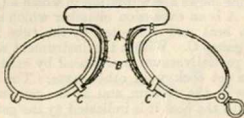
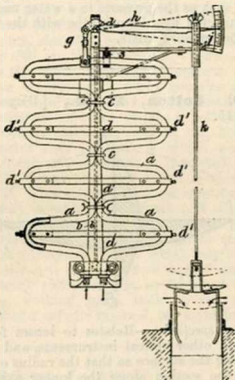


the glasses not being shaken off. When the glasses are to be folded, the arms B are turned back



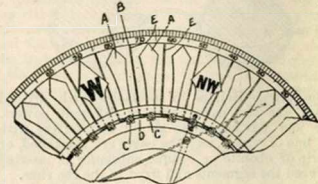
between the devices A and the frame, and then offer no hindrance to the usual operation.

11,211. Walz, A. Sept. 21.



*Thermometers.*—The thermostatic apparatus described below is fitted with an index so that it acts as a thermometer. The steam, water, &c., is passed through a bent tube *a*, capable of expanding in a vertical direction only, the ends being firmly secured to the lower part of the frame *b*, the inner bends connected by clamps *c*, and the outer bends secured by transverse stays *d*, with set-screws *d'* for adjustment. The uppermost bend of the pipe is connected by means of a link *g* to a lever *h* pivoted at *i*, carrying an index finger *j*, and connected to a rod *k* attached to a valve, damper, or other regulator. When used as an ordinary thermostat, the coil and the frame are made of different metals, and the frame may, in any case, be covered with some bad conductor of heat. The apparatus may, by means of levers or of an electric circuit, be made to operate signals at a distance.

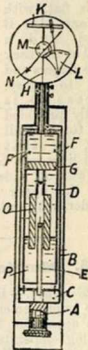
11,213. Mitchell, A. Sept. 21.



*Compasses, magnetic.*—The “points” A are independent of, and made movable on, the card B so as to adjust for deviation and prevent errors in reading. They are preferably formed of thin sheets of metal, and attached to the card as desired by screws C and a slotted ring D. The half points may be marked by bent wires E.

11,336. Schlotfeldt, H. W. Sept. 23.

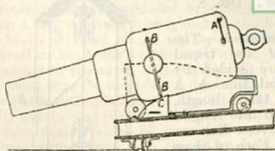
*Logs.*—Relates to apparatus which may be used as a speed indicator, a log, a pressure gauge, or a governor. The instrument, of which a convenient form is shown, consists essentially of an arrangement of two vessels containing two liquid columns the relative height of which is varied by a centrifugal pump; the motion of a float indicates the speed of rotation of the pump and consequently of the machinery connected therewith. A is the rotating shaft fixed to a vessel B carrying blades C and filled with water; within is the vessel D, also filled or partly filled with water which is caused to circulate by the blades C, passing down the pipe E and back to D through the apertures F, F. The piston float G is thus moved, and by the rod H, slotted bar K, quadrant L, and pinion M works the index finger N. This arrangement is such as to cause the movements of the index finger to be proportionate to the increase of speed, and the parts of the indicator have the requisite adjustments. A second float O may be fixed to the rod H and dip in mercury P. For use as a log, two pipes, one at right-angles to the flow of the water and the other inclined at about 41½ degrees to it, are led to the two vessels.





## 11,415. Grant, J. G. Sept. 25.

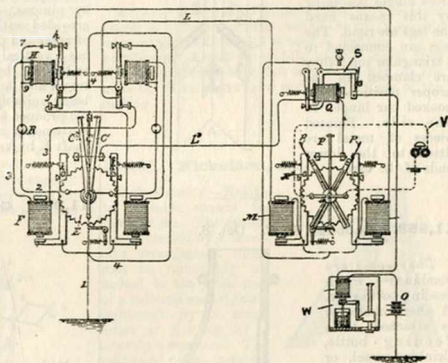
*Range-finders.*—Relates to sights for ordnance on elevated coast batteries, constructed so as to show the range for which the gun is pointed. The gun being at a known height above the level of the sea, the distance of any object may be found by observing the angle of depression. A is the back sight, which is fixed to the gun, and B is a sliding rod which passes through a hole in the trunnion and rests on the curved surface C. The curved surface along which the lower end of the rod B slides as the gun is elevated or depressed is so arranged that as the distances increases the sight is lowered, thus causing the axis of the gun to lie at a greater elevation to the line of sight. By graduating the edge of the surface C the distance of the object may be inferred from the position of the pointer B upon it.



## 11,898. Thompson, W. P., [Clarke, C. L.]. Oct. 6.

*Barometers; thermometers.*—

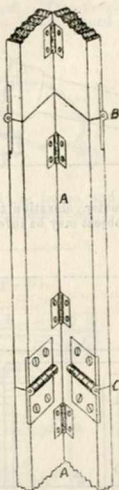
Relates to means for indicating at a distance the motion of instruments, such as barometers and thermometers. The principal features are (1) preventing injury to delicate contact-points by employing a weak current to complete a shunt circuit along which the stronger working current flows; (2) arranging the current-interrupting mechanism in a separate circuit, which is only completed after the requisite operations have been performed; (3) providing means for indicating failure of the instrument from any cause. The change of temperature, pressure, &c. causes the arm C to make contact with the point on one of the arms C', C'' (say the former), which are rigidly fixed to the ratchet-wheel E. The circuit 1, 2, 9, 3, L, &c., in which is the resistance R, is



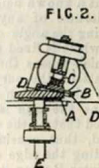
completed, and a slight current passes, sufficient to magnetize the coil H. This, by attracting its armature, breaks contact at *y* and closes it at *h*, causing a powerful current to flow along the shunt circuit 1, 4, 7, 3, L, &c. By the employment of this shunt injurious discharges are prevented at the delicate contact-point on C' when the strong current is broken. The coil F now becomes magnetized and, attracting its armature, causes the pawl *k* to move forward the ratchet-wheel. At the same instant the coil M is also magnetized, and a corresponding advance of the ratchet-wheel in the recording-instrument takes place. At the end of the stroke contact is made for the line L' by points on the bent arms of the armatures, and the coil Q is magnetized, causing its armature to strike against the lever S and break the main circuit. A similar process takes place when C makes contact with C'', the ratchet-wheels being then pushed in the opposite direction. The arm P on the recording-instrument, if thrown too far to one side or the other, completes the alarm circuit V through one of the points *p, p* on arms which may be set by hand as required. In case the main battery O should become too weak to perform its functions, the circuit is liable to remain closed. The electromagnet in the arrangement W then slowly draws forward its armature, controlled by a dash-pot, and sets free a signal indicating that the apparatus is not working.

**11,959. Dollond, A. W.** Oct. 8.

*Tripod stands.*—The legs of the tripod stand are divided by a medial line A, A along their length, and also into lengths by transverse divisions B, C. Each of these parts is connected by hinges in such a way that when the legs are flat they may be folded at the cross hinges. When, however, the legs are extended they may be folded lengthwise so as to assume an angular form, and the cross hinges becoming by this means fixed the legs are rigid. The legs are connected to a triangular top; they are clamped in the proper position by a hooked bar hinged to one side. Pointed pieces of metal are fitted to the lower ends of the bars.



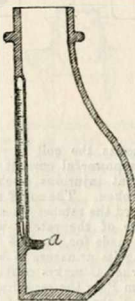
upon is mounted upon a revolving table A and the cutting or grinding tool B is carried by a spindle C, the axis of which cuts that of the table either above or below the latter, according as a



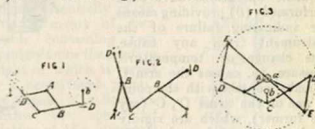
concave or convex surface is to be produced. The tool is preferably made in the form of a disc, and may have a metal ring D fixed to it as in Fig. 2. Its spindle is arranged to be set at any required angle, and may for that purpose be carried by a frame provided with toothed segments operated by pinions. This frame with its driving-gear is provided with a horizontal adjustment by means of racks and pinions or otherwise, while the table A has a vertical adjustment, its shaft E being raised or lowered by screws. The table may be made to travel also horizontally if desired, the driving-belt being suitably arranged to admit of such motion. To produce surfaces other than spherical suitable movements are given to the spindle C or the shaft E by known mechanical devices.

**11,968. Pooock, S. J.** Oct. 8.

*Thermometers combined with feeding-bottles &c.* A thermometer a is attached to a feeding-bottle, drinking-vessel, or the like in any suitable manner so that its bulb is in contact with the liquid. It may be marked in any required fashion to indicate when the food has the requisite temperature



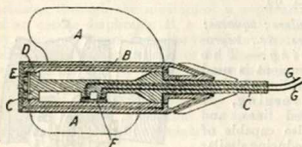
**11,990. Golding, W.** Oct. 9.



*Mathematical drawing-instruments.*—Relates to a system of crank &c. linkages, three forms of which are shown in the Figure, and which may be applied as ellipsographs, pantographs, or the like. Two links A B, C D pinned together at B are termed a "clavier," and by modifications and additions, and combinations of two or more claviers, mechanism of many descriptions for the transmission and conversion of motion are constructed. In the case of ellipsographs the arrangement shown in Fig. 1 may be used; the stud A or the left-hand stud D is then fixed in a slot and the pencil is attached at the right-hand point D. Similar arrangements are adapted for drawing epicycloids and hypocycloids, or as pantograph linkages for reproducing designs &c. to any desired scale. The two points D, D may be fixed each to one leg of a pair of compasses or dividers; a pencil through A C will then mark the centre of a given line. A double clavier linkage may be used to trisect any angle.

**11,985. Fric, J., and Fric, J.** Oct. 8.

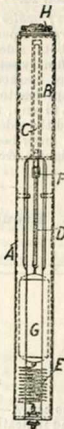
*Lenes; reflectors.*—Relates to apparatus for grinding and polishing curved surfaces in metal or glass, and especially for making lenses and reflectors. The lens or other object to be operated

12,181. **Faymonville, B.** Oct. 13.

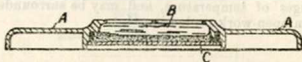
*Logg.*—Relates to electric counting-apparatus specially applicable to ships' logs. The blades A are fixed to an external cylinder B which revolves round the fixed axis C. An internal cylinder D is connected with the outer by gearing E so that it turns more slowly than the other, and it carries a metal plate F which at each revolution completes the circuit of the wires G, G. An armature is thus caused to oscillate, and a pawl thereon advances a ratchet-wheel connected with the registering-counter. This counter consists of a series of decagonal drums placed loose upon a spindle, each having ten internal teeth on a projecting rim. The first of these is moved by a toothed wheel, which gears with another wheel with teeth upon part of its circumference only. The face of the drum is thus changed rapidly at the proper time, and then remains still until the next change is necessary. Motion is communicated to the second drum by a spring-controlled rod on the first drum the end of which rests on a cam on the spindle. During every tenth of a revolution of the first drum this cam thrusts the rod into engagement with the above-mentioned internal teeth on the second drum. The other drums are actuated similarly.

12,240. **Thomson, Sir W.** Oct. 14.

*Sounding - apparatus.*—Within a metal frame A is a cylindrical vessel B with an inwardly projecting cylindrical neck C. The pressure of the water forces a graduated piston-rod D into this neck against the resisting force of the helical spring E, and moves a light marker F along the rod so as to record the depth. Between the rod and spring is a float G capable of supporting the weight of the piston and half the spring, and designed to annul the disturbing effect on the piston of the shock on the bottom. A screw plug H is provided to let off any water which may leak into the vessel B. To prevent the shock on the bottom



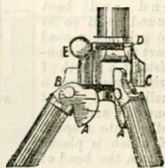
disturbing the marker, the apparatus is fitted into a cylindrical sheath suspended by a helical spring, within a long narrow can weighted at the bottom with lead and closed at the top by a screw cap: perforations are made in the sides of the can for the passage of the water. The casting-line, which is of steel wire, is wound on a drum fitted with a brake (as described in Specification No. 5675, A.D. 1883), but to prevent the wire from jumping off the drum flexible strips of sheet iron are fixed to its surrounding sheath, and curved round so as to embrace the inner edges of its flanging.

12,278. **Thropp, J.** Oct. 15.

*Levels.*—Consists of a spirit level, of which the frame is a hollow metal casting A of  $\cap$  section open at the bottom and slotted at the top. It is partitioned off near the middle, and the spirit tube B is introduced from below and supported by the plate C. The instrument rests on the edges of the casting.

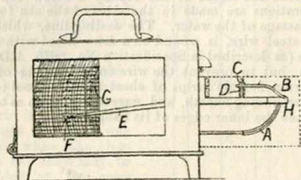
12,425. **Nicholson, A.** Oct. 17.

*Tripod stands.*—Relates to portable stands for cameras &c. The camera &c. is carried by a three-claw arrangement which may be removably attached to the male part of a ball-and-socket joint, tightened by a screw collar at the top of a telescopic standard. The lower end of the standard has a plug with three flat projections A, to which are jointed the flat parts B of plugs in the top of the legs. The projections A form stops to prevent the legs from folding inwards, and they may be prevented from moving in the opposite direction by projections on the locking-collar C bearing against the ends of the parts B. A pin D limits the motion of the collar and a knob E serves as a handle.

12,427. **Johnson, J. Y., [Richard Bros.]** Oct. 17.

*Thermometers.*—Relates to registering-thermometers. A "Bourdon tube" A is fixed at one end to an arm B adjustable by the nut C and spring D; the other end is connected by levers to the spring-arm E, carrying a pencil F for tracing a record of temperature on the drum G, revolved by clockwork. The pencil may be thrown out of contact with the

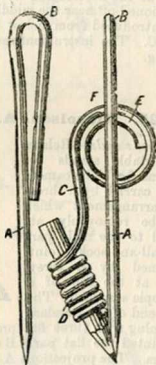
drum when desired. The "Bourdon tube" is placed outside the case containing the registering-apparatus, so as to be thoroughly exposed to



changes of temperature, and may be surrounded by an open-work protection H.

**12,437. Waite, J., Waite, T. C., and Waite, F. W.** Oct. 19.

*Compasses, drawing.*—The instrument is made in two parts, preferably of steel wire. The first part consists of a length of wire A sharpened at one end and bent round at B so as to grip the second part C. This consists of a length of wire formed into a helical coil D at one end, and at the other into a spiral E which is placed within the bend of A so as to turn about the rivet F. The pen or pencil is fitted into the coil D.



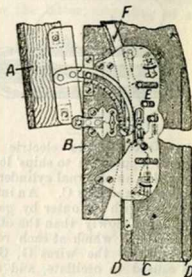
**12,582. Chadwick, W.** Oct. 21.

*Specific gravity estimating apparatus; barometers; thermometers.*—Relates to scales for hydrometers, thermometers, barometers, and similar instruments. The Figure shows a scale adapted for an hydrometer or spirit tester. The invention consists in making the scale in two or more columns, and distributing the divisions among these, so that room is given for each to be numbered.



**12,668. Groth, L. A., [Puigsech, J. T. y.]** Oct. 22.

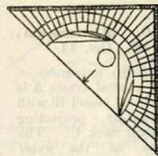
*Rulers; squares; curves &c., reproducing.*—The instrument is used for ruling parallel, converging, or curved lines, and is also capable of reproducing similar curves &c. in various positions. One form is shown in the Figure where a ruler A, or a square, is pivoted to a carrier B which slides along the guide C. This guide is formed either straight or curved



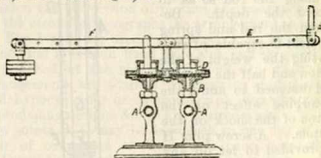
as required, and projecting rims D, D run along its edges. The piece E fixed to the slide B carries rollers pressing upon the inside face of the rim D, various steadying devices, and a spring pawl which, taking into the teeth of the rack F on the rim, regulates the motion of the carrier. When converging or curved lines are to be drawn the ruler passes also through a special form of swivelling guide fixed at the centre of convergence. For reproducing curves and irregular lines &c., the ruler is fitted with a pencil holder and is mounted in a swivelling guide.

**12,704. Marle, H.** Oct. 23.

*Squares; scales; protractors.*—Upon one or both sides of an ordinary set-square are marked scales, protractor graduations, a circle, and the sides of the inscribed regular figures, &c.



**12,716. Brough, R.** Oct. 23.



*Thermometers.*—Relates to apparatus for regulating and indicating temperatures. The expansion

of any suitable liquid or gas contained in the tube A actuates, through the medium of a cup-leather or of an elastic diaphragm B, a piston D connected by means of levers E to the ventilators, valves, or other regulating-apparatus, or by electrical means to fire-alarms &c. A similar arrangement provided with a weighted lever F acts as a safety-valve or regulator. A pressure gauge may be attached to the tube A and graduated so as to indicate temperatures as well as pressures.

12,921. **Brust, C.** Oct. 27.



*Spectacles.*—Relates to appliances for “imparting” electricity to various parts of the human body.<sup>6</sup> Spectacles are made with copper frames fitted with zinc plates *a*, *b*. Other pairs of metals may be used.

12,970. **Hill, C. F.** Oct. 28.

*Rulers.*—A shell A carries a roller B the ends of which are formed into journals which revolve in bearings in the shell at the ends. When in use, the surface C, which is serrated to obtain a better grip, is pressed upon the paper, and the roller is lifted up off it. To move the ruler, the shell is tilted, so that the roller comes into contact with, and can run along, the paper. The shell is formed with a curved face D, and a hollow E at the back to give a good hold for the fingers.



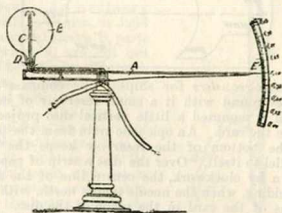
13,006. **King, H. J. H.** Oct. 29. *Drawings to Specification.*

*Thermometers.*—In connection with thermostatic apparatus for controlling the temperature of malt and hop kilns, a pointer is connected with part of the mechanism so as to indicate the temperature upon a dial outside the kiln.

13,050. **Lux, F.** Oct. 29.

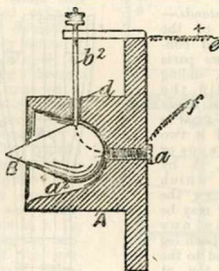
*Specific-gravity estimating apparatus.*—The instrument consists of a balance A at the end of one arm of which is a globe B with inlet and exit pipes C, D. These pipes are brought round close to the fulcrum and connected there with india-rubber tubing by means of which gases or liquids

are led into the globe. The other arm of the balance moves over a scale E, and thus the specific gravity of fluids can be estimated while flowing as well as when stationary. If the nature of the gas



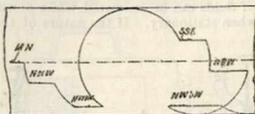
be known, the pressure can be deduced by the weight observed. Further, a mixture of known gases may be analysed quantitatively by placing between each of a series of these instruments vessels containing substances which absorb the gases one by one, and observing the specific gravity of the results.

13,269. **Anders, G. L.** Nov. 3.



*Anemometers.*—The telephonic transmitter described below is stated to be applicable as a wind-pressure gauge. A body acted on by the sound waves is suspended in a cavity, and carries one contact, while the other is attached to the side of the cavity. In the form shown in the Figure the pear-shaped “collector” B is suspended in the paraboloidal cavity *a* in the support A by a rod *b* which is connected to one terminal *e* and is free to oscillate in the hole *d*. The other terminal *f* is connected to the screw *a* carrying one contact, while the other is attached to the collector B, which should be of low specific gravity. When wind blows into the cavity, the body moves in the opposite direction, and by attaching a suitable index the apparatus may be used as an anemometer.

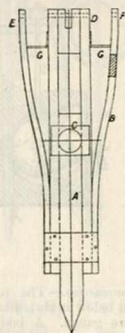
13,331. **Berg, C. F. E.** Nov. 4.



*Course-recorders for ships.* The compass card carries round with it a small reservoir of ink in which is mounted a little vertical disc projecting above the card. An epicyclic train from the pivot to the bottom of the reservoir keeps the disc parallel to itself. Over the disc a strip of paper is drawn by clockwork, the centre line of the strip coinciding, when the needle points north, with the radius of the card in the plane of the disc. The Figure shows the diagram thereby marked on the paper; the lines parallel to the centre one show the courses steered, their length being proportional to the time on each course. It is read by means of a transparent compass circle of the same radius as the distance from the pivot to the place where the ink disc touches the paper and with lines drawn from the points parallel to the north and south line. The disc is moved with its north point towards the commencement of the diagram.

14,205. **Ashford, J.** Nov. 20.

*Tripod stands.*—Each leg of the tripod stand consists of two parts A and B, sliding one within the other. The lower part A has fixed to the top of it two cross-pieces or cheeks C, C, by tightening which with a screw the lower half may be clamped in any position. Each leg is connected to the triangular top at three points, viz., a central point D by a bolt and ear, and two side points E and F by centres against which strips are forced out by struts G, G.



14,289. **Berly, J. A.,** [Coutand, N.] Nov. 21.

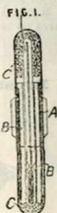
*Mathematical drawing-instruments.*—The head-joints of dividers or like mathematical instruments which are



provided with a pin formed of a steel or other elastic metal strip *a*, spirally coiled. In some cases a central pin may be secured within the coil.

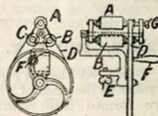
14,406. **Boswell, H. St. G.** Nov. 24.

*Thermometers, cases for.* Cases for clinical thermometers and other fragile instruments are lined inside with india-rubber from which flexible longitudinal ribs B, B protrude towards the axis; these may be of various forms, tubular, solid, corrugated, &c. The ends are padded with cotton-wool C, C.

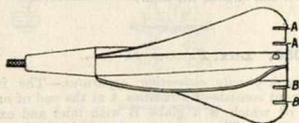


14,669. **Duncan, W. H.** Nov. 30.

*Kaleidoscopes.*—Relates to a portable grinding-apparatus for domestic use combined with means for rotating kaleidoscopes. Three or more grinding-wheels A, B, C are mounted in a movable frame which may be turned so as to bring the driving-strap D into gear with a pulley on the spindle of any of the wheels. One of the wheels (say A) is a hone stone, B a grindstone, and C an emery wheel; a file wheel may be substituted for one of these for sharpening pencils. The main framework of the apparatus can be clamped to an ordinary table by the screw E, and motion is given by the handle F. On the spindle of the wheel A is a thumb-screw G by which bent pieces of wire, different coloured discs, &c. may be fixed for producing effects similar to those of the chameleon top. Supports for a kaleidoscope may also be fixed into the top of the main frame and a slow turning motion imparted by a longer strap than that shown.



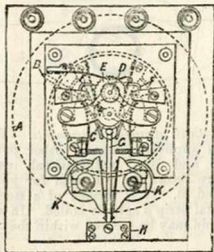
14,757. **Newton, H. E.,** [Bliss, J., and Bliss, G. H., trading as J. Bliss & Co.] Dec. 1.



*Logs.*—Consists in improvements in the blades of the rotators, whereby the speed of rotation

may be regulated without altering the pitch of the blades. Supplemental fins or the like are formed in the blades, or attached thereto, which may be bent or adjusted for this purpose. In the Figure the fins are formed by slitting the blade at A, A and B, B and bending the part between as required. In other forms blades or wedge-shaped blocks may be attached to the blade by screws or rivets, or any similar method may be employed.

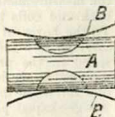
14,855. Sax, J. Dec. 3.



*Wind vanes*, electrical indicating-apparatus for. A vane exposed to the wind is connected by gearing with special electric apparatus consisting of contact-pieces controlled by tumbling-weights in such a manner that contact is made for a brief period for each definite movement of the drum. The resulting currents are sent to the indicator (shown in the Figure), in one direction if the drum moves right-handedly and in the other if it moves left-handedly. The indicator consists of a dial A and an index-finger B on the spindle of which is a toothed wheel C gearing with a pinion on the spindle D carrying a toothed wheel E. This wheel is actuated by one or other of the pawls F, F (according to the direction of the electric current), by means of the oscillating piece G of soft iron carried by a permanent magnet H. The electric circuit includes the coils of the electromagnet K, to the right or left pole of which the piece G is drawn as the current passes in one direction or the other. The index-finger may, if desired, be arranged to close the circuit of an alarm at certain specified points.

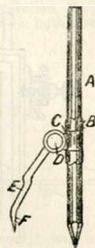
15,133. Scott, L. K. Dec. 9.

*Levels*.—Consists in mounting very small glass levels, which are necessarily of thin glass, in a jacket of thick glass with an outer jacket of metal cut away at the sides to show the internal tube. The level A thus formed is carried by springs B, B to further reduce the effect of sudden shocks.



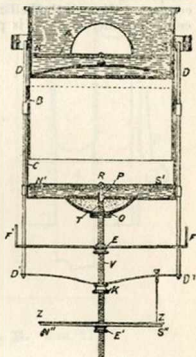
15,199. Harger, T., and Harger, J. V. Dec. 11.

*Compasses, drawing*.—Relates to pocket compasses. An ordinary pencil A, or pen, is held by a metal sleeve B, parts of which C are cut out and bent back. Through these is passed a screw fitted with a tightening-nut D. The leg E is pivoted on the screw, and is bent at the end F so as to fit close against the pencil point and act as a protection while carrying the instrument in the pocket.



