaneously with a pair of discs *f*, each of which contains a single viewing-slot. In the case of refracting-instruments, the views are mounted on the polygonal faces of a rotating drum and the instantaneous views are obtained by mounting a rotating drum with diametral holes in it, in front of the lenses.

1435. Clarke, J. June 12.

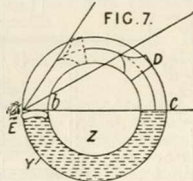
Thermometers and pyrometers.—In gauges for measuring temperature, the number of times the temperature rises or falls beyond certain limits is registered as follows:—Connected to the axis *d* of the index finger is a ratchet arm *k*, which, every time the index finger moves beyond a certain limit, actuates a tooth of the ratchet-wheel *l*, forming with star-wheels *r, v* a counting-mechanism. If the index finger moves beyond a certain higher limit, the arm *k* actuates in the



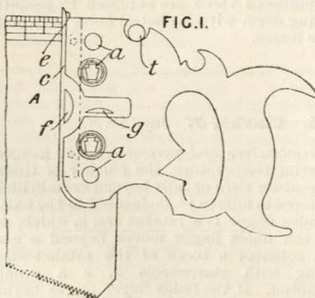
same way the ratchet-wheel *x* and counting-mechanism. Should the finger fall below a certain limit, the arm *z* actuates a counting-mechanism *z*¹.

1555. Peppé, G. T. June 26.

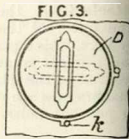
Clinometers; levels.
—An annular tube *Y* surrounding a disc *Z* is half filled with some coloured liquid. The eye is brought into such a position as will bring the two levels *b, c*, into a line, when all objects on this line are upon the same level as the eye. By attaching a graduated arc, a movable brass clip *D*, and a sight *E*, angles of elevation may be measured.



1648. Disston, H. July 9.

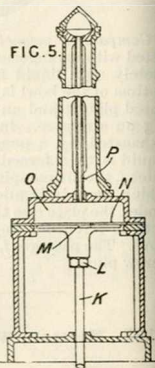


Squares; straight-edges; levels and plumbing-instruments.—Two metal strips *c*, to form the butt of the square of the combined saw and square described in Specification No. 2509, A.D. 1857, are riveted to the saw blade *A* independently of the handle, and are pointed at *e* to form a scriber for use in conjunction with the straight graduated back edge of the blade. Two spirit tubes *f, g*, or a tube attached to a plate *D* which may be rotated between stops *k*, are mounted in the handle to form with the back of the blade a level and a plumbing-instrument.



1784. Robertson, A., and Ritchie, A. July 24.

Pyrometers.—A cylindrical vessel *O*, fitted with a tube *P* of narrow bore containing liquid, is provided with a flexible bottom *N*, against which bears the upper end of an iron rod *K* exposed to the heat. The rod *K* is attached by an adjustable screw *L* to a disc *M* bearing against the underside of a diaphragm *N* of material such as caoutchouc. The tube *P* may be provided with a scale.



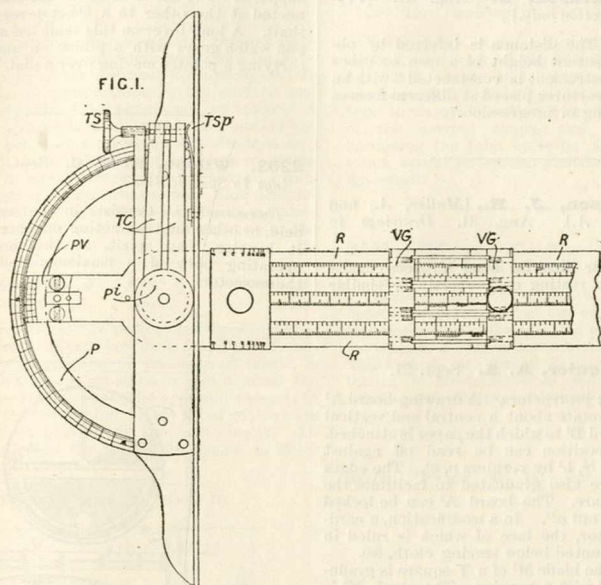
1793. Newton, W. E., [Lyman, J.]. July 24.

Squares; protractors; scales.—A graduated metal blade *R* is pivoted at *P* to the centre of a semicircular protractor *P*. A tail-piece carries a vernier *PV*, the fine adjustment of which is effected by a tangent screw *TS* which bears against an arm *TC* acted upon by a spring *TSp*. The blade *R* is engraved with a number of scales read off by appropriate verniers formed on a sliding piece *VG*. The instrument may be used either side up. The blade, having been adjusted, is clamped by a screw to the protractor. The protractor scale reads from zero at the middle point in an upward direction, whilst the lower quadrant is graduated to show the complement of the angle.

(For Figure see next page.)

1860]

1793.

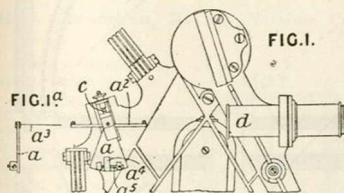


1827. **Olorenshaw, J.** [*Fellows, L. S.*].
July 27. [*Provisional protection only.*]

Spectacles.—The joints of the lens frames, instead of being tight, are fitted with springs, so that the frames can be easily expanded to allow of removing or fitting in the lenses.

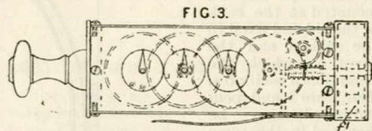
This pendulum carries on a cross-bar a^2 projecting arms a^3 . Fig. 1a, over which sights are taken. The pendulum is adjusted by a weight a^4 on a screw a^5 .

1845. **Rahill, J.** July 30.



Sextants, quadrants, and the like; horizons, artificial.—To obtain a horizontal adjustment when the horizon is not available, a pendulum a is suspended from an axis cutting the axis of the telescope d and adjustable by a nut and screw c .

1893. **Klinton, J. F.** Aug. 4.



Logs.—A vaned rotator is mounted on a cylindrical casing which contains indicating-mechanism operated by a pendulous weight. Fig. 3 shows this mechanism. The weight p , by the rotation of the casing, actuates the train of indicating-wheels through a worm and pinion. The indicator fits friction-tight in the rotator-casing by means of a spring, and is provided with a knob for withdrawal after the cover of the casing is removed.

2102. Richardson, G. Aug. 31. [*Provisional protection only.*]

Telemeters.—The distance is inferred by observing the apparent height of a man or other object. The instrument is constructed "with an aperture or apertures placed at different focuses" and diminishing in progression."

2105. Johnson, J. H., [Muller, A., and Lencauchez, A.]. Aug. 31. *Drawings to Specification.*

Pyrometers for blast for blast furnaces consist of a metal bar resting on porcelain or similar

supports. The bar is fixed at one end and connected at the other to a short lever fixed to a shaft. A long lever on this shaft has a segmental end which gears with a pinion on another shaft carrying a pointer moving over a dial.

2203. Wilson, R. H. C. Sept. 12. *Drawings to Specification.*

Thermometers.—Consists in the use of dilute acid, or other fluid not acting on mercury, which it heavier than spirit, as the liquid in the operating bulb of a maximum and minimum thermometer.

2302. Trinquier, A. A. Sept. 21.

Plane tables; protractors.—A drawing-board A^1 is mounted to rotate about a central and vertical pivot in a board B^1 to which the paper is attached. The angular position can be read off against circular scales b^1, b^2 by verniers a, a^1 . The edges of the table are also graduated to facilitate the use of a T-square. The board A^1 can be locked by a clamping nut a^{10} . In a modification, a cardboard protractor, the face of which is ruled in sections, is mounted below tracing cloth, &c.

Squares.—The blade M^1 of a T-square is graduated and fitted with a vernier. The stock M^2 is also graduated to read as a vernier against the scale c^1 .

Clinometers; levels; compasses, magnetic.—

Fig. 2 shows an instrument in which a compass S , fitted with sights G^1, G^2 , is provided with a lid F .

In a recess in this lid a graduated circle I is fixed in front of which is mounted free to swing a semicircular disc J , with a weight j attached. A telescope may be mounted at the back of the lid and fixed to the scale I and the pivot on which the pendulum J oscillates. The scale I and pendulum J may be mounted in the same box and on the same pivot as a compass needle.

