

(No Model.)

F. C. VREDENBURGH & C. F. LATHROP.
PLUMB LEVEL.

No. 603,368.

Patented May 3, 1898.

Fig. 1.

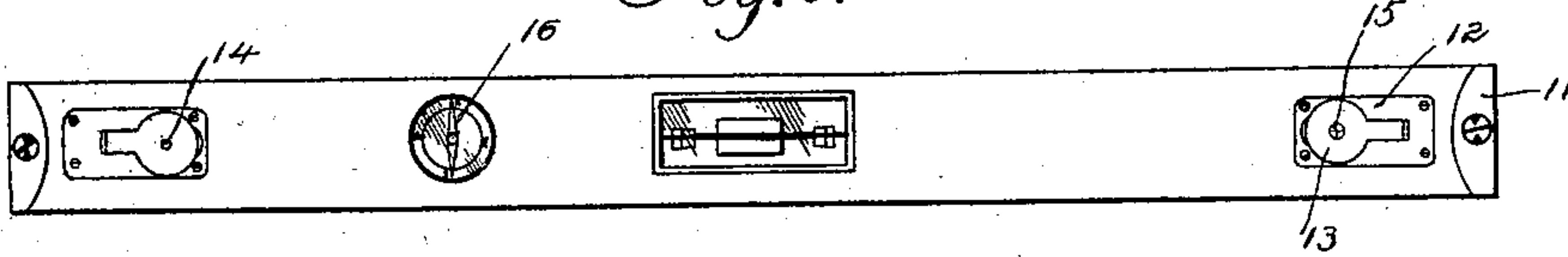


Fig. 2.

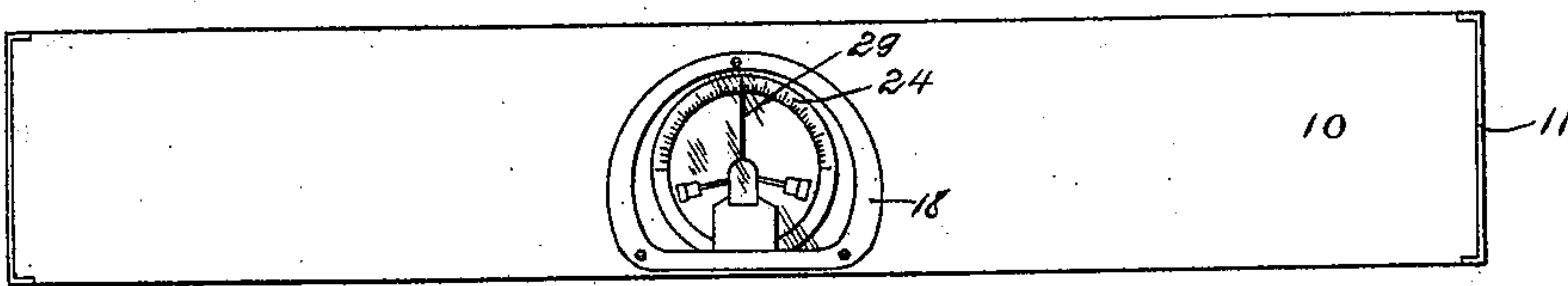


Fig. 4.

