

No. 709,990.

Patented Sept. 30, 1902.

G. W. LINGLE.  
LEVEL, PLUMB, AND INCLINOMETER.

(Application filed Dec. 20, 1901.)

(No Model.)

2 Sheets—Sheet 1.

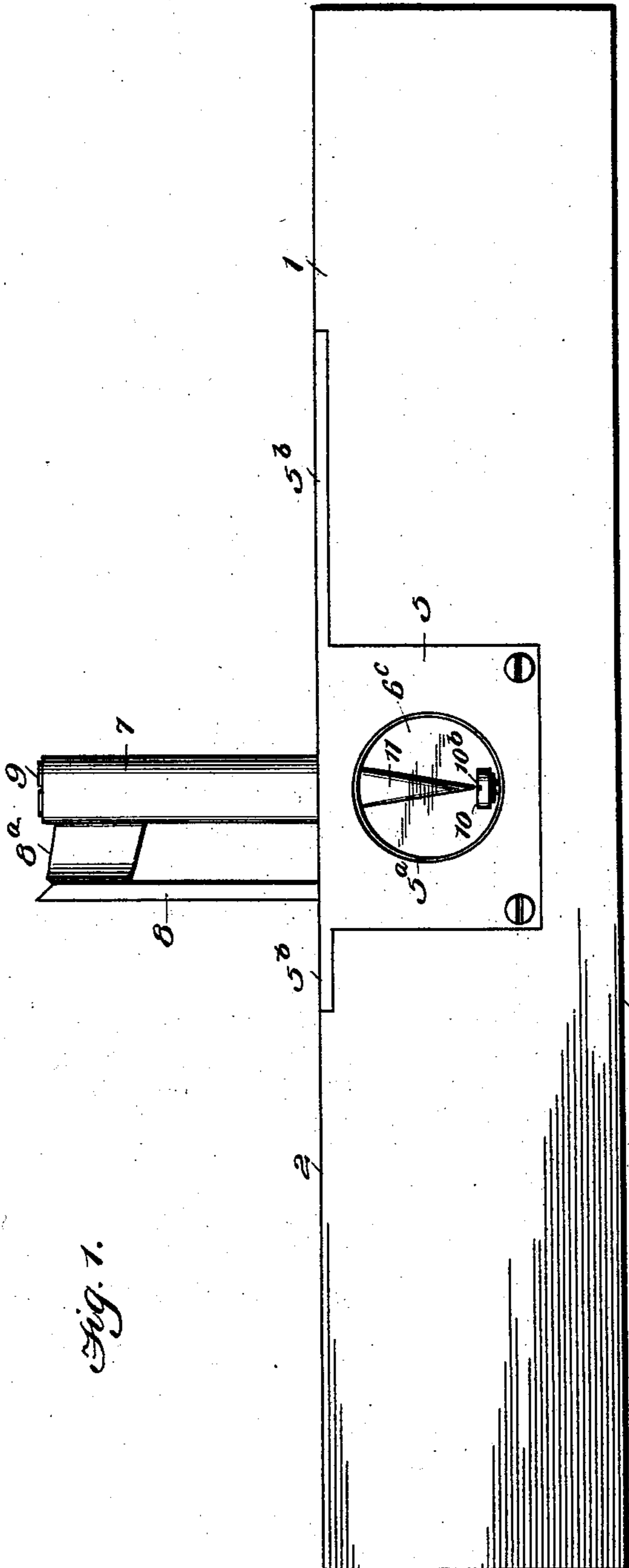


Fig. 1.