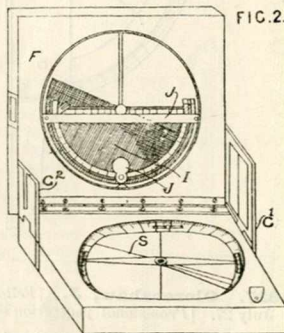


FIG. 2.

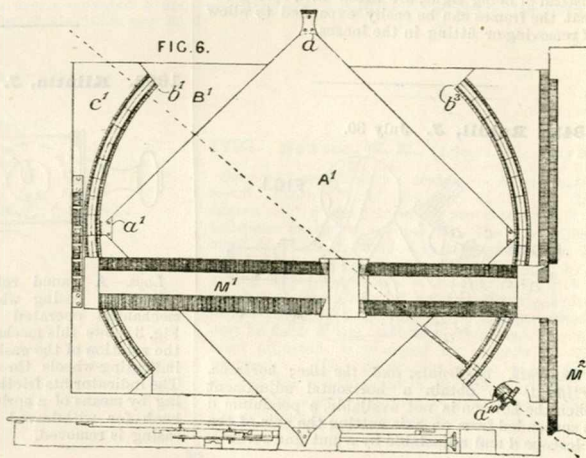


FIG. 6.

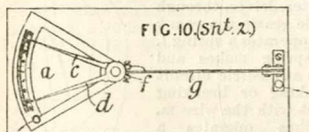
- 2323. Batchelor, H.** Sept. 24. [Provisional protection only.]

Curves, figures, &c., drawing; ruling-pens.—Ornamental figures or designs are traced on slate, paper, &c., by means of threads connecting certain projections or perforations in the surface, and serving as guides for a pencil, pen, or tracer. A recess or groove is made near the point of the pencil or pen to retain the thread. Designs may also be obtained by means of templets revolving singly or in sets of two or more round fixed points on the surface to be ornamented. One templet may be fixed, and the others driven by a band; the tracer may be on a moving templet or on the band.

- 2438. Calkin, J.** Oct. 8. *Drawings to Specification.*

Face-protectors.—To protect the upper part of the face from the weather, dust, &c., a wire frame, covered with an open or transparent fabric, is secured to a cap, or attached by a clip round the head. The fabric covers the eyes and extends to the nose, the lower edge being fitted with a wire which can be bent to fit the face closely. An opening is left in the top of the frame to allow heated air to escape.

- 2462. Wheatstone, C.** Oct. 10.

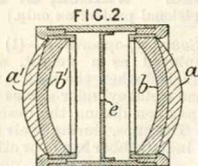


Thermometers for indicating electrically at a distance a variation of temperature above or below given limits are constructed as shown at Fig. 10, (Sheet 2). The arms *c, d* which carry the contact screws *f* are set to the upper and lower limits on the scale *a*, and the compound iron and brass bar *g* makes contact with one of the screws and closes the circuit of a bell &c. when the limit is exceeded in either direction. A Breguet helix may also be used.

- 2496. Brooman, R. A.,** [Harrison, C. C.] Oct. 13.

Lenses; microscopes; telescopes.

—A lens, primarily for photographic use, but stated to be applicable to microscopes, telescopes, and other instruments, is formed of a symmetrical pair of achromatic miniscus lenses, *a, b* and *a', b'*, the outer surfaces of *a* and *a'* forming portions of a sphere having its centre at *e*.



- 2511. Newton, W. E.,** [Hubbard, J. B.] Oct. 15. *Drawings to Specification.*

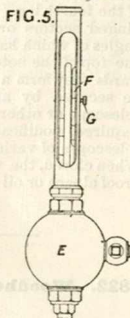
Barometers.—Metal pipes and tubes of oval section, of the kind described in Specification No. 1185, A.D. 1860, suitable for Bourdon barometers, are made by flattening a cylindrical tube to an oval section, introducing a mandrel of the correct shape, and burnishing and hardening the tube while on this mandrel, for which operation special machines and tools are described.

- 2551. Munn, J. A.,** [Hubbard, J. B.] Oct. 19. [Provisional protection only.]

Thermometers.—A metallic strip forming nearly a circle is fixed at one end to one arm of a forked standard; the free end operates, by a pin working in a slot, a lever pivoted in the fork. This lever is also forked at one end and a silk thread is stretched from one arm, around the spindle of the index, to the other.

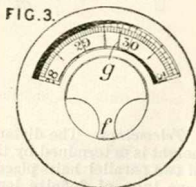
- 2578. Tylor, W. H.** Oct. 23.

Specific-gravity estimating apparatus.—A salinometer consists of a thermometer having an adjustable scale *F*, operated by a screw *G*, and enclosed in a casing *E*.



- 2631. Elliott, F. H.** Oct. 27.

Barometers.—A case for an aneroid is formed of inner and outer covers revoluble upon each other and provided with openings so as to expose a portion of the dial when desired. The side of the outer cover is formed with slots engaging studs on the inner. In the centre is a circular plate fitted with a tail-piece *f* and an index *g*.





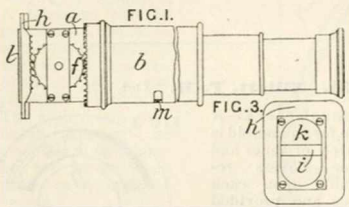
2661. Ghislin, T. G. Oct. 31. [Provisional protection only.]

Telescopes and opera glasses.—A marine plant, *eiklonia buccinalis*, is treated "by chemical and "other processes" and used for covering telescopes and opera glasses.

2772. Williams, V. V. Nov. 13. [Provisional protection only.]

Tripod and like stands.—A collapsible camera, telescope, or other instrument stand, which may be closed up as a walking-stick, consists of an outer tube, split into three legs, which are jointed to a tubular socket at the top, and have specially-shaped shoulders at the bottom to prevent the points from penetrating too far into the ground. A tube, terminating at its lower end either in a tapering screw or a vulcanized-rubber cap, passes through the socket, and forms a fourth or central leg, controlled in position by a thumb-screw through the socket. Another tube, provided with circular notches, works inside the above-mentioned fourth leg, and may be fixed at any height by a spring working in the notches and controlled by a thumb-screw in a collar at the top of the fourth leg. When used for a camera, four hinged sectors or ribs of hard wood, the inner angles of which have been removed, are fitted to the top of the notched tube, and when folded outwards they form a table on which the camera may be secured by an elastic band. If used as a telescope or other stand, and the table top is not required, modifications are made in the top to fit telescopes of various diameters and descriptions. When closed, the whole is provided with a water-proof alpaca or oil silk cover, and a knob or cap.

2822. Woodhouse, W. H. Nov. 16.

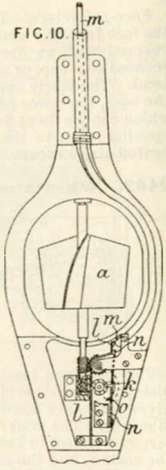


Telemeters.—The distance of an object of known height is determined by the amount of separation of two parallel hairs placed at one end of a telescope tube of definite length. Fig. 1 is a side elevation of the instrument, and Fig. 3 an end view. The end of the tube *b* is toothed and engages with a pinion *f* mounted in an inner tube *a*

holding a fixed hair or wire *i*, Fig. 3, and carrying the sliding plate *h* which carries the hair *k*. This plate is formed with a rack engaging with the pinion *f*, so that by rotating the outer tube *b* over the inner one the plate *h* is moved up or down and the hairs *i*, *k* are separated till they cover the object. The amount of separation is read off on a scale *l* and the distance obtained by calculation. The amount of movement of the tubes is limited by a stud *m* working in a slot in the tube *b*.

2982. Siemens, C. W. Dec. 5.

Logs; current meters.—Relates to an improved log and current measurer, and consists in relieving the measuring-apparatus from the impeding influence of the connecting gearing by substituting an electric current as the motive agent. Fig. 10 shows an elevation of part of the improved log. The screw *a*, which is rotated by the action of the water, drives, through suitable gearing, a cam *k* which operates a spring *l*. This spring makes and breaks an electric circuit by making or breaking contact with the wire *m*, and thus operates a recording-instrument placed in any suitable place on board. Another spring *n* and cam *o* ensure the quick action of the first spring *l*. A tail is attached to the log by which it is maintained in a horizontal position in the water and prevented from revolving.

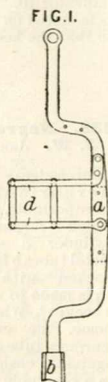


3040. Wallich, G. C. Dec. 11. [Provisional protection only.]

Sounding-apparatus.—(1) A metal cylinder is employed as a weight, and is automatically detached when the bottom is reached. (2) This same metal cylinder serves to keep the receiving-cups open during the descent of the apparatus. (3) The cups, during their ascent, are kept closed by india-rubber bands or other springs.