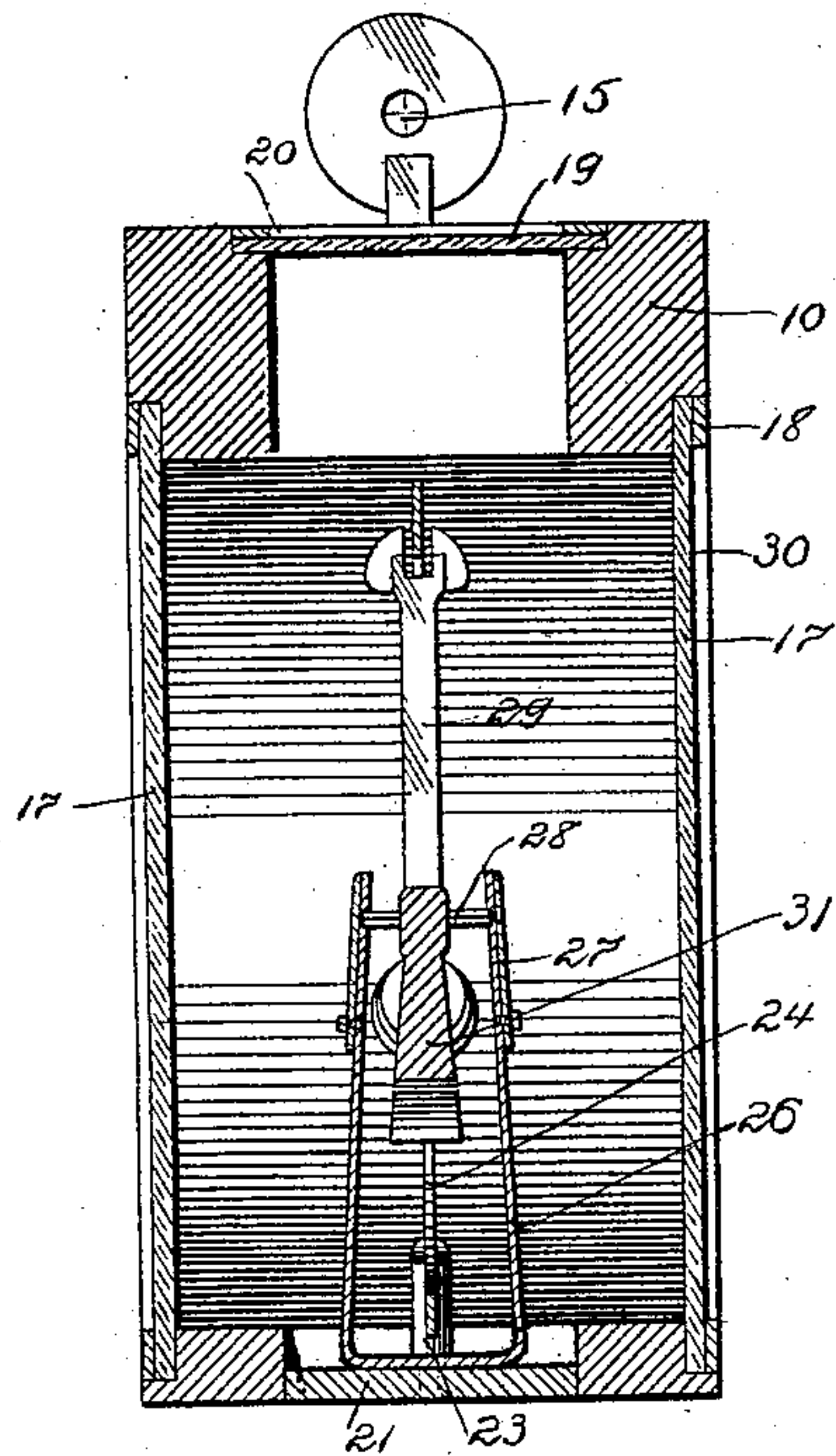
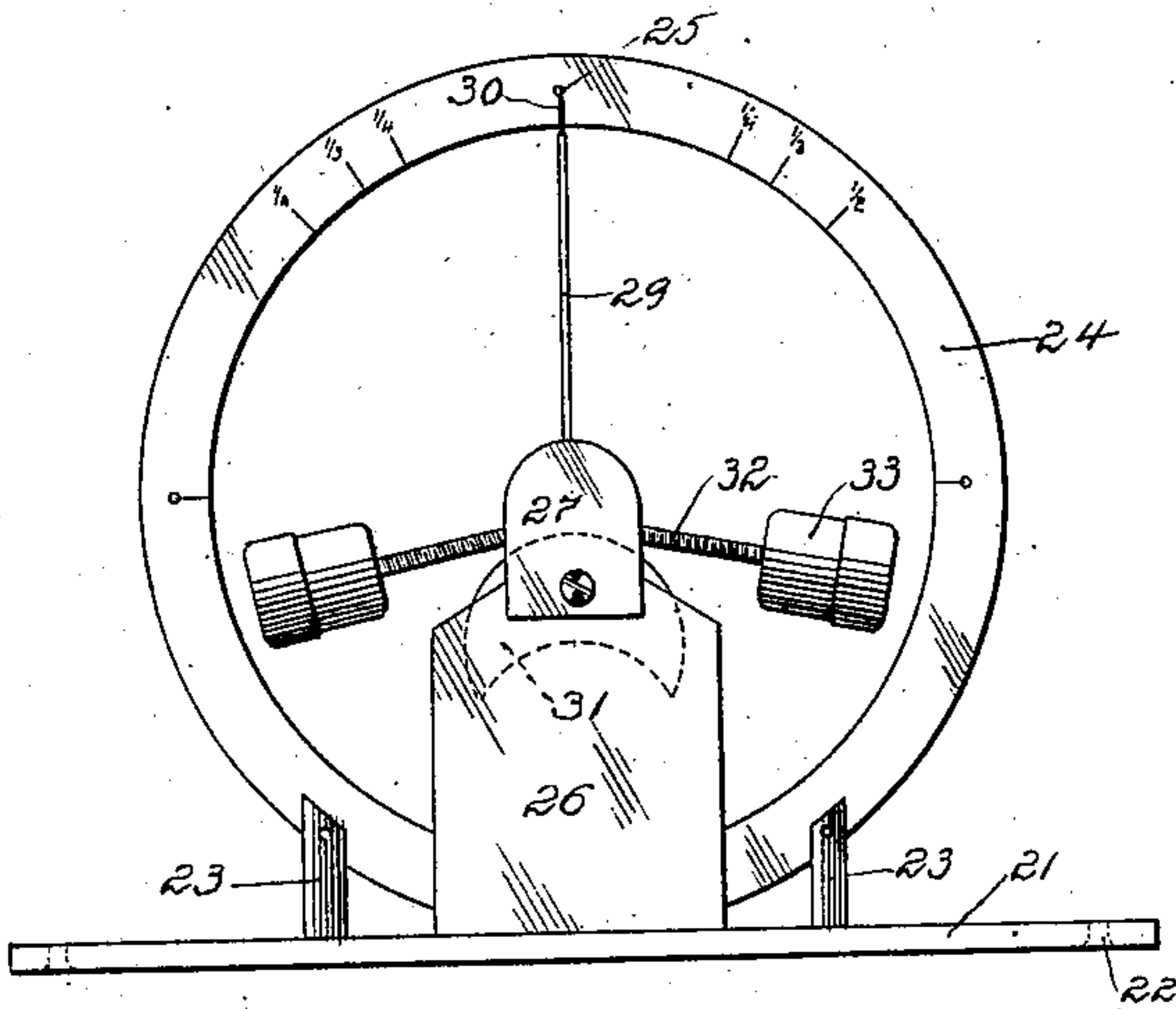


