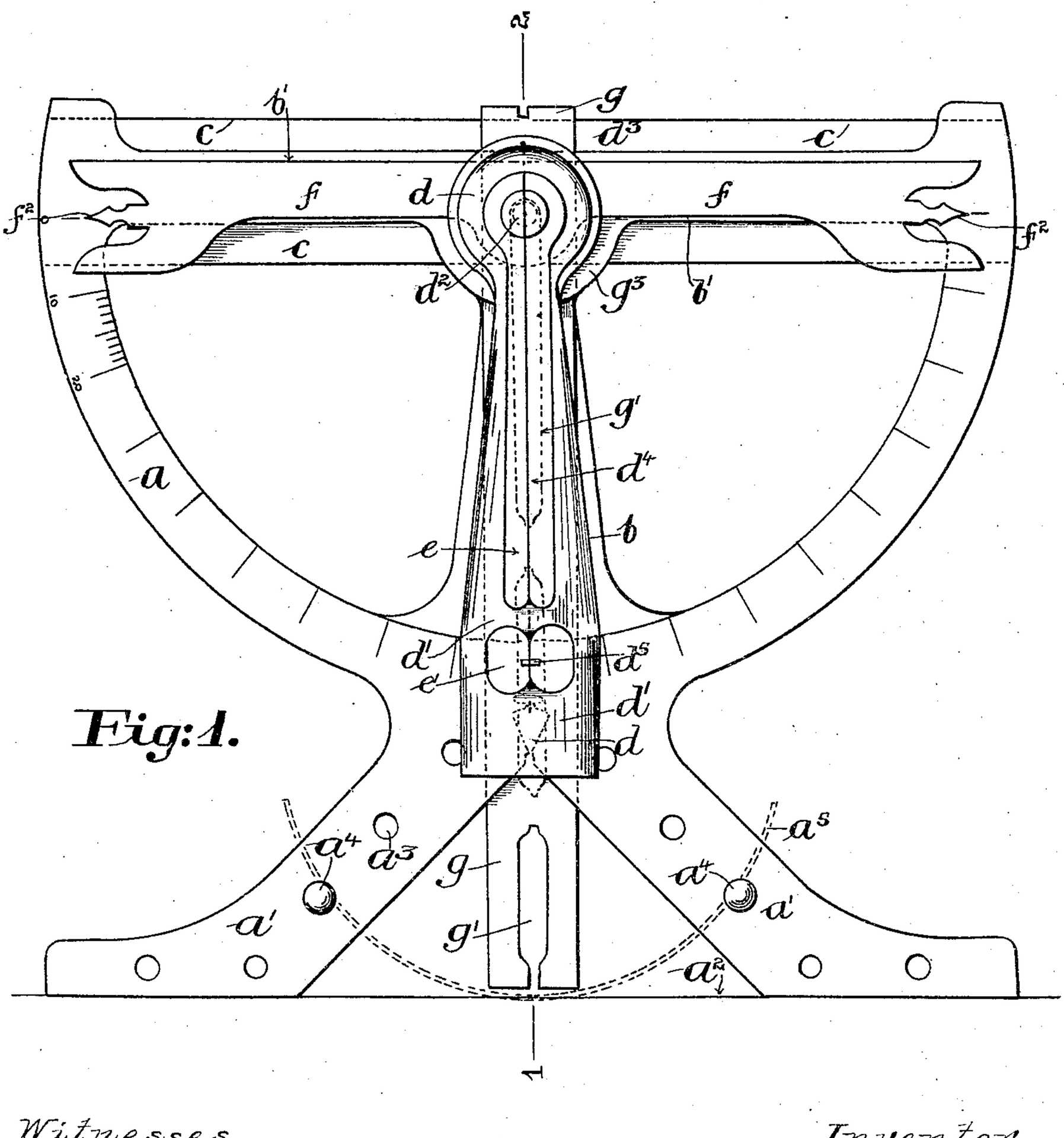
No. 765,858. PATENTED JULY 26, 1904.

D. RICONO.

LEVEL.

APPLICATION FILED NOV. 13, 1903.

NO MODEL. 3 SHEETS—SHEET 1.



Witnesses.
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NO MODEL. 3 SHEETS—SHEET 2.