3042. Massey, T. Dec. 11.

Sounding-apparatus.—Relates to the apparatus described in Specification No. 2661, A.D. 1857. The guard protecting the recording-mechanism is either placed centrally above the lead, or is supplemented by a second guard, in order to prevent the apparatus from sinking obliquely. Fig. 1 shows the guard *d* arranged in the bend of the arm *a* carrying the lead *b*. In a modification, the arm *a* is double, the guard being mounted in the centre; or the arm may be straight and be fitted with a second guard on the opposite side.



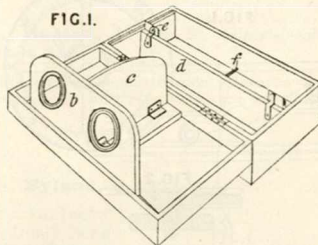
3059. Henson, R. Dec. 13. [Provisional protection only.]

Spectacles and eyeglasses.—The wings of spectacles are attached to the frames by a spring hinge. The lenses are held in the frames by forming a screw-thread on the frame, on which works a nut.

3073. Mello, J. A. Dec. 13. [protection only.]

Stereoscopes.—Portions of the pictures, such as the sky, water, &c., are cut away entirely, and the pictures are viewed against a transparent or open screen through which coloured light is thrown.

3153. Gibbons, W. J. Dec. 24. [Complete Specification, but no Letters Patent.]



Stereoscopes.—A folding stereoscope is combined with a box to contain the pictures. The lens holder *b* and the partition *c* are hinged to the lid, as shown; the carrier, fitted with spring holders *c*, is made to slide in grooves in the sides of the box and may be adjusted by a screw *f* or by hand. In a modification, in which the instrument is separate from the box, the lens holder and partitions are hinged in the same manner to a back plate carrying the spring holder.

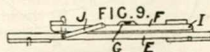
A.D. 1861.

102. Desilva, W., and Griffith, T. F. Jan. 14. [Provisional protection only.]

Altitudes, angular, measuring.—A weighted rod is hung by gimbals from a tripod stand. At its lower end is fixed a graduated circle, to the centre of which is pivoted a telescope fitted with reflectors &c. for taking altitudes of the sun &c. To neutralize vibrations, springs are interposed between the tripod and the rod mounting.

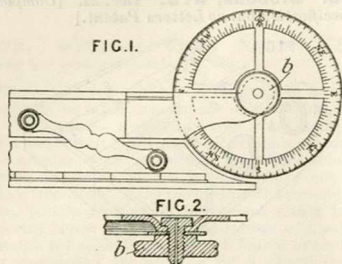
137. Henry, M., [Gallegos, J.], Jan. 17.

Clinometers.—A clinometer for use with velocipedes to show the inclination of the road, in order that the gearing may be varied accordingly, consists of two wood bars *E*, *F*, jointed together at *I*, so that



their inclination to one another can be adjusted and measured by means of the bar J. The bar E rests on the ground, and the bar F is adjusted until horizontal as shown by the fluid level G.

156. Clark, W., [Wood, C. B.]. Jan. 19.

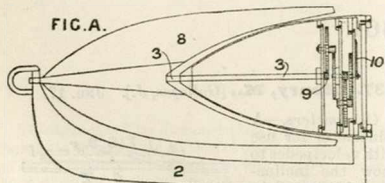


Maps and charts, setting out courses and bearings on, &c.—A pair of parallel rulers is pivoted on the centre of a divided circle marked with the compass points, so that the edge of one of the rulers is in line with the centre. By means of the nut b, the circle and ruler may be clamped together. The instrument may also be used in plotting surveys and in mechanical and architectural drawing.

159. Albrecht, C. E. Jan. 21. [Provisional protection only.]

Barometers, aneroid. A cylinder is provided with a tightly-fitting piston, one side of which is attached to a spring. A vacuum is produced in the cylinder on that side of the piston, not directly exposed to the atmosphere. The piston moves until the pressure of the spring balances that of the atmosphere. A pointer, attached to the piston, moves over a scale on the cylinder.

218. Boulby, J. Jan. 28.

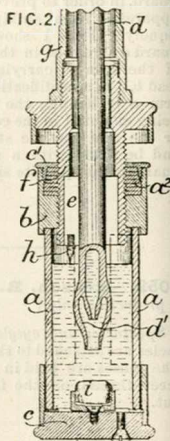


Logs; current meters.—Blades 8 are mounted to rotate with a shaft 3 in a frame which is towed by the ship and is fitted with a keel 2. A pinion 9

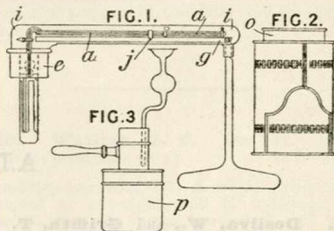
drives through, spur gearing, a distance or speed indicator 10. In a modification, the spur gearing is mounted on a weight hanging from the shaft 3 so that the keeled frame 2 is dispensed with.

238. Negretti, E. A. L., and Zambra, J. W. Jan. 29.

Barometers.—To render mercurial barometers more portable, the cistern, which is formed of a glass cylinder a secured in metal tubes b by caps c, c' packed with leathers a', is made to screw on to a socket f. When screwed home, the end of the mercury tube d is pressed against a cushion i fitted in a revoluble cap. The tube is protected by a metal tube g, and is secured at its lower end in a block of wood e which is atmospherically porous. In the base of this block is fitted an ivory piece h, the point of which forms the zero mark; the cylinder must be screwed up until the surface of the mercury just touches the peg. The bottom of the tube d is formed with an air chamber d' to intercept any bubbles of air.



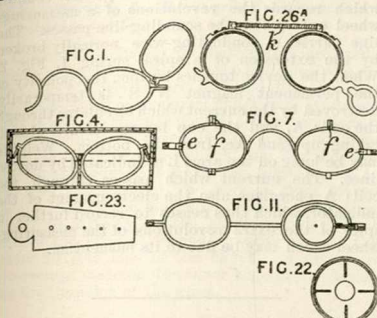
284. Clark, W., [Brossard-Vidal, M. E. E., and Patte, A. A. N.]. Feb. 2.



Boiling points of liquids, instruments for determining; alcoholmeters; specific-gravity estimating-apparatus.—A thermometer, the stem a of which is bent at right-angles and fixed to a plate i, is passed through a stopper e adapted to fit a small boiler p. A stand o receives the boiler and lamp. A marker j, moved to the point at which the mercury stands when the liquid boils, shows

on an adjustable scale *g*, its alcoholic strength. The scale *g* has its zero first adjusted to the boiling point of water. The instrument may also be employed for indirectly determining the strength of a saline or saccharine solution.

389. **Braham, J.** Feb. 16.



Spectacles and eyeglasses.—(1) Additional glasses or shades are attached, or adapted, to the frames to suit various needs. The glasses may be tinted and may be plain or lens shaped. They may be attached by a swivel joint, as in Fig. 1, or hinged to fold back, or they may be fitted, as shown in Fig. 7, by means of clips *f* and sockets *e*. Fig. 4 shows a case for holding spare glasses. (2) For the use of marksmen, the shades may be of some opaque material having a small aperture, Fig. 11, which may, if desired, be fitted with a lens or may have vertical or horizontal slots also, as shown in Fig. 22. Fig. 23 shows a "trial plate" for testing the suitability of the size of the hole. (3) The springs *k*, Fig. 26^a of pince-nez are formed of wire wound helically, either by itself, or around a flat strip of metal, or within a tube. (4) Cases for pince-nez are formed of two slightly-convex metal plates covered with leather.

402. **Carter, A.** Feb. 19. [Provisional protection only.]

Telemeters.—Four staves are arranged at the corners of a square or rectangle of tapes, kept true by means of diagonal tapes. Two of these staves are arranged in line with the object, and, of the other two, that nearest to the observer is provided with a scale. The position of the observer when in line with the object and with the fourth staff indicates the distance on the scale. The staves may be provided with plummets and lines, and these lines may be used for sighting the object.

404. **Browning, J.** Feb. 19. [Provisional protection only.]

Telescopes.—To adapt the instrument for day and night work, the object glass is made larger than usual, and an additional draw-tube is fitted having an eyepiece of extra power. The cover for the object glass is surrounded by a leather strip and is fitted with a loop for a strap.