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK C. VREDENBURGH AND CHARLES F. LATHROP, OF ATLANTIC, IOWA.

PLUMB-LEVEL.

SPECIFICATION forming part of Letters Patent No. 603,368, dated May 3, 1898.

Application filed March 1, 1897. Serial No. 625,444. (No model.)

To all whom it may concern:

Be it known that we, FRANK C. VREDENBURGH and CHARLES F. LATHROP, citizens of the United States, residing at Atlantic, in the county of Cass and State of Iowa, have invented a new and useful Plumb-Level, of which the following is a specification.

The object of this invention is to provide a device which shall be of simple, cheap, strong, and durable construction and accurate in operation and which may be used in finding perpendiculars and for all the various purposes for which an ordinary plumb is adapted for determining inclines—as, for instance, when finding the pitch of rafters and the like—and also for finding horizontals or slight variations therefrom, as when running ditches, surveying drainage-surfaces, &c.

Our object is, further, in this invention to provide an indicator which will quickly come to a standstill after the plumb-level has been placed in position and which will point with great accuracy to a scale upon which are marked various degrees, and, further, to provide simple, inexpensive, and easily-operated means whereby the indicator may be adjusted to correspond with the indicating-scale of the device, so that a slight bend in the indicator itself or in other parts of the device will not render the whole implement worthless, as any slight deviation from absolute accuracy of registration may be quickly and easily compensated for.

A further object in this invention is to provide an implement of inexpensive construction which may be used in place of a number of instruments which have been required heretofore to accomplish the same ends.

Our invention consists in certain details in the construction of the indicating device proper and in the arrangement and combination thereof with a stock and sighting devices thereon, as hereinafter set forth, pointed out in our claim, and illustrated in the accompanying drawings, in which—

Figure 1 shows a top or plan view of the completed instrument. Fig. 2 shows a side elevation of the same. Fig. 3 shows a side elevation of the plumb-level device detached from the stock. Fig. 4 shows a vertical transverse sectional view through the stock near its central portion and showing one of the

sights on top of the stock in an elevated position.

Referring to the accompanying drawings, the reference-numeral 10 is used to indicate the stock, which is preferably made of wood, reinforced by the metal plates 11 at its ends in the manner usually employed in spirit-levels. On the top of the stock, near its ends, the metal plates 12 are set flush with the top. In each of these plates is a sight 13, hinged to swing upwardly. One sight is provided with a small central opening 14 and the other with a larger opening, having crossed wires therein. These sights are of ordinary construction and are used in the ordinary manner. The reference-numeral 16 indicates a compass, also seated in the top. At its central portion part of the stock is removed to contain the plumb-lever proper. The glass plates 17 are inserted in the frames 18 in the sides of the stocks, and the glass 19 is held in the frame 20 at the top of the stock, thus covering the said opening.

