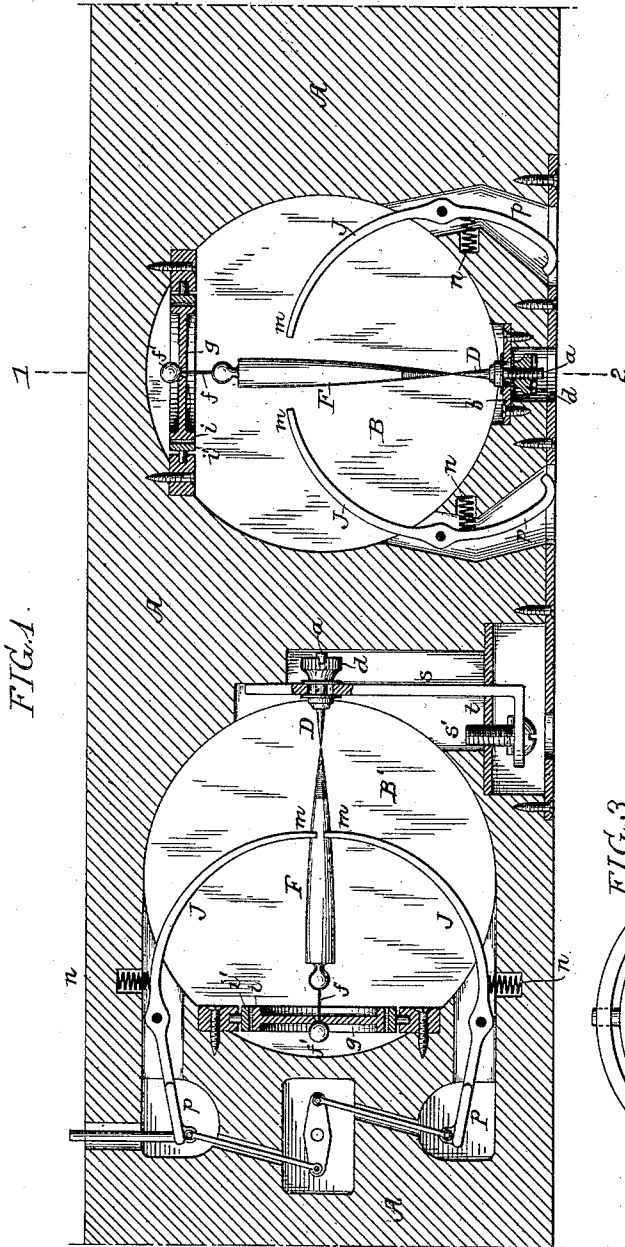
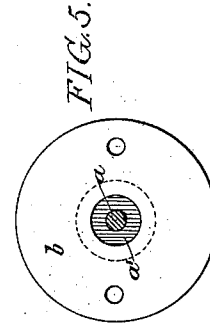
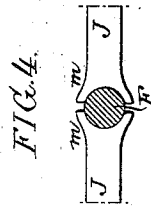
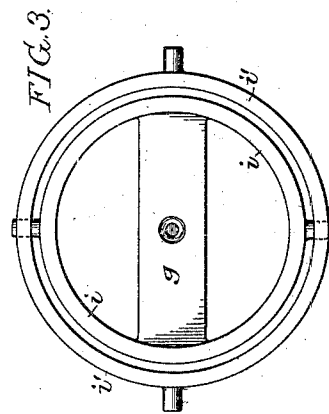


(No Model.)

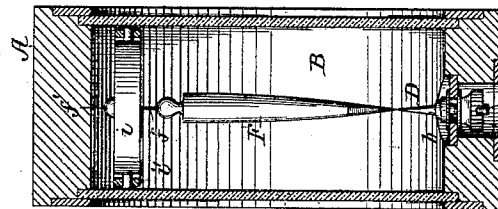
J. T. LAMBDIN.
PLUMB LEVEL.

No. 444,705.

Patented Jan. 13, 1891.



Witnesses:
Murray L. Boyer
A. J. Groupe



Inventor:
James T. Lambdin
by his Attorneys
Howson & Howe

UNITED STATES PATENT OFFICE.