421. **Sutton, J.** Feb. 20. [Provisional protection only.]

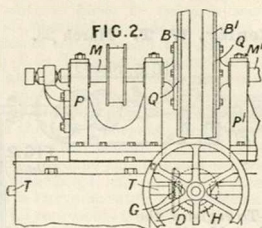
Spectacles.—The sides of spectacles are swivelled to the frame in which the lenses are mounted.

451. **Eyland, C.** Feb. 22.

Spectacles.—The fronts are stamped from a single piece of metal, the lugs *a* being split and each half turned at right-angles. The wings or temples are also stamped from sheet metal, one end being looped and then turned round. The parts are then connected by screws and rivets as usual.



554. **Petitjean, T.** March 5.



Reflectors.—Relates to the manufacture of sheet glass, applicable also to the manufacture of convex mirrors or reflectors, &c. A bulb is prepared by the glass-worker and, in the same process or working, is compressed between two oppositely-rotating concave discs, so that by means of the imprisoned air the glass is pressed against the discs. The discs *B*, *B'*, Fig. 2, are carried by means of discs *Q* on belt-driven shafts *M*, *M'* supported in sliding heads *P*, *P'* which can be made to approach each other by means of a right and left handed screw *T* operated by bevel gearing *G*, *H* from a hand-wheel *D*. As the bulb is compressed the glass worker stops the orifice of the blowpipe with his thumb, by means of which

a high pressure can be obtained, capable of easy regulation. The discs are made of metal, stone, clay, wood, or carbon; preferably, however, a specially-prepared carbon is used.

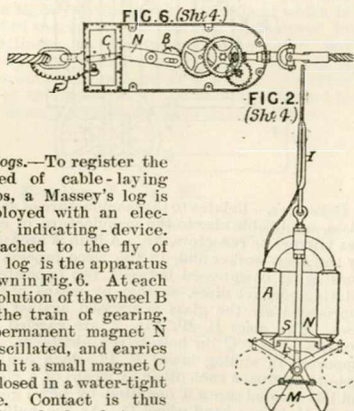
610. Ripamonti, G. L. March 12. [*Provisional protection only.*]

Compasses, magnetic.—To diminish local attraction, a number of magnets are arranged beneath the card, parallel to each other and pointing north and south.

706. Scott, S. H. March 20. [*Provisional protection only.*]

Section-lying apparatus.—Relates to an instrument, for use alone or with other drawing-instruments, to enable section and other lines to be evenly spaced. In applying the invention to a set-square, T-square, or the like, a horizontal lever is mounted on a fulcrum at the centre or near one end, its horizontal motion being determined by adjustable screws. A tumbler lever suspended from the lever operates the set-square. Springs are applied to the main and tumbler levers to return them to their initial positions. The fulcrum may be mounted on a plate with a slot to admit the instrument operated, or the main lever may overhang this instrument.

734. Henley, W. T. March 23.



Logs.—To register the speed of cable-laying ships, a Massey's log is employed with an electric indicating device. Attached to the fly of the log is the apparatus shown in Fig. 6. At each revolution of the wheel B in the train of gearing, a permanent magnet N is oscillated, and carries with it a small magnet C enclosed in a water-tight case. Contact is thus made or broken between an insulated conductor F and the framework of

the log, and an electromagnetic indicator or counter on the ship receives the current impulses and records the distance travelled. The indicator may be provided with two hands, one of which records the amount of cable paid out. The log may be attached to an iron frame at the side of the ship.

Sounding-apparatus.—In sounding-apparatus for cable-laying ships, an electric indicating device is used, comprising an electromagnetic counter which records the revolutions of a measuring-wheel over which the sounding-line passes. The line carries a conducting-wire normally broken by the extension of a spiral spring I, Fig. 2. When the device touches bottom, the polarity of the permanent magnet N S is temporarily destroyed by the current which circulates through the coils A, and the cup forceps M are closed, taking up sand &c. from the bottom. Weights may be hung on the arms L as indicated by dotted lines. The current which passes through the coils A energizes also the electromagnet of the indicator, which thus ceases to record further in spite of the extra revolutions of the measuring-wheel which may be due to its momentum.

791. Ehrenberg, C. A. March 30. [*Provisional protection only.*]

Compasses, magnetic.—To neutralize local attraction, two needles are employed arranged parallel to one another and pointing in opposite directions. Gutta-percha may also be used as an insulator. The bottom of the bowl is covered with zinc, which serves, when acted upon by moisture, to generate a weak current of electricity.

813. Huray, A., and Leilé, H. April 2.

Kaleidoscopes.—An instrument, termed a "gonio-metroscope," consists of a casing formed of two pieces hinged together and opening book-wise, the interior surfaces acting as reflectors. A protractor is fitted at the top of one part to enable the reflectors to be set at any desired angle. Through each part passes a needle provided with a head, by means of which the needle point can be made to protrude slightly from the bottom and thus hold the pattern &c. firmly on the table.

853. Ghislin, T. G. April 6. [*Letters Patent void for want of Final Specification.*]

Telescopes and opera-glasses.—A marine plant, *euklonia buccinalis*, is used for manufacturing, coating, or ornamenting telescopes and opera-glasses.



913. **Gorke, E.** April 13. [Provisional protection only.]

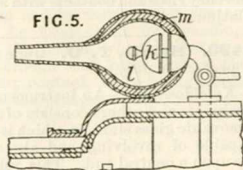
Telemeters for fixing on rifles are provided with an aperture, which is adjusted so as to be filled by the distant object of known size.

961. **Eaves, A. F.** April 19. [Provisional protection only.]

Barometers.—Bezels for barometers are made from a strip of sheet metal in the following way:—The ends of the strip are soldered together and the hoop placed on a conical chuck and so pressed that it is made slightly conical. The hoop is now placed in another chuck, the hoop passing more than half-way into the chuck, and the edge is opened out to place it nearly at right-angles to the rest of the hoop. The hoop is next placed on a conical chuck, hollow on its face. The hoop fits about half-way on the chuck, and the inner half of the hoop is turned inwards against the inner inclined face of the chuck. A groove is afterwards made on the inner edge of the bezel, for the insertion of the glass.

1031. **Barker, D.,** [Smith, T. T. V.] April 25.

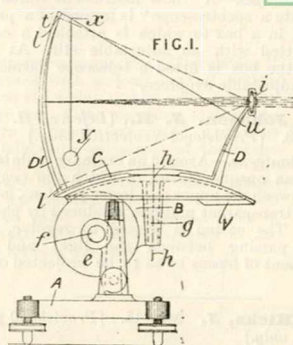
Reflectors for sound. A steam whistle is placed in a parabolic reflector *l*, provided with a tube to direct the sound, for signalling at sea or on land. The reflector is covered with felt or other material *m* to reduce the sound behind the whistle.



1088. **Browning, W.** May 1. [Provisional protection only.]

Range-finders.—Consists of a quadrant, the scale of which is graduated in distances, having one fixed and one movable arm for sighting, to be used in conjunction with a fixed base-line. In order that the base-line may make a right-angle with the line joining the observer and the object, a telescope, having a cross-sight, is sighted on the object. The quadrant, at a distance of 40 yards, say, is then arranged so that the zero radius is in line with the cross-sight of the telescope. When the movable arm is sighted, the distance of the object can be read off directly.

1103. **Brooman, R. A.,** [F. VIRTUE] May 2. MUSEUM



Latitude and longitude instruments.—Consists of a solar chronometer giving the hour in true and mean time, without the aid of any table of corrections; it may also be used to indicate the meridian as well as the latitude of the spot. The stand *A* supports the projecting disc *e*, with a vertical front, against which the piece *B* is fitted and secured by an axis *f*, this axis being accurately perpendicular to the plane of the disc *e*. The piece *B* is provided with a socket *g*, the axis of which is accurately parallel to the face of the disc *e*, and into which fits the axis *h, h* of the spherical cap *C*. The upper circumference of this cap is divided into 24 equal parts, which are again divided to read minutes. Fixed to the spherical cap are two pieces *D, D'*, the piece *D* carrying a lens *i*, and the piece *D'* being a section of a sphere *l, l*, of which lens *i* is the centre. Through the centre of the lens and the axis *h, h* a plane *h, h, l, l*, is imagined, cutting the spherical section at *l, l*; the zero of the vernier *v* is in this plane, as is also the stretched thread *t, u*. The trace of a plane, drawn through the centre of the lens *i*, perpendicular to the axis *h, h* upon the spherical section *l, l*, will be the equinoctial line. Around this line and the trace of the vertical plane *h, h, l, l, i, i*, on the spherical surface, is drawn a curve showing the equation of time. The line *l, l* represents true time. The apparatus is levelled by suspending a plumb line *x, y* from the thread *u* and adjusting the stand *A* until the planes *h, h, l, l, i, i* and *t, u, x, y* coincide. The piece *B* is then given the required inclination at midday by placing the zero of the vernier at noon and bringing the focus of the lens *i* on the point of the curve corresponding to the day on which the operation takes place. The piece *B* is then fixed by tightening the screw *f*. To find the time, the focus of the lens is brought to the point of the curve corresponding to the day, and the vernier reading gives the mean time. If the focus falls on the line *l, l*, the vernier will give the true time. Longitude may be found by comparing the time found with that indicated by a chronometer. Latitude may be calculated with the help of a compass.