The plumb-lever proper comprises a base 21, which is provided with screw-openings 22, whereby it may be inserted in the opening in the stock and screwed to the base with its lower edge in alinement with the lower edge of the stock. Two uprights 23 are fixed to the said base and are bifurcated longitudinally. 24 indicates a flat circular rim resting in the said uprights and riveted therein. At the top central portion of the rim is an opening 25, extended transversely through the rim, and at various points throughout the circle other similar openings are formed. We preferably place on one surface of the rim a graduated scale indicating degrees, beginning at "0" at the top of the rim and extending to "90" at the sides of the rims at points at right angles to the top. On the opposite side of the rim we have placed certain lines or marks to indicate the pitch—that is, a one-half, one-third, one-fourth pitch, &c.

The reference-numeral 26 indicates a support made of a single piece of plate metal with its ends extended in parallel positions and its central portion connected by soldering or rivets to the central portion of the base 21. The said ends are arranged on opposite sides of the center of the rim 24 and are provided with openings arranged concentrically

with the rim, and plates 27 are fixed to the said ends to cover the said openings.

The reference-numeral 28 is used to indicate a journal having its ends extended through the openings in the support 26. Fixed to the said axle is an indicating-arm to project upwardly therefrom to a point near the axial surface of the rim. This arm is indicated by the reference-numeral 29. At the top of the said indicating-arm are two laterally-projecting wings 30 to extend on opposite sides of the rim and having their top edges so arranged relative to the rim that the outer points of the edges may be seen through the opening 25 in the rim. These wings serve to act on the air and materially impede the motion of the indicating-arm, so that it will soon stop when it has been vibrated, and the tops of the wings serve as sights.

The reference-numeral 31 indicates a weight fastened to the indicating-arm beneath the journal. Thus the weight of the arm is counterbalanced, and the said parts are so proportioned and arranged relative to each other that when the base 21 is in a true horizontal position the indicating-arm 29 will point to the opening 25 in the rim 24. It is of course obvious that any deviation from a true horizontal position of the base 21 will cause the indicator to be deflected to one side or the other, and the amount of said deflection to be indicated by the position of the wings 30 relative to the scales on the rim 24. It is obvious that violent shocks to the instrument, such as might be caused by a fall, might tend to deflect the indicating-arm 29, so that it will not register accurately relative to the rim. We have provided means whereby such deflection may be compensated for as follows:

The reference-numeral 32 is used to indicate two screw-threaded rods to project laterally and downwardly from the top of the weight. On each of these rods is mounted a weight 33, internally screw-threaded to engage the threads on the rod 32. It will be seen that upon an adjustment of the weights 33 relative to the center of gravity of the weight 31 the indicating-arm may be deflected, and in case the indicating-arm should not register correctly upon the rim one or both of these weights is adjusted either to or from the pivotal point of the indicator.

In practical operation the instrument may be used for ascertaining or trying for perpen-

diculars and horizontals in the same manner as the spirit-level is used. However, with this device the amount of the deflection from the perpendicular or horizontal may be quickly and accurately determined. Assuming that it is desired to ascertain the pitch of incline of rafters or the like, the stock is placed on top of the rafter and the rafter is moved until the indicating-arm points to the proper pitch line or degree upon the rim. When used as a surveying instrument for running ditches or making grades, the stock is placed on a suitable support and adjusted to the incline desired, whereupon the operator may by looking through the sights direct the location of stakes or other marks, which would cause a grade to be struck corresponding to the incline of the stock of the plumb-level. By constructing the bearings of the journal 28 in the manner shown the said journal may rotate freely and yet its longitudinal movement be restricted.

Having thus described our invention, what we claim as new therein, and desire to secure by Letters Patent of the United States therefor, is—

A plumb-level, comprising a suitable stock having a central opening, a plate 21 detachably secured to the stock within its central opening, two uprights 23 having their upper ends bifurcated, a circular scale-rim mounted in said bifurcated ends, a support 26 secured to the plate 21 and extending upwardly on both sides of the scale-rim and having openings therein arranged concentrically with the rim, plates 27 covering said openings, a journal mounted in said openings, an indicating-arm 29 fixed to the said journal, wings 30 attached to the upper end of the indicating-arm and overlapping the rim, a weight 26 attached to the lower end of the indicating-arm, two screw-threaded rods 32 fixed to the indicating-arm and extending downwardly at an angle relative thereto, and internally-screw-threaded weights 33 designed to be screwed on the said rods 32, all arranged and combined to operate in the manner set forth and for the purposes stated.

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