JAMES T. LAMB DIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO EDGAR L. FISHER, OF SAME PLACE.

PLUMB-LEVEL.

SPECIFICATION forming part of Letters Patent No. 444,705, dated January 13, 1891.

Application filed January 25, 1890. Serial No. 338,073. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. LAMB DIN, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Leveling Implements, of which the following is a specification.

The object of my invention is to provide an extremely sensitive and accurate mechanical leveling device, and this object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of sufficient of the leveling-instrument to illustrate the invention. Fig. 2 is a transverse section on the line 1 2, Fig. 1, with parts in elevation. Fig. 3 is a plan view of the universal-joint hanger for the leveling-needle. Fig. 4 is a sectional view showing the jaws of the locking device for said needle; and Fig. 5 is a sectional plan view of the adjusting device for one of the fixed needles.

A represents part of the wooden frame or stock of the instrument, which may be substantially the same as that of an ordinary spirit-level, this stock having two openings B B', as usual, one for horizontal leveling and the other for determining vertical alignments. As both of the leveling devices are alike, save in a matter of adjustment hereinafter referred to, a description of the horizontal leveling device in the opening B will be sufficient.

The leveling device consists of two needle-points D and F, the point D being fixed—that is to say, occupying a fixed position during the leveling operation, but being adjustable so as to properly center it in the first instance, the point having a threaded stem *a*, which passes through an enlarged opening *a'* in a plate *b*, and has a nut *d* whereby it may be secured in position after adjustment. The swinging needle F is hung by a thread or filament *f* from a ball *f'*, which is mounted in a socket or bearing on the cross-bar *g* of a universally-pivoted hanger comprising inner and outer rings *i i'*, with pivots at right angles to each other, as shown in Fig. 3. The supporting-ball thus forms one universal joint and the hanger another, so that free swing-

ing of the needle F in any direction is permitted. When the instrument is not in use, however, it is advisable to confine the swinging needle, so as to prevent any movement of the same as the stock A is being carried about. For this purpose the needle is normally held between clamping-jaws *m m*, as shown in connection with the needle in the opening B', these jaws forming part of levers J, which are acted upon by springs *n* tending to close them upon the needle. The levers terminate in openings *p* in the stock A, and by pressing inward these terminations of the levers the jaws *m* are separated, as shown in the opening B, so as to free the needle F and permit it to swing in any direction.

The levers J may project beyond the face of the stock A when the jaws are closed on the needle, so that the act of applying the face of the stock to the surface to be leveled will effect the automatic operation of the levers and the automatic release of the needle, as shown in the opening B, or one of the levers may have a projecting portion, and may be connected to the other lever, so as to cause the latter to move in unison with it, as shown in connection with the levers of the leveling device occupying the opening B'.

The fixed needle-point of the leveling device in the opening B' is carried by a slide *s*, to which is swiveled a set-screw *s'*, engaging with a threaded opening in a plate *t*.

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

1. The combination of the stock, the fixed point, the swinging needle, and the supporting device for the latter, consisting of a suspended filament or thread and a supporting-ball mounted and free to swing in a socket or bearing, substantially as specified.

2. The combination of the stock, the fixed point, the swinging needle, the suspending-filament therefor, the supporting-ball, and a universally-jointed hanger providing a bearing for said ball, substantially as specified.

3. The combination of the stock and the swinging needle with the fixed needle adjustable laterally to effect proper centering of the same, substantially as specified.

4. The combination of the stock, the fixed

point, the swinging needle, and clamping-jaws for said swinging needle, substantially as specified.

5 5. The combination of the stock, the fixed point, the swinging needle, and spring-actuated levers having clamping-jaws for said swinging needle, substantially as specified.

10 6. The combination of the stock, the fixed point, the swinging needle, and spring-actuated levers having clamping-jaws for the swinging needle, and a portion or portions

projecting beyond the stock so as to effect the automatic opening of the jaws, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES T. LAMBDIN.

Witnesses:

H. F. REARDON,
HENRY HOWSON.