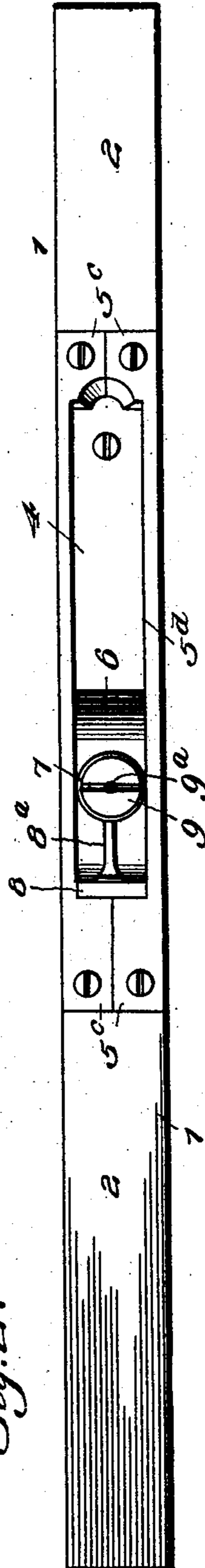


Fig. 2.

Witnesses

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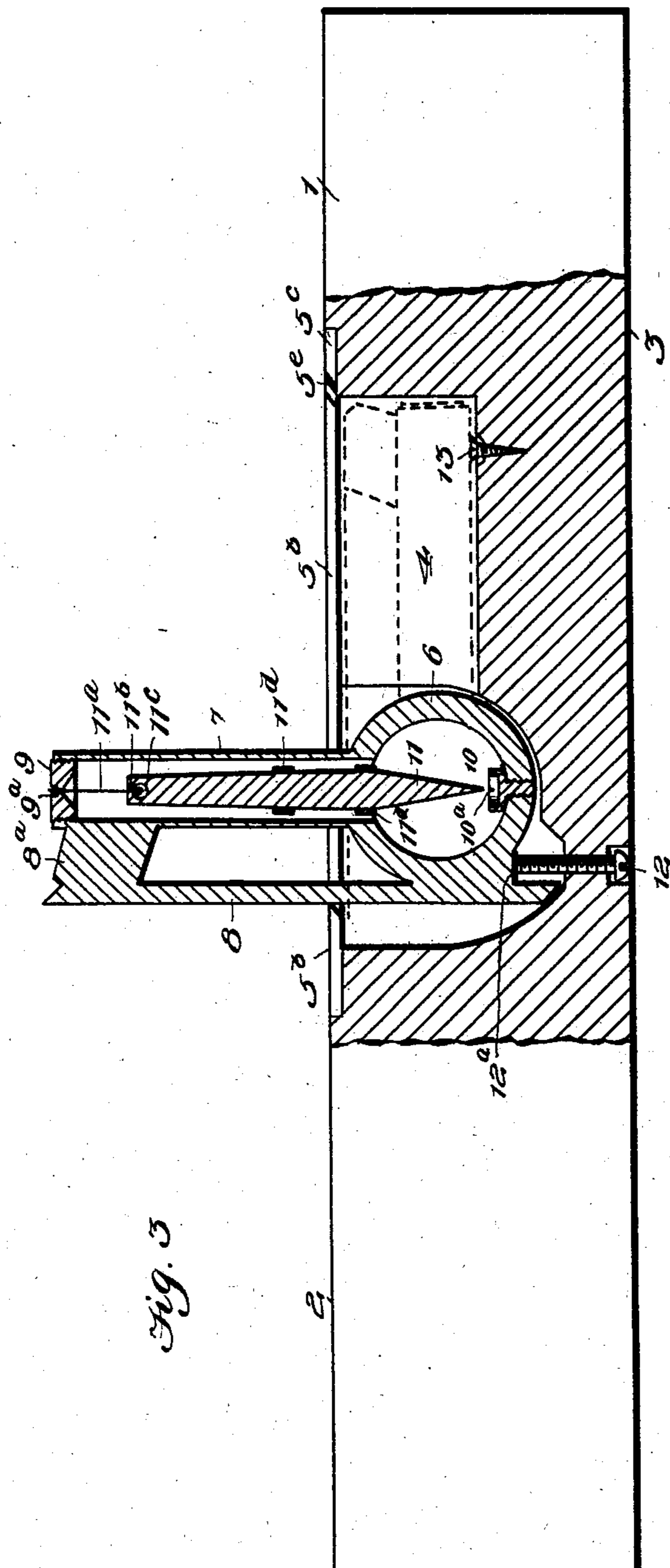