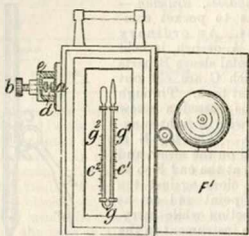
15,537. Lake, H. H., [Berlingieri, E.]. Dec. 17.

*Compasses, magnetic*.—An ordinary compass N S is mounted in the cylinder B open at the bottom upon which slides the weighted cylinder C, the connection being by means of the rods D, D' passing through guide-rings on C and united at their lower ends by the cross-piece D' K D'. The cylinder C is moved up or down by the nut K on the screw V, which also carries the nuts E, E' for adjusting the position of the soft-iron bar F F' and the magnetized needle N<sup>11</sup> S<sup>11</sup> to which is fixed an azimuth card Z Z. A pivot P mounted in a tube T containing a spring O supports a shallow cylindrical box connected with a needle N<sup>1</sup> S<sup>1</sup> by the cap R and floating on petroleum. Under this arrangement the magnets N<sup>1</sup> S<sup>1</sup> and N S would usually be caused to deviate in opposite directions, but by proper adjustment of the magnets N<sup>1</sup> S<sup>1</sup>, N<sup>11</sup> S<sup>11</sup>, and the induced magnet F F', an equilibrium may be struck for the needle N S between the disturbing influences of the ship's iron &c. and those of the system N<sup>1</sup> S<sup>1</sup>, N<sup>11</sup> S<sup>11</sup>, and F F', and the needle caused to point true "magnetic north."





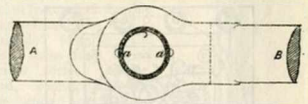
15,543. **Lindley, C., and Mudford, F. J.**  
Dec. 24.



*Thermometers.*—Relates to alarm thermometers. To use the instrument the contact *d*, enclosed in the metal dust-proof case *e*, is made by screwing in the spindle *b*. On the temperature rising the mercury rises in the tube *c'*, making contact at *g'* and completing the circuit, the points *g'* and *a* being connected through the bell mechanism *F'* and the cell. The mercury at *g* is permanently connected

with the case *e*. When attention has been called the contact at *d* may be broken and the bell stopped ringing. The instrument will indicate similarly a lowering of temperature, since this produces a rise of mercury in *c'* and the point *g'* is connected with *a*.

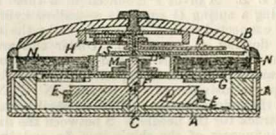
15,938. **Gautier, A., and Pozzy, S.**  
Dec. 28.



*Mathematical drawing-instruments.*—Relates to joint pins applicable, among other purposes, to compasses and like mathematical instruments. The Figure shows the pin used for jointing two rods *A* and *B*. It is formed of a steel or other elastic metal strip *a* spirally coiled. In some cases a central pin may be secured within the coil.

A.D. 1886.

700. **Ferguson, F. O.** Jan. 16.

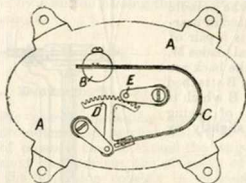


*Scales* or measuring-instruments for laying-off or measuring lines on plans, surveys, drawings, and the like. In a case *A* with a glazed cover *B* is mounted on a central spindle *C* a drum *D* around which is coiled a chain *E* with a pointer at its end.

This can be drawn out through a slot in the case for the purpose of measuring or laying-off the lines, the drum and chain being thereby rotated. On the central spindle is a toothed wheel *F* gearing with a second wheel the axis of which carries a pinion engaging with the rack *G*, which is caused to protrude from the case when the drum is revolved; when the measurement has been made the rack is pushed back and coils the chain up again on the drum. To the cover of the instrument is fitted a cap *H* carrying two index-fingers *K* geared to revolve at speed in the proportion of 1 to 4. The quicker-moving finger is connected rigidly to a notched disc *L*; when the cover of the instrument is shut a wedge-shaped piece on a spring *M* engages in one of the notches of the disc *L* and forms a connection between the drum and the index. A series of

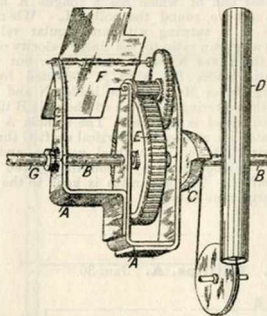
annular dials N, graduated with various scales, are placed below the index-fingers, the one required for each measurement being adjusted at the top of the pile.

737. **Leggott, W.** Jan. 18.



*Thermometers* for ovens and other hot-air chambers. On the inside of the door is fitted a case A carrying a log B to which is fixed a curved bi-metal strip C. The quadrant D worked by this strip gears with a pinion on the spindle E passing through the door. The dial is situated outside, and its index-finger is attached to the end of the spindle E.

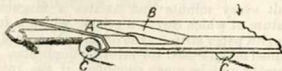
807. **Chadburn, W., and Smith, G.**  
Jan. 19.



*Logs.*—A swinging frame A is pivoted on the spindle B, which is connected to the tow-line of the log. The motion of the frame is controlled by a stop in one direction and by a spring in the other, the cam C being connected by a chain to the spring, which may be coiled in a tube D. A toothed wheel E on the spindle B gears with the first of a train of wheels carried by the swinging frame and terminating in the fan F. When the log revolves, the fan causes the frame to swing

away from its normal position, the extent of displacement being indicated on a dial by a finger fixed to the spindle G. Where it is desired to show also the direction of revolution, the movement of the frame is controlled in both directions by springs.

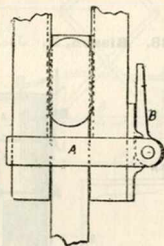
849. **Salsbury, H.** Jan. 19.



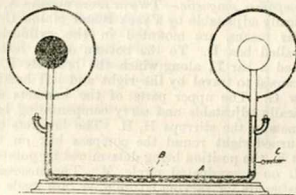
*Rulers.*—A curled sheet of metal A, with indents B or slots for the fingers if desired, is fitted with rollers C. The Figure shows one of various forms which may be adopted.

899. **McKellen, S. D.** Jan. 20.

*Tripod stands.*—The object is to facilitate the folding and erecting of tripod stands. This is effected by a clamp consisting of a strap A which is tightened by folding down an eccentric-headed lever B.



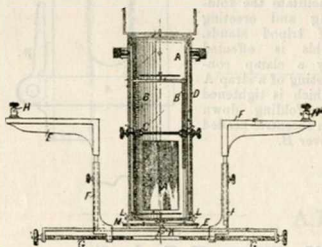
949. **Wilson, W. E.** Jan. 21.



*Sunshine-recorders; thermometers.*—The invention consists in the employment of a differential thermometer, which may be of various types, one

sensitive part of which is exposed to, and the other shielded from, the sunshine. When the sun is obscured the two readings of the thermometers will be the same, but will differ as soon as the sunlight falls on the instrument, and the consequent motion of an index makes contact between two platinum wires in an electric circuit. The recording-instrument consists of a drum revolved by clockwork, the axis having a screw cut upon it passing through a tapped socket, so that the drum receives a motion of translation as well as rotation. The clock completes the above-mentioned circuit every minute and excites a magnet the armature of which carries a pricker which is forced through a paper strip on the drum: the record thus obtained may be used for printing duplicates. The apparatus may be much simplified if the recorder can be placed near the thermometer, or if only one recorder is desired. The Figure shows the application of a differential air thermometer, the movement of the mercury thread A making contact between the platinum wires B, C. In some cases two mercurial thermometers are employed with stems of large bore provided with plungers connected by a link which is prolonged to carry a marker. Or a thermometer with a bi-metallic spiral spring may be employed.

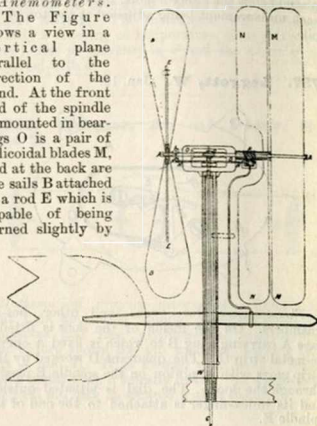
1038. Bisson, E. Jan. 23.



*Compasses, magnetic.*—Two or more needles A, A, vertically adjustable by a rack B and pinion C or similar means, are mounted in the cylindrical gimballed box D. To the bottom of the box is pivoted a bar E, along which the brackets F, F are caused to travel by the right and left handed screw G. The upper parts of the brackets are vertically adjustable and carry compensating bar-magnets in the stirrups H, H. The brackets can be turned right round the compass box on the pivot K, the position being determined by pointers L, L on a graduated circle M. The necessary adjustments for varying latitude &c. are made by certain experiments.

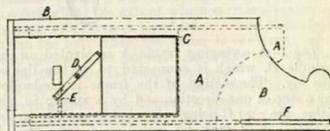
1345. Dines, W. H. Jan. 30.

*Anemometers.*  
—The Figure shows a view in a vertical plane parallel to the direction of the wind. At the front end of the spindle A mounted in bearings O is a pair of helicoidal blades M, and at the back are the sails B attached to a rod E which is capable of being turned slightly by



cranks from a sliding rotating collar L. A loose sleeve on the spindle A carries four flat vanes N at right-angles and has a thread R on it engaging with a grooved cylinder on one end of a rod H, the other end of which has a tongue K fitting into a groove round the collar L. When the spindle A is turning with an angular velocity having a certain ratio to the linear velocity of the wind, the vanes N remain stationary, but when the ratio alters the wind is deflected by the rotating blades M on to the blades N and turns them, thus altering the pitch of the sails B till the required speed is attained. The spindle A communicates its motion to a vertical shaft C through the worm D and spur-wheel gearing, and the velocity is ascertained by a counter worked from the shaft C. The apparatus is kept to the wind by a large vane below.

1353. Phillips, A. Jan. 30.



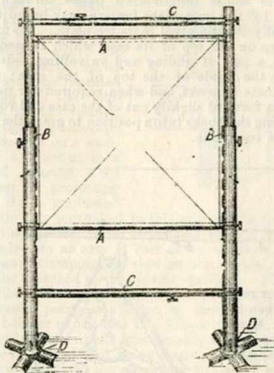
*Magic-lanterns.*—The slide carrier A (shown in dotted lines) works in grooves in a stationary

frame B, and the pictures are dropped into it from above. To ensure the correct centering of the pictures, they are pushed forward by a shoulder C on the carrier until they come in contact with the lever D pivoted to the frame and thrown back to meet the slide by the stop E on the carrier. A mask plate with apertures of various shapes can be moved into any desired position by a button passing through the slot F in the frame B.

1938. **Derham, T.** Feb. 10.

*Specific-gravity estimating apparatus.*—Relates to hydrometers and saccharometers in which a series of poises is used to extend the range of the instrument and prevent the necessity of a long stem; the invention consists in so constructing the poises, with reference to the bulk and specific gravity of each, that the stem shall indicate the same number of degrees of specific gravity whichever poise is in use. For this purpose the poises are made, respectively, of a bulk equal to once, twice, thrice, &c. that of the graduated stem; also, if G be the initial specific gravity of the instrument and  $\alpha$  the number of degrees shown on the stem, the  $n^{\text{th}}$  poise of the series has a specific gravity  $2G + (n + 1)\alpha$ .

1930. **Bruster, J., and Gibbs, J. M.**  
Feb. 11.

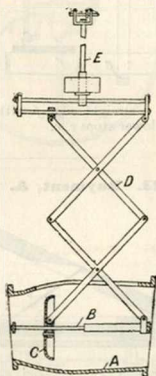


*Magic-lantern apparatus.*—The sheet is made of transparent paper or cloth, and coloured to produce the effect of tinted slides. It is then mounted

on rollers A, A which are fixed by thumb-screws into holes in telescopic pillars B, B held in position by cross-stays C, C, also telescopic and standing on removable part-tubular feet D, D. The sizes of the various pillars and stays are such that they can be all packed within the largest for convenience of carriage.

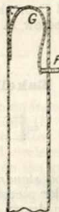
1991. **Sporton, H. H.** Feb. 11.

*Current meters.*—Relates to apparatus for estimating the flow through a sluice valve casing. The valve is removed and a tube A inserted in its seat. This has a horizontal spindle B on which slides a valve C, the movement of which is communicated to an indicator pencil by lazy-tongs lattice bars D and the rod E. The diagram barrel is rotated by clockwork so that a continuous record is obtained. The rod E passes through a small stuffing-box inserted in the main one of the sluice valve.



2039. **Lucas, H.**  
Feb. 12.

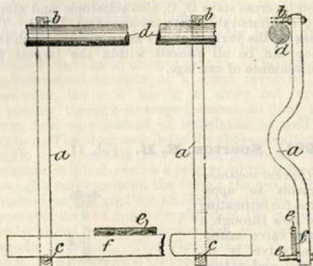
*Tripod stands.*—Relates to a method of clamping the telescopic parts of the legs of the stand. This may be done by forcing a ferrule with saw cuts into a conical nut, or by a tongue piece F pressed out through a slot by a spring G.



2130. **Butler, A. E., and Butler, H. M.**  
Feb. 13.

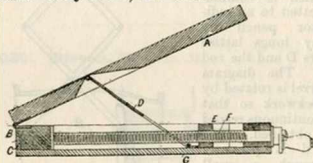
*Levels for levelling shafting.* Two steel bars  $a, a$ , bent as shown, have two stops  $b, c$  on each. The

distance between these two stops is accurately the same on each bar. They are hung on the shaft *d*,



and a straight edge *f* with a level *e* is placed on the lower stops *c, c*.

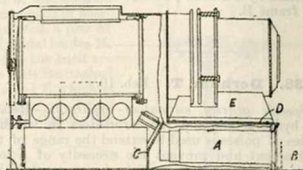
**2423. Rayment, A.** Feb. 19.



*Tripod and like stands for photographic cameras.* The top of a tripod or other stand is constructed to enable the camera to be tilted through any required angle. For this purpose the board *A*, on which the camera is fixed, is hinged at one side at *B* to another board *C* fixed on the tripod top. The board *A* is supported in any position by a stay rod *D* on the end of which is a nut *E* actuated by the screw *F*. The board *A* can thus be set at

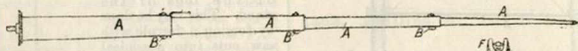
any angle by moving the nut *E*. In order to keep the centre of gravity of the camera over the tripod stand, the part *C* is made to slide transversely on the part *G* attached directly to the tripod top.

**2459. Wrench, A..** [trading as J. Wrench & Son]. Feb. 19.

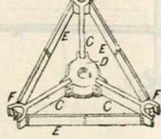


*Magic-lanterns.*—Consists of various improvements in detail, of which the following are the principal. The body of the lantern is extended in front to form a receptacle *A* in which the lamp chimney is packed and held in its place by the hinged catch *B*. The receptacle is separated from the body of the lantern by a partition *C* which acts as a stop for the lamp, and prevents the light from showing through in front. On the top of *A* are formed two guides *D* in which slide a casting *E* carrying the stage and "OG" tube. The door of the lantern is closed by the usual catch, to which there is added an inner projection so that, holding firmly on both sides, the door acts as a stay to steady the whole. At the back the lanterns are transversely slotted along the bottom and a thumb-screw passes through the slot; by this means the lantern may be adjusted laterally about a pivot in its toe-plate. To fix the lantern on the top of its case, which is used as a stand, a pair of sliding and swivelling rods run along the inside of the top of the case; these terminate in hooks, and when required for use are drawn forward slightly out of the case and rotated to bring the hooks into a position to grasp the back of the base-plate.

**2495. Eskell, C. A.** Feb. 20.

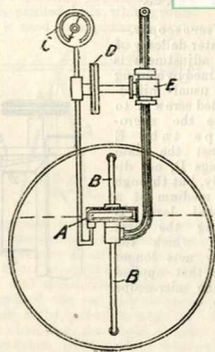


*Tripod stands.*—Each leg of the tripod consists of two or more triangular pieces *A*, *A* which telescope one into another. When the legs are drawn out to their full extent tongue pieces *B, B* are forced out by springs into slots in the tube and fix the respective pieces in place. The head is also constructed to be collapsible. Three radial arms *C, C, C* are connected to a central boss *D* by hinged joints. Hinged stay rods *E, E, E* are connected to the ends of the radial arms, keeping them apart, and giving a broader support to the camera. The legs are attached to forked ends *F, F, F* of radial arms by pivots. When a leg has been shut up a hinged clip cap is folded over it.



## 2520. Thomson, J. Feb. 20.

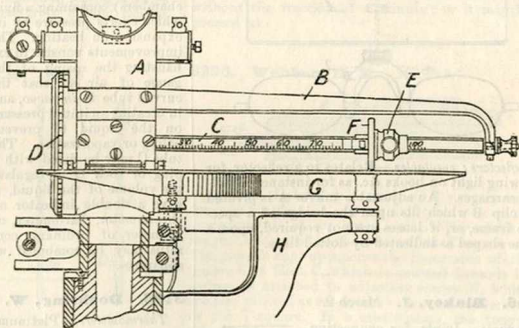
*Thermometers.*—The apparatus consists essentially of an expansion chamber in which is placed some fluid such as ether; a connecting-tube leads from the expansion chamber to a pressure gauge which may be graduated for various purposes, and a branch tube leads to a diaphragm which is made to actuate regulating-valves. The Figure shows an arrangement for indicating and regulating the water level in a steam boiler, but an analogous arrangement may be used for controlling the flow of heated fluids through a pipe, and for regulating and indicating the temperature of hot chambers, ovens, &c. The expansion chamber A is placed in an enlarged portion of the tube B which leads into the boiler at both its upper and lower ends, the enlarged part being at or near the normal water level. Should the level fall, the expansion chamber becomes surrounded by steam which is at a higher temperature than the water in the lower part of the boiler. A consequent increase of pressure will take place in the chamber A, which will be communicated to the pressure gauge C (graduated for levels), and to the diaphragm D which operates a valve E controlling the feedwater supply. The pressure may be indicated on a separate gauge connected by a tube passing into the boiler below the level of the water. The diaphragm E may also sound an alarm, control an overflow valve, or operate a safety-valve.



## 2527. Dalrymple-Hay, H. H. Feb. 22.

*Railway and like curves, setting out.*—

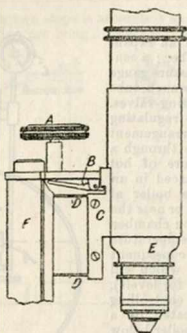
The instrument is of the nature of a theodolite, and is mounted when in use on a tripod stand with the usual levelling-arrangements; it is intended for setting out curves by "Rankine's method," but dispenses with the use of curve tables and with the repeated setting of the telescope by the vernier. The sighting-telescope is mounted on a standard A working in a coned bearing and having a projecting arm B; a graduated



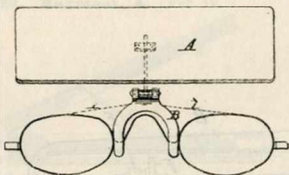
spindle C is journaled in this arm and in the centre of a dial face D, and terminates in an index-finger. On the spindle is an adjustable slide E with a wheel F to roll on a horizontal table G, which is mounted on an arm H carried by a sleeve on the coned socket. The various parts are fitted with the necessary clamping and slow-motion devices, and the table G is marked with a graduated circle read by a vernier attached to the central standard. The action is as follows:—The slide E is set on the graduated spindle according to the radius of the curve to be ranged, and the motion of the telescope in sighting for successive points is effected by moving the arm B, the extent of the movements being shown by the index-finger on the dial D. Where a change of position of the point of observation is necessary, and the whole instrument has consequently to be moved, the telescope is adjusted with reference to the graduated circle on the table, it being necessary then to turn it through 180° after sighting the original position before continuing the ranging of the curve.

2622. **Swift, J.** Feb. 23.

*Microscopes.*—Greater delicacy of fine adjustment is obtained by causing the usual milled-headed screw A to move the microscope tube E against the plate springs D, not directly, but through the medium of a pivoted lever B having the arm upon which the screw acts longer than that applied to the microscope tube.



2764. **Imray, J.** Feb. 25.



*Reflectors; spectacles.*—Relates to a reflector for throwing light on books &c., as for instance in railway carriages. An adjustable mirror A is pivoted to a clip B which fits upon the bridge of a spectacle frame, or, if lenses are not required, upon a frame shaped as indicated by dotted lines.

2946. **Blakey, J.** March 2.

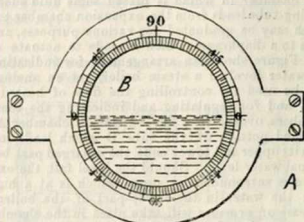
*Squares.*—Joints for connecting the bars of T-squares, frames, &c. are formed of cast or sheet metal with prongs or points so that they can be attached without the use of separate nails; they may further be of an ornamental character. The Figure shows their use for connecting a frame together at the corners.



2967. **Hicks, J. J., and Tight, C.** March 2.

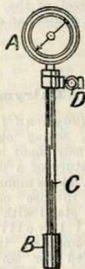
*Levels.*—The block of a spirit level carries a flat chamber B having a glass front surrounded by

angular graduations and a white back. This is either half filled with spirit or filled so as to leave only a small bubble.



3023. **Murrie, J.** March 3.

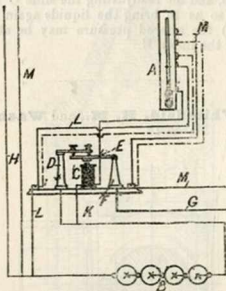
*Thermometers; barometers.*—Relates to apparatus for indicating temperature or pressure. The indicator A is of the 'Bourdon pressure gauge' type and is connected by the tube C with a chamber B (or two connected chambers) containing a fluid which exerts pressure by its expansion on heating. The improvements consist in exhausting the casing of the gauge of air so that the curved tube is *in vacuo*, and in creating an initial pressure on the liquid to prevent boiling or vaporization. The tube C may be fitted with a plug or cock D to regulate the volume of the liquid, and the apparatus may have a double indicator or be combined with a chronometer, barometer, or glass mercurial thermometer of ordinary construction. The apparatus may be combined with pressure-indicating apparatus.



3136. **Doehring, W.** March 5.

*Thermometers.*—Platinum wires fused into the stem are so connected with a button B and contact-breaker C that call and recording apparatus are brought into action when the temperature falls below or rises above certain points. When the temperature is below the minimum, the current flows through the pillar D, armature E, pillar F, and wire G to a signal box and bell, whence it returns by the wire H. While the temperature is between minimum and maximum the current flows through the magnet coils K, the mercury, and the wire L. The excited magnet attracts the armature E, thereby breaking the former circuit and stopping the alarms. On the maximum temperature being reached, a part of the current returns from the mercury by the circuit M, in which a second signal and alarm are included. An auxiliary battery is

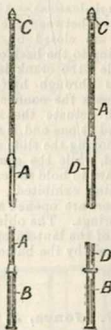
put in this circuit. In addition to the ordinary signal box, there may be sets of electromagnets to record the times of the alarms. On a clock-driver drum, and in connection with bells, there may be two



special clockwork current-breakers to print a word by Morse code apparatus. If one of the poles of the auxiliary battery is connected with earth the current in the maximum wire M may be switched into the circuit of a fire-brigade station. Different minima and maxima may be used by having a series of wires from the thermometer to a plug rail, as shown in dotted lines.

**3155. Guinness, L. H.** March 6.

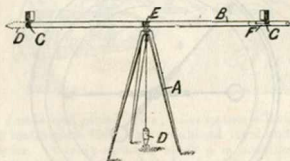
*Thermometers, protectors for.* Relates to a protecting-case for use when plunging thermometers into liquids. A long metal tube A has a handle B at one end and a screw cap C for securing the thermometer at the other. At the cap end the tube is partly cut away and slotted to expose the bulb of the thermometer and allow its index to be seen. Over the tube A slides a protecting-tube D, which can be pushed forward to cover the thermometer while it is being inserted in the liquid, and afterwards drawn back.



**3172. Vetch, G. A.** March 6.

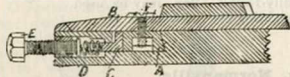
*Surveying-instruments.*—Relates to means for measuring distances, the method being based on the fact that, when small, the angles subtended by a line of known length may be considered inversely proportional to the distances of the points at which they are subtended. A tripod stand A carries a

horizontal rod B on which a known length is defined by lines C forming the inner boundaries of coloured bands painted on a white ground. A terminal shoe D is used as a plummet and marks



one end of the distance to be measured, while at the other end is a theodolite to measure the angle subtended. In the centre E of the rod are sights by which it may be set at right-angles to the line joining plummet and theodolite. For very long distances the length of the rod may be increased either telescopically or by pieces to screw in. To reduce errors in observing the angle, a series of readings should be taken, each starting where the other left off, and the total angle reached should be divided by the number of observations. By means of divisions F marked at the end of the rod, fractions of a minute may be ascertained from a proportion involving the distance calculated without the fraction of a minute; or it may be guessed at.

**3290. Webber, B. K.** March 9.



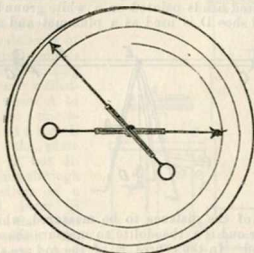
*Squares.*—Relates to combined T-squares and drawing-boards. A dovetailed groove is made along one side of the board, and in this slides a tongue A fastened to the head of the T-square B. The piece is kept up against the inner side of the groove by a fillet C, which is pressed inwards by springs D attached to adjusting-screws E, which are also utilized as set-screws to prevent movement of the T-square. In a modification, the tongue fills the groove and has rollers underneath, while the screw E attaching it to the square is replaced by a screwed bush with wing-belt for locking the square.

