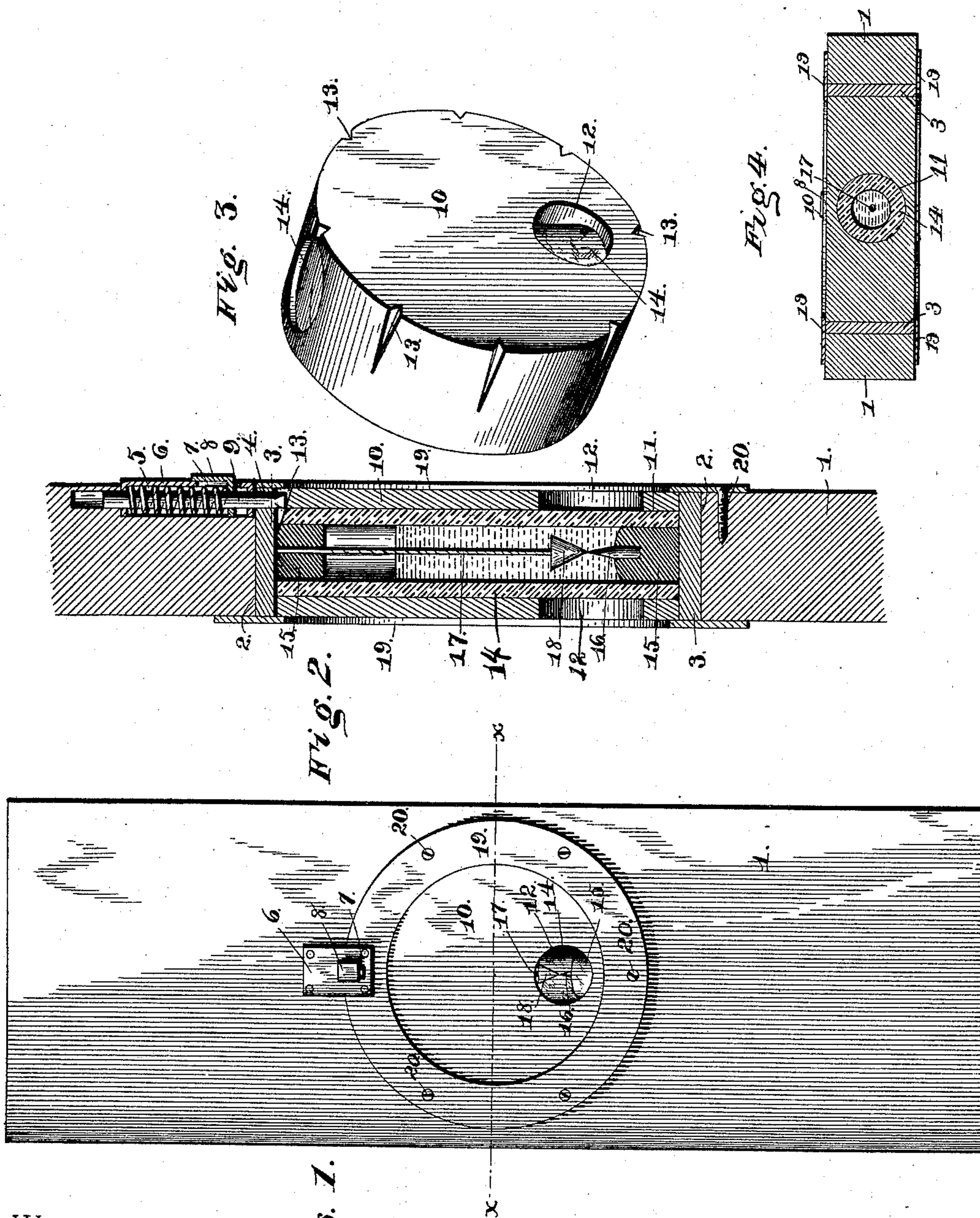


(No Model.)

W. RUSH.
LEVEL.

No. 474,861.

Patented May 17, 1892.



Witnesses

Chas. G. Ford.

M. S. Duval

Fig. 1.

By his Attorneys,

C. A. Snow & Co.

Inventor
William Rush.

UNITED STATES PATENT OFFICE.

WILLIAM RUSH, OF TYRONE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO
S. L. SMITH, OF SAME PLACE.

LEVEL.

SPECIFICATION forming part of Letters Patent No. 474,861, dated May 17, 1892.

Application filed January 22, 1892. Serial No. 418,920. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM RUSH, a citizen of the United States, residing at Tyrone, in the county of Blair and State of Pennsylvania, have invented a new and useful Level, of which the following is a specification.

This invention relates to improvements in levels, the objects in view being to provide a level of cheap and simple construction adapted to accurately indicate the various inclinations of any object or surface and to be set to any degree of a circle for such purpose.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is an elevation of a level constructed in accordance with my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a detail in perspective of the disk. Fig. 4 is a transverse sectional view on the line $x x$ of Fig. 1.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 designates the usual level-bar, constructed of wood or metal, and the same is provided at its center with a circular opening 2, extending throughout the width of the level-bar. This opening has snugly fitted therein an annular bushing or ring 3 of metal, the same being employed or not, as may be desired. At one side and near its edge the bushing 3 is provided with a recess 4, and registering with the same is a recess or cavity 5, formed in the adjacent face of the level-bar 1. A metal housing 6 is seated in the cavity 5, and has its edges secured by nails or otherwise to the level-bar. The housing has its front face slotted, as at 7, and moving in the same is a thumb-lug 8, which is secured at its inner end to a bolt 9, spring-pressed from the rear, as shown. The outer end of the bolt is chamfered or beveled and projects through and beyond the opening 4 of the bushing.