Fig. 3

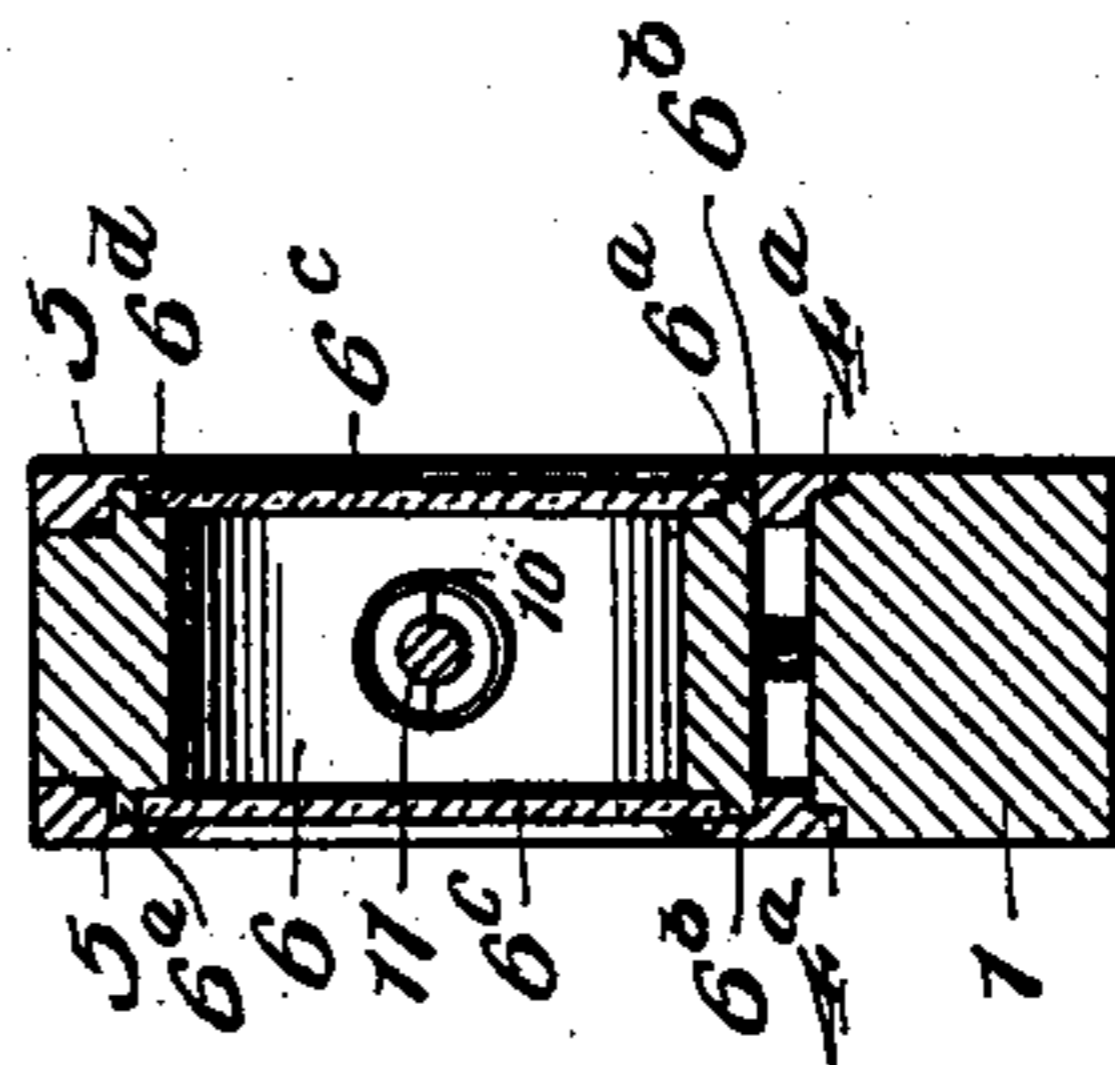


Fig. 4.