**3425. Watkin, H. S. S.** March 11.

*Barometers.*—Relates to dial indicators specially applicable for aneroid barometers. The pointer slides longitudinally while revolving, so that the end describes a spiral; in this way it may make more than one revolution while still showing a continuous reading. The sliding is effected by means of a fixed barrel having a cord wound upon it, the ends of which are attached to the ends of the pointer. Or the pointer may have a rack



gearing with fixed pinions. The Figure shows two positions of the pointer.



**3594. Calderara, S. A., and Calderara, A. J.** March 13.

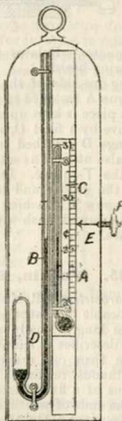
*Specific-gravity estimating apparatus.*

—Consists in blowing the bulb of a hydrometer in a mould so as to obtain an exact bulk and any required vertical and horizontal sections. The Figure shows an instrument with a square bulb A; the lower mercury bulb B is preferably attached subsequently, and the scale tube C is fixed to the conical part D of the upper bulb. Instead of mercury, shot held together by sealing-wax, or a readily-fusible alloy, may be used for weighting the instrument.



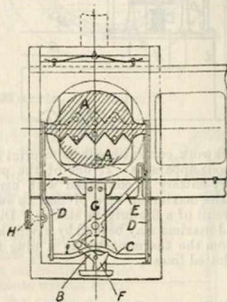
**3625. Normanville, S. A. de.** March 15.

*Barometers.* — Relates to a modification of the form of barometer known as the sympiesometer. The object is to dispense with the ordinary temperature corrections; for this purpose a thermometer A is mounted beside the manometer B on a sliding block C which carries the barometer scale. The size of the bulb D is so calculated that the travel of the liquids in the manometer and thermometer are equal for equal changes of temperature. The liquids having been adjusted at the same level will remain so whatever the temperature so long as the barometer pressure



does not vary. The index E is fixed to the frame to read correctly by comparison with a standard barometer. Any difference of level between the liquids in A and B shows a change of pressure, and on readjusting the slide C by the button F (so as to bring the liquids again to the same level) the altered pressure may be at once read off by the index E.

**3805. Whitefield, H. M., and Washington, S.** March 18.

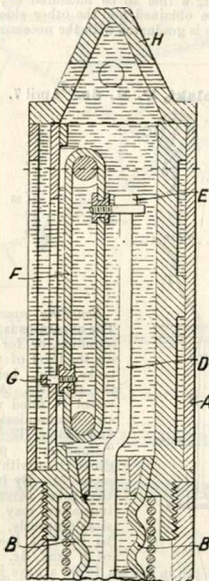


*Magic-lanterns.*—A pair of shutters A, A are pivoted between the objectives and condensers; they are closed by the crank B on a spindle running to the back of the lantern and ending in a handle; the crank is turned backwards and forwards through half a revolution, and its pin depresses the connecting-rod C of the arms D, D which actuate the shutters. A pivoted arm E slotted at one end is also acted upon by the crank for moving the slide carrier when the shutters are closed, while the cam F forces a strong spring G forward to hold the carrier fixed while the picture is being exhibited. At the proper moment the shutters are opened and the spring G pushed back by springs. The objectives are focussed from the back of the lantern by means of a rack and pinion operated by the button H.

**3967. Jones, J. G.** March 20.

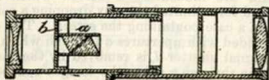
*Sounding-apparatus.*—In a long cylindrical case A is fixed about the middle a corrugated india-rubber tube B closed at the bottom by a cap and surrounded by a coiled spring. To the cap is screwed the rod D, which passes upwards and ends in a head E engaging with a forked projection on the endless band F. An indicator G is also carried by the endless band. Water is admitted to the interior of the instrument through a perforated

cap H, and elongates the tube B according to the pressure, while the rod D draws down the endless band and raises the indicator; as the pressure



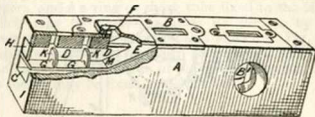
diminishes, the rod leaves the forked projection and consequently the indicator remains in its highest position and records the depth.

**4375. Rohrbach, C. E. M.** March 29.



*Telescopes; optical instruments.*—Consists in placing a polarizing-prism in a suitable part of an optical instrument to cut off light polarized by reflection from bright surfaces, particles of dust, &c. In the case of a telescope the prism *a* is placed close to the diaphragm *b* of the eye-piece. The plane of the main section of the prism should be arranged to pass through the source of light.

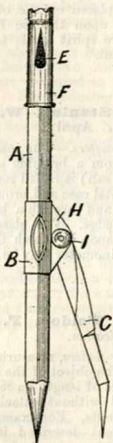
**4433. Smith, C. G., Warren, Warren, C. H.** March 30.



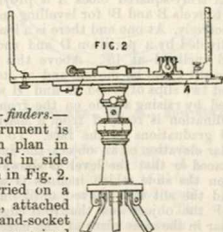
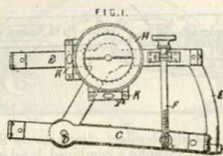
*Levels and plumb-rules; clinometers.*—Relates to an instrument forming a combined level and clinometer. A truly-squared block A is provided with two spirit levels B and B' for levelling and plumbing respectively. At one end there is a longitudinal hole C, divided by a partition D and ending in a mirror E inclined at 45°. Above this mirror a transverse slit F can be moved, and at its base M are hinged two slips of wood G and H which can be inclined by raising a slide on the front face I. Their inclination is read off from a mark on the slide and graduations on the face. To ascertain the angular elevation of an object the instrument is first placed so that the level B shows horizontality, then the slide which inclines G and H is raised, and the slit F is moved, until on looking through F the object and the front edges of the slips appear in the same place of the mirror. The slip G has two perforated diaphragms K to aid the sighting.

**4449. Milligan, J. W., [Weissenborn, E.]** March 30.

*Compasses, drawing; dividers.*—On an ordinary pencil A is a sliding sleeve B to which are pivoted either one or two compass legs C with their points bent inwards so that, when closed, they shall fit close to the pencil point, and lie buried in slots E cut in the point protector F. The legs are of thin metal stamped to a U form in section and are pivoted between pairs of ears H. On the pivot pin inside the leg is a small disc, and the ends of the pin are riveted to dished spring washers I pressing against the ears to give the requisite stiffness of movement.



4891. **Lake, H. H.**, [Schneider, K.].  
April 1.



*Range-finders.*—

The instrument is shown in plan in Fig. 1, and in side elevation in Fig. 2. It is carried on a frame A, attached by a ball-and-socket joint to a tripod stand. The frame A carries two arms B, C, of which B is attached rigidly to the frame, while C is pivoted to it at D and can move over the concentric arc E. The arm B carries sights, as also does the arm C. The arm C is first placed in line with the object, and then the arm B is, by means of the micrometer screw F, also placed on the object, the distance being read off upon the arc E. H is a compass, and K, K are spirit levels for use when setting the instrument.

4624. **Stanley, W. F.**, and **Sarjeant, W. L.** April 2.

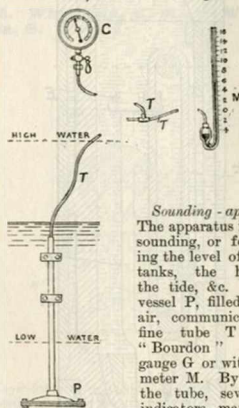
*Actinometers.*—The sensitive paper, which is prepared from a bromide salt (instead of the usual chlorine salt) is rolled round a pin in a small circular metal case and brought out through a slot in the case and through a box with a glass top fitted on the edge. The glass is partly covered with tinted paper, by which the exposure is estimated. The actinometer may be suspended from the watch chain.

4739. **Weldon, F.** April 5. *Drawings to Specification.*

*Range-finders*, measuring lines or tapes for use with. The object of the invention is to so graduate measures of length on reduced scales that they may be used without calculations with range-finding instruments. For example, with the range-finding instrument described in Specification No. 2583, A.D. 1883, a triangle is obtained, the known base of which is one-fiftieth of the distance to be

obtained. The tape measure used to measure this base is graduated with a scale of one yard to fifty. In case this base is very long a further observation is made giving a line to be measured  $\frac{1}{100}$  of the distance to be obtained, and the other side of the tape measure is graduated with the necessary scale.

4888. **Wolski, F. R. de.** April 7.



*Sounding-apparatus.*—

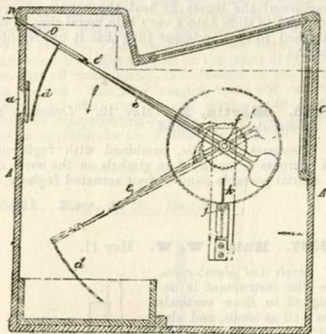
The apparatus is used for sounding, or for indicating the level of water in tanks, the height of the tide, &c. A flexible vessel filled with dry air, communicates by a fine tube T with a "Bourdon" pressure-gauge G or with a manometer M. By branching the tube, several such indicators may be used simultaneously. P may be fixed at the bottom of a tank &c. or at a

sufficient depth in the sea to be always immersed and uninfluenced by the waves. Apparatus may also be provided for keeping a continuous record and for ringing an alarm when certain specified levels are attained.

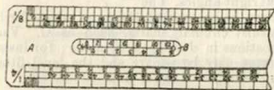
5139. **Cooper, T.** April 13.

*Camera obscura.*—The images in a camera obscura are hidden by a screen which can be removed for a limited time by dropping a coin into a slit in a case containing the screen. The case A is provided with apertures a through which, when an internal shutter d is removed by the insertion of a coin through a slit n, the images can be seen. In the Figure is shown one kind of mechanism for actuating the shutter. A pair of counterweighted levers e, carrying the shutter, are pivoted on studs f to the sides. The ends of these are connected by a piece e' shaped to receive the coin which passes through the slit n along the shoot o. The weight of the coin causes the levers to descend, and so removes the shutter. When the levers reach the position shown in dotted lines the coin falls into the receptacle d. The return motion is

delayed, preferably by a fly *k* attached to a pinion *j* which the lever on its return rotates through the ratchet device shown.

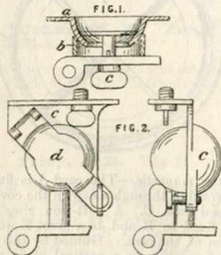


5407. Stanley, W. F. April 19.



*Scales.*—The scale A is provided with a duplicate scale B of some hard material such as metal, ivory, or vulcanite, fixed away from the edge. Upon these small dimensions may be taken by compasses, the working scale thus being kept uninjured.

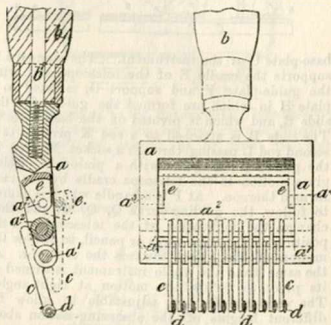
5636. Pumphrey, C. April 24.



*Tripod stands for photographic cameras.* Relates to a ball-and-socket joint for attaching the legs to

the camera. Fig. 1 shows one arrangement: *a* is a flange on a hemisphere for attaching it to the camera, and *b* a ring or short tube fixed to the leg, which may be pressed against its surface by a screw pin *c*. In the arrangement shown in Fig. 2, a sphere is grasped between two partial sockets *c* and *d* on opposite sides of it. Either the ball or the socket may be fixed to the camera.

5794. Massey-Mainwaring, W. F. B. April 28.



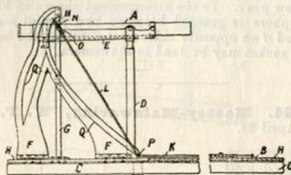
*Ruling-pens.*—Relates to apparatus for producing parallel lines of perforations or of pencil, ink, &c., applicable for copying or printing music and other purposes. For producing stencils in waxed paper as is described in Specification No. 2450, A.D. 1881, perforating-discs *d* are mounted on fingers *c* pivoted at *a*<sup>1</sup> in a frame *a*. For producing parallel lines on any surface, discs of lead or other material, such as are described in Specification No. 8629, A.D. 1885, are substituted for the perforating-discs *d*; or a number of writing or ruling pens may be used as described in Specification No. 8628, A.D. 1885. The rear ends of the fingers are extended and press upon a rubber or flexible roller *a*<sup>2</sup>, so as to allow the discs to readily adjust themselves to the surface when in use. Any of the fingers may be turned up out of use and secured by a shield *e* pivoted at *a*<sup>3</sup>, as shown by dotted lines. The frame *a* is swivelled upon a handle *b* by the pin *b*<sup>1</sup>. When ink or colour lines are to be drawn the colour is supplied from reservoirs in the fingers *c* or by a roller resting on the discs.

5996. Redfern, G. F., [Stang, H. G. J.]. May 3.

*Maps and charts, setting out courses and bearings on.*—Relates to an instrument for tracing on a map the course of a moving object, such as a vessel at sea under observation from an elevated

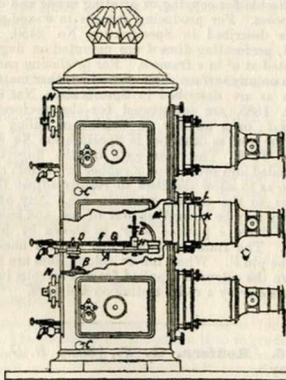


point, applicable also for laying down coast lines. The object, or the coast line, is followed by the telescope A, which is connected to a slide B, with cross-wires or a pencil, moving over a map on the



base-plate C of the instrument. The standard D supports the cradle E of the telescope and, with the guide-plate F and support G, is fixed to a plate H in which are formed the guides for the slide B, and which is pivoted on the base-plate C. The slide B is attached to a rod K pivoted to a second rod L passing through a socket M fixed to the pinion N; N gears with a pinion O, which gives motion to the telescope cradle by the rack formed thereon. At P is a handle which is caused to follow the guiding-curve Q, Q, Q, and thus changes the inclination of the telescope and the position of the cross-wires or pencil, to follow the motion of the object towards the observer. At the same time the whole instrument is turned on its pivot to follow the motion at right-angles. The various parts are adjustable to allow for different heights of the observing-station above the sea-level.

6154. Noakes, D. W. May 6.



Magic lanterns. — Special arrangements for adjusting the lime-light apparatus and specially-constructed dissolving-cocks are described. The

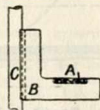
Figure shows a triple dissolving lantern. To regulate the size of the views, masks K with variously-shaped apertures are employed; these slide easily into the hood L. To obviate the fracture of the lenses by heat the condensers are arranged to slide into a very thin metal ring M so attached to the condenser tube that it can readily expand.

6275. Martin, E. May 10. Drawings to Specification. Amended.

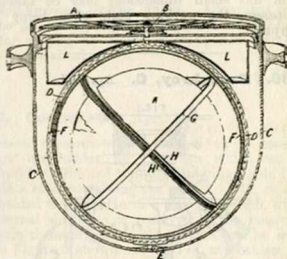
Compasses, magnetic, combined with the foghorn. A compass is mounted in gimbals on the cover of a special portable hand or foot actuated foghorn.

6337. Hulse, W. W. May 11.

Levels and plumb rules. —The instrument is designed to show verticals as well as levels, and also to exactly indicate slight deviations. It consists of a graduated spirit tube A fitted into an L-shaped frame B, the two arms being at right-angles. The arms may be grooved on the outer edges for holding against circular shafts, such as C. Various modifications in detail can be made; for instance, the frame may be square and the level fitted to either the upper or lower side.



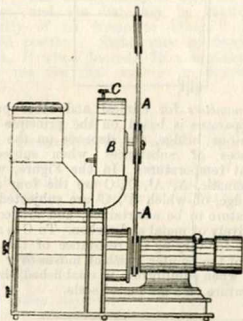
6353. Wilke, C. F. F. May 11.



Compasses, magnetic. —The card A is fixed to its pivot B working through a cap on the cover of the bowl-shaped case C. A soft-iron ring D of U section is fixed to B and to a pivot E working on the bottom of the case. Guided by this ring, but capable of rotation in a vertical plane within it, is a ring magnet F formed of two half-rings, of magnetized steel and soft iron respectively, fixed

together. A brass elliptic ring G is fixed within F, and, at right-angles, two copper annular discs H, H' soldered to a copper sphere K. Between the discs H, H' and round the ring magnet is closely wound copper wire, the ends of which are soldered together. To the pivot B is fixed a cylindrical float L, and the whole bowl is filled with rape oil. The weights of the parts are so arranged that they are just on the point of floating, so that all works easily, and pressure on the pivots is avoided. The ring magnet turns the card, by means of the ring D, and carries with it the various compensating-devices, while the oil acts as an insulator for the conducting-wire.

6431. **Key, J. T.** May 13.



*Magic-lanterns.*—The views are mounted in apertures round the periphery of a circular disc A which is rotated by clockwork B, either continuously, or on pressing the knob C.

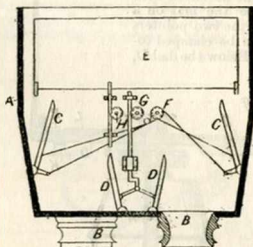
6642. **Utting, M. W.** May 18. *Drawings to Specification.*

*Magic-lanterns.*—The pictures &c. are carried by a disc which is revolved intermittently by clockwork &c.

6848. **Ferry, J. B.** May 21.

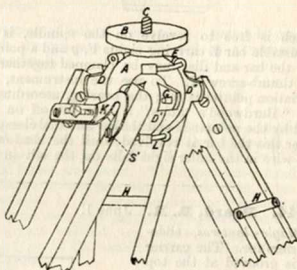
*Optical instruments* for circumscribing vision in viewing pictures &c. The case A of the instrument is similar to that of a stereoscope but with no lenses in the eye-holes B, B and open at the bottom. Within the case and pivoted thereto are two pairs of flaps C, C D, D, for limiting the horizontal vision, and another pair E, E for limiting the

vertical vision. These flaps are worked from thumb-nuts F, G, H by means of cords, sliding bars, &c., so that the corresponding flaps are always



equally inclined to the optical axis. Movable eye-holes, not shown in the Figure, are also provided, which may be moved to or from the fixed holes B, B.

6936. **Brown, J.** May 24.

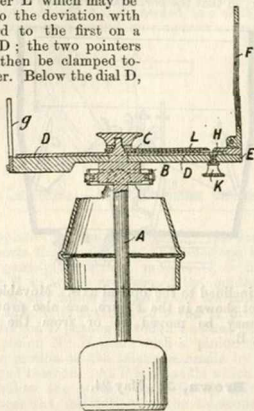


*Tripod stands.*—Relates to means for attaching a camera to the top of a stand. The ball A is connected to the baseboard of the camera by the projecting piece B and screw C. The ball A is supported by three cup pieces D, D', D'', to which are fitted pegs G for the purpose of attaching the tripod legs. E is a spring for pressing the pieces against the ball. The divided ends of each leg are held on the pins by links H. One of these links K is adjustable and has an inclined hook fitting on the pin S', by pressing down K on which the whole apparatus is tightened. Other contrivances for tightening the cup pieces may be used.

7077. **Gillie, J. W.** May 26.

*Compasses, magnetic,* correcting errors of. Relates to course correctors for ships' compasses. A weighted spindle A is mounted in a small gimbal

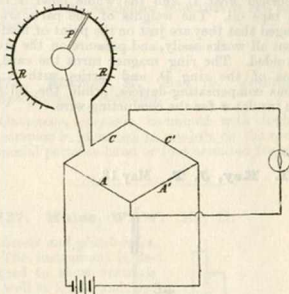
ring B, and carries a fixed pointer C to show "ship's head." Above this is a second movable pointer L which may be set to the deviation with regard to the first on a dial D; the two pointers may then be clamped together. Below the dial D,



which is free to revolve on the spindle, is an adjustable bar E carrying sights F, g and a pointer H; the bar and dial may be clamped together by the thumb-screw K. To use the instrument, the deviation pointer is set; the bearing, according to the "Burdwood's tables," is then set off on the dial by the pointer H and the bar and dial clamped; after this the bar is revolved until the shadow of the wire in the taller sight falls on the slit in the

shorter. The magnetic course can then at once be read off on the dial. The apparatus may be somewhat modified.

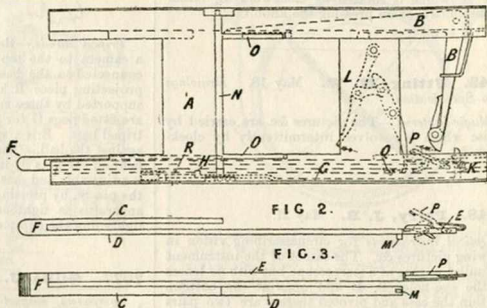
7289. **Immisch, M.** May 31.



*Thermometers for clinical and other purposes.* The apparatus is based on the principle of the Wheatstone bridge, and depends on the varying resistances of substances when subjected to different temperatures. In the Figure, which is diagrammatic, A, A', C, C are the four arms of the bridge, of which A', C' are subjected to the temperature to be ascertained, and are composed respectively of metal and carbon. To C is attached a device for varying the resistance of this arm by means of the pointer P which moves over the ring R and, when equilibrium is established, shows the temperature on a graduated scale.

7344. **Beard, R. R.** June 1.

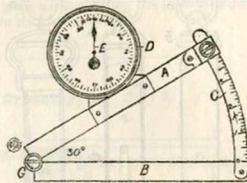
*Magic-lanterns, slide-carriers for.* The carrier A is grooved at the top with a wide channel which is divided into two by the lever B; at the bottom is a double groove (the dividing-ridge being cut away at the end), and channels for the three fingers C, D, E of a runner F shown in elevation and plan in Figs. 2 and 3. At the bottom of the carrier is an independent sliding rod G with projections H, K at either end. The slide is placed in the front upper and lower grooves of the carrier and pushed forward by the finger C until the finger D strikes the centering-lever L



and grips it in position. On drawing back the runner the projection M on D engages with the projection H and draws back the rod G so as to bring the projection K against the lever B and lift the division of the upper channel; about the same time the projection H strikes a rod L connected with a crank on a spindle N having arms O, O; these being slightly rotated throw the slide to the back grooves of the carrier. On pushing forward the next slide the spring finger P on E is raised by the stop Q, and when the runner is again pulled back draws out the first slide, leaving the second in place. The spring finger is lowered again by the stop R.

**7664. Blakey, J.** June 8.

*Levels; clinometers.*—Upon one of two pivoted arms A, B, which may be set at any angle by means of a graduated arc C, is fixed a frame D carrying a dial on each side. The front dial is provided with a weighted pointer E as shown; to the other is pivoted at the edge a weighted pendant which actuates a separately-pivoted pointer; this arrangement is used for delicate readings, and the dial may be rotated independently of its frame to bring it into the required position. Sights may be fitted to the arms A, B when desired. In a modification for pocket use the dial box is in one with the pivot G.

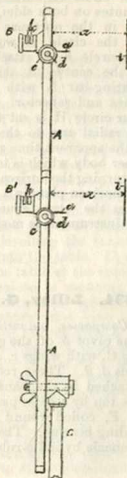


**7752. Schmidt, W.** June 9. *Drawings to Specification.*

*Thermometers.*—In the steam pipe of a specially-constructed steam generator a vessel is inserted and filled with some liquid, such as water, of which the pressure is indicated by a manometer. By these means the temperature of the passing steam is ascertained.

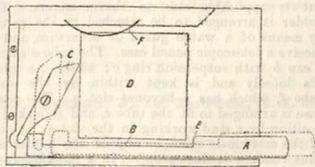
**7820. Wood, J. J.** June 11.

*Sight-testing apparatus.*—Relates to an apparatus for detecting defective vision in each eye separately, by means of which also the lenses intended for the correction thereof may be tried. The form of instrument employed for long-distance vision is shown. It consists of an upright A mounted adjustably upon a standard C and carrying two pairs of eye-pieces B and B', the upper pair for tall and the lower for short persons. Each eye-piece is provided with a shutter  $a$ , and the arrangement is such that by turning the thumb-screw  $c$  one eye-piece is closed and the other is simultaneously opened. This is effected by mounting upon the shaft  $d$  two barrels, one of which carries one shutter, while



the other is toothed and gears with a segmental rack to which the second shutter is attached. The eye-pieces are provided with slots  $k$  into which the trial lenses are placed. The apparatus is fixed at a distance  $x$ , not less than fifteen feet, from the test types  $i$ . For reading distance the instrument contains only one pair of eye-pieces, the axes of which are inclined, and carries a support for the test type at the usual reading distance from the eye-pieces.

**8076. Hughes, W. C.** June 17.



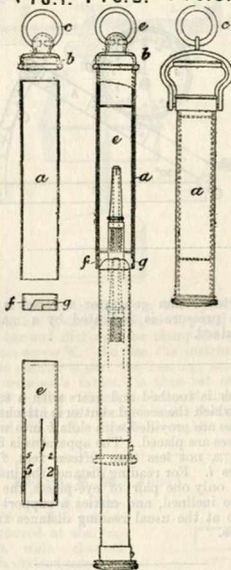
*Magic lanterns, slide-carriers for.* At the bottom of the carrier is a runner A working in a slot and partly cut away at B. To the frame is pivoted a cam C, against which the runner strikes.