1181. Browning, J., and Crooks, W. May 9. [Provisional protection only.]

Spectroscopes.—A "new instrument which we designate a spectroscope" is formed of a prism arranged in a box to which is attached a collimator fitted with an adjustable slit. At the back of the box is fitted a telescope furnished with an adjustable eyepiece.

1218. Johnson, J. H., [Lefevre, H. A.] May 13. [Provisional protection only.]

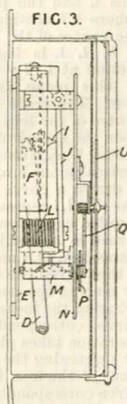
Magic lanterns.—Around an ordinary table lamp is fitted an opaque casing, of which the central band, between the upper and lower portions, forms a ring of transparent pictures produced by photography. The casing is caused to revolve, the pictures passing between the light and an arrangement of lenses so as to be projected on a screen.

1244. Hicks, J. May 15. [Provisional protection only.]

Thermometers, minimum. The mercury column is divided by a small air bubble. The neck of the bulb is contracted to prevent the bubble from passing into the bulb, and is fitted with a small platinum wire, which facilitates the passage of mercury from the tube to the bulb across the bubble. In setting the instrument, the air bubble is brought into the neck of the bulb, the length in degrees of the separated column is measured, and the temperature indicated is noted. The minimum temperature during a given period is ascertained by measuring the diminution in length of the column of mercury above the air bubble.

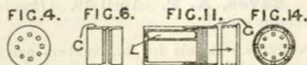
1366. Cameron, P. May 31.

Barometers.—A thin disc of mica or other material is held between washers by a ring on the front of a circular metal box F, the interior of which is exhausted. A knife-edge I on the middle of the disc is in contact with a lever J, the lower end of which is retained by a volute or helical spring L. A stud on the lever J engages in a slot in a roller M, which turns in plates E, N and carries a toothed quadrant Q in gear with a pinion on the axle of a pointer U. The roller M is also acted on by a fine spiral spring P. In a modification, both sides of the vacuum chamber are mica discs, retained with some curvature, so that the pressure tends to flatten them. In another modification, the lever J has a slotted cross-piece at its free end, which is retained by two springs; the cross-piece carries a traversing link, jointed to an arm of a small sphere, which is carried by a stationary screw parallel to the slot.



Another arm of the small sphere engages a slotted arm on the axle of the quadrant Q. The lever J then rocks the sphere on the screw, and thus turns the quadrant; the screw enables the sphere to be adjusted along the slots, to vary the extent of motion of the quadrant produced by a definite movement of the lever J.

1393. Mennons, M. A. F., [Chouippe, A. L.] June 4.



Microscopes.—A miniature microscope for viewing microphotographs has its lens L, Fig. 11, arranged eccentrically in its case. The views are formed in a circle, as shown in Fig. 4, on one or both sides of a glass disc which is mounted in a reversible cell G, Fig. 6. The rotation of the cell G on the case is facilitated by a pin and groove, or by a spring and a series of depressions or projections, Fig. 14. Several concentric rings of views may be formed on the glass disc, to be viewed either by extra lenses or by shifting the position of the single lens. The views may be rotated by clockwork.

1443. Balsac, H. A. June 7. [Provisional protection only.]

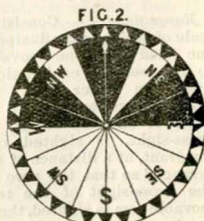
Thermometers for fire and temperature alarms. A platinum wire is sealed through the walls into the mercury of a thermometer, and a circuit is completed, and an alarm operated, when the mercury rises and contacts with another adjustable platinum wire.

1490. Small, T. O. June 11. [Provisional protection only.]

Kaleidoscopes.—An instrument for the use of designers and others consists of a case, lighted by a movable glass slide, in which is mounted a roller capable of revolving and also of sliding to and fro upon a central rod. This roller is studded all over with pieces of metal, or with glass, silk, artificial flowers, beads, jewels, &c. In the front of the case is a tube containing prismatic reflectors similar to an ordinary kaleidoscope, and behind the roller is a radiated disc, each radial division being of a different colour or shade.

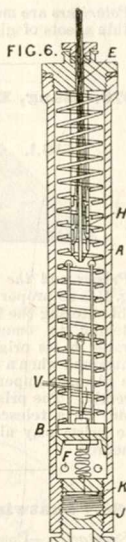
1496. Singer, S. B. June 11.

Compasses, magnetic.—To render the N and S portions of the card easily distinguishable, the card is made with half its surface black or other dark colour and the remainder white or some light colour. In addition, radial portions may be formed of these distinguishing colours, as shown.

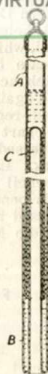
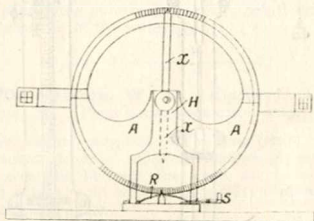


1545. **White, D. B.** June 17.

Sounding - apparatus. — A tube A, closed at the upper end, is lowered to the bottom by a line E containing a number of wires; it is open to the water at holes F, and contains a piston B, which is forced up against a spring by the pressure of the water. The piston carries tongues or rollers V, which, in rising, make contact with plates H, connected separately by the wires E to a number of coils influencing magnetic needles, so that these show the rise of the piston. When the upper rollers V have passed all the plates H, lower rollers begin to pass them and also an intermediate strip, which is connected to another indicator, to show when the plates H are being passed the second time. A cup J contains some mercury, below a metal disc K; these are connected in an electric-bell circuit, so that, when the tube A reaches the bottom and falls over, the mercury touches the disc K, and the bell is rung. The Provisional Specification describes the use of a brass bell and clapper to make contact, instead of the disc and mercury. This contact arrangement may be used alone, for sounding. In a modification, the piston B is replaced by a plunger sliding through the lower end of the tube A, the mercury contact device being placed in the lower end of the plunger.

1616. **Howson, R.** June 24.

Barometers, mercurial. The cistern B is formed with a long central hollow portion C passing up the tube A nearly to the top of the mercury, so that the cistern is freely supported, and rises and falls with variations of the atmospheric pressure; the level of the mercury in the tube A thus ranges over an increased height determined by the ratio of the internal area of the glass forming the tube.

1698. **Kull, J., and Caspar, C. A.** July 4.
[Provisional protection refused.]

Chronometers; levels.—In an apparatus constructed of metal, ivory, bone, wood, or glass, a circle A divided into 360°, or a half-circle divided into 180°, is attached to a metal pivot hanging, preferably upon rubies or steel, between two uprights fixed on a ruler by screws or otherwise, and is balanced by a weight attached at the bottom. In the middle of an opening in the front upright H, an index or a vernier shows the angle of inclination. For measurements, pinules, or lunettes with scopes and hairs are used, which dwell exactly upon the ninetieth degree of the scale. For finding the level of a ceiling, or other hanging object, a movable needle x is attached in the half-circle instruments to show the degrees. The level being found, it may be fixed by a spring R and bolt S, or a screw from behind. The index may sometimes be movable and the circle A fixed.

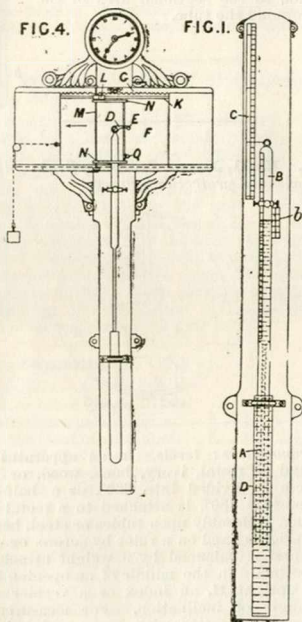
1605. **Sapia, P. H. A. C.** June 22. [Provisional protection only.]