Witnesses

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# UNITED STATES PATENT OFFICE.

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## LEVEL, PLUMB, AND INCLINOMETER.

SPECIFICATION forming part of Letters Patent No. 709,990, dated September 30, 1902.

Application filed December 20, 1901. Serial No. 86,723. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. LINGLE, a citizen of the United States, residing at Eagle-grove, in the county of Wright and State of Iowa, have invented certain new and useful Improvements in Levels, Plumbs, and Inclino-meters; and I do hereby declare the fol-lowing to be a full, clear, and exact descrip-tion of the invention, such as will enable oth-ers skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in plumbs, levels, and inclinometers, and par-ticularly that class thereof in which a sus-pended pointer is employed to indicate the perpendicular position.

The object of my invention is to provide a device of the character described which will be readily applicable for use and which is simple in construction, durable in use, and cheap to manufacture.

My invention consists, broadly, of a ring or cylinder suitably mounted within the usual block or bar for levels, adapted to be oscil-lated through an arc of ninety degrees and provided with a hollow extension having sus-pended therein a pointer or bob which is per-mitted to swing or play over an indicator within said ring and to point to said indicator when in a perpendicular position.

In the preferred embodiment of my inven-tion shown in the accompanying drawings, Figure 1 is a side view of my device, show-ing it adapted for use as a level. Fig. 2 is a plan view thereof. Fig. 3 is a longitudinal section. Fig. 4 is a cross-section of my device when the tubular extension is inclosed within the bar.

In carrying out my invention I employ a block or bar 1, similar to that usually used for levels, having parallel upper and lower edges 2 3. About midway between the ends I cut away a portion of the block and also provide a slot or recess 4 therein, forming a continua-tion of said cut-away portion. Around this cut-away portion are preferably depressions 4<sup>a</sup>, within which are suitably secured, pref-erably by screws, bearing-plates 5, having orifices or openings 5<sup>a</sup> and forward and rear-ward extensions 5<sup>b</sup>, provided with overlap-ping lugs 5<sup>c</sup>, secured, preferably, in depres-sions in the upper edge of the bar by screws.

These bearing-plates close the sides of said cut-away portions and together with their ex-tensions 5<sup>b</sup> and lugs 5<sup>c</sup> form an elongated slot 5<sup>d</sup> in the top edge, opening directly over said cut-away portion and the recess 4<sup>a</sup>. Be-tween said bearing-plates I mount a ring or cylinder 6, having extensions or bearings 6<sup>a</sup> at each side, which are let into or journaled within sockets or depressions 6<sup>b</sup>, formed around the openings or orifices 5<sup>a</sup> in the bear-ing-plates 5 on their inner sides. Each side of the ring is closed by a glass plate or disk 6<sup>c</sup>, held in internal annular depressions 6<sup>d</sup> in the edges of said ring by the overlapping edges of the bearing-plates 5. Said ring is provided with a tubular extension 7, in a line with its radius, and a plate 8, connected to its periphery and parallel to the tubular ex-tension, to which it is preferably joined at the outer end by a brace 8<sup>a</sup>. The upper end of said tubular extension is internally screw-threaded and provided with a screw-threaded plug 9, having a hole or perforation 9<sup>a</sup> there-in. Within the ring 6, directly beneath or diametrically opposite the tubular extension 7, is an indicator 10, which consists, prefer-ably, of a cup, having screw-threaded con-nection with the ring, and a fine wire 10<sup>a</sup>, stretched across the cup and secured in notches 10<sup>b</sup> in its upper edges. Above the indicator is adapted to swing or play a pointer or bob 11, having, preferably, a conical lower end point suspended within the tubular ex-tension by a cord or wire 11<sup>a</sup>, suitably con-nected to the plug 9. In the present instance the cord is shown passed through the hole in the plug and knotted and also through a hole 11<sup>b</sup> in the top of the pointer 11, which com-municates with a transverse hole 11<sup>c</sup> therein, and again knotted. The plug 9 being screw-threaded within the tubular extension per-mits of the adjustment of the pointer 11 over the indicator. By screwing the plug either in or out the pointer may be so adjusted as to swing in a path just out of contact with the in-dicator-wire 10<sup>a</sup>, which greatly increases the accuracy of the instrument. Said pointer or bob may be provided with rubber bumpers 11<sup>d</sup> for protection from contact with the sur-rounding walls.