The picture D is thus gripped centrally between the cam and the edge E on the runner. A spring F is used to steady the slides.

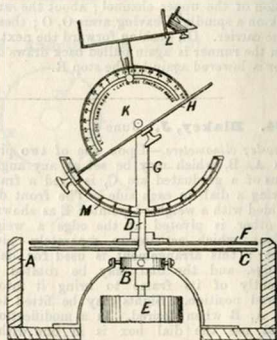
8189. Dickman, G., [Mabie, Todd, & Bard].  
June 21.

FIG. 1. FIG. 2. FIG. 3.



*Thermometers, cases for.* The invention is described with reference to pencil-case holders but is applicable also to thermometers. The holder is arranged to be attached to the person by means of a watch guard or otherwise, and to receive a telescopic pencil case. The tube *a* carries a cap *b* with suspension ring *c*; within *a* a tube *e* fits loosely and is kept within by the short tube *f*, which has a bayonet slot *g*. The pencil case is arranged to fit the tube *e*, and is locked in position by a stud working in the slot *g*; the end of the case closes the open end of the holder and thus renders it dust-proof. In a modified form, the suspension ring is placed at the open end as shown in Fig. 3.

8230. Harris, R. E. June 22.



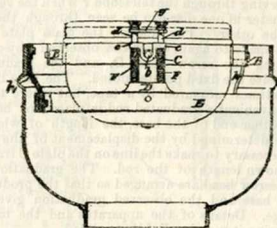
*Compasses, magnetic, determining errors of.* Within an octagonal box A is mounted, on a collar B swinging in gimbals, a base-plate C. Through the collar passes the screwed spindle D carrying an adjustable balancing weight E, and upon the base-plate is the horizon plate F revolving on the spindle and graduated with compass points and degrees. In a fork support G is pivoted the hour circle H, suitably graduated in hours and minutes on both sides, but in opposite senses, for use in the northern and southern hemispheres. On the circle H works a pointer to which the semicircle K is attached; a radial arm is pivoted to the centre of this semicircle and carries a sighting-bar L with special triangular sighting-vanes and reflector. To use the instrument, the hour circle H is set to the latitude on the arc M, the radial arm to the declination, and the pointer to the apparent time on the hour circle; the sun, or other body which is to be observed, is then sighted by turning the horizon plate round. The reading on the horizon plate in a line with the ship's head now gives the "true course." Where tables are used the instrument is modified and simplified.

8334. Lilley, G. C. June 24.

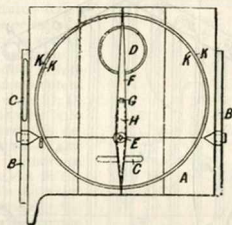
*Compasses, magnetic, suspending or supporting.* The pivot *b* of the gimbal ring B rests in a bearing C, with wings *c, c*, which slide on the guide-rods *d, d*. These rods are fixed on the piece D, attached to the band-ring E, and are connected at the top by a cross-piece *g*, held by screws. Springs F, F, coiled round the rods *d, d*, support the sliding bearing. The band ring E is fixed to the binnacle by india-rubber strips *h, h*.

(For Drawing see next page.)

8334.



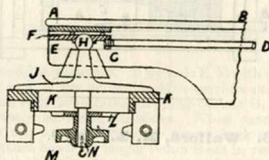
8748. Farquharson, W. July 3.



*Surveying - instruments.*— Two specially-constructed instruments, the “cross-staff” and the “distancer,” are employed, a plan of the latter being shown: each instrument is mounted on a tripod in the usual manner of levels. The cross-staff is adapted to take sights accurately at right-angles, the distant object being first sighted and a line then laid off at right-angles, and of any desired length. At the end of this line is placed the “distancer,” which consists of a truly-flat square table A mounted on trunnions in a frame B, B, the upper edges of which are true planes. Levels C, C are provided for levelling the various parts, and a compass D is let into the table. Upon a spindle E passing through the table at the centre of the line joining the trunnions is mounted a “sighting” hand F, and upon a central spindle G is fixed an index-finger H which runs over the graduated circles K, K, K. The two spindles E, G are geared together so that the finger H magnifies the motion of the hand F, which can be set in any direction required by milled heads on a wormed spindle beneath the table. The table may be set at any required inclination to the frame edges B, B by means of a toothed segment gearing with a worm on a spindle ending in a milled head. The “distancer” is adjusted by turning the sighting-hand to sight along the line to the “cross-staff,”

and so bringing the line joining the trunnions to coincide with it. The sighting-hand is then turned to the distant object, and the circles K, K are so graduated that the finger H points to the multiple the distance is of the base line. The height of the distant object above the plane of observation is determined by proportion when the distance is known. For this purpose the inside edges of vertical bars on the frame B, B have scales of inches marked thereon at a specified distance (say 4 inches) from the pivoting axis of the table. By observing the division cut by the inclined table when sighting the distant object the proportion may be obtained.

8866. Crossley, E. July 7.

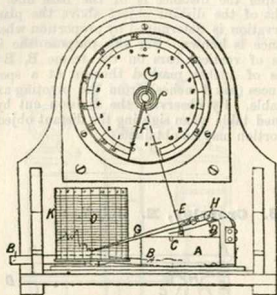


*Tripod stands for measuring-rods.* Designed for measuring distances over uneven ground. A metal rod C, D is provided at each end with caps F which fit spherical heads H mounted on tripod stands. The tripod top is fitted with a ring K, and the spherical head H is attached to a plate J resting upon the ring. The plate K may be clamped in any position by means of a three-rayed star L and milled nut M on a stem N. A plummet is hung from the hook at the end of the stem. In use, one tripod is placed with its plumb-line accurately over the starting point, and a second tripod at a distance measured by a chain so as to be roughly equal to the length of the rod. The plate J of the second tripod is then adjusted till the caps of the rod fit both spheres. To compare the rod with a standard it is replaced by a tube with one end telescopic, supported in a case resting upon the spheres. The tube is extended till both ends touch the spheres, and its length is measured by a scale and vernier.

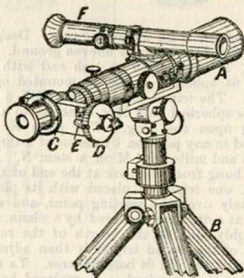
8920. Gordon, J., and Lowdon, E. J. B. July 8.

*Anemometers.*— A pair of bellows A has a single inlet pipe B open at its other end, and the upper plate C, which is free to move up and down, is controlled by a spring D; the upper plate is also connected to a cord E passing round the spindle of the index-finger F, and to a lever G pivoted at H and carrying a pencil at its opposite end to

trace a record on the drum K rotated by clock-work. Various slight modifications in the arrangement of the working parts may be introduced.



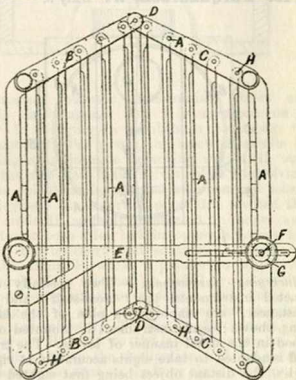
8973. Walford, N. L. July 9.



*Range-finders.*—A telescope A is mounted on a tripod stand B, and the object of which the distance is to be determined is covered by a vertical line traced on a glass plate C, which can be moved in front of the eye-piece by a screw with graduated head D and fixed pointer E. A second telescope F is fixed above the first and at right-angles to it for purposes of adjustment. After making the observation the telescopes are removed to a second tripod at the opposite end of a base line, and a sighting-device placed on the first tripod; this consists preferably of two discs placed at either end of a rod, which is set accurately in line with the original position of the telescope F. One of the discs is slotted vertically and centrally, and the other has a clearly-marked vertical diameter; the telescope A can thus be

adjusted exactly parallel to its former position by observing through the telescope F when the vertical diameter in one disc can be seen through the slot in the other. The line on the glass plate C is then made to again cover the observed object, by turning the screw head D, and the graduation opposite the fixed pointer noted. The base line is sometimes measured by a tape, but where this is inconvenient a graduated rod is placed or held at the other end of the base, the length of which is then determined by the displacement of the head D necessary to make the line on the plate C traverse a known length of the rod. The graduations on the screw head are arranged so that the product of the base and the observed graduation gives the range. Details of the apparatus and the method of using it may be slightly modified.

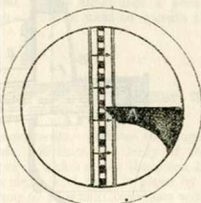
8984. Claud-Mantle, J. G. July 9.



*Parallel rulers; scales.*—Relates to a "gridiron ruler" and scale for laying out ordinates and obtaining results from indicator and other diagrams. The ruler is formed of parallel bars A jointed to two pairs of parallel links B, C hinged together at D. A cross-bar E is fastened to one of the two extreme bars, and takes over a screw F on the other so that, by a milled nut G, they may be held at different distances apart to suit diagrams of various lengths. To alter the relative distances between the intermediate bars their joint pins H are put into other holes of the links B, C, or they may slide in slots. The sum of the ordinates is marked off on paper and read by graduations drawn to a scale which is that of the diagram multiplied by the number of ordinates, thus saving division to find the mean pressure.

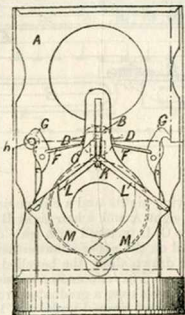
## 9244. Yeates, S. M. July 16.

*Levels; telescopes.*  
 —The bubble case and ends of a "Gravatt's level" are made all in one piece, as also are the telescope tube, stage, and centre. The cross-hairs are cemented between two pieces of glass or the plane surfaces of two lenses. Instead of the cross-hairs a steel edge A may be used.



## 9383. Hughes, W. C. July 20.

*Magic-lanterns.*  
 The picture-frame A rotates or reciprocates on a spindle carrying at its end a slotted disc B into which enters a detent C with wings D, D. When the view is to be changed this detent is depressed, and is thus withdrawn from the slot in the disc, while the wings strike against the arms F, F on the spring catches G, G, freeing the pin H and allowing the frame to be rotated. The detent also strikes one end of the lever K, the other being connected by toggles L, L with a pair of shutters M, M for shutting off the light during the change.



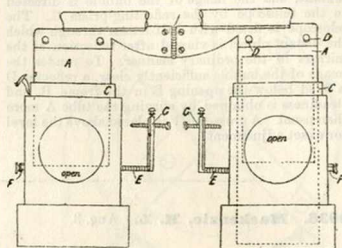
## 9385. Ward, P. July 20.

*Thermometers.* — Consists in the use of tetrachloride of carbon, coloured by dissolved iodine, as the expansible liquid.

## 9469. Hughes, W. C. July 21.

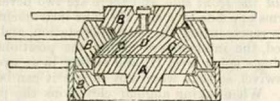
*Magic-lanterns.* — The apparatus is intended to produce the effect of "rolling up" the pictures one after the other. A double sliding shutter made in two parts A, A, hinged together so as to adapt it to the convergence of the lanterns, alternately shuts off the light from the two lanterns, and is so arranged that as one picture is obscured from

below, a corresponding portion of the other picture is exposed. The shutters work in pockets C, C to ensure steadiness, and screws D, D are provided engaging with slots in a back plate to allow of



horizontal adjustment. Two rods E, E with square heads at F, F run across the slide-carriers and have at their ends adjustable stopping-devices G, G for accurately centering the slides. When panoramic views are used, the rods are drawn back so that the square heads no longer retain them in position, and the adjusting-devices may then be turned out of the way.

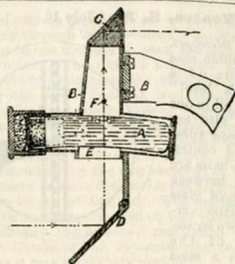
## 9798. Defries, H. July 29.



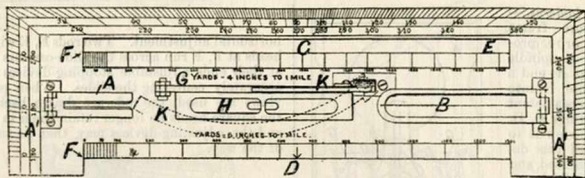
*Lenses.* — A white or coloured plate of glass is incorporated with the flint glass forming the body of the lens, which may be white or similarly coloured. The ordinary grinding and polishing are dispensed with. In case a coloured plate is incorporated with a white body, the whole is rendered coloured by this process, the colour being uniform at whatever angle the lens is viewed. The plate is first cut to the required size and placed in a receiver, where it is heated to a plastic condition. It is then dropped upon the plug A in a mould B made in three sections and the fluid metal intended to form the body of the lens poured upon it; on pressing with a plunger the plate C and body D become incorporated. The method of manufacture may be varied, and in some cases the metal dropped in may form a flange around the plate.

9844. Evelyn, G. P. July 30.

*Sextants; horizons, artificial.*—A short spirit level A is fitted in a frame B attached to the sextant, and the image of the bubble is directed to the telescope by the reflecting-prism C. The telescope is fitted with half-lenses through which the distant object is viewed after reflection at the mirrors in the ordinary manner. To render the image of the bubble sufficiently clear, a reflector D is fixed below the opening E in the frame B, and steadiness is obtained by curving the tube A more than usual. A cross-line F is placed above the level for exact adjustment.



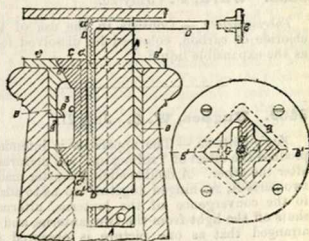
9936. Mackenzie, H. L. Aug. 3.



*Surveying-instruments.*—Relates to a protractor carrying sights and a clinometer for use in preparing sketch maps for military and other purposes. A slit sight A and a hair sight B are pivoted at opposite ends of the front side, and there are two bevelled edges C, D, marked with scale of distances. The edge C forms one side of a slot E. The instrument is turned on the paper about either of the corners F, over points representing the observing-station, and lines are drawn along the bevelled edges in the directions sighted, the intersections giving the positions of places. The clinometer consists of a pivoted arm G carrying a spirit level H, and ending in an eye which travels over a graduated arc K. The arc is hinged to a swivel, so that when not in use it can be put down and turned under the level as shown in dotted lines. When taking angular elevations the protractor is inverted, and its back used for sighting, while the arm G is held horizontal. The back of the protractor is marked with a diagonal scale of inches, links, and chains, and also with a scale of horizontal equivalents for angles subtended by a length of ten feet.

9970. Marsden, S. Aug. 4.

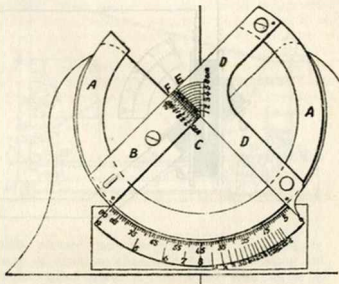
*Stands for "mathematical and other instruments."* Relates to adjustments for music stools, stands, &c., and is described as applied to a music stool. The stem A slides in a socket B fixed by a flange B' to the body of the stool. Sliding on inclined surfaces b, b in the socket is a wedge C which may have serrations c', c' engaging serrations a', a' in the stem, or both may be plain, in which case the stem may be tapered. By pushing the end E of a rod D, passing down a groove in and fixed to A, the wedge C may be slightly raised, allowing the top of the stool &c. to be adjusted in height. The slot B' and the projection B' limits the motion of the wedge. A pad or spring fitted



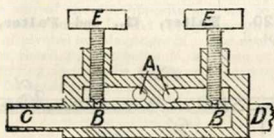
to the wedge prevents clicking when the stem slides. Rollers may be fitted to the wedge at *c, c,* or the wedge may be hinged by two links like a parallel ruler. The Provisional Specification describes an arrangement in which a lever is used to operate the wedge *C*.

**10,068. Laidler, W. H., and Laidler, T.**  
 Aug. 6.

*Angle-measuring instruments.*—Relates to gauges for measuring sectors. Within the body of the instrument is a groove in which slides the piece *A*, forming an arc of a circle, and kept in place by a fixed bar *B*, one corner *C* of which coincides with the centre of the arc. To *A* is attached the right-angled piece *D* carrying a pointer at one of its ends, and arranged so that the corresponding edge passes always through the centre of the arc. By moving the arc the jaws *E, F* open and can be made to grip the circular sector to be gauged, the angle being then read off on the scale shown, and also the number of these sectors contained in a complete circle. Scales of diameters and circumferences are marked on the edges of the jaws.



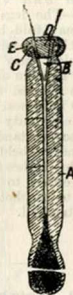
**10,411. Barber, F., [Prowse, G. R.]**  
 Aug. 14.



*Magic-lanterns, dissolving-apparatus for.* Consists in an arrangement for regulating the pressure of the gases before they reach the dissolving-cock. The hydrogen is conveyed to the burners by two tubes *A* supplied through holes *B* in the main *C*. The oxygen is similarly conveyed from a main *D* by two tubes lead parallel to the tubes *A*. The four tubes lead through a plug cock having two pairs of ways at right-angles. The pressure is regulated by conical-ended screws *E* over the holes *B*. In order to keep both burners alight a small uninterrupted stream passes from one hydrogen tube to the other through a passage controlled by a fifth screw.

**10,816. White, J. E.** Aug. 24.

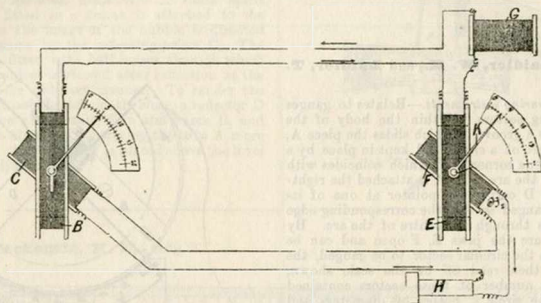
*Thermometers.*—In an alarm thermometer, the terminals of the alarm are both placed at the top of the bore to prevent the corrosion that occurs in the one usually inserted in the mercury of the bulb. In the arrangement shown the bore of the thermometer *A* is spread out at the top into a conical or other chamber *B*, the outside of which is formed into a lip *C*. The top of this chamber is plugged by a cork or other material through which the terminals *D, D* of an electric alarm are led, and the whole is secured by a cap of cement *E*. When the mercury rises into the chamber *B* the circuit is completed for the alarm.



**11,041. Moennich, P.** Aug. 30.

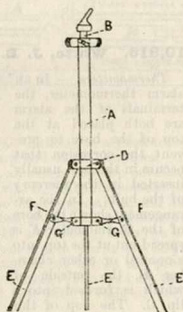
*Thermometers; barometers; hygrometers; anemometers.*—Relates to means for observing from, or transmitting to, a distance indications or measurements taken by these instruments. At the station where the instrument is located there is a pair of coils *B, C*, the latter being turned within the former (which is fixed) by the movements of the instrument. At the reading station is an exactly-similar pair of coils *E, F*. The fixed coils *B* and *E* are in the secondary circuit of an induction coil *G*. The coils *C* and *F* are put in circuit with a telephone *H*, so that the currents induced in them by the coils *B* and *E*

flow in opposite directions. When the coil F is turned by hand till no sound is heard in the telephone it is in the same relative position to E as C is to B, and the pointer gives the reading on a graduated arc.

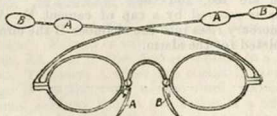


**11,175. Riley, W. J.** Sept. 2.

*Tripod and like stands.*—The legs E, which may fold back along the standard, and which may be three or more in number, are jointed to a collar D fixed near the lower extremity of the telescopic standard A, B, and are held extended by catches F, G hinged either to the legs or to the bottom of the standard.



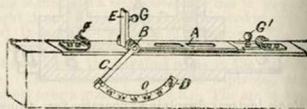
**11,179. Leighton, J. T.** Sept. 2.



*Spectacles.*—Disks A, B of dissimilar metals, which in contact with the skin produce weak electric currents, are attached to the wings and

bridge. The bridge is wrapped with insulated wire, and becomes magnetized by the current from its discs.

**11,220. Falter, G., and Falter, J.** Sept. 3.

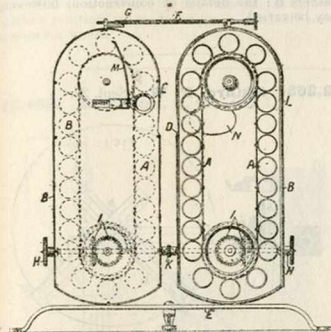


*Levels; clinometers.*—Relates to an improved levelling-instrument and clinometer. The case A carrying the tube is pivoted at B, and has a finger C for indicating inclinations on a graduated arc D. By lodging the end of an arm E under a spring F the tube is held at right-angles to the block for plumbing. The level is set before use by screws G.

**11,631. Courlander, L.** Sept. 13.

*Sight-testing apparatus.*—Lenses A are arranged in order of focal length on endless bands within two cases B. They are brought in succession to the sight-apertures C, through which is viewed the test type carried by a sliding holder on a graduated bar behind. The cases are recessed slightly at D to accommodate the nose and rock a little on their stand E in order that the lenses may be collimated with the pupils by a screw F. The distance between the pupils is shown by

graduations G. The endless bands are advanced by turning a spindle H, the motion of which is transmitted to the lower pulleys of the band by mitre-wheels I. The spindle is divided at the



centre, the two parts being connected by a loose joint K to allow play of the cases and independent use of each band. The power of any lens is marked on the rim of the one opposite, and can be read off at a side aperture L. At the eye apertures are a pair of pivoted temple gauges M. The apertures may be closed by scutcheons N, and two of the lens-carrying rings may be used to receive removable lenses for testing astigmatism.

**11,802. Harling, W. H.** Sept. 16.

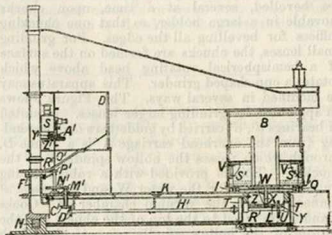


*Mathematical drawing-instruments.*—Relates to socket-joints for securing pencil or pen legs to compasses, ruling-pens in their handles, &c. The Figure shows the application to a bow pen. A taper shank A passes into a taper or cylindrical socket B, and is made fast by a slight pressure or twist.

**12,125. Bromley, J.** Sept. 24.

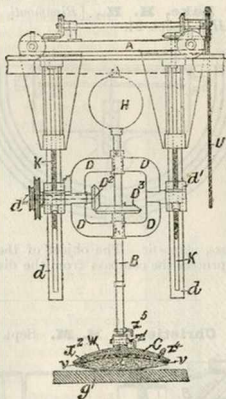
*Magic-lantern apparatus.*—In connection with roundabouts of special construction, panoramic effects are exhibited at the centre of the apparatus. To revolve the panoramic screen D, the axle R is continued by the shaft H', and by means

of gearing D', C', M', N', and P', the wheel loose on a bearing F', is rotated, and thereby the screen D', which is attached thereto by the rod O'. On the screen the picture is thrown by a lantern S,



which picture may be varied, if required, by means of friction-wheels Z' and Y' rotating the circular glass plate A' on which the series of pictures is painted.

**12,148. Pearce, E. H., and Besson, H.**  
Sept. 24.



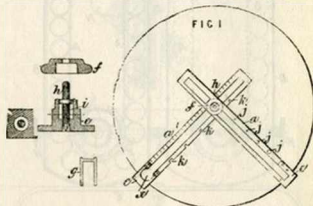
*Lenses for spectacles, telescopes, &c.* Relates to surfacing or polishing apparatus, being improvements on apparatus described in Specifications No. 7461, A.D. 1884, and No. 8310, A.D. 1885. In the use of chucks, the action of which depends upon the presence of a vacuum behind the article, it is found that delicate articles become distorted. To obviate this a backing of water is introduced



between the chuck and the article. For bevelling &c. large plates a series of such chucks may be inserted in holes in the holder, which is faced with rubber strips, is adjustable as to inclination, and receives a reciprocating motion. Smaller plates are bevelled, several at a time, upon chucks movable in a large holder, so that one chucking suffices for bevelling all the edges. For grinding small lenses, the chucks are formed on the surface of a hemispherical rotating head above which rotates a cup-shaped grinder. This apparatus may be modified in several ways. The Figure shows an apparatus for grinding larger lenses. Mounted in bearings  $d^1, d^2$  carried by guide-bars  $d, d$  descending from the overhead carriage A is a frame D, through which passes the hollow spindle B of the chuck C. This is provided with a rubber facing ring  $v$ , a cock  $z^1$  for the water W, and a passage  $z^2$  connecting with the vacuum chamber H. Cocks  $z^1$  and  $z^2$  are fitted to the top of the chuck, and the bottom of the hollow spindle respectively, which are connected by a screw coupling. The chucks may therefore be changed at will. It is rotated by the pulleys  $d^{11}$  and bevel gear  $D^1, D^2$ , and is swung to and fro by a rope. The height of the bearings above the grinder  $g$ , and hence the radius of curvature of the lens, is adjusted by the screws K, K actuated by the rope U. In a modified form the hollow spindle is mounted on a frame travelling upon curved guides.