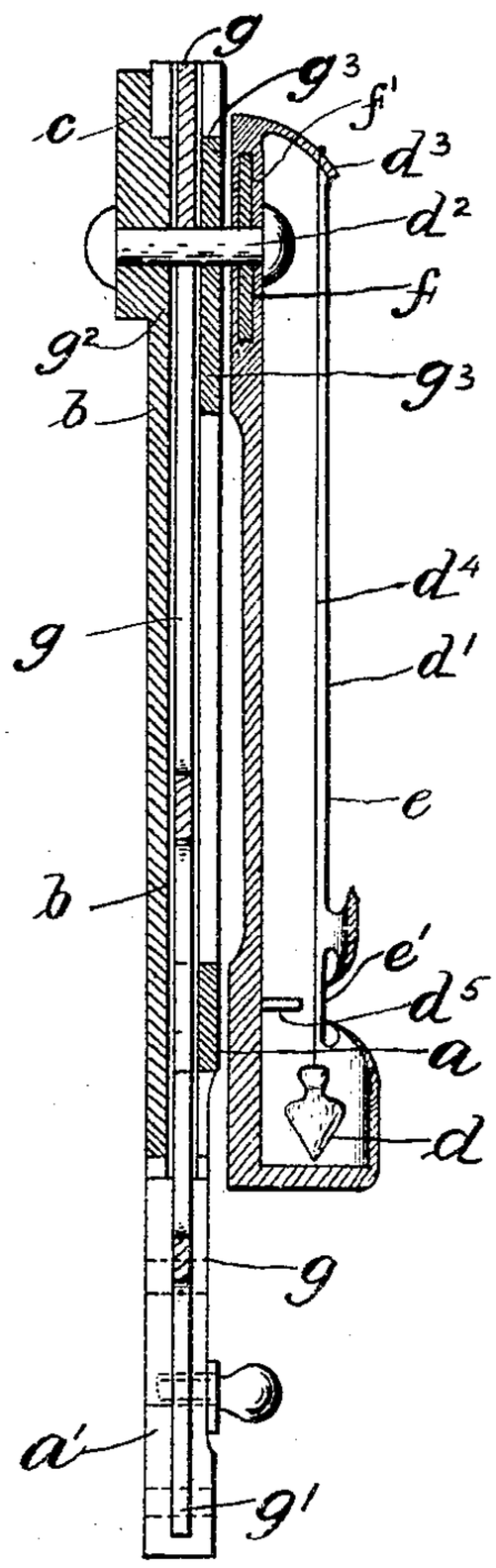

Fig: 2.

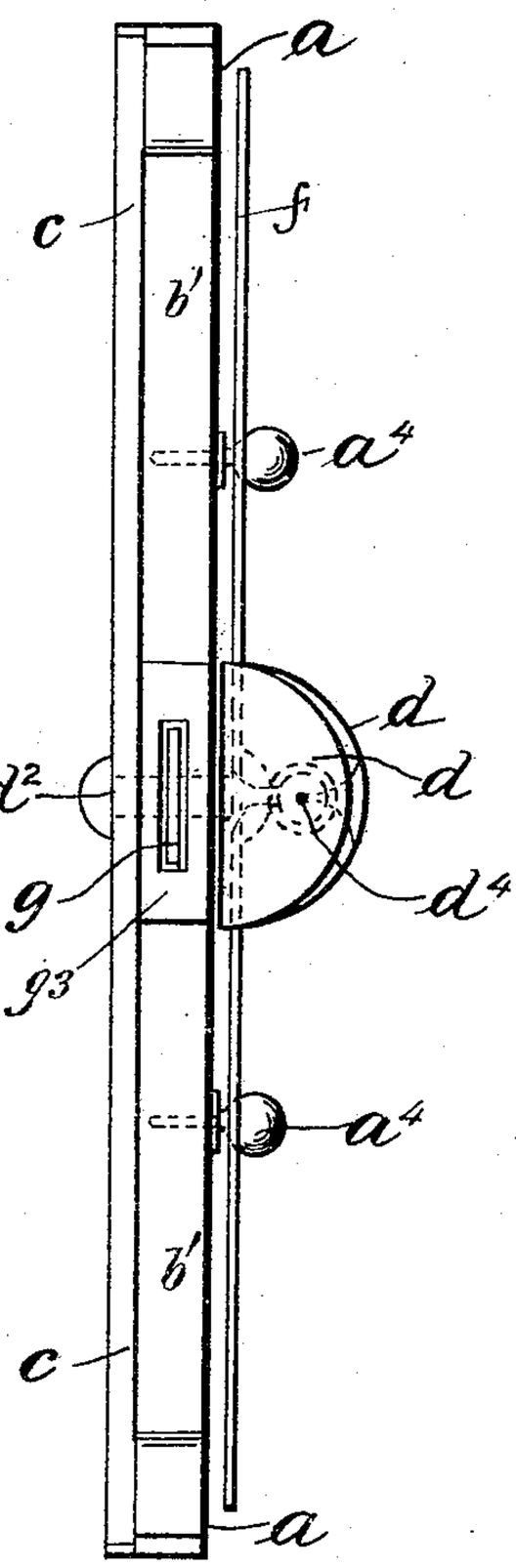

Fig: 3.