Optical instruments; telemeters.—Relates to (1) apparatus for measuring angles, and (2) the application of such apparatus to range finders. It is stated that the indicator of an alidade or telescope is applied eccentrically to a graduated limb or dial plate in such a way that the angle to be read is magnified.

1733. **Macneill, T. F.** July 9.

Barometers.—In order to give a more extended scale to a mercury barometer, the tube A is

enlarged at its upper end B and floated in the cistern D, so as to rise and fall in guides. The real height of the mercury above the cistern level, which remains constant, is read off against a scale *b*, but the rise of the barometer tube, which accompanies the fall of the mercury, is read against a more open scale C. Fig. 4 shows a self-registering barometer of the above type. A chart board F, fitted with a rack G, is traversed in guides from right to left by clock-work. In the upper part of the barometer tube a pencil E is attached to the end of an arm D. This pencil is automatically and intermittently pressed against the chart by a frame N on a spindle M which is rocked by a rack K passing

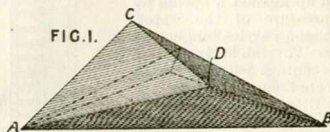


beneath a spring pawl L. A datum line may be marked by a second pencil Q. The paper upon which the record is taken may be wound upon one roller from another, passing over a prismatic inking-surface against which it is pressed intermittently by the pencil; or the paper may be wound on a single drum against which the pencil presses. The barometer may be adapted to give maximum and minimum readings by attaching it to a cord wound around a drum and passing thence to a suspended weight. The drum is allowed to rotate in one direction only by means of a pawl. It is stated in the Provisional Specification that the barometer may be suspended from a spring or other balance.

1770. Walker, T. July 15. [Provisional protection only.]

Polarizers are made by superposing a number of thin sheets of glass to act by reflection.

1876. Sang, E. July 26.



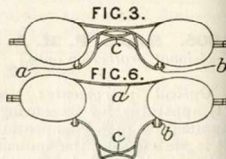
Prisms and the like.—A tetrahedron of glass, Fig. 1, is so proportioned that in one adjustment light entering the face B, C, D is twice internally reflected to emerge from the face A, C, D parallel to its original direction. This position is attained when a distant object, as seen through the glass, is superposed on the object as seen directly. The prism may therefore be used as a finder on a telescope or for sighting purposes. The prism may also be in the form of a pentahedron.

1886. Chatwin, H. Aug. 9.

Spectacles.—Cases for spectacles are made round or square of wood, papier mâché, &c., the sides being united with glue. After being shaped they are cut open, and round the division is placed a facing of thin bone, ivory, or metal, so that it will be flush with an outer covering of gilded, embossed, or printed &c. leather, or of metallic fretwork. Photographic pictures on glass may be inserted into the leather &c. and secured by clips or studs if desired. The parts of the case may be hinged and provided with a spring snap.

2064. Rostaing, A. S. Aug. 20.

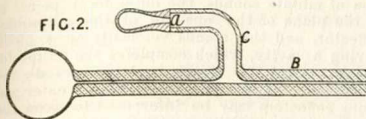
Spectacles.—To enable the wearer to raise the glasses from before the eyes and keep them away from the forehead, an extra bridge-piece *c* is hinged to the frames at *a* and *b* so that it can rest on the nose in either of the two positions shown. The hinge *b* is fitted with a spring.



2083. Clark, W., [*Douhet, W. F., Count de.*]
Aug. 21.

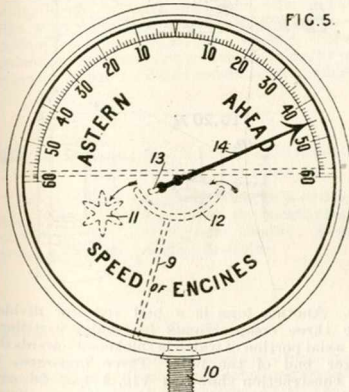
Lenses, prisms, and reflectors are made hollow and filled with water, alcohol, carbon sulphide, chloroform, or other liquid.

2100. Casella, L. M. Aug. 22.



Thermometers, minimum. The horizontal stem B is fitted with a lateral chamber C, shouldered at a, into which the mercury expands when the temperature rises.

2174. Pemberton, C. Aug. 31.



Current meters.—A gauge shows the direction and amount of air moved by a screw pump, which is geared to a ship's engine, the combination being used to show on deck the action of the engine. The gauge has an axle carrying a vane 13 over a curved plate 12, below which is a partition 9. The axle also carries a pointer 14, which normally stands central, but is deflected in either direction when an air current passes over the plate 12, between the connecting-pipe 10 and an opening 11.

2181. Siemens, C. W., [*Siemens, W., partly.*]
Aug. 31. [*Provisional protection only.*]

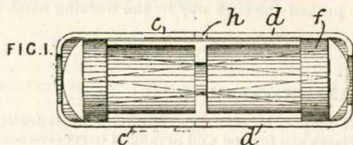
Thermometers and pyrometers.—Relates to apparatus for indicating temperature in

inaccessible places, such as coils of wires, accumulations of coal, hemp, jute, &c., or furnaces or the like. A coil of insulated copper wire, enclosed between concentric cylinders closed at each end, is placed in each place of which the temperature is to be tested, during the coiling of the cable &c. The ends of the coil are connected to a battery, one connecting-wire passing round a galvanometer needle. A second coil of equal resistance, immersed in a water &c. bath of which the temperature can be adjusted, is connected through a coil round the galvanometer needle, acting in the reverse way to the first one, to the same battery. The temperature of the bath at which the galvanometer needle is unaffected gives the temperature of the inaccessible part. Increased accuracy may be obtained by using for the coil in the water &c. bath a metal of which the resistance varies with temperature less than that of the thermometer coil. The coils, when used for ascertaining the temperature of furnaces &c., are made of gold, platinum, or like refractory metal or alloy. By using for the pyrometer coil an alloy such as german silver, the resistance of which varies very little, and for the water-bath coil a metal, such as copper, the resistance of which varies to a greater extent, a large range of temperature of the pyrometer corresponds with a small range of temperature of the water bath.

2270. Gedge, W. E., [*Ripamonti, G. L.*]
Sept. 12. [*Provisional protection only.*]

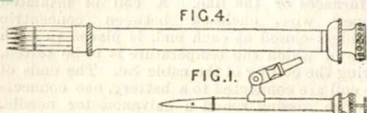
Compasses, magnetic.—To counteract local attraction in iron ships, a number of magnets are arranged beneath the card, all parallel to each other "and with their points directed due "north and south."

2347. Dagron, R. P. P. Sept. 19.



Microscopes.—Relates to improvements on the invention described in Specification No. 801, A.D., 1860. Between a spherical lens and a cylindrical one *f* at each end of a tubular casing *h, d*, a microphotograph &c. is placed. Each photograph is at the focus of the lens at the other end of the casing. The space between the spherical lenses may be occupied by a cylinder of glass; or the photographs may be mounted close together near the middle of the apparatus. The apparatus may be in one solid piece of glass, the photographs then being affixed to the outer surfaces. The lenses may be achromatized.

258. Tenk, C. G. Sept. 25. [Provisional protection only.]



Ruling and like pens.—Relates to pens for ruling, drawing, designing, &c. In the top of the cylinder constituting the holder is a cork, above which there may be a screw attached to a wire passing down the cylinder in the pen "to open or close the same at liberty by a pressure of the screw," by which operation the stroke can be made fine or thick. There is a small hole in the pen, through which only the amount of ink required for ruling &c. is discharged. Fig. 1 shows a pen as used generally by engineers and having the screw and wire. Fig. 4 is a pen for ruling five lines for music, also without the wire.

2546. Corke, E. Oct. 12. [Provisional protection only.]

Range-finders.—Relates to a range-finder of the type in which the apparent height of a known object is measured. It is provided with a graduated vertical aperture furnished with a vertical slide. The range-finder may be fitted on a bayonet by means of a triangular socket, or an arm jointed to the range-finder is formed with a socket for fitting the barrel of a gun.

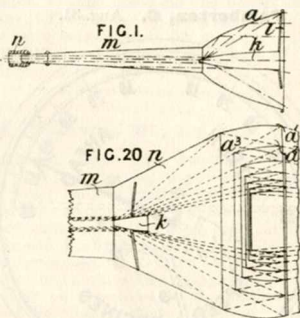
2560. Browning, J. Oct. 14. [Provisional protection only.]