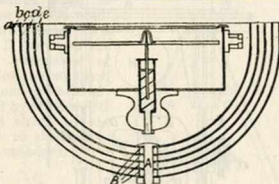
influence of adjacent iron; for this purpose the box is gimbaled in the midst of one or more plates or layers of soft iron, steel, &c. In the Figure, the plates  $a, b, c, d, e$  take the form of hemispherical cups held together by a bolt A and distancing-washers B; the details of construction, however, may be varied.

12,265. Munro, F. W. Sept. 27.



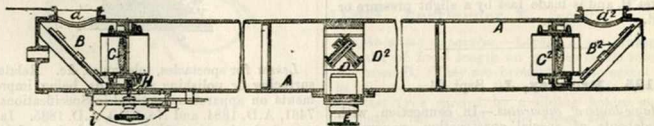
*Squares.*—Relates to an appliance for marking and setting-out work, which may also be used as a T-square or set-square. The appliance consists of two slotted arms  $a, a'$  which may be provided with wire and plate gauges  $j, k$ . These arms have a square bodied piece  $e$  passing through them by which they can be clamped either parallel or at right-angles to one another by means of the nut  $f$ , the piece  $e$  being capable of rotation in the end  $z$  of one of the slotted arms. A scriber or pin  $h$ , held in position by the spring  $i$ , passes through the centre of the piece  $e$  and is used for marking the work. Wings  $g$ , mounted on a central pin or attached by a rule joint &c., are fixed at one of the ends of each bar, the wings being kept parallel to or at right-angles to the bars by flat springs  $c$ . For centering, as shown in Fig. 1, the wing pieces are turned at right-angles to the arms, which are fixed so that the scriber will mark or describe a small circle round the centre of the object as the wings are moved along the periphery. The appliance may be used also as a T or a set-square.

12,176. Lake, H. H., [Ripamonti, L., and Driest, H.]. Sept. 24.



*Compasses, magnetic.*—The object of the invention is to protect the compass from the disturbing

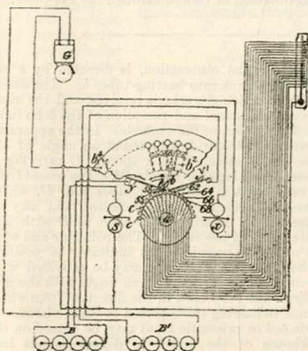
12,404. Christie, W. H. M. Sept. 30.



*Telemeters.*—At both ends of a tube A are fixed reflectors B, B' which receive pencils of light from the object, the distance of which is to be determined through the apertures  $a, a'$ . The reflectors are

inclined at  $45^\circ$  to the axis of the tube, and so direct the image of the object through the object glasses C, C' to the mirrors D, D' also inclined at a similar angle so as to turn the rays of light into the eye-piece E. Each object glass may be made adjustable longitudinally in the tube, but C is also adjustable transversely by means of a micrometer screw H with graduated disc *i*. Two images of the distant object are seen in the eye-piece E, the distance between them being greater the nearer the object. The lens C is moved by the micrometer screw until the images coincide or come into some definite relative position, when the range is read off on the graduated disc *i*. In detail the invention may be somewhat varied.

12,489. Hoffmann, C. G. Oct. 1.

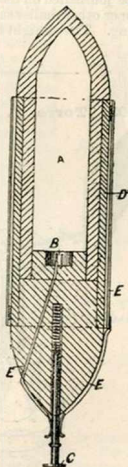


*Thermometers.*—Relates to means for enabling the rise and fall of temperature at any place to be observed at a distant locality. The Figure is a diagrammatic view of a portion of the apparatus. A series of wires are melted into the tube of the thermometer and are in metallic connection with a corresponding series of insulated metal bands round a cylinder *a*, the bands being provided with teeth *c*, *c'* arranged in a half spiral and coming in contact one at a time with contact-plates *y*, *y'* respectively. The cylinder *a* can be rotated in either direction by a spring barrel operating through epicyclic bevel gear, but is normally held stationary by two locking-devices controlled by the electromagnets *s* and *x* connected to the batteries B, B', the first locking-device being released when the circuit of *s* (which is normally closed) is broken, and the other when the circuit of *x* is closed. On the axis of the cylinder is fixed the indicating-hand *b*. The operation is as follows:—Supposing the temperature to be  $58^\circ$ , the circuit is closed for *s* through the mercury column of the thermometer, but broken for *x*. If now the temperature rise to  $60^\circ$  the circuit of *x* is completed, one of the locking-devices released, and the cylinder revolves in the direction of the feathered arrow; the tooth marked 60 thus moves into contact with the plate *y*, the tooth 62 with the plate *y'*, and the current of *x* is again broken; the

hand *b* moves with the axis of the cylinder from 58 to 60 simultaneously. In case the temperature falls, the circuit for *s* is broken, the other locking-device released, and a reverse movement of the cylinder and index-hand takes place. Adjustable contact-pieces may be fixed to the scale plate of the instrument connecting insulated plates *b'* at each desired degree with a plate *b'*, and thence with an alarm bell G. A light spring on the index-hand presses on the plates *b'* and contact is thus made when the hand reaches the degrees at which the adjustable contact-pieces have been fixed. Maxima and minima recording-fingers are also provided, and a means of tracing a permanent record of the movements of mercury.

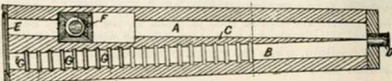
12,848. Joly, J. Oct. 9.

*Sounding-apparatus.*—The sinker is not attached to a line, but is allowed to descend freely, and is arranged to explode on touching the bottom. The depth is then estimated by the length of time elapsing between discharging the sinker and hearing the explosion. The Figure shows one form of the sinker. The part A is filled with some explosive which is ignited by a fine platinum wire B becoming incandescent under the influence of an electric circuit, closed by the pushing in of the button C on the apparatus striking the bottom. The battery is formed of the two elements D, E, the sea-water acting as the liquid. In other forms the concussion explodes a detonating cap, breaks a small vessel of sulphuric acid, or acts otherwise to produce the explosion.

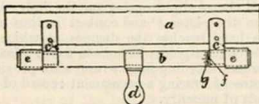


## 12,867. Lovibond, J. W. Oct. 9.

*Colours, testing.*—Relates to testing the intensity of the colour of transparent bodies. The apparatus consists of two tubes A, B separated by a wedge-shaped partition C so that they are slightly inclined to one another. An eye-piece D is fitted to command a view of both tubes, the other ends of which are open, or merely covered by a screen of ground-glass E so as to freely admit light. In one tube is placed a block of the substance to be tested, a definite thickness of course being chosen, generally one inch; in the case of liquids a containing-vessel of white glass is used. Into slots in the other tube a series of standard intensity of colour glasses G, G, G are placed until the required shade is obtained as viewed through the eye-piece.

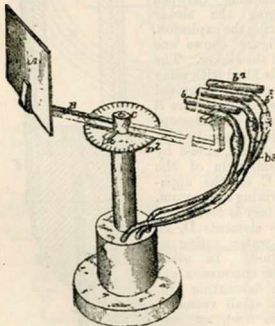


## 12,965. Turner, J. Oct. 12.



*Parallel rulers.*—A straight-edge *a* is connected with a roller *b* by straps *c, c*, on one of which a pointer *f* is formed, moving over a scale *g* on the ruler, to show the distance travelled. A handle *d* may be journalled on the roller, and collars of india-rubber or other similar substance *e, e* used to prevent slipping. The straight edges may be graduated.

## 13,003. Torre, F. D. Oct. 12.

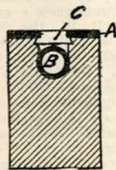


*Sounds, locating.*—Relates to a method of indicating, on a ship, the proximity of icebergs or other obstructions to navigation. The echo of a sound produced on board the ship, or a sound

direct from the obstruction, is directed by a reflector such as A into hearing-tubes *b*. The direction from which the echo is received and the time between the sound and reception of the echo indicate the position of the obstacle. In the apparatus shown the reflector A is placed at an angle of 45° on a bar B attached to a spindle C carrying a pointer *c* working over a scale D. The sound from the reflector A is received in tubes *b* or *b'*, which point to the centre of the reflector, and may be connected by hearing-tubes such as *b''* with any desired part of the vessel. The pointer *c* and tube *b* in which the echo is heard indicate the position of the obstacle. The bar *b* may be provided with a second reflector placed at an angle with the first to direct the echo back in the direction from which it came to hearing-tubes placed beneath a hood. A V-shaped or prismatic front may be placed on the deckhouse of the vessel to deflect sounds into hearing-tubes connected with any suitable portion of the vessel, and other modifications are described. To facilitate the navigation of shallow coasts, inland waters, &c., sound reflectors or combinations of reflectors are placed at suitable points on the shore or banks, and their positions marked on a chart carried by the vessel. The reflectors are so arranged that the echoes produced distinguish the reflectors from each other, and the position of a vessel is ascertained by producing a sound on the vessel and noting the time of reception of the echo and its direction.

## 13,436. Harrington, J. W. Oct. 21.

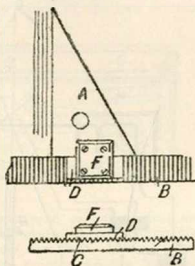
*Levels.*—Spirit levels are fitted with a protecting-plate C for the spirit tube B. This plate slides in grooves beneath the face-plate A.



- 13,581. Clark, A. M., [Briggs, D. W.].  
 Oct. 23.

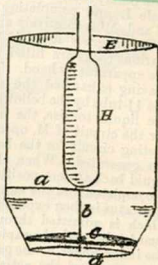
*Mathematical drawing-instruments.*

—Relates to apparatus for ruling section lines, co-ordinate lines, parallel lines, parallel curves, or the like. A set-square A and straight-edge B are used for ruling parallel straight lines, a ridged or toothed surface being formed on the latter and a similar ridged or toothed surface C on a part D rigidly attached to the former by a piece F. By this arrangement the distance between the adjacent lines can be made equal to, or any required multiple of, the distance between consecutive teeth, or by using the hypotenuse of the set-square as ruling-edge (which may have any angle with the sides) this distance may be any required submultiple. For parallel curves, the ruling-edge is made of any desired contour. The same principle can be applied to T-squares and drawing-boards. The details of the invention admit of modification; thus, the teeth may be formed on the edges of the square and straight-edge, and the toothed parts may be fixed adjus-



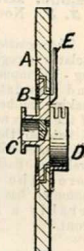
- 14,204. Aldous, H. G. Nov. 4.

*Thermometers.*—Relates specially to thermometers for taking the temperature of brewers' mash, fluids, and grain. The bulb H is placed in a cylindrical receiver E, the whole being attached to a strong handle. At the base of the receiver is a seating d for a clack valve c sliding on the guide-bar a. When inserted in the mash to be tested some of this mass is forced through the valve, which closes on withdrawal. The temperature of the thermometer is thus maintained until it can be observed, while the bulb of the thermometer is protected from injury.



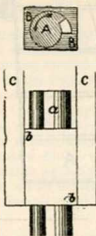
- 14,523. Thompson, W. P., [Culbertson, H.].  
 Nov. 10.

*Sight-testing apparatus.*—Within a fixed stand A is mounted a revolving holder B for a (preferably double) prism C adjusted accurately so that the line of sight passes through the median line. At a definite distance is placed a screen upon which is painted a small circle to act as the object. The size of this circle and its distance are so arranged that to normal eyes the two images produced appear to touch one another, but with long or short sight these images overlap or are separated. Corrective lenses are fitted into the holder D. To determine astigmatism the prism holder is revolved by the handle E, which acts as an index on a scale; to normal sight the images move round one another, touching throughout; but where astigmatism exists they overlap or separate in certain positions.



- 13,620. Dollond, A. W. Oct. 25.

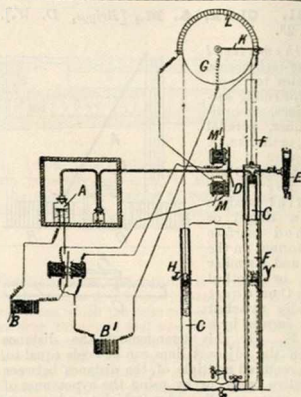
*Tripod stands for cameras &c.* The sliding part a of a leg is of the special section shown at A and slides through a corresponding hole in the block B or b, b connected to the other part c, c of a leg. On partially rotating the part a it is jammed or released.



- 14,548. Dessendier, J. E. Nov. 10.

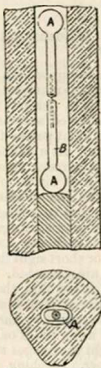
*Photometers and actinometers for use in photography.* The actinic power of the light is estimated by the rapidity with which a mixture of hydrogen and chlorine combine under its influence. For this purpose hydrochloric acid is electrically decomposed in the bottle A when the circuit of the battery B is closed, and the component gases led to the larger leg of a U-tube C when the cock D is opened by the closing of one of the circuits of the battery B'. The U-tube is filled with liquid up to the zero point (line x y) and blackened below this point; the longer leg can be exhausted of air by a bellows E, and a sliding cover F works over this leg and is

with a float H on the liquid in the other leg. The pulley carries an index-hand K moving over a scale L and completing circuits of the magnets M and M' respectively at either extreme position; these magnets M and M' control the cock D. Various cocks are fitted to the U-tube to control the apparatus by hand. The action is as follows:—Having exhausted the air in the longer leg of the U-tube by the bellows, and consequently caused the liquid to rise, the index-hand makes contact for the circuit of M, opening the cock D and completing circuit for the battery B so that the gases are generated. When the gases have driven the liquid back to zero position the cock-closing circuit is completed and the supply circuit broken. The apparatus is then exposed to the light to be tested, which is admitted through a narrow slit in the guard tube, and the rapidity of the movement of the index-finger, as the gases combine and the liquid rises, measures the actinic power. A record may be kept on a drum revolved by clockwork, the pencil being traversed along the drum by a screw rotated by a descending weight and controlled by an electric escapement from the rotating pulley G.



**14,555. Hicks, J. J.** Nov. 10.

*Thermometers.*—Relates to registering-thermometers and consists in making the head A of the index needle B flat, so that it can be used with an oval or flattened bore; the thermometer has preferably a lens front.

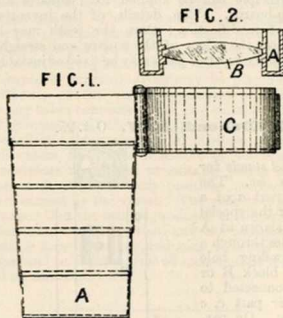


**14,650. Read, W.** Nov. 12.

*Lenses combined with drinking-cups.* The cup is collapsible, as shown in Fig. 1, and consists of a series of conical rings diminishing in size; the lowest A is fitted at the bottom with a lens or "eye glass" B, Fig. 2, for the use of jewellers, mining prospectors, &c. The various rings are formed with special devices for preventing their falling apart; and, when collapsed, they may be folded or placed in a case such as C.

(For Drawings see next column.)

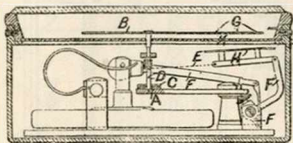
**14,650.**



**14,730. Watkin, H. S. S.** Nov. 13.

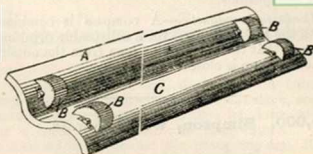
*Barometers.*—Relates to the class of aneroid barometers, where the index-finger is capable of two or more revolutions over an extended scale. (1) The spiral spring A which controls the motion of the index-finger B usually has a tendency to buckle. To prevent this the spring may be enclosed in a shallow box C; or, it may be replaced by a helical spring surrounding the index-finger spindle D; or, the spindle may have a helical groove formed thereon round which passes a cord attached at one end to a helical spring; or, the spiral spring

may be placed round an independent spindle connected with D by reducing-gear, so that it turns through a much smaller angle than the index-finger. (2) To show which of the two or more



concentric scales is to be read, various devices are used, actuated by the chain E connecting the vacuum chamber lever F, F with D. In the Figure, the finger B has three pointers G, one for each scale, and which to use at any time is indicated by that number on the plate H which lies under the aperture K in the dial plate. A spiral scale is sometimes employed, in which case the dial itself revolves, and the pointer travels in an adjacent spiral groove.

14,811. Griffin, F. Nov. 15.

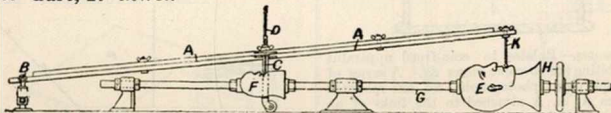


*Parallel rulers.*—A plate A of any suitable material, curved as shown, is mounted on four wheels B, B. In ruling, the fingers are placed in the concavity C, and the pencil or pen drawn along either edge.

14,891. Sutton, S. H. Nov. 17. *Drawings to Specification.*

*Rulers.*—A tube-shaped pen, pencil, or other case forming a calculating-apparatus or ready-reckoner and time-teaching appliance for children is also adapted to serve as a ruler.

14,899. Gare, T. Nov. 17.



*Pantographs.*—The apparatus is intended for copying designs in colour, cutting materials, profiling sculpture, &c., and the invention consists in substituting for the ordinary pen or pencil of a pantograph a special form of pen (capable of holding several colours to be used together or successively), a rotary tool, or tool with chisel movement, &c. In the Figure the apparatus is shown as arranged for profiling sculpture. A is a pantograph which can in addition to its usual movement be moved vertically about the hinge B; the pen is replaced by a rotary tool C driven by a flexible shaft D. The model E and the block F on which the model is to be reproduced are fixed on a shaft G which can be turned by the hand-wheel H. The tracer K is moved over the model E and the rotary tool C copies the outline in the block F; by turning the shaft H slowly the entire block may be carved. In the case of colour, a bottle is used having a number of radial compartments each holding a different kind of colour. The liquid or powdered colour, sand, &c. may be applied by an air blast. For cutting fabrics a rotary tool is employed, and for engraving a chisel tool actuated by a flexible shaft. Several such tools may be used simultaneously.

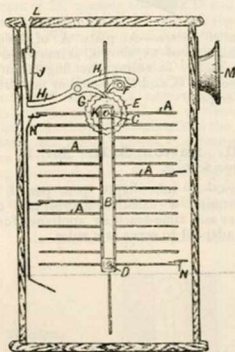
14,931. Burns, W. Nov. 17.

*Spectacles; telescopes; microscopes; lenses, holders for.* Relates to elastic frames for enabling lenses or plates to be applied in situations where it is desired that they should be readily inserted or removed. They are made of india-rubber or other extensible material with a groove for the reception of the glass, and are attached by cement &c. The invention is applicable, among other purposes, in connection with the lenses of spectacles, telescopes, and microscopes.

14,960. **Levetus, H.** Nov. 18. *Drawings to Specification.*

*Compasses, magnetic.*—A compass is combined with the lid of the case for a collapsible drinking-cup, so that the dial may be seen from the outside when the cup is closed.

15,000. **Simpson, W. S.** Nov. 18.

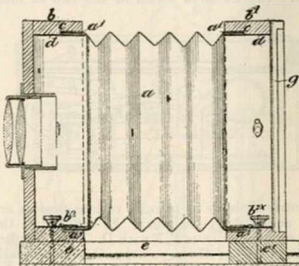


*Stereoscopes.*—Relates to coin-freed apparatus for exhibiting stereoscopic views &c. A series of stereoscopic views, photographs, &c. are mounted in frames A, A, attached to the links of an endless chain B or the like passing over pulleys C, D. Motion in the wrong direction is prevented by the ratchet E and detent F, while the apparatus is normally locked by the pawl G on the counter-balanced lever H gearing with the ratchet-wheel K. When a coin is inserted through the slit L it falls into the pivoted hopper J and depresses the lever H, setting the spindle of the ratchet-wheel K free. After a certain number of views have been observed through the eye-holes M, a projecting finger N on one of the frames pushes the coin off the lever H, which then locks the wheel K, the coin falling down into the till. The eye-holes may then be closed by a shutter, or the next frame may hold an advertisement instead of a view.

15,187. **O'Reilly, W. P.** Nov. 22.

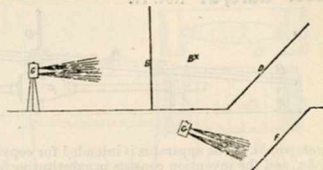
*Magic-lanterns.*—The apparatus can be adapted for use as either a photographic camera, photographic enlarging lantern, or magic-lantern. The bellows *a* is made so that it can be detached from the front and back *b* and *b'*. The bellows is attached to frames *a, a'* made to fit in grooves *c, c* in *b, b'*. The inner surfaces of the camera ends *b, b'* are lined with blackened tin plate *d, d*. The front is secured to the baseboard *e* by a screw *b''*, and the

back to the sliding piece *a'* by the screw *b''*. The focussing-glass and slide are fitted in the groove *g*. When used as a magic-lantern a metal case is



substituted for the bellows. A tin back and reflector is slipped in the groove *g*, and the conical front with slide holder attached in any suitable manner.

15,192. **Bruce, E. S.** Nov. 22.

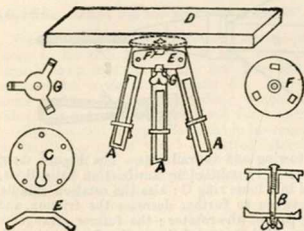


*Dissolving-view apparatus.*—The object is to cause a portion of the view, e.g. the foreground, to stand out in bold relief. For this purpose the background is shown by the lantern C on the transparent screen B. The foreground is shown by the lantern G on the sloping screen F, and a reflection thereof on the sloping sheet of plain glass D stands out clearly in relief at B<sup>x</sup>.

15,697. **Parker, J., and Lee, D. T.** Dec. 1.

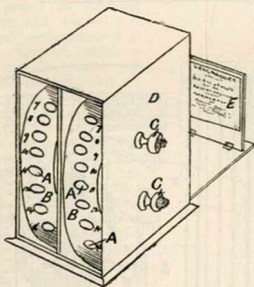
*Tripod stands* for cameras, colour boxes, &c. The legs A are held in their extended positions by a clamp which also connects them to the camera &c. The head of the bolt B engages a slotted plate C on the underside of the camera &c. D, and by screwing up the winged nut the plates E are held between the claws of the clamping-plates F, G. When metallic legs are used, balls on their upper extremities are gripped between two clamping-plates. Half-balls on the sides of the

wooden legs may be gripped by corresponding recessed clamping-plates. Instead of the head of the bolt engaging a slotted plate C the bolt may be formed with fingers gripping a ball on the



underside of the camera D. Another form of clamp is described, consisting of a band passing round grooved segments of a sphere and tightened by a nut. The telescoping portions of the legs are secured together by sliding rings and wedge pieces.

**15,786. Barnard, E** Dec. 3.



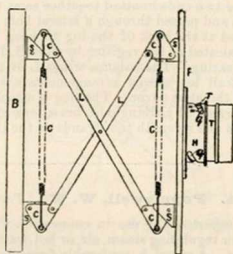
*Sight-testing apparatus.*—Spectacle lenses A are arranged on two flexible strips B which can be wound from one to the other of two rollers C mounted in a case D. The front of the case (which has been removed) has two eye-holes opposite the space between the rollers. The back is open, and behind it is a board E of test type placed at the normal reading distance from the eye-holes. The test type is observed through the lenses as they are brought in succession to the eye-holes. The strips can be used separately so as to suit odd eyes. In order to look at distant objects the board E is hinged so that it may be turned down out of view.

**15,842. Potts, J.** Dec. 4.



*Thermometers for silos, stacks, &c.* A tube A with auger end B is screwed into the stack, and a maximum thermometer C is then let down into it by a cord D to obtain the temperature. The bottom of the tube and the protecting-case E of the thermometer are perforated to facilitate access of heat to the thermometer. The case E has an india-rubber plug at the bottom to prevent breakage of the thermometer by shock against the bottom of the tube.

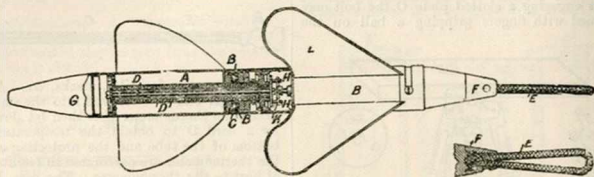
**15,873. Kingdon, Z. H.** Dec. 4.



*Magic-lanterns.*—The fronts and backs of photographic cameras, magic-lanterns, and similar apparatus are connected by systems of links or levers, which are constrained by springs, stops, catches, &c. The front and back can thus be separated or pushed together by one simple movement. In the Figure they are shown connected by the diagonal links L, L, to the ends of which are pivoted triangular links C, C, which are themselves pivoted to the brackets S, S on the front and back. The springs G, G, which are connected to the links C, C, maintain the tensions on the links L, L. Other arrangements are described, in one of which stretcher levers are jointed like the blade joint of a knife, while in another the stretcher bars or levers have stops near their joints which prevent them from doubling backwards except a small amount past their dead centres. The focussing is effected by moving the lens T by the rotation of a sheath H with inclined slots *g, g*, which act on studs *r, r*. The senses of touch and hearing may be used for focussing and adjusting lenses, by the action of a spring on notches &c.