The ring 6 is adapted to oscillate within its bearings through an arc of ninety degrees, its

movement being limited, preferably, by a screw 12, threaded through the bottom edge of the block or bar and engaging an abutment 12<sup>a</sup> on said ring, and a screw 13 in the recess 4<sup>a</sup>, engaging the tubular extension 7.

The tubular extension 7 is adapted to be received and inclosed within the recess 4<sup>a</sup>, and when so inclosed the plate 8 should preferably lie flush with the top edge of the bar and close the elongated slot 5<sup>d</sup>. The plate 8 is oppositely beveled at the ends, and the overlapping lugs 5<sup>c</sup> at one end are beveled on their under sides to correspond with the opposing beveled end of said plate, and those on the opposite end are provided with niches or notches 5<sup>e</sup> for the insertion of the thumb or an instrument for raising the plate and the tubular extension.

In using my device as a level the tubular extension is raised to a perpendicular position, so that a line passing through the point of suspension of the pointer and the center of the indicator, which is marked by the wire 10<sup>a</sup>, will be at right angles to the base or bottom edge of the block or bar 1. It is readily seen that when the said block is level along the base-line the pointer will be directly over the wire of the indicator. It is obvious that various inclinations may be determined by moving the ring to different positions and that the adjustment of the device can be regulated by the adjusting-screws 12 and 13.

My device provides a convenient and accurate level, plumb, and inclinometer which is simple in construction and durable in use.

It is obvious that for denoting the various angles, &c., I may provide a suitable index.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An instrument of the character described, comprising a block, a ring having a hollow extension, rotatably mounted within said block, an adjustable support within said hollow extension, and a pointer suspended from said adjustable support, adapted to swing over an indicator in said ring, substantially as set forth.

2. An instrument of the character described, comprising a block, a ring, having a hollow extension, rotatably mounted within said block, a plug adjustable within said extension, and a pointer suspended from said plug, adapted

to swing over an indicator in said ring, substantially as set forth.

3. An instrument of the character described, comprising a block, a ring, having a tubular extension, rotatably mounted within said block, a plug adjustable with said extension, and a pointer suspended from said plug, adapted to swing over an indicator in said ring, substantially as set forth.

4. An instrument of the character described, comprising a block having a recess therein, bearing-plates secured to the sides of said block, having openings opposite said recess and annular depressions at the edge of said openings, a ring, having a hollow extension, rotatably mounted between said bearing-plates, a plug adjustable within said hollow extension, and a pointer, suspended from said plug, adapted to swing over an indicator within said ring, substantially as set forth.

5. An instrument of the character described, comprising a block, a ring, having a hollow extension, rotatably mounted within said block, a pointer, suspended from within said hollow extension, adapted to swing over the indicator in said ring, and a plate, connected to said ring, adapted to lie flush with the edge of said block, substantially as set forth.

6. An instrument of the character described, comprising a block, having bearing-plates provided with openings secured to said block, a ring, having a hollow extension, rotatably mounted between said bearing-plates, a pointer, suspended from within said hollow extension, adapted to swing over an indicator in said ring, and transparent disks interposed between said bearing-plates and said ring, substantially as set forth.

7. An instrument of the character described, comprising a block, a ring having a hollow extension, rotatably mounted within said block, an indicator within said ring, comprising a wire suitably held at opposite ends in the edges of a cup, and a pointer, suspended from within said tubular extension, adapted to swing over said indicator, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. LINGLE.

Witnesses:

GEORGE J. BUCHHOLZ,  
HERMAN LONG.