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APPLICATION FILED NOV. 13, 1903.

NO MODEL. 3 SHEETS—SHEET 3.

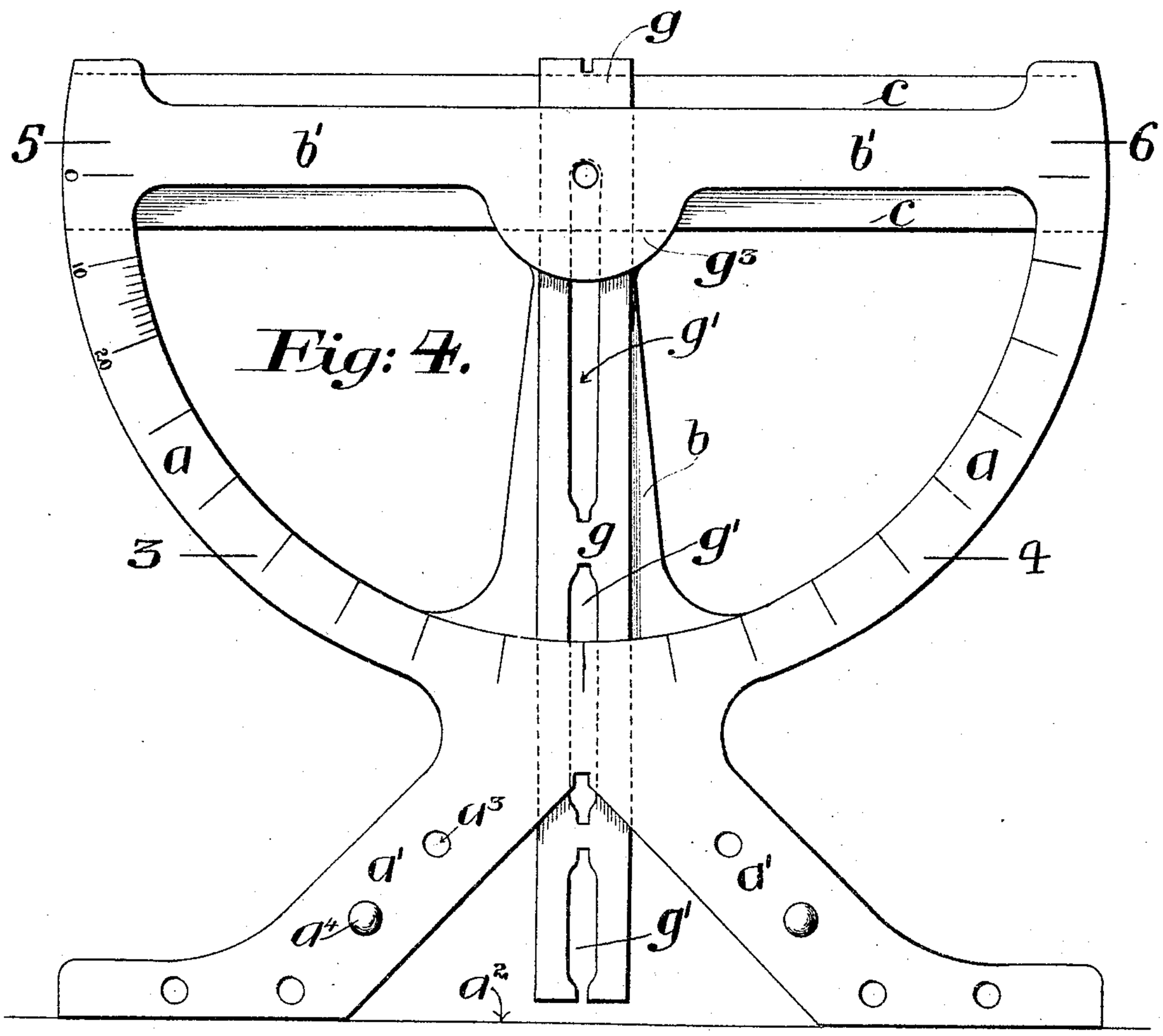

Fig: 4.