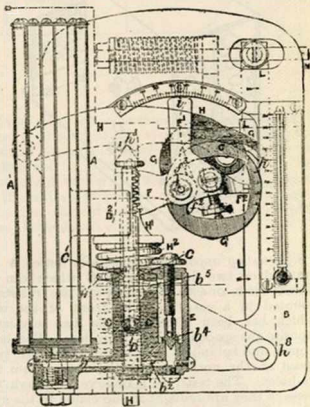
16,202. Heath, G. W. Dec. 10. Amended.



*Logs.*—Relates to various detail improvements in both towing and taffrail logs. The Figure shows a section of the former. The end pull friction of the rotator A is reduced by antifriction balls B or by a series of coned rollers, the balls or cones being mounted in a loose ring C; also the rotation spindle D is carried by a long hollow bearing with a loose sleeve between to further decrease the friction, and is connected at one end with the external sleeve D' forming part of the rotator; the former arrangements are also applicable to the taffrail log. The rotary parts are oiled through holes in the fixed casing B, or by a slow-dropping lubricator on the fixed casing of the taffrail log. The line is attached to a loop E with the two ends knotted together so as to be held within the screw cap F, or the knot may be made on the line and passed through a lateral hole in a hollow cone at the front of the rotator: an air chamber G is formed at the back of the log to keep it well immersed. The rotations of the main spindle D are communicated to the register by pins H, H on a sort of double crank K at the end of the spindle or by wheel gearing. The balance wings L of the towing-log are placed at the front of the fixed casing. In the taffrail log special arrangements are made in connection with the dials and for locking the bezel holding the glass cover. The line is attached near the register to a triple line which passes through the three corners of a triangle of brass termed a "regulator," and is then again united into a single line; for lightness and strength the strands of the line have, some or all, a core of copper.

16,414. Poplewell, W. W., [Trueb, J.]. Dec. 14.

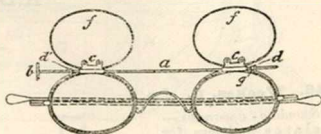
*Thermometers* for use in connection with apparatus for regulating steam, air, or hot-water heating systems. A vessel A, preferably formed of a series of tubes closed at the top and open below to the hollow base, is filled with a suitable fluid and communicates by a passage  $b^1$  with a cylinder  $c$  fitted with a piston D, the rod of which is provided with rack teeth which gear with the teeth on the pivoted segment F. The cylinder  $c$  is filled with oil from the adjacent vessel E, which communicates with it above and below by passages  $b^2$  and  $b^3$ , and is fitted with a stop valve  $b^4$ . The segment F forms one arm of a three-armed lever, the other two arms F<sup>1</sup>, F<sup>2</sup> forming index-fingers for indicating respectively, upon suitable scales, the temperature of the room and the temperature at which the apparatus is set. This three-armed lever is pivoted at  $f^3$  and is attached by an adjustable set-screw  $f^2$  to a ring G<sup>1</sup> also pivoted at  $f^3$  and secured to a curved lever G. This lever rests upon a horizontal antifriction roller carried by a lever H and resting at  $h^1$  upon the upper end of a vertical rod H<sup>1</sup> pressed upwards by the spiral spring H<sup>2</sup>. By means of the curved lever G the pressure upon the spiral spring is kept constant during the oscillation of the piston. The lever H carries also another antifriction roller  $h$  which bears against a vertical lever L pivoted at  $h^3$  and attached at the other end to a spring lever connected to the supply valve. The supply valve is arranged in a casing to which the heating-medium is supplied, and is connected by a link to one arm of an angle lever, the other arm of which is connected to a



balancing-valve. In some cases the ring  $G^1$  may be dispensed with and the lever  $G$  be connected directly to the lever  $L$ , and in a simpler form the levers  $G$  and  $L$  are also dispensed with and the lever  $H$  and the supply-valve lever are connected directly with the segment  $F$  and arm  $F^1$  respectively.

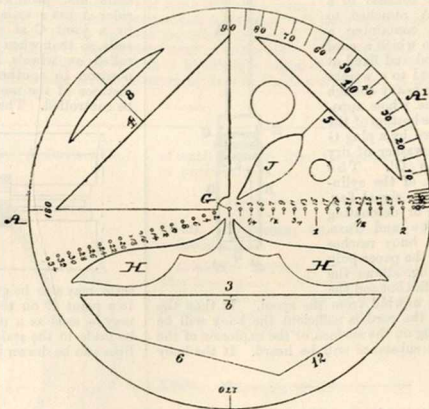
16,464. **Day, J., and Cartwright, W.** Dec. 15.

*Spectacles.*—Consists in pivoting a second pair of lenses to the ordinary lenses so that they may be turned down in front of the first pair and thus increase the power for reading &c. The extra lenses  $f, f$  are fixed to a spindle  $a$ , which is provided with a button  $b$  at the end for turning it, by clips  $c, c$ , and the spindle works in bearings  $d, d^1$  on the frame, one of which is slotted laterally so as to allow of the withdrawal of the second pair of lenses;  $g$  is a stop for facilitating the correct alignment of the lenses.



17,061. **Goldsmith, E. M., and Reizenstein, E.** Dec. 29.

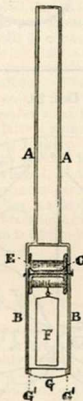
*Mathematical drawing-instruments.*—Relates to instruments for laying-off or plotting geometric and other figures. A circular disc  $A$  is graduated at  $A^1$  as a protractor, and has variously-shaped figures cut out of it for the purpose of guiding the pencil in drawing figures and curves. A central perforation  $G$  is made through which a pin may be passed and the disc rotated about it; also radial lines of perforations into any two of which a pin and pencil point may be inserted for describing circles. The right lines 3, 4, 5... are for describing regular figures, triangle, square, pentagon, &c., and the scrolls  $H, H$  and pear-shaped hole  $J$  for plotting out various curves approximately.



A.D. 1887.

**146. Weekes, C.** Jan. 5.

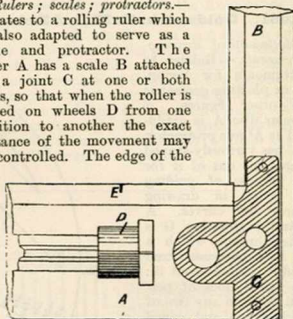
*Sounding - apparatus.*—Relates to buoys for sounding, intended to be thrown to a distance from the ship, with or without a light line attached, by means of a rocket or gun. One form is shown in the Figure; it consists of a cylinder A attached to a box B containing a spool C on which a cord E is wound and fixed at the free end to a weight F, which is heavy enough to sink the whole apparatus. The bottom of the box is closed by a plug G fixed by a washer of dry paper pulp G<sup>1</sup>. The upper end of the cylinder carries a signal flag, blue light, or detonating substance and fuze. When the buoy reaches the water, the paper pulp G<sup>1</sup>, softening, allows the plug G to fall out and the cord E to unwind from the spool. If then the length of the cord is sufficient the buoy will be seen floating on the surface, or the explosion of the detonating substance will be heard. If the buoy



sinks the depth is known to be greater than the length of the cord.

**627. Jackson, L. C.** Jan. 14.

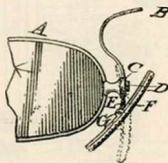
*Rulers ; scales ; protractors.*—Relates to a rolling ruler which is also adapted to serve as a scale and protractor. The ruler A has a scale B attached by a joint C at one or both ends, so that when the roller is rolled on to another position to another the exact distance of the movement may be controlled. The edge of the



scale may also be graduated in angles with regard to a point E on the ruler, so that the instrument may be used as a protractor. A sector joint may be made in the scale so that two series of parallel lines can be drawn inclined at any desired angle.

**798. Lubin, S., Frawley, J. J., and Abraham, A.** Jan. 18.

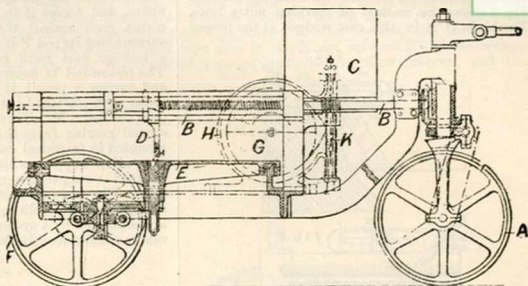
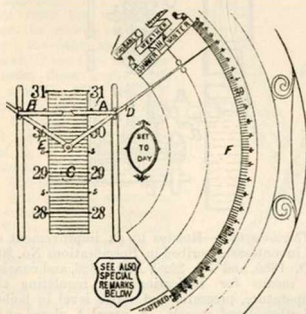
*Eyeglasses.*—The bridge B is fixed to the lens frame A of a pince-nez by a screw D passing into the stud C. Upon this stud, and similarly fixed, is a strip of metal E which is curled round at its end, and to which is pivoted the nose-clip F by means of a central lug G. This arrangement enables the glasses to be set at any required distances from, and angle with, the eyes, while the clips adjust themselves readily to the shape of the nose.



**1082. Clark, A. M.,** [*Villepigue, A. E. D. F. de*]. Jan. 24.

*Roads, determining inclines and curves of.*

—A carriage mounted on three equal wheels is drawn along the road. The front or guiding wheel A is geared with a worm shaft B which rotates a drum C on which the gradient diagram is taken, and draws forward the pencil D on the circular table E to which the paper for taking the length and direction diagrams is fixed. A central spindle of this table is connected by differential gearing with the two hind wheels F, which revolve independently, in such a manner that when the carriage moves along a straight line the table is stationary, but when it turns a corner, or goes round a curve, one of the wheels revolving faster than the other causes the table to revolve. It follows that the pencil will describe a radial line (proportionate to the distance travelled) so long as the carriage moves straight forward, but will deviate proportionally as the carriage turns to either side. For obtaining the gradient diagram a float, consisting of a metal cylinder G with a liquid-tight segment (shown in dotted lines), floating in mercury in a cylindrical casing H, is connected by flexible bands with the rod K which carries the pencil for marking the cylinder C.


**1324. Joseph, I.,** [*trading as J. Davis & Co.*]. Jan. 27.


*Barometers.*—The movement of the reading-indices A, B over the central scale C is magnified by the index-fingers D, E, which pass through loops on two vertical racks at the back of the dial and move over magnified scales F for delicate readings. One finger corresponds to the current date, and the other to the day before, and each is set by turning a pinion gearing with the proper rack by means of a key. Below the dial a series

of small dials are fixed for recording the readings of previous days.

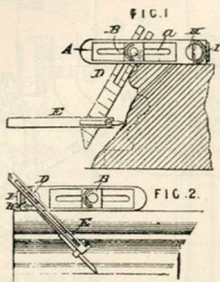
**1346. Stevens, H.** Jan. 28. *Drawings to Specification.*

*Levels for billiard or bagatelle boards or tables.* The loose piece which closes the end of a folding bagatelle board is adapted to serve as a marking or scoring appliance, and is fitted also with a spirit level, the combination with which is claimed.

**1364. Farrell, W. T.** Jan. 28.

*Levels and plumb-rules.*—Relates to a combined gauge and level designed for marking the mouldings and mitre lines on stone. The stock A has a longitudinal slot for the graduated blade D to work in, and a second slot *a* at right-angles thereto in which works the spindle of a pointer *b* on a scale carried by the sliding piece B. This spindle has an arm projecting from it which is embraced by the legs of the blade D so that the pointer *b* indicates the angle at which the blade is set with the stock. A clamping-screw is fitted on the end of the spindle to lock the parts in any desired position. The tracer E is slotted from end to end, the inner facings being rough, so that a slight pressure by the fingers binds it on the blade. Fig. 1 shows the instrument ready for marking longitudinal mouldings, the stock being placed on the top of the stone

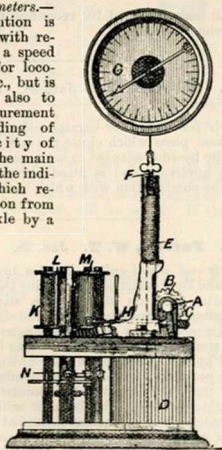
and moved along it. In an analogous manner the mouldings round a circular base may be marked. Fig. 2 shows the method of marking mitre lines. The blade D is in this case wedged at the proper



angle into the slots between the two parts of a revolving socket H, and the scriber E moved up and down on the blade. I is a small plumb-bob for levelling the horizontal planes of the mouldings.

1581. Boyer, J. Feb. 1.

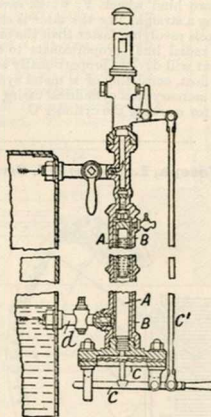
*A new meters.*—The invention is described with reference to a speed indicator for locomotives &c., but is applicable also to the measurement and recording of the velocity of wind. The main shaft A of the indicator, which receives motion from a wheel axle by a



strap and pulley, actuates bevel gear B, C driving a rotary or other pump D; the bevel gear includes a sliding clutch to ensure the pump being driven in the same direction when the engine is reversed.

A piston and cylinder are arranged close by in connection with the pump, which draws fluid from above, and forces it in below, the piston; as the piston rises against the tension of a spring E surrounding its rod F it exposes more and more of a leakage port until equilibrium is established. The piston-rod is connected with an indicator G and carries a pencil H for tracing a record on a paper strip stretched between drums K and L and over the drum M. These drums are all driven by special gearing from the shaft A, K and L being mounted in frictional contact with their shafts so as to allow slipping when the paper is too tightly strained owing to the changing diameter of the rolls. The strip is held against the drum M by spring-controlled rollers, which, with the pencil H, are connected by a system of links N so that they can be simultaneously thrown out of action.

1770. Murrie, J. Feb. 4

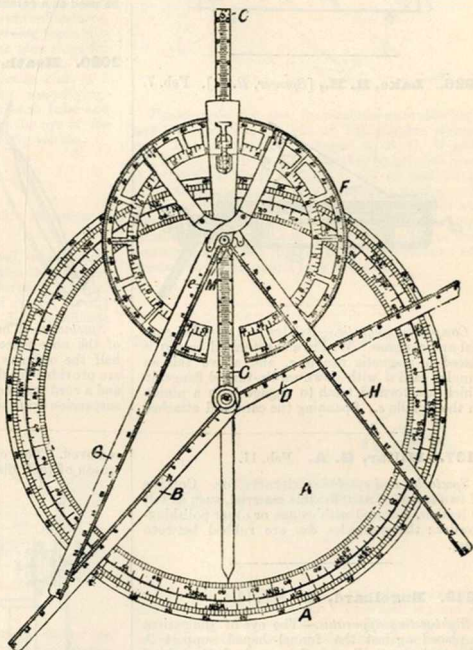


*Thermometers.*—Relates to an improvement on the inventions described in Specifications No. 303, A.D. 1885, and No. 2520, A.D. 1886, and consists of means for indicating and regulating the temperature, pressure, and water level in boilers and other closed vessels. A vessel A, closed at its upper end and containing water or other fluid, is enclosed in a casing B connected with the water space of the boiler by a tube d at the lowest water level. The lower end of the tube A is open and the liquid in it communicates either directly as shown, or through a coiled or other pipe, with a diaphragm C. The chamber B is filled with water so long as the level in the boiler is above the tube d, but when it falls below this steam will displace the water in B and will cause the water in A to boil and the

diaphragm C to be moved outwards by the extra pressure produced in A. The diaphragm C is connected to a stud which actuates levers  $c, c'$  which may sound a steam whistle or other alarm as shown, or may operate a safety-valve, or may cause the contents of a water reservoir on the top of the boiler to be emptied into the latter, thus forming an automatic feed regulator. In order to keep the temperature of the diaphragm as low as possible, a long coiled pipe may be interposed between it and the bottom of the vessel A, and to this pipe may be connected a gauge graduated to show pressure and the corresponding temperatures.

1884. **Harrison, N.** Feb. 7.

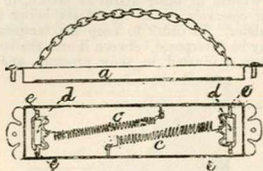
*Bearings, instruments for determining.*—Relates to an instrument for finding the position of a vessel without a compass from the given positions of three landmarks, and thereby correcting compass errors. Over a circle A graduated in points of the compass and angles move three radial arms B, C, D, graduated from the centre to a scale of distances. On the arm C slides a graduated circle F, at the centre of which are pivoted arms G, H, graduated for distances like B, C, D. The mode of using is as follows:—The true bearings and distances from each other of the three landmarks X, Y, Z being known, the arms B, D are set to the bearings of lines X Y, Y Z and simultaneous angles are taken from the vessel between the middle landmark Y and the other two. The arms G, H are then set so as to make these angles with the arm C. The circle F is then slid along the arm C and the arm turned till the arms G, H cut the arms B, D at the known distances of Y from X and Z. The pointer in line with the arm C then shows on the scale A the true bearing of Y from the vessel, and the reading of the edge M on the arm C gives its distance. By comparing the bearing thus found with the compass bearing, the error of the ship's compass can be obtained.



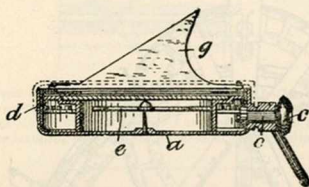
1905. **Woolfert, A., and Hetterich, O.,** [trading as Albert & Otto]. Feb. 7.

*Opera-glasses, handles for cases of.* The ends of the flexible handle, preferably made of metal or other links, pass through slots in the metal case or fixing-plate  $a$ . The end links  $d$  are connected to springs  $c$  and have wire stops  $e$ . When not in use the springs draw the handle close to the face of the case  $a$ ; when in use the springs are expanded till the stops  $e$  come close to the slots. The plate or case  $a$  may be in two parts.

(For Drawing see next page.)



1926. Lake, H. H., [Spencer, R. L.]. Feb. 7.



*Compasses, magnetic.*—Relates to a portable sundial and compass. Within a sheet-metal case *a* is placed a magnetic needle *e*, and above this an annular card *d* with downwardly-turned flange, in which are formed teeth to engage with a pinion on the spindle *c*. Spanning the card and attached

2137. Millar, G. A. Feb. 11.

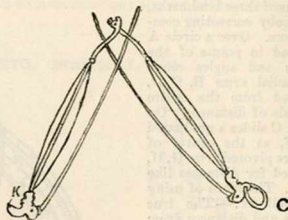
*Spectacles and eyeglasses, cleaners.* Consists of two leaves of soft, flexible material, such as felt or leather, smeared with rouge or other polishing-powder; the spectacles &c. are rubbed between them.

2249. Engelhard, L. Feb. 12.

*Sight-testing apparatus.*—The eye of the patient is placed against the funnel-shaped support *A* adjustable vertically on the standard *B*; behind this eye-piece revolve two discs *C, D* carrying cylindrical and spherical lenses respectively around their circumferences. At the head of the standard *B* is fixed a combination of lenses *E* by which the distance of the far point of a normal eye is reduced for convenience in the subsequent operation. On the graduated bar *F* slides a support *G* for test letters, and behind the instrument at a distance of 9 feet is placed a plane mirror. For testing the far and near point, the patient observes the test letters, placed at his side, in the plane mirror, suitable lenses being brought before his eye by means of the discs *C, D* but the combination *E* being

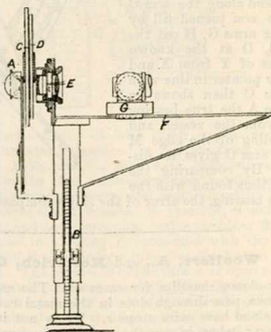
thereto is the hinged style *g*, which can be turned down when the instrument is not in use. The card is marked with the cardinal points (a few degrees being shown on each side the north point to correct for the compass error) and with time graduations. To use the sun-dial the case is held horizontally and the dial rotates by means of the milled head *c*, until the needle shows the meridian to be true. Around the edge of the card 31 equal divisions may be marked, and a fixed pointer provided on the case so that the instrument may also be used as a calendar.

2020. Heath, C. Feb. 9.



*Spectacles.*—The frames are hinged at the centre of the nose piece, and the arms are made about half the ordinary length. A loop *C* and catch *K* are provided for fixing the spectacles when folded, and a cord may be passed through the former for suspension from the neck of the wearer.

removed. The cylindrical lenses in *C* can, by reason of their disc being mounted on a revolving



arm, be set with their axes at any angle so that the proper combination of cylindrical and spherical

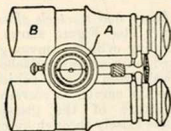
lenses, where astigmatism occurs, can be discovered. Further tests are made by replacing the combination E and putting the test letters on the sliding support G; these are first observed without any assistance from the lenses in the discs C, D, but the support is moved on the bar F and the graduation for clear vision noted. Next the support is moved to the extreme end of the bar, and the last result checked by bringing the requisite lenses on the discs C, D into use. In cases of strabism a revolving prism is employed to test the distortion. As a final confirmation of to the whole diagnosis, the eye itself is examined by a special form of ophthalmoscope, the disengaged eye meanwhile observing some distant object such as a white card with blue rings for the purpose of relaxing the ciliary muscles. The patient and operator look into opposite ends of a telescopic tube with the necessary magnifying-lenses; light is directed through a branch tube and suitable reflectors and condensers to the eye of the former, and the retina rendered clearly visible.

**2345. McCarthy, D.** Feb. 15. *Drawings to Specification.*

*Pyrometers.*—A copper rod or coil in a baker's oven, the expansion of which operates the dampers controlling the air supply to the furnace, operates a pinion outside the oven, the said pinion having an attached pointer moving over a dial to indicate the temperature of the oven.

**2493. Biggs, F. J.** Feb. 17.

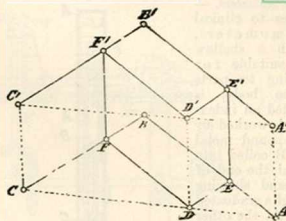
*Field glasses.*—Consists in fitting a stop-watch A to the field glasses B by means of a loop on the back thereof sliding over an adjustable finger on the body of the field glasses. The method of attachment may be varied. A glass panel in the case of the instrument allows the watch to be seen without removing the glasses when they are not wanted.



**2790. Mason, W. F.** Feb. 23.

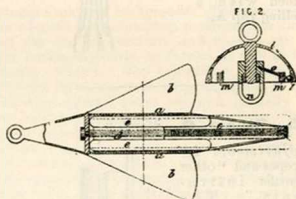
*Thermometers combined with clocks.* The temperature of a baking-oven is shown by any of the ordinary instruments on a time dial having a hand to indicate when the batch was set in. A clock face may be used, and the clock may sound an alarm at the time for drawing the oven.

**2836. Frankenberg, E.** Feb. 23.



*Pantographs* for use in machine-embroidering, and for producing designs on lithographic stones &c. Two pantograph linkages A, B, C, D and A', B', C', D' are coupled together by pivoted bars A A', E E', D D', F F', and C C', so that both move simultaneously. The driving or tracing and driven or describing points may thus be placed on the bars C C', D D', or on branches projecting from the same, instead of being confined as in the pantograph to the line A D C. Any number of driving or driven points may be used.

**3018. Walters, W. M.** Feb. 26.

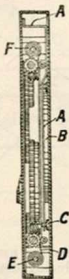


*Logs.*—In a taffrail log the cylinder *a* carrying the fins *b* surrounds a screw *c* on which is a nut *d* having long straight wings *e*. The wings slide between guides and by turning the screw are projected to adjust the speed of rotation. In order to give an alarm if the rotation of the tow line is checked, it is divided and the fore part is tied to a bell dome, Fig. 2, having burrs *m* round it at intervals, while the aft part is tied to a swivel *n* carrying the striker *o*. When the fore part of the rope is held the aft part continuing to rotate takes the clackers over the burrs and sounds the bell. The bell may be replaced by a rattle and both are applicable to towing-logs as well as taffrail logs.



**3089. Silveira, F. A. da.** Feb. 28.

*Thermometers.*—Relates to clinical thermometers. Within a shallow box, suitable for applying to parts of the body, is mounted an index-hand A worked by a compound metal strip B coiled into a spiral, the end of the hand showing through a graduated slot. At the other end the index hand carries a marker C tracing on a graduated strip of paper D drawn forward by clockwork between the rollers E and F.



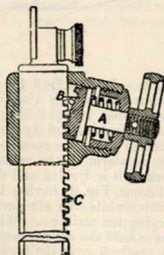
**3161. Ferguson, F. O.**  
March 1.

*Compasses and dividers.*—The head stem E is fluted and provided with a swivelling cap A.

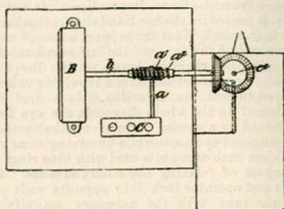


**3285. Stuart, G.** March 3.

*Adjustments for telescopes and "other scientific instruments."* The mechanism is described as adapted for adjusting the sight-bars of guns, but it is stated to be applicable for adjustment as above mentioned. The spindle A has a coned end B upon which a worm is cut to gear with a rack C. The worm is drawn back out of gear when large movements of the bar are required.