Barometers.—To register maximum and minimum readings, two loose hands are added which are pushed one each way by the working hand.

2613. Marshall, J. Oct. 19.

Reflectors for sounds. Two or more reflecting-surfaces are formed and arranged to receive sound from a distant or near source, and concentrate it as a parallel beam. Several forms are described. In the ear trumpet shown in Fig. 1, a parabolic reflector a terminates at a plane containing its focal point, and is united there to a conical tube m , which is provided with a piece n to fit in or on the ear. The tube m may be variable in length. A small circular space may be left between the tube m and the ear-piece n , to prevent roaring in the instrument. Or the tube m may end in a parabolic or other form to concentrate the sound in the ear. A paraboloid k , the largest diameter of which is two-thirds the largest diameter of the tube m , is supported by stays l in the reflector a , so that their focal

points coincide; the paraboloid may be adjustable longitudinally by a screw. For a near source of sound the reflector a is made ellipsoidal, the distant focal point being at the source; the inner reflector k is shorter and of varying curvature. For very deaf people, the form is such that the external focal point is very near, so that as much sound as possible is collected. A similar instrument may be used as a stethoscope. In a further modification, for the observation of minute sounds, the outer focal point is in the plane of the opening of the ellipsoidal reflector, and this stands vertically on a block having a cavity, which completes the ellipsoid, and contains the object to be observed; the inner reflector is a paraboloid. Small outer and inner reflectors may be interposed between the large reflector a , Fig. 1, and the tube m . The inner reflector may be open at the rear end. In another modification, Fig. 20, the external reflector is divided into two forms of parabolic or ellipsoidal rings a^1, a^2, a^3 , &c., fixed coaxially on a conical or other support n . An imperfect apparatus has a small cone supported in a larger



one. Another form is a bell reflector divided into three compartments by radial partitions, the axial portion of which is thickened towards the larger end of the bell. Three apparatus of the construction shown in Fig. 1 may be connected at small angles, the three tubes m being united into one ear-piece n ; the outer reflectors may be angular in cross-section, so as to fit together. For various purposes, the tube m , Fig. 1, may be bent at an angle, and provided with a flat or concave reflector at the angle, to deflect the sound. Two ear trumpets thus formed may be connected by two spring bands, and thus held on the head, both trumpets being directed forward. Or a number of such trumpets may be placed at equal horizontal angles about a vertical tube, so that the sound is directed down this to one or more plane reflectors and lateral ear trumpets; this apparatus may be used for listening for ships' signal guns. Either form of apparatus may consist of several pieces, to render it more portable.

Sounds, locating.—The apparatus last described, with several receiving-trumpets and air tubes, is applicable for locating sounds.



- 2664. Chesterman, J.** Oct. 24. *Drawings to Specification.*

Pyrometers.—According to the Provisional Specification, the expansion of metal bars is used to ring a bell, or give a signal, when the desired heat is attained in a heating-furnace for tempering steel.

- 2710. Gibbon, R.** Oct. 29. *Drawings to Specification.*

Specific-gravity estimating-apparatus.—The beams or levers of apparatus used for weighing known volumes of barley or malt are engraved or otherwise marked with numerical tables for the deduction of the specific gravity, value, and other particulars.

- 2790. Stuber, F. G.** Nov. 6. [*Provisional protection only.*]

Hygrometers.—Cellular, porous, or scaly substances, such as wood, wool, hair, silk, and other like substances, are treated in a solution of a deliquescent salt, such as calcium chloride, potassium carbonate, or sodium chloride, by which means they are rendered sensitive to humidity.

- 2947. Pitkin, J.** Nov. 23. [*Provisional protection only.*]

Barometers, aneroid. Consists in jewelling the axes of the working parts of the mechanism and of the spindle carrying the needle. A spring cover is fitted to portable aneroids.

- 2996. Amphlet, S.** Nov. 27.

Spectacles.—Spectacle cases are ornamented by combining Scotch-plaid or imitation-tortoiseshell patterns with photographs, from which the backgrounds have been removed. This is done on the surface itself, or on paper which is afterwards affixed to the surface. The tartan or Scotch plaid patterns are ruled, or the tortoiseshell imitation is painted, printed or stained upon the surface, and the photographs are then attached. The surface is finally sized, varnished, and polished.

- 3058. Bailey, J., and Bailey, W. H.** Dec. 6. *Drawings to Specification.*

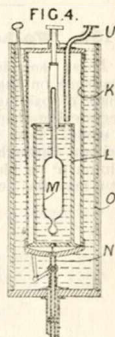
Thermometers.—A lever is employed which is in contact with the flange of a short metal tube. The expansion of the tube actuates the lever, and the heat is gauged by means of a wheel and pinion with index hand.

- 3092. Stanley, W. F.** Dec. 6. [*Provisional protection only.*]

Surveying-instruments; sextants, &c.; compasses, magnetic; mathematical drawing-instruments.—Consists in the use of aluminium in the construction of theodolites, levels, circumferentors, sextants, quadrants, miners' dials, magnetic and prismatic compasses, drawing-compasses, scales, rules, &c. In sector and knee joints for mathematical instruments, the centre plate is of thin steel, fixed to the head side of the joint, and between the other parts of the joint a loose steel washer is placed, so that the aluminium surfaces shall not be in contact.

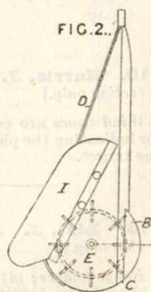
- 3127. Beaulieu, E. C. B. de.** Dec. 13.

Specific-gravity estimating-apparatus.—The device shown is placed at the top of a barometric column, containing distilled spirit, and connected to the worm of a distilling-apparatus. The spirit enters a glass beaker L in an airtight glass cylinder K surrounded by cold water. The beaker contains a hydrometer M whose indications can be taken from the outside. The overflow from the beaker passes to the barometric tube N.



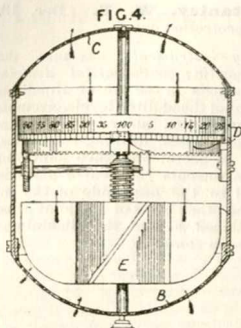
- 3129. Friend, J. W.** Dec. 13.

Logs; sounding-apparatus.—A paddle or vane wheel is rotated by the passage of water through the instrument. Fig. 2 shows the arrangement for the log, and Fig. 4 for the sounding-apparatus. The water flows in the direction B to C, and the revolutions of the paddle or vane wheel are communicated to the dial D, which shows the distance travelled by the ship in the one case, and the depth of the water in the other. Wing plates I, Fig. 2, prevent the log from rotating.



(For Fig. 4 see next page)

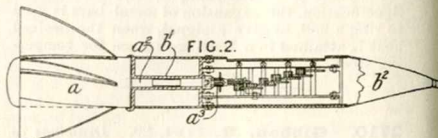
3129.



3130. Walker, T. Dec. 13.

Logs; sounding-apparatus.—To avoid end pressure on the rotator *a*, it is mounted upon a shaft *a*² passing through a tube *b*¹ into the registering-chamber, which chamber is made with a conical nose *b*². The indicating-pointers are driven through spur-gearing operated by a pinion *a*³ on the end of the shaft *a*². The apparatus may also be used on the end of a flexible shaft

to give speed indications on deck. In a modification, adapted for sounding purposes, the rotator is mounted in two intersecting oval frames. The



rotator is normally kept from rotating by a spring catch which is disengaged, as the apparatus is descending, by the upward pressure of the water.

3141. Brooman, R. A., [Beauregard, F. A. T. de]. Dec. 13. *Drawings to Specification.*

Pyrometers.—Relates to apparatus for superheating steam and gases and for projecting them, combined with air, upon ignited combustible matter. In the superheating-vessel are cups, containing metals or alloys of different degrees of fusibility, which answer as pyrometers and as a guide to the attendant in regulating the fire which heats the apparatus.

A.D. 1862.

110. Harris, J. Jan. 14. [Provisional protection only.]

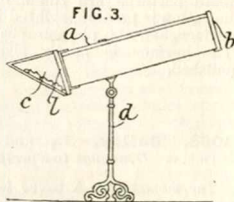
Wind vanes are combined with target signals for indicating the place where the bullet strikes the target.