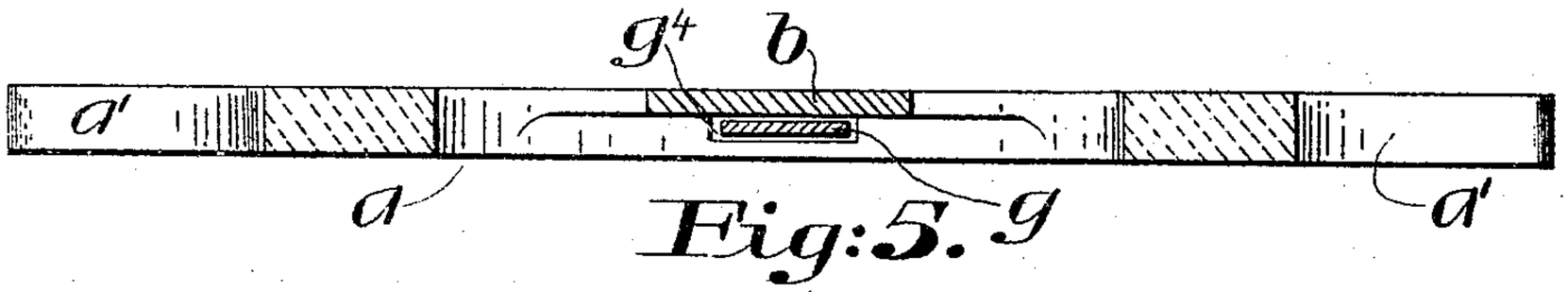

Fig: 5.

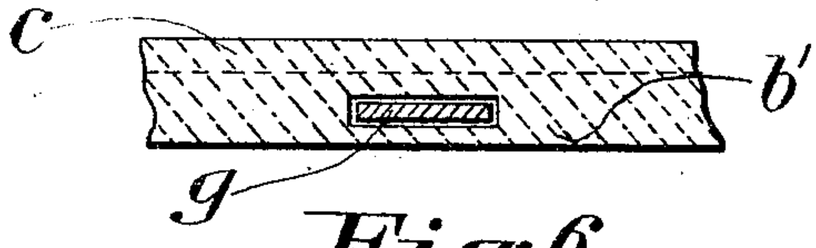

Fig: 6

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No. 765,858. Patented July 26, 1904.

UNITED STATES PATENT OFFICE.

DOMENICO RICONO, OF FREMANTLE, WESTERN AUSTRALIA, AUSTRALIA.

LEVEL.

SPECIFICATION forming part of Letters Patent No. 765,858, dated July 26, 1904.

Application filed November 13, 1903. Serial No. 181,073. (No model.)

To all whom it may concern:

Be it known that I, DOMENICO RICONO, a subject of His Majesty King Edward the Seventh of Great Britain, residing at Fremantle, in the State of Western Australia, Australia, have invented certain new and useful Improvements in Levels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention, as its title implies, is a combination instrument, and has been designed for manifold uses and purposes in connection with the setting out and arrangement of constructional operations incidental to building and engineering.

Among the manifold uses and purposes for which this instrument may be employed the following may be mentioned as illustrative of same, such as leveling, protracting or dividing circumferences and peripheries of objects into degrees or parts, ascertaining the angle of embankments or walls, setting valves and setting eccentric sheaves on their shafts, setting boilers and girders in position, truing up shafting, and all other analogous constructional operations.

The instrument consists of a combined level protractor and clinometer, and owing to the use of a pivot it is rendered what is technically known as "universal" in its use and application.

In order that the construction of the instrument may be clearly understood, reference will now be made to the attached drawings.

In the drawings, Figure 1 is a front face view, Fig. 2 being a sectional elevation on line 1 2 of Fig. 1, while Fig. 3 is a top plan view. Fig. 4 is an elevation of the dial with the index-arm and plumb-bob box removed. Fig. 5 is a section on line 3 4 of Fig. 4. Fig. 6 is a partial section on line 5 6 of Fig. 4.

In such figures the protractor is made of a semicircular form, having the dial-face a, which is divided off into parts or degrees, as shown. This dial may be made one with legs a', which are placed at true right angles to each other, while their base-line, as a^2, forms a datum-line of the instrument as a whole. These legs are formed with holes, as a^3, to receive the pins a^4, which act as stops for the curved spring-band a^5, whose object is to hold or grip the instrument in position when in use on a shaft or round object. This is accomplished by allowing one end of the spring to rest against one of the stops and passing the other end around the shaft and allowing it to rest on the other pin, the inherent resiliency possessed by the spring-band holding the instrument sufficiently tight in position by pressing against the shaft and the pins a^4.