**3419. Thorne, J., and Burr, E. B.**  
March 5.

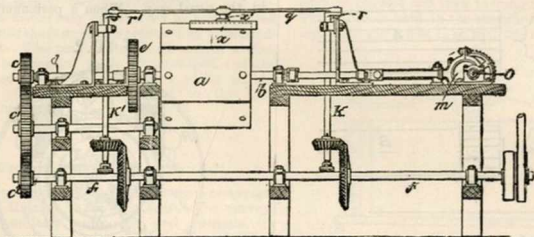


*Logs; current meters.*—Consists in combining the special speed indicator described in Specification No. 6931, A.D. 1886, with a log rotator so as to indicate the speed of a ship; if desired, a log register may also be combined driven from the same rotator. The log rotator (not shown) has a worm on its spindle which drives the shaft *a'*, mitre-gear with the shaft *b*. The speed indicator B consists of a copper drum rotated in a magnetic field, the induced currents being utilized to actuate the index-finger. The copper drum is rotated from the shaft *b*. On *b* is fixed a worm *a'*, gearing with the worm-wheel *a'* on a spindle *a*, the rotation of which actuates an ordinary log-register *c*.

**3689. Beck, W. H.,** [Soc. F. Benoit et L. Berthiot]. March 11.

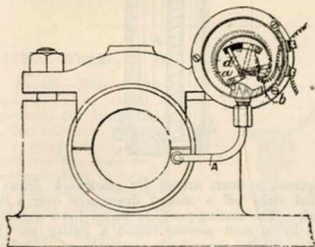
*Lenses and spectacle glasses, grinding and polishing.* The Figure shows the arrangement for grinding cylindro-convex glasses. The glasses are fixed on segments attached to a revolving cylindrical drum *a*, and subjected to the action of a tool *x* curved to correspond with the required curvature of the glasses. The tool arm *x'* passes loosely through an eye in the rod *q* which receives a "coupling rod" motion from the cranks *r, r'* fixed upon vertical shafts *k, k'* driven by bevel gear from the countershaft *f*. The drum *a* receives both a rotary and reciprocating motion in the following manner; it is mounted on a shaft *b* which reciprocates in its bearings by means of its connection with the eccentric *m* on a cross-shaft *o*. This cross-shaft is bevel-gear with a shaft *d* parallel to the shaft *b* and connected with the countershaft *f* by gearing *c, c', c''*. The rotary motion of the shaft *b* is taken from the shaft *d* by means of gearing *e*. By altering the shape or arrangement of the drum *a* and making slight changes in the motion, concave and spherical glasses may be ground or polished.

(For Drawing see next page.)

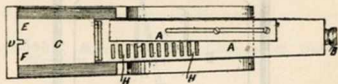


**3827. Landon, E. I.**, [Executrix of *Landon, H. R.*], **Thackeray, W. T. W.**, and **Richardson, H.**, [Administratrix of *Richardson, J.*]. March 14.

invention described in Specification No. 12,867, A.D. 1886, by which the colours of transparent solids or liquids are standardized or measured by comparison with standard coloured glass strips and



*Thermometers.*—Consists essentially of a reservoir in connection with a "Bourdon tube," both of which are filled with an easily-expansible gas or liquid and so arranged that the movements of the "tube" shall operate an alarm. The Figure shows the invention applied to a bearing; the reservoir A is connected to the "tube" a, of which the free end moves, by the adjustable link b, the contact-maker d. This contact-maker may pass over one or more contacts in connection with one or more electric bells, or it may be arranged to control a clockwork or other mechanical alarm. The apparatus is especially adapted to indicate heating of the brasses of connecting-rods of marine engines, in which case a portable battery and bell may be attached to the rod.



sometimes a coloured background. The instrument is now adapted for estimating, measuring, or comparing the surface, texture, and appearance of opaque bodies, materials, or fabrics, as well as for comparing colours. For comparing colours by transmitted light, the glass strips described in the Specification quoted above are now partially or wholly replaced by liquid or glass wedges. The wedge is moved across the field of view till it interposes a stratum which matches the solid or solution under examination. The Figure shows the arrangement for comparing opaque objects by reflected light. The observing-tubes A, running from the single eye-pieces B, terminate in an open space C which admits light to a stage D divided into two parts E, F which may be fitted with blocks on which fabrics to be examined may be stretched, or with trays to hold powders &c. For measuring the intensity of colour of an opaque object, the object is put upon the part E, and its colour is compared with that transmitted through the glass strips H, or the wedges, from the white or coloured surface of the part F. The instrument may be inclined by a pivoted strut at the back.

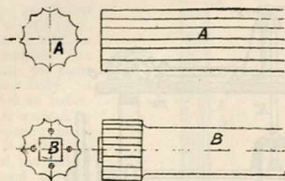
**3859. Lovibond, J. W.** March 14.

*Colours, surfaces, textures, and the like, comparing and testing.*—Relates to improvements on the

**4100. Stebbing, J.** March 18.

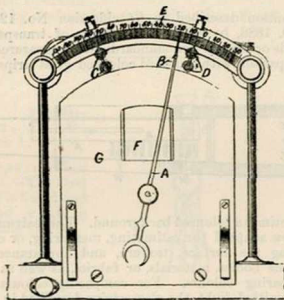
*Rulers.*—Consists of a polygonal roller, plane or fluted; the flutes may extend the whole length

of the surface A, or may be confined to end pieces B.



4135. Haight, H. J. March 18.

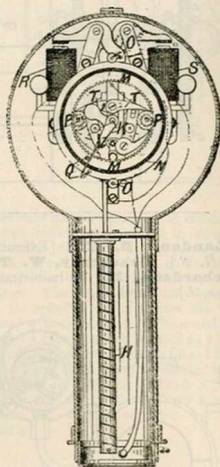
FIG 1



*Thermometers.*—The object is to obtain a thermometer which will show the temperature and keep a record thereof, indicate the highest and lowest temperatures during a given period, and sound an alarm bell or display a signal when certain predetermined temperatures have been reached, any or all of such recording &c. devices being used as required by circumstances. Fig. 1 shows a view of the receiving-instrument; the index A, which receives its motion electrically from a distance, is provided with an insulated point B, by which contact is made between one pair of the light coiled springs C, D. These contacts are adjustable along the scale plate E, and fixed by changing screws at the desired temperatures. Circuit is thus closed for an electromagnet the armature of which carries a vertical rod; this rod, when moved by the attraction of the armature, operates a second sliding rod, which, thrusting together two contact-plates, closes the circuit of an alarm bell; it also passes through two slots in pivoted arms, which by its movement close together and bring two signal shutters attached thereto into sight within the aperture F in the face-plate G. A special

circuit-breaking appliance may be used for cutting out the bell circuit when desired. The index A may also operate maximum and minimum fingers in the usual way. When a permanent record is

FIG. 2



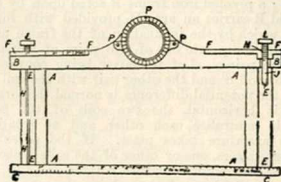
required, a drum driven by clockwork draws a ruled strip off a second drum, and over a flat plate. The tracing-pencil is drawn down a guide-rod by a cord passing round a pulley on the index-spindle, against the pressure of a helical spring. Fig. 2 shows the transmitting-instrument. The thermostatic coil H rotates the spindle K on which is the contact-making arm L. A metal ring M, divided into two parts by the insulating-ring N, is supported externally by the rollers O, O, and internally by the pinions P, P gearing with internal teeth on the ring; each separate part of the ring carries a contact-stud Q, separated by a little more than the distance moved by the arm L, for one degree change of temperature. As this arm makes contact with one or other stud, according as the temperature is rising or falling, circuit is completed for one or other of the magnets R, S, and the vibration of the respective armature causes the rotation of the spindle of the corresponding pinion by means of one of the paws T, T, thus rotating the ring M and again breaking contact. A shunt circuit, including a local battery, may, by somewhat modifying the details, be employed to relieve the main line of this work. A number of the receiving-instruments may be placed together in one case, where the temperatures of several rooms &c. have to be observed together. The drum of the recorder may be actuated by a

pawl on the armature of an electromagnet, energized at given intervals by a clockwork movement; but, where several recording-instruments are employed, the drums may be revolved by being geared with a motor shaft or shafts actuated by a descending weight. The main motor shaft carries a disc, on which escapement teeth are arranged, and the necessary control is exercised by a pallet on the armature of a magnet, included in the time transmitting circuit.

**4198. Verner, W. W. C.** March 21.

*Scales and protractors; clinometers; compasses, magnetic.*—Relates to drawing-boards for surveying and military purposes, and consists in constructing them with rollers for holding and stretching the paper, with clamping-screws for securing the rollers, and with various scales engraved on the board. To the board are fixed a head-piece B, B and a foot-piece C, C. A plate F with a screwed socket M is fixed to each end of the head-piece, and through these sockets pass thumb-screws L, the unscrewed ends of which serve as pivots for the rollers E, E. Each of the

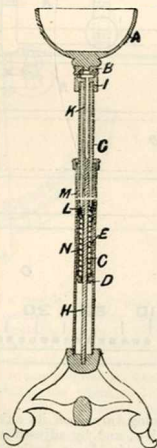
rollers E is hollow and slotted on one side at H, and the paper is secured thereto by inserting the edge in the slot and then turning round the roller. The paper is held in the stretched state by screwing home the screw L, so that the roller is clamped



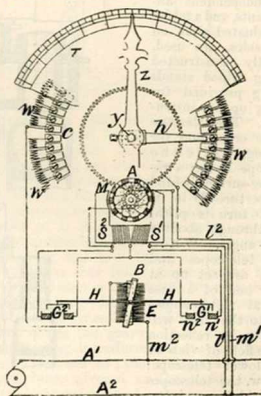
between the screw L and the foot-piece C. A compass is fitted in the graduated frame P, P. On the back of the board a semicircular protractor with a support for a plummet is provided, so that the board may be used as a clinometer, and small boards have at the back a wrist strap secured to a pivoted pin. The foot and head pieces are engraved with various scales.

**4270. Rouse, J. H.** March 22.

*Stands.*—Relates to an adjustable stand or pedestal for lamps and other articles. The head or receptacle A, which receives the lamp &c., is connected by a collar B to the tube C, which is closed at the bottom by a cap D. This cap carries a clutch formed by a braided-wire tube E, which grips the guide-rod H. The crosshead I of the tube K slides in vertical slots in the tube C. By depressing the collar of the crosshead the operator causes the flange L of the tube K to compress the braided-wire tube E, which expands, and releases its hold upon the guide-rod H. The tube C is then free to slide in the tube M until the tube K is released, when the weight of the tube C and the parts attached thereto stretches the tube E and causes it to clutch the guide-rod H. The tube K is normally supported out of contact with the tube E by the spring N. The invention is applicable to flower holders, music stands, and other articles; or the head may form a shelf.



**4545. Abel, C. D.,** [Siemens & Halske].  
March 26.



*Current meters.*—Relates to electrical apparatus for measuring and indicating quantities of any kind, such as the difference of potential between two points of an electric circuit, the velocity of a stream, &c. The Figure shows the invention as applied to the measurement of potential difference. Branching from two mains A<sup>1</sup>, A<sup>2</sup> the potential difference between which is to be measured are

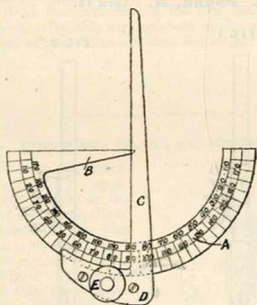


object covered by the cross-lines. A note is now made of the portion of the tablet scale cut off between the zero line and a second vertical line on the glass plate, the tablet scale being graduated empirically so as to give readings  $\frac{B}{K}$  where B is the base, K a constant depending on the focal length of

the instrument, &c. The tablet and telescopes are next interchanged, and in consequence the image of the distant object is displaced in the telescope A; the adjusting-screw K is therefore turned until the image is again covered by the cross-lines, bringing the telescope A into a position making with the former position an angle ( $\alpha$ ) equal to that subtended by the distant object at the base line. This adjustment causes a displacement of the zero line of the tablet in the telescope B which is read off on the scale of the glass plate F graduated to give a reading  $K \sin \alpha$ . The product of the two readings gives  $B \sin \alpha$ , that is, the required distance. Where the base line cannot be taken exactly at right-angles to the line joining the telescope and distant object, the distance found is corrected when necessary by a percentage scale marked along the slot in which works the clamping-device N of the telescope A, this scale showing the reduction necessary for different angles of obliquity. For finding the distance between two distant objects, their distances from the point of observation and the angle they subtend is first observed. Two graduated arms are set to the said angle, and on these arms the distances are laid off to any scale. The distance between the points is then a matter of simple measurement on an equal scale.

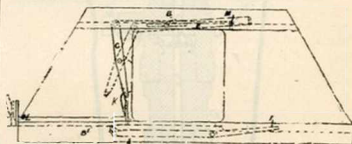
*Trippod stands.*—Each leg of the stand is jointed at the middle. The upper portion is formed of two parallel bars, and the lower part of a single bar which can be folded about the joint and made to lie compactly between the bars of the upper part. The three legs can also be folded upwards so as to project above the head of the stand and form a protection for the pivot of the instrument which is carried by the head.

4768. Ogden, T. D. March 30.



*Protractors.*—Consists of a circular arc A with a finger B running to the centre, the outer edge being radial. A second adjustable finger C with radial edge is provided, the part D of which has a groove fitting the outside edge of the protractor; this finger may be clamped in any desired position by the screw E, which tightens the edges of the groove on the circular rim. The required angle can then be drawn with the radial edges as rulers. The finger C may terminate at the centre, instead of passing beyond it, for drawing angles within the protractor only.

4804. Coles, W. J. March 31.



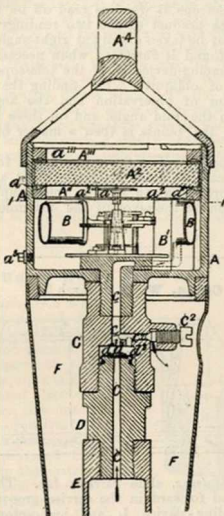
*Magic-lanterns, slide-carriers for.* The slides are pushed forward in the carrier grooves B, B' by a sliding-device L, and are automatically centered by being gripped between the projecting end K and a projection M on the slotted lever E. E is pivoted to a lever C which is directly operated by K. Having centered the first (No. 1) slide, the sliding-device L is drawn back and a new slide (No. 2) introduced and pushed forward as before; after meeting No. 1, it forces it forward until lever E rises so that No. 1 passes under M and falls down the step in the groove B', while No. 2 is centered as before. No. 1 now rests on one end I of a lever, the other end J of which is consequently lifted and blocks the groove B' so as to prevent No. 3 slide being introduced till the first has been removed. Instead of the sliding-device L, an L-shaped lever pivoted at the upper left-hand corner of the carrier may be used.

5235. Beck, F. W. April 9.

*Hygrometers.*—A spiral of vegetable fibre, from the seeds of a plant *Erodium gruinum* or "Stork's "bill," is fixed at one end, the other end being constrained to move over a flat spiral scale of three

fills. On absorbing moisture the fibre uncoils, the position of the free end indicating the amount of moisture in the air.

5357. Smith, G. April 13.



*Barometers; sounding-apparatus.*—Relates to pressure indicating and recording apparatus for use in ascertaining heights and depths. The apparatus consists essentially of a "Bourdon gauge" having a valve opening one way only, so that the index-finger takes up the position due to the extreme pressure, high or low, to which the instrument is exposed. It is thus applicable for ascertaining altitudes or taking soundings at sea. The Figure shows the arrangement for the latter purpose. The sensitive tube B commencing on the right and terminating on the left is enclosed in a cylindrical casing A, and works the index-finger *a* over the dial *a*<sup>2</sup> in the usual manner. There may be a second index-finger loose upon the spindle and moved by the finger *a*. The dial is graduated in fathoms corresponding to the pressures, and is visible through a thick glass *A*<sup>2</sup> which is fitted airtight into the top of the casing by means of india-rubber washers *a*<sup>1</sup>, *a*<sup>11</sup> and brass screw rings *A*<sup>11</sup>, *A*<sup>111</sup>. The interior of this case is filled by air at the pressure of the sea level admitted through a hole closed by the screw *a*<sup>3</sup>. The gauge tube communicates with the outer pressure by a

passage *c* leading through two connections C, D screwed together to a chamber E open at the bottom to the water, but having a gauze cap to prevent entrance of solid matters. This cylinder is of considerable volume, so that the water may never reach the gauge, the pressure being transmitted to it through the air first occupying the whole chamber. The check valve is placed at the top of the connection D. It consists of a disc *d* carried between two pieces of oil-silk, and fitting a slight depression in the end of the connection D. To ensure its closure, the valve is covered by a thin strip of vulcanized india-rubber *d*<sup>2</sup>, or backed by a spiral spring. In order to restore the gauge to the ordinary pressure after the observation, an inlet *c*<sup>2</sup>, closed by a screw C<sup>2</sup>, is provided above the check valve. Instead of this, however, there may be a rod extending to the bottom of the chamber E, by which the check valve can be raised. At the top of the casing A, a suspending-ring *A*<sup>4</sup> is attached, and from the bottom extends a cone F protecting the parts C, D, E, and carrying, if necessary, sinking-leads. The apparatus for ascertaining heights differs from this only in making the check valve open outwards and placing it at the bottom of the chamber E.

5465. Pound, H. April 14.

FIG. 1

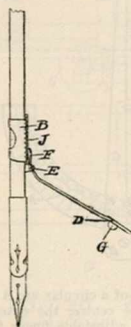
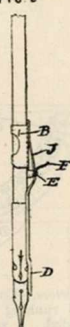


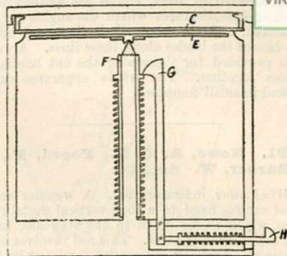
FIG. 2



*Ruling-pens.*—The penholder is provided with means to prevent the nib from coming in contact with the ruler while ruling lines &c. A bent lever D, F is pivoted at E to a movable clip B; a spring J presses on the arm F and tends to force the device into the position shown in Fig. 2, a clip G securing it in that position. On pressing in F, the arm D is raised and the nib may then be dipped into the ink.

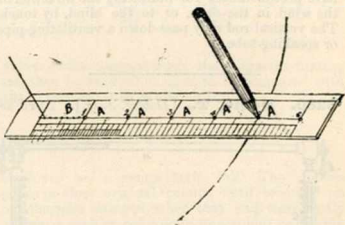
## 5470. Kendall, P. F. April 15.

*Compasses, magnetic*, for use in determining the direction of the dip of rocks in deep bore-holes. The instrument is lowered by a tool on to the core, to which it is attached by cement or a peg. When the needle card E has come to rest, the tool is raised to liberate the spring trigger H G, which releases the notched tube F. The tube F is then forced upwards by the spring surrounding it, and lifts the card E off its pivot and secures it against the glass cover C. The core can then be extracted and its orientation determined.



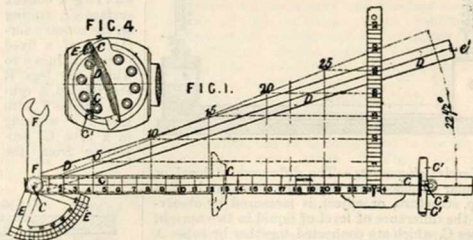
## 5900. Price, C. W., and Corsham, R. April 22.

*Scales; circle-describing instruments.*—The scale is pierced with a series of holes A, A at the inch divisions or otherwise, through which a pencil point may be inserted, and with a series of smaller holes B at the divisions of the first inch for a pin point. By this arrangement circles may be described of any radius less than the length of the scale.



## 5913. Cumming, W. S., and Crawford, D. April 23.

*Angle-measuring instruments.*—Relates to apparatus for measuring the pitch of screw propellers. An instrument for this purpose is shown in Fig. 1 and the method of using it in Fig. 4. It consists of two thin steel blades C, D, each about two feet long, jointed by a stud e with thumb-nut. A centre line is clearly marked on each blade and one, C, is divided on a scale of  $\frac{1}{4}$  inch to the foot to represent the circumferences of circles from one to twenty-four feet in diameter. A T-square, divided on a similar scale into feet, and a protractor E also form part of the instrument. To measure the pitch of a screw the blade C' is applied to the turned end of the boss and the axis placed horizontal by means of the spirit level C', C' secured on the blade C. The angle at any point in the blade is then taken by means of the blades C and D, the former being held vertical while the other is laid across the face or the blade as shown in Fig. 4, and the angle between their centre lines measured by the protractor E. To ascertain the pitch at the diameter at which the angle was measured, the T-square is placed with one edge on the division on C corresponding to that diameter, and the number on the T-square where the centre line D cuts the same edge read off, which gives the pitch. If the pitch is constant it can be found at any diameter in a similar way. If the blades of the screw are



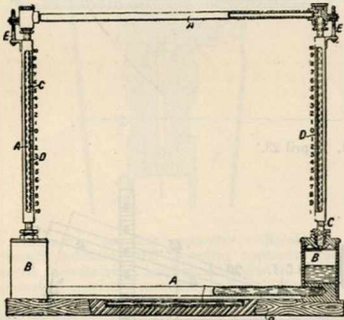


bent forward or back, circles are scribed across them at the distances where the angles are to be measured, and the blade D is bent and held to the face of the blades along these lines. A wrench F is provided for tightening the nut holding the blades together. The whole apparatus can be packed in small compass.

**5991. Howe, A. C. E., Foord, P., and Barber, W.** April 25.

*Wind vanes*, indicators for. A weather cock or wind vane is fixed to a long vertical metal rod or tube, which passes down to the staircase, hall, or any other suitable place. This rod revolves on ball bearings, wheels, or rollers, and carries at its lower end a pointer which moves over a disc marked with the points of the compass. The disc may have protuberances for indicating the direction of the wind in the dark, or to the blind, by touch. The vertical rod may pass down a ventilating-pipe or speaking-tube.

**6280. Dobie, T.**, [Dobbie, J. G.]. April 29.

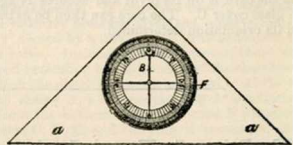


*Levels; clinometers.*—The difference of level, or angular displacement from the horizontal, of a ship, structure, or object, is measured by observing the difference of level of liquid in two upright tubes C, which are connected together by tubes A at the top and bottom. These upright tubes carry scales D, which are graduated to give the difference in level of the ends of the ship, or of the liquid in the tubes, or in any other suitable manner. The lower tube and the vessel B may contain mercury, and the upright tubes water, spirit, or other liquid. The height in each upright tube stands at zero when the base-plate P is horizontal, the scales being adjustable by screws E. A spirit level is fitted in the sole-plate P.

**6377. Shettle, J.** May 2. Amended.

*Rulers.*—A ruling-shell, preferably concave at the side nearest the roller and convex at the other, is pivoted by end pieces to a cylindrical roller; the shell rests upon the paper as the cylinder is moved up or down by the fingers.

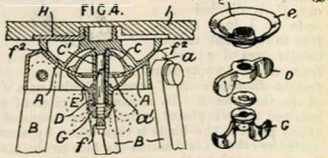
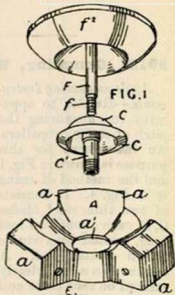
**6383. Bosshardt, F.**, [Hahn, A. F.]. May 2.



*Levels; clinometers.*—Relates to a combined level and clinometer for general use. A wooden block a carries, in a central cavity covered by a glass F, a free pendulum which keeps an index-finger B always vertical, so that inclinations can be read off on a graduated dial behind it.

**6459. Johnson, W. D.** May 3.

*Tripod stands for surveying-instruments, cameras, &c.* The table I has a plate H which screws on to a head having a convex surface  $f^2$ , resting on the concave surface A of a fixed plate with lugs a to which the legs B are jointed, a central spindle F with thread f working in a tube C' projecting from the



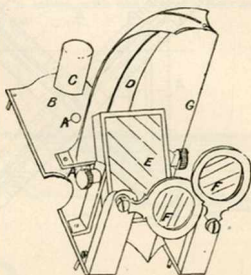
cup C and receiving another cup E. The edges e, c of the cups E, C are caused to grip the plate A by a winged nut D. When the table is levelled,

the aperture *a* allowing sufficient play for the spindle *F* and tube *C*, the parts *C*, *E* are made to clamp the fixed plate *A*, and the head, with its spindle *F*, then gives a horizontal rotary adjustment quite independent of the levelling-arrangement. The spindle *F* may be clamped by the winged nut *G*.

**6489. Reynolds, F. S., and Reynolds, A. W.,** [trading as Reynolds & Son]. May 3.

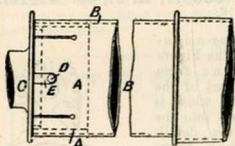
*Compasses, magnetic,* determining errors of. The apparatus is placed on the glass cover of the compass, a brass fitting at the centre of which is passed through one of a series of holes *A* pierced in the base-plate *B* along its central line; movable weights *C* are employed to balance the instrument and get a true level. On the base-plate are mounted a slotted curved sight-vane *D*, a mirror *E*, and shades *F*, *F* pivoted so that they can be brought into use or turned back as desired. A vertical thread *G* runs from the point of the sight-vane to the point of the base-plate. To take an observation, the apparatus is turned on its axis, and the mirror so adjusted by the milled heads on

its spindle that the observer sees the reflection of the object (through the slot in the sight-vane) cut by the thread *G*, and brought to bear upon the



points of the compass card; the magnetic bearing can then be read off at once, to be compared with the known azimuth of the object.