213. List, J. Jan. 28. [Provisional protection only.]

Range-finders; altitudes, linear, measuring.—A folding frame is fitted with sights one of which slides against a scale by which the distance is read off. Heights may be determined from the angles subtended.

214. Treppass, H. H. Jan. 28.

Kaleidoscopes; camera lucidas.—The body *a*, mounted on a stand *d*, is fitted with a reflector *c* and a slide carrier *l*. By fitting the eye piece with a lens, the pictures may be projected either on to paper or on to a screen. To obtain designs for carpets, wall papers, ironwork, &c., plaster casts attached to cardboard may be used.



303. **Browning, J.** Feb. 5. [Provisional protection only.]

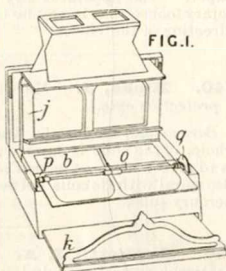
Barometers.—To correct aneroids for temperature, the working parts are made of compound metals or of metals of different degrees of expansibility. A transmitting-spring consists of a "simple, bent blade formed in one piece united by a screw"; the other end terminates in an eye which is pivoted to a slotted link engaging a stud with a roller upon which the transmitting lever rests. The barrel on which the index chain is wound is made conical.

312. **Pitkin, J.** Feb. 6. [Provisional protection only.]

Barometers, aneroid. The index hand is made adjustable by being connected to a hollow spindle carrying a pinion which engages a sector on a key spindle at the back of the instrument.

322. **Brooman, R. A.,** [Saugrin, L. F.] Feb. 7.

Stereoscopes are constructed and applied so as to fold up inside the lids or covers of cases, albums, or books. Fig. 1 shows a case, having a stereoscope attached by a spring joint to the lid, a receptacle for the views and an arrangement for changing them. The view cards *b* are pressed



upwards by springs (not shown) against the toothed rollers *p* on the shaft *o*, which may be turned by means of the discs *q*, to slide the uppermost card into the tray *k*. An independent cover or frame *j*, normally lies over the views, but is shown raised to expose the changing device.

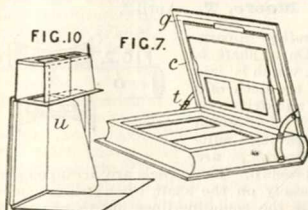


Fig. 7 shows an album with the stereoscope attached by a spring hinge *g* to the cover *c*, which is held at the required angle by a compass joint *t*. Fig. 10 shows a pocket book with stereoscope ready for use, the partition *u*, which is attached by a spring hinge, maintaining the parts in position.

348. **Munck, A., and Myhre,** Feb. 10. [Provisional protection only.]

Logs.—Inboard registering-apparatus is arranged with the various pointers rotating about the same axis, which is also in line with the axis receiving motion from the rotator in the water. The motion of the rotator is transferred to the indicating pointers by worm gearing. The rotation line is attached to a socket with a square axial hole into which a plug of the registering apparatus passes. Sudden jerks are therefore not transmitted. The usual hollow axle of a rotator is dispensed with by brazing the pins together.

429. **Ségoffin, C. D.** Feb. 18. [Provisional protection only.]

Graphoscopes.—A box casing with one open side is fitted with a lens in front; the sides may be of bellows form.

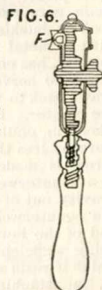
443. **Hinton, W.** Feb. 19.

Barometers.—The dials are made of ground glass, or of glass covered with muslin, paper, &c., and are placed in a framing so as to be visible from a distance. They may be illuminated at night.

452. **Wilkie, D.** Feb. 20. [Provisional protection refused.]

Compasses, magnetic.—To counteract local attraction, the bowl is made double, the intervening space being filled with a "fluid or body extracted from porpiss, or other fish."

504. **Bliss, E., and Lamplough, H.** Feb. 25.



Microscopes.—A number of microphotographs are mounted near the edges of a glass disc which can be rotated to bring each photograph in turn into the field-of-view of a lens *F*.

589. **Smith, J. T.** March 4. [Provisional protection only.]

Angle-measuring instruments.—Apparatus stated to be applicable for measuring angles

consists of two prisms of equal refracting power fitted in a tube in such a manner that they may be revolved "through equal angles in opposite directions."

618. **Coathupe, H. B.** March 7. [*Provisional protection only.*]

Barometers; thermometers.—Clips for holding the glass tubes of barometers and thermometers are cut or stamped from sheet metal in the form of the letters H, T, Y, X, or similar forms. One or two of the arms are formed into spikes or nails, and the others clip the tube.

682. **Vidie, L.** March 13.

Barometers, aneroid. Consists as follows:—Firstly, in taking the movement for working the hand of the spring at a point moving horizontally, or in taking it off a point working in the same direction on a piece fixed to the said spring without links. Secondly, in applying an external spring to cause a pressure on the vacuum box, which box is supported by springs, and in employing the said external spring to cause the working of the mechanism to determine the point, and to support the counterweight. Thirdly, in converting the vertical movement of the vacuum box into a horizontal movement, by means of two rods abutting at right-angles against a lever, the axis of which is placed diagonally and turns on pivots &c. A flexible blade, if preferred to an axis to support the lever, must also be set diagonally. Fourthly, in applying to the rotative part of the axis which actuates the axis of the hand two pins set in conical orifices, or laying one in a hole and the other in a groove, and in surrounding the axis with a strap to prevent displacement. Fifthly, in making use of a bow for expanding a wire or metallic blade when employed for giving the rotative motion to the axis of the pointer or other piece. Sixthly, in attaching the end of the chain, wire blade, or bow before mentioned, by a hook or buckle. Seventhly, in forming a helix with a metal wire, which, after being twisted spirally, has one of its ends drawn back to the centre to serve as a pivot, the other end being drawn back to the centre to serve as the axis of the pointer. Eighthly, in regulating the course, when an endless screw is used, by inclining more or less the axis of the lever by which the screw is made to turn. Ninthly, in employing as a counterweight a piece having its centre of gravity out of the centre. Tenthly, in placing the counterweight inside the vacuum box at the end of the lower blade of a spring, the said blade being sufficiently extended beyond the point on which it rests at the bottom of the box. Eleventhly, in attaching to the central part of the diaphragm an arm advancing horizontally inside or outside, and having at its extremity a counterweight. Twelfthly, in replacing by a box the sole plate on which the apparatus is fixed. This box has a stepped conical bottom, and is thereby strong enough to enable the vacuum box to be attached to it.

733. **Davies, G.** [*Soulayr, J.*] March 17. [*Provisional protection only.*]

Pantographs; camera lucidas; camera obscuras.—Relates to a drawing-appliance, stated to be applicable for use "with slight variations" as a camera obscura, camera lucida, or pantograph. A drawing-board is formed with grooves along its upper and lower edges, in which are placed rods on which slide brackets connected one to the other by a pair of vertical parallel rods. Between these slides a rod guided at its lower end on the parallel rods, and extending beyond the upper bracket. On the upper end of this rod is arranged a style intended to follow the contour of the object &c. to be drawn, and on its lower end is a holder for the pencil, which rests on the paper and may be raised by a rack. "An eye-piece completes the apparatus." Metric scales and index fingers are provided, to indicate the degree of movement of the pencil in either direction. For panoramic views a long strip of paper is wound on rollers, one at each side of the board. The rollers are split and connected by rings, for clamping the ends of the paper. The apparatus may be mounted on a rotary foot so that it may be turned to change the direction of the view.

740. **Hicks, J.** March 17. [*Provisional protection only.*]

Barometers, mercurial. The upper part, or the whole, of the tube is formed as a helical coil so as to give a more extended scale. The scale is also spiral with its coils between the coils of the mercury tube.

756. **Ronketti, J. A.** March 18. [*Provisional protection only.*]

Thermometers; barometers; hygrometers.—Scales for these instruments are made separate and enclosed in glass tubes, which are hermetically sealed and then fixed by the side of the tube of the instrument.

932. **Moore, T.** April 2.

Sounding-apparatus.—On a shaft *b*, Fig. 2, which is laid along the deck of a vessel and driven by steam or manual power through suitable gearing, are placed reels *a*. These reels are arranged so as to run loosely on the shaft when it is intended to pay out the sounding-lines but to become fixed thereto, by moving a lever which is on the shaft, when the lines require hauling in. The different reels are independent of each other. The reels are formed of double cylinders between which is a spiral spring *d* connecting the two parts. This spring allows the outer part of the reel to yield when there is a sudden jerk on the lines. If heavy