The protractor is provided or made one with the upright back-plate b and with the horizontal stay-plate b'. These plates render the protractor rigid and self-contained. This back-plate b is set back from the dial, so as to allow of clearance for the free working of the case holding the plumb-bob.

The instrument is further provided with a transverse ledge-piece, as c, by which means the instrument may be hung, as, say, from the top of a wall or other flat surface, and the upper and lower faces of this bar c act as further working or datum lines for the instrument.

The plumb-bob, as d, is housed within its box d', so as to avoid disturbance by wind, and this box is suspended on the pivot d^2. The bob is suspended from the roof d^3 by the thread d^4, which rests against the notched projections, as d^5. In the box are formed openings, as e and e', for sighting the thread and bob.

The true level-bar, as f, is rigidly secured to and let into the hub f' of the box d' and at a true rectangular position to that of the line of the plumb-box and vibrates in unison with the plumb-box. This level-bar is formed at each end with the indicator or needle f^2.

The instrument is further provided with the sliding bar g, which is arranged so as to move at true right angles to the base-line a^2. This bar is formed with slots g' for purposes of taking sight and also to allow the bar in its movement to pass free of the pivot d^2. This bar is held and guided between the boss g^2 of

the back-plate b and the boss g^3 of the stay-plate b', while at a lower position it is guided in and by the slotted recess g^4, formed in the dial of the protractor.

The various and apparent uses of this instrument will readily suggest themselves, and the following descriptions of same may be read in an illustrative and not exhaustive manner.

Assume that it be desired to use the instrument as a clinometer, so as to ascertain the dip or angle of an embankment, in which case the instrument is placed against same on its datum-line a^2, whereupon the plumb-bob d and level f will respectively remain at the true vertical and true horizontal positions, and by means of the needle f^2 the degree of incline is indicated and easily read.

Again, assume that it is required that the circumference of a shaft or tube is to be divided off at, say, twenty degrees, in which case the instrument is placed by its legs a' on the tube and is freely held by the hand a^5. The true vertical or starting point is given by the plumb-bob and marked off by the center slot g' of the bar g. The instrument is then moved down until the indicator-needle points to twenty degrees, whereupon the corresponding degrees are marked off on the tube, as shown by the point given by the slot g' of the bar, as above mentioned. The instrument is moved around until all the required points are marked off and in agreement with and as shown by the needle-bar.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an instrument such as described, a dial having legs whose lower edges are parallel to the zero-line of the dial, a plumb-bob box pivoted at one end to the center of the dial, an index-arm rigidly connected to the plumb-bob box, a plumb-bob suspended in the box and a bar vertically slidable behind the dial, substantially as described.

2. In an instrument such as described, a dial, legs therefor, a transverse piece by which the instrument may be hung, said transverse piece and the lower surface of the legs being parallel to the zero-line of the instrument, an index-arm and plumb-bob box secured at right angles to one another and pivoted to the dial and a plumb-bob hung in said box, substantially as described.

3. In an instrument such as described, a dial having legs at right angles to one another, a transverse piece on the back of the dial, said transverse piece and bottom surfaces of the legs being parallel to the zero-line of the dial, an index-hand and a plumb-bob box pivoted to the dial, a plumb-bob hung in said box and visible through a vertical opening therein, pins in said legs and a spring-metal strip resting on the pins and adapted to hold the instrument to a round body placed in the angle between the legs, substantially as described.

4. In an instrument such as described, a dial having legs at right angles to each other, a ledge on the back of the dial from which the instrument may be suspended, a bar vertically slidable back of the dial and pivoted means to indicate on the dial, substantially as described.

5. In an instrument such as described, a dial having legs at right angles to each other and having holes therein, in combination with removable pins adapted to be placed in the holes, pivoted means to indicate on the dial and a spring to be sprung over said pins and under a round body to be held in the angle between the legs, substantially as described.

6. In an instrument such as described, a dial, an index-arm and plumb-bob box fixed at right angles and pivoted at the center of the dial, a ledge on the back of the dial, a vertical bar slidable on the pivot back of the dial, a plumb-bob hung in said box and visible through a longitudinal opening therein, and resilient adjustable means to secure the instrument to a round body when desired, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

DOMENICO RICONO.

Witnesses:
JAS. H. HAYES,
FRED. WALTHAM.