10 designates a metal disk of a width corresponding with that of the level-bar and of a diameter adapting it to fit without lost motion and for rotation in the bushing 3. The disk 10 is provided with an annular passage or bore extending throughout the same and indicated at 11, and at one side of its center

the disk is provided with opposite sight-openings 12, which communicate with the radial passage or bore near one end of the same. The disk has its periphery divided off into degrees of a circle, which degrees are indicated by inclined notches 13, designed to be engaged by the spring-pressed pawl or detent 9, heretofore mentioned. Fitting within the passage 11 of the disk and nearly equaling the same in length is a glass bob-tube 14. Each end of the tube is stopped or plugged by suitable hermetical plugs 15, from the upper side of the lower one of which extends up into the tube a pin or pointer 16, which pin is concentric with the diameter of the tube, or, in other words, bears axial relation therewith. The upper plug has passed downwardly and centrally through it a thread 17, which depends into the tube, the lower end of the thread having attached to it a small plummet 18 of lead, which when hanging plumb or vertical meets or is directly over the fixed pointer just mentioned.

For the purpose of maintaining the disk within the bushing annular rings 19 are secured to the face of the level-bar by screws 20. These rings have an external diameter slightly greater than the diameter of the annular opening 2 of the level-bar, and have an internal diameter slightly less than the diameter of the disk, so that the joint between the disk-bushing and level-bar is covered by the rings.

This completes the construction of the level, and the operation is as follows: For instance, in order to plumb a wall, it is simply necessary to revolve the disk until the spring-detent engages with the notch indicating zero, and thus when placed against a wall the plummet can be observed through the sight-openings as being directly in axial and vertical alignment or coincident with the stationary pin at the lower end of the plumb-bob tube. The face of the disk is preferably divided off into degrees of a circle, which degrees are indicated within the area of the metal ring and terminate at their outer ends in notches for engagement by the detent, said detent being vertically above and in line with the stud or pin. For example, take a plane at forty-five degrees inclination, place the

level-bar upon it, disengage the detent from the disk, and revolve the disk until the forty-five-degree notch is engaged by the detent, at which time the zero-notch will be exactly vertical, and if the incline be truly at an inclination of forty-five degrees the plummet will appear directly over the pin or stud. In order to prevent the plummet from undue vibration and quickly settle the same, the tube is preferably filled with alcohol.

From the foregoing description, in connection with the accompanying drawings, it will be seen that I have provided a level of great simplicity and durability, the bob-tube of which, together with its contents, is thoroughly protected and not open to impairment by the atmosphere, falls, jars, or other rough handling; furthermore, that any inclination may be readily obtained or indicated, and that with accuracy and dispatch.

Having described my invention, what I claim is—

1. In a level, the combination, with the level-bar having a transverse annular opening, of a disk mounted for rotation in the opening and provided with a transverse recess and at one side with a sight-opening communicating therewith, a plumb-bob tube located in the recess, a centrally-located pointer at the lower end and within the tube, and a plummet loosely suspended from the opposite end within the tube, substantially as specified.

2. In a level, the combination, with the level-bar having a transverse annular opening, of a disk mounted for rotation in the opening and provided with a transverse recess and at one side with a sight-opening communicating therewith, said disk being provided with notches at its periphery in accordance with the degrees of a circle, a spring-detent located at one side of a disk and adapted to engage the notches, a bob-tube located in the recess of the disk, a pin or pointer located centrally at one end of and within the tube opposite the sight-opening, and a plummet suspended from the opposite end of and within the tube coincident with the pin or pointer, substantially as specified.

3. In a level, the combination, with the level-

bar having the annular opening and the metal bushing snugly fitting the same, of the disk mounted for rotation within the bushing, said disk being provided with a transverse recess, and a communicating sight-opening in its face, a bob-tube fitted in the recess opposite the sight-opening, plugs located in the opposite ends of the tube, a centrally-located pin projecting upwardly within the tube from the lower plug, and a plummet loosely hung from the opposite plug within the tube, substantially as specified.

4. In a level, the combination, with the level-bar having the annular transverse opening and the metal bushing fitting snugly within the opening and provided at one side with a recess communicating with a cavity formed in the level-bar, of a metal disk fitting the bushing, said disk having its face provided with the degrees of a circle terminating at the periphery of the disk in notches, and the disk being further provided with a radial recess or passage and opposite sight-openings communicating with the lower end of the passage, a spirit-tube located in the passage, plugs in the opposite ends of the tube, a point projecting upwardly within the tube from the bottom plug, a thread passed through the center of the upper plug, a plummet secured thereto and depending into the tube, a metal housing located in the cavity of the level-bar and secured to said bar and provided with a slot, a thumb-lug mounted for movement in the slot, a bolt or detent secured to the inner end of the thumb-lug and having its free end projected through the notch in the bushing and adapted to engage the notches of the disk, a coiled spring arranged in rear of the bolt, and the retaining-rings secured to the opposite sides of the level-bar and overlapping the joints between the bushing, level-bar, and disk, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM RUSH.

Witnesses:

W. WALTON,

H. B. CALDEWOOD