**6539. Caulfeild, F. St. G.** May 4.



*Surveying - instruments; levels.* — Consists in attaching the collimating diaphragm, cross-lines, &c. used in surveying and levelling instruments to an independent tube *A*, which slides into the inner sliding tubing *B* holding the eye-piece *C*. The tube is gripped by the slotted mouth of the tube *B*, and is retained in accurate position by studs *D* fitting slots *E* in *B*. The tube *A*, with its attachments, can thus readily be inverted by partially withdrawing it from *B* till the studs are clear of the slots, and then turning it round.

**6730. Himly, M., Leiser, F., and Bardtholdt, J.** May 8.

*Hygroscope.* — Objects endowed with the property of changing their colour when subjected to damp &c. are produced by coating, painting, or impregnating with a solution of magnesium platino - cyanide in any suitable medium. Artificial flowers, cards, or pictures may be thus treated, or the solution may be

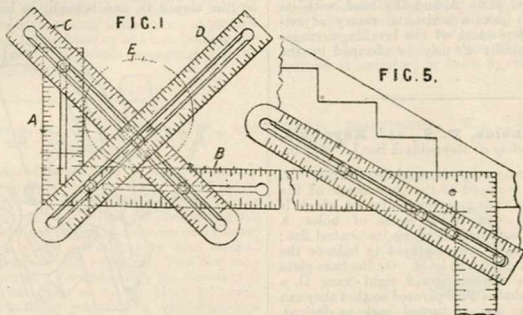
employed as a sympathetic ink. The objects preserve their original colours until breathed on or otherwise damped, when they will temporarily assume a pink or red colour, or a colour partaking of these tints.

**6741. Klif, J.** May 7.

*Squares* for carpenters' and builders' use. The object of the invention is to facilitate the setting-out of mortises and stair-stringers, finding the centre of circles, setting out radial lines, ascertaining the heights of buildings, the lengths of rafters, braces, and the like, &c. The square *A*, *B* has its two arms slotted down the centre and graduated with convenient scales. Two scales *C*, *D*, also slotted and graduated, are used in combination, the parts being fixed in the required positions by screw studs. In Fig. 1 the instrument is arranged for finding the centre of the plate *E*, the scale *D* being fixed so as to bisect the right-angle of the square with one edge, and *C* at right-angles to *D*. In Fig. 5 one only of the scales is used, being fixed across the square, as shown, so as to set off stair-stringers. When drawing radial lines of a circle &c., the square is dispensed with, and a slotted cross-piece is fixed by a stud at right-angles to one of the scales. On this cross-piece two slotted arms are fastened at equal distances from one edge of the scale, projecting equally so as to lie against the circumference of the circle. A somewhat similar combination may be used as a T-square.

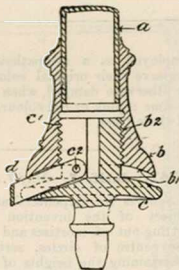
(For Drawing see next page.)

6741.


**6780. Deans, J. W.** May 9.

*Tripod stands.*—

Relates to tubular telescopic stands. The stem is tubular and forms a casing for the feet. The outer tube *a* has at its lower end a boss *b*, internally screw-threaded at *b'* and with its under side *b''* dished. The three feet *d* are jointed by pins *c'* in grooves in a screwed plug *c*, *c'* which fits the boss *b*. When in use, the plug is screwed home, pressing the feet *d* against the dished part *b''* holding them in position; when not in use the feet *d* are turned up and passed, their outer ends first, into the tube *a* and the plug again screwed home.


**6907. Thompson, W. P.,** [Lebret, A. E.].  
 May 11. *Drawings to Specification.*

*Barometers; hygrometers; weather indicators.*—The dials of barometers, hygrometers (of the Saussure type), and other weather-prognosticating instruments are made to turn instead of the index-hands, and are coloured so as to supply the sky to a landscape screen in front. The sky varies in shade according to the weather. The dial has also a series of pictures appropriate to the words "fair," "stormy," &c. The material of the dial is preferably mica or something equally light. Barometer and hygrometer dials of different sizes are sometimes mounted upon the same spindle so that the

indications of both appear together and correct each other. The hygrometer dial may be coated with a substance which changes colour according to the humidity of the atmosphere.

**7122. Cooper, A. J., and Wigzell, E. E.**  
 May 16.

*Sounding-apparatus.*—

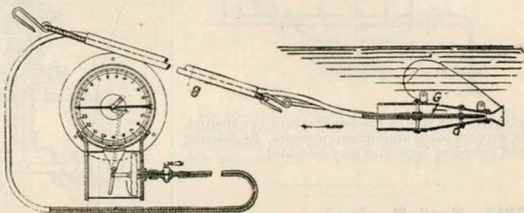
The Figure shows one form of the part of the apparatus which is let down into the water, the details of other forms being varied, but maintaining the same principle. A Bourdon tube *A*, as it straightens out under pressure, works the wheel *B* by means of intermediate gearing *C*. The teeth of this wheel are insulators, but have a conducting substance let into them, so that the circuit of a battery on board the ship is made and broken by the contact-spring *D* as it slips over the teeth, and the depth-registering hand is moved over the dial of the indicator by means



of an electric escapement. The conducting-wires E, F are combined with the sounding-line, which is paid out from the ship by a special drum constructed so as to ensure perfect electric contact during the operation. G, G are spring sand grippers for bringing up a sample of the bottom, and a trigger arrangement H is provided which breaks the electric circuit when the grippers close on the instrument striking the bottom; when this takes place, a tablet, with the words "Reached the bottom" thereon, is raised behind a window in the indicating-dial.

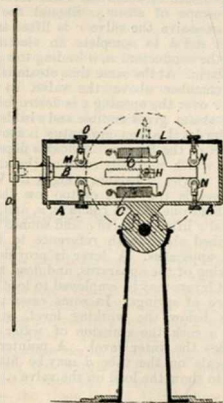
**7132. Michel, J.** Aug. 16.

*Logs.*—Two concentric tubes G, the outer cylindrical in front but conical behind, and the inner of uniform bore, are drawn through the water with the vessel, being either attached to its hull or towed by a line. The inner tube is connected by a flexible tube with an aneroid gauge. The passage of the water through the contracted space between the two tubes creates a partial vacuum in the gauge depending on the speed, which is consequently shown on the dial. The vacuum-producer is prevented from rotating by flat vertical and horizontal fins. When the apparatus is attached to the vessel's side, the effect which the varying pressure (due to greater or less immersion in pitching and rolling) has upon the vacuum is balanced by a second aneroid chamber which communicates with the water at the same place as the vacuum-producer. The diagrams of the two chambers are connected by a link to the centre of which one end of the lever which operates the index-finger is jointed. It is stated that, in order to render the action of the pointer more sensitive, a very small orifice, preferably in a cock, is formed for the admission of air into the vacuum tube.



measured. Within the case A a bar B is mounted so as to be capable of longitudinal motion. The rear of the bar is attached to springs C, and in front it projects from the case and carries a disc D at right-angles. A toothed slot in the centre of the bar engages a pinion H on the arbor of a pointer I which moves over a graduated dial L. This dial has several circles of graduation corresponding with different sized discs D. The case A has universal adjustment in order that the disc D may be presented normally to the wind. As shown, adjustable rollers M, N support the bar B; but in a modified apparatus the rollers are replaced by sectors; or the bar may slide in a tube containing a spring.

**7182. Walters, W. M.** May 17.



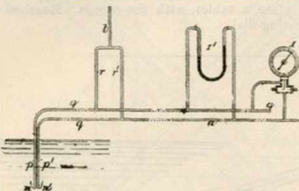
Anemometers.—The pressure of the wind is

measured. Within the case A a bar B is mounted so as to be capable of longitudinal motion. The rear of the bar is attached to springs C, and in front it projects from the case and carries a disc D at right-angles. A toothed slot in the centre of the bar engages a pinion H on the arbor of a pointer I which moves over a graduated dial L. This dial has several circles of graduation corresponding with different sized discs D. The case A has universal adjustment in order that the disc D may be presented normally to the wind. As shown, adjustable rollers M, N support the bar B; but in a modified apparatus the rollers are replaced by sectors; or the bar may slide in a tube containing a spring.

**7469. Capito, C. A. A.,** [Prytz, P. K., and Rung, G. A.]. May 23.

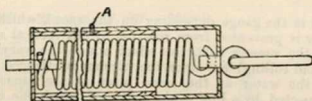
*Logs; current meters.*—The tubes  $p, p^1$ , with their ends  $m, m^1$  bent respectively against and with the current, are connected to tubes  $q, q^1$  which in turn communicate by branch tubes with pressure gauges P, I. Two other branch tubes  $r, r^1$  are provided, uniting into a common pipe  $t$  through which air is forced so as to bubble slowly out of the ends of the tubes  $p, p^1$ . A difference of pressure is thus set up in the tubes  $q, q^1$ , which is shown on the scales of the pressure gauges

graduated in any convenient manner according to the application. In a modification, one pipe only may be used and one leg of the mercurial pressure



gauge, or one side of the diaphragm of the aneroid, be exposed to the atmospheric pressure. Registering and recording apparatus may be added.

**7914. Rood, R. June 1.**

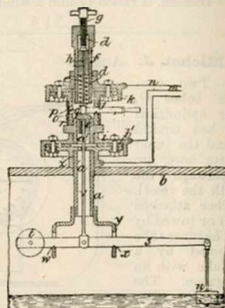


*Logs; current meters.*—Relates to a log for registering the speed of vessels, which can also be used for measuring the speed of currents. A pair of telescopic tubes, connected internally by a helical or other spring as shown in the Figure, can be fixed at one end aboard the ship, the other end having attached to it a line and plummet which is thrown overboard. The elongation of the tubes caused by the water pressure on the plummet is observed by means of a pointer *A* moving on a scale of knots or miles on the outer tube, which shows the corresponding speed.

**7986. Bailey, M. June 2.**

*Sounding-apparatus.*—Relates to pressure &c. alarms for use with any apparatus working under pressure, such as steam boilers, sounding-apparatus, &c. When the pressure exceeds a given limit a weighted piston or valve is raised so as to complete an electric-alarm circuit, and at the same time to admit steam or other fluid under pressure to a chamber from which it escapes to give an alarm, by breaking a disc of fragile material which covers a hole in the side of the chamber. An alarm is also given in a similar way, when the water level is too high or too low, by a float which raises the above-mentioned piston or valve. In place of this latter alarm a test cock may be placed in the side of the chamber so that by opening it the emission of water or steam determines the liquid level. A vertical section of a convenient form of the apparatus, as applied to a steam boiler, is shown

in the Figure. An open tube *a* has screwed on its upper end a flange *e* to which is bolted a flange *i* in such a way that it is electrically insulated from it. Into this second flange *i* is screwed a length of

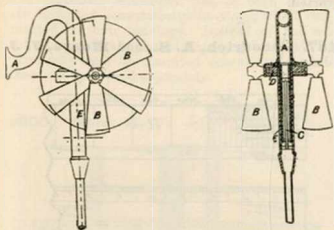


tube *a*, on the upper end of which is seated a valve *c* loaded by a spring *e* which abuts against a piston *f*, of which the position in a tube *d* can be altered by a screw *g* to determine the pressure on the valve. The tube *d* is screwed into a flange *k* bolted to, but insulated from, a flanged tube *j* screwed into the length of tube *a*. In the side of the tube *j* is an opening *q* closed by the cylinder of fragile material *r*. This is surrounded by an outer cylinder *o* in which is a hole *p* which is placed opposite *q* when it is desired that a warning of over-pressure or abnormal water level be given by the escape of steam. Should the pressure become excessive the valve *c* is lifted and comes against a rod *h* to complete an electric circuit through the conductors *m, n* leading to a generator and an alarm. At the same time steam is admitted to the chamber above the valve, so that the cylinder *r* over the opening *q* is destroyed, and the escaping steam gives audible and visible warning. The water-level alarm apparatus is shown in the lower part of the Figure. A float *u* depends from a lever *s* which normally rests on the knife edges *v, x* and carries a balance weight *t*. When the water level is too high or too low the lever *s* swings about one of the fulcra *w, x*, and by means of the rod *e* lifts the valve *c* and sounds the alarm as described above with reference to the high-pressure apparatus. A lever is provided to test the working of the apparatus, and dead weights or weighted levers may be employed to load the valve *c* in place of springs. In some cases the tube *a* descends below the working level, so that on opening a cock the emission of water or steam determines the water level. A pointer working over a scale on the tube *d* may be fitted to the piston *f* to show the load on the valve *c*.

8013. **Pass, E. de**, [*Rougeot, P.*]. June 3.  
*Drawings to Specification.*

*Thermometers* combined with feeding-bottles. The feeding-bottle is provided with a shoulder through which the thermometer passes, being cemented in position so that the graduations may be read from the outside.

8600. **Gordon, J.** June 15.

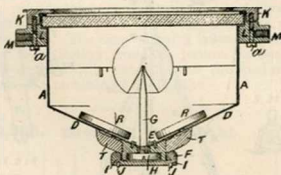


*Anemometers.*—Relates to improvements on the invention described in Specification No. 8920, A.D. 1886. The instrument consists of an open-mouthed tube leading to spring-controlled bellows which work the indicator &c.; the present invention relates to the method of keeping the mouth of the tube turned to the wind. The end of the open-mouthed tube A carries bearings for the spindle of two vanes B, B and swivels about the pointed rod C. The vane spindle has a worm formed thereon gearing with a worm-wheel D rigidly attached to the fixed part E of the air tube. In case of a change of wind the vanes rotate, and the worm on their spindle, engaging with the fixed worm-wheel, turns the head of the apparatus till the vanes again present their edges to the wind, and, in so doing, move the mouth of the tube to the required direction. A momentary change of wind has no influence on the apparatus, as the gearing requires time to act.

8714. **Reynolds, W. J.** June 16.

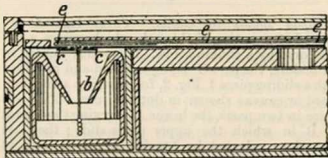
*Compasses, magnetic.*—The bowl A of a liquid compass is formed from copper or the like by the spinning process in the shape shown with a flange and lip at the top. On the coned bottom is fixed a ferrule F by means of the screw centre G, the head H being covered by a screw cap I with india-rubber cushion J. The rubber acts as a guard, while the compass can be filled through the hole E on removing the ferrule and screw centre. The glass is fitted into the flange of the bowl, and secured by the rings K and L, which are drawn together by screws a; on the ring L are the gimbals M, while between K and the glass is a packing

of tinfoil and india-rubber. To allow of expansion in the liquid by heat, two collapsible vessels R, R are provided with air passages leading into a hollow



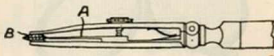
in the balancing weight T. In transparent compasses the coned bottom is dispensed with, the card centre being fixed to a cross-bar, and the bottom glass plate attached in a like manner to the top.

8754. **Ready, A. J.** June 17.



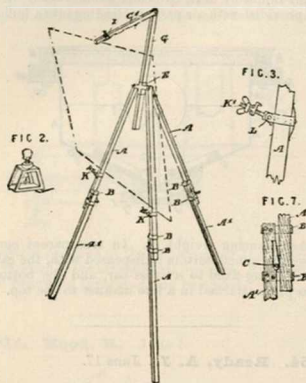
*Colours, testing.*—A liquid is allowed to travel along a bibulous strip under capillary action. The liquid is drawn up from a reservoir by a wick b hanging from a button c. The absorbent strip is laid along a lath e and turned underneath it at the end so as to touch the wick on the button. In modifications, the liquid rises up a vertical strip or radiates from a centre. Coloured liquids may be compared as they advance along parallel strips of paper.

8985. **Stanley, W. F.** June 24.



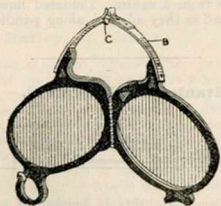
*Dotting-pens.*—Consists in employing an intermediate nib A (or two or more intermediate nibs for broad dotted lines) to increase the capillary attraction for the ink, and ensure a better supply to the rowel wheel B.

8998. Cross, A. K. June 24.



*Tripod stands for easels.* Three legs A are pivoted to a casting E through which passes a rod G secured by a thumb-screw. This rod is jointed in the middle, the part G<sup>1</sup> being notched and provided with a sliding piece I, Fig. 2, for securing a drawing-board or canvas shown in dotted lines. The legs A are in two parts, the lower A<sup>1</sup> carrying two bands B, B in which the upper parts slide; they are secured or released by turning a pin C, oval in section, Fig. 7. The canvas is supported on pieces K, Fig. 3, which are adjustable and secured by the pins K<sup>1</sup>. Each pin is pivoted as shown at L; hence, the heavier the canvas, the tighter the grip.

9202. Thompson, W. P., [Taylor, C. W.].  
June 28.



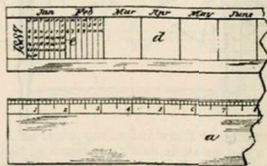
*Eyeglasses.*—To prevent undue strain when folded, the connecting-spring B of a pince-nez is knuckle-jointed in the middle, the hinge-pin C being parallel to the focal axis of the lenses.

9454. Stanley, W. F. July 4.



*Spectacles.*—The object is to obtain strength of frame while making the upper edge invisible. For this purpose the upper half of the eye-frame is plain cylindrical or semi-cylindrical wire sunk in the glass, the lower half being of the usual hollow section frame wire. Or the arrangement may be inverted.

9487. Goodrich, A. S., and Moore, J. J.  
July 5.

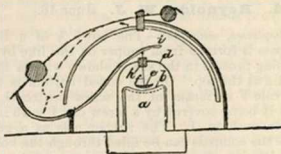


*Rulers combined with calendars.* On the lower face of the graduated ruler a is formed a shallow channel d with grooves at the side, into which a cardboard calendar strip e is slipped, so that it may be withdrawn for changing when necessary; the names of the months may be marked on the ruler itself.

9520. Weeksler, B., and Becker, M. I.  
July 5. *Drawings to Specification.*

*Compasses, magnetic, combined with calendars.* Relates to rotary dial apparatus for determining the day of the week on any date, which may be combined with a compass or other article.

9801. Boulton, A. J., [Fischer, J. M.].  
July 12.



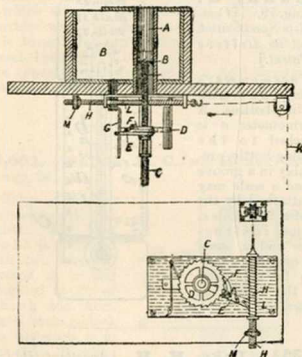
*Thermometers.*—A flexible air-vessel a, with concave or undulating top, is covered by a thin metal or (for low temperatures) vulcanite casing b, which,

as the air expands under an increasing temperature, raises the disc *e*. To *e* is attached a rod *f* passing through a guide *h* in the bell cover *d*, and so operating the lever *i*, which is arranged to release the hammer of an alarm bell at a certain desired temperature. In a modification, the movement of the rod *f* may complete the circuit of an electric alarm bell.

**9814. Douglas-Hamilton, A. H.** July 12.

*Stereoscopes; telescopes.*—In order to adjust the distance between the optic axes in stereoscopes and binocular telescopes, one or both the tubes are mounted eccentrically in rings, which can be rotated in their bearings. Instead of the whole tube being thus mounted, the eye-piece and object glass may each be mounted eccentrically, so that they can be turned separately.

**9900. Dale, H. F.** July 14.



*Microtomes.*—The substance to be sliced is pushed up from the vertical tube A, surrounded by the freezing-chamber B, by the screw spindle C on which is fixed a ratchet-wheel D. An arm E, loose on this spindle, carries the actuating-pawl F, and is vibrated by a depending wire G on the reciprocating rod H, worked by a treadle through the connected cord K. The rod H is controlled in its motion by the coiled spring, and its play is limited by the adjustable nut M, so that for each stroke of the treadle the screw may be raised the exact distance required. By this arrangement both hands are left free to manipulate the cutting-razor &c.

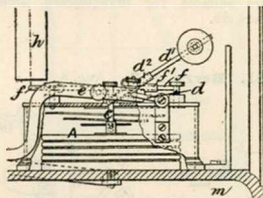
**10,502. Game, J. A., and Afalo, M.** July 28. *Drawings to Specification.*

*Rulers.*—According to the Provisional Specification rulers are formed with an envelope or sheath of absorbent material to act as a blotting-appliance.

**10,527. Chamberlin, F.** [Chamberlin] July 29. *Drawings to Specification.*

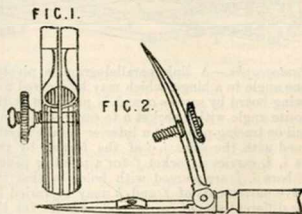
*Sounding-apparatus.*—Relates to means for ascertaining the depth of water by means of sound. In an open-bottomed chamber near the bow some audible signal is made by blowing a whistle, ringing a bell, &c. The time elapsing between this signal and its reflection from the bottom, as heard in a bell-mouthed tube extending to the keel near the stern, is a measure of the depth.

**10,595. Hicks, J. J.** July 30.



*Anemometer.*—The pressure chamber A is constructed in bellows fashion of a series of corrugated discs united at the rims and at central holes. A crank *d* carrying an adjustable loaded lever *d'* in a sleeve *d''* receives the movements of the pressure chamber through a link *c* jointed to *d'* and imparts them through arms *e* and *f* to a recording-pencil and an index-finger respectively. The record is made on a drum divided into hours only, and is read by a separate scale. The index is actuated by a cord *h* from the arm *f* in opposition to a spiral spring. The arm *f* is adjustable in a sleeve *f'* like the lever *d'*. The frame and case *m* is made of cast iron so as not to warp. The corrugated bellows chamber may be used with any other recording and indicating mechanism.

**10,712. Mileson, H. G.** Aug. 4.



*Mathematical drawing-instruments.*—Relates to means for preventing the loss of adjusting nuts and screws. In Fig. 1 the end of a stud is shown enlarged, and Fig. 2 shows a screw with a small

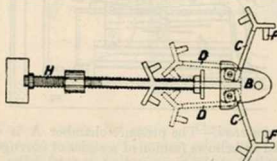


collar secured to it, inside one limb of a ruling-pen, to prevent its withdrawal and to dispense with a spring for opening the pen. The above devices may be modified to adapt them to screws or studs for various purposes.

**10,744. Eyre, G. E. B., and Spottiswoode, W. H.** Aug. 4.

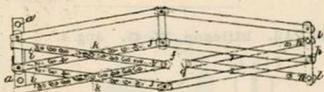
*Parallel rulers.*—The connecting links are internal and so hidden when the rule is closed; the rule may be graduated for use as a scale or measure suitable for draughtsmen, architects, engineers, &c.

**10,841. Berry, J. L.** Aug. 8.



*Tripod stands.*—Relates to folding tripod tops, which may be combined with clamps, for use with photographic cameras. Two of the arms C, C of the tripod top are hinged at the centre and fold up into the position D, D. The usual studs F, F are furnished for attaching the tripod legs. To form a clamp, one of the limbs C of the top is prolonged and bent down, the end forming a nut for the screw H.

**11,032. Reid, J.** Aug. 12.



*Pantographs.*—A link parallelogram is pivoted at one angle to a hinge, which may be secured to a drawing-board by screws *a*, and is provided at the opposite angle with a socket *h* to carry a copying-pencil or tracing-point. An interior parallelogram, formed with the sides *j, j* of the former by two links *i, i*, carries a socket *f* for a point or pencil. The bars *i, j* are pierced with holes so that the relative movements of *f* and *h* may be varied by using different sets of corresponding holes for the joint pins *k*. The numbers marked against the holes show the scale of inches to the foot (reduction or enlargement) which will be obtained by using the tracing-point in *h* and copying-pencil in *f* or *vice versa*. For making an equal-sized copy a

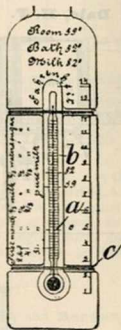
holder *g* is used instead of the holder *f*. It is carried at the junction of rods *n* which are fastened at *l* to a cross-strip that is kept parallel to itself by links parallel to two sides of the parallelogram. Heavy cylinders are provided for weighting the pencil.

**11,317. Simpson, W. S.** Aug. 18. *Drawings to Specification.*

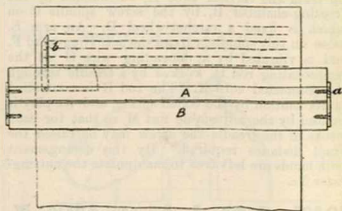
*Kaleidoscopes; stereoscopes.*—Relates to a coin-freed apparatus for exhibiting kaleidoscopic or stereoscopic effects. The coin falls on a tipping-lever and completes an electric circuit through a lamp or turns on a gas light in order to illuminate the designs, views, &c.

**11,320. Hartmann, G.**  
Aug. 19. [*Complete Specification but no Letters Patent.*]

*Thermometers combined with feeding-bottles.* A thermometer *a* is attached to the feeding-bottle, preferably in a groove *b*, and a scale may be attached by the elastic &c. bands *c*. Various instructions and a scale for quantities may also be impressed on the bottle as shown.



**11,362. Lake, H. H.,** [*Aquetant, B. L.*].  
Aug. 19.



*Parallel rulers.*—The straight-edge *A* is attached by links *a* at the ends to a roller *B*, and has a pivoted gauge *b* to measure the distances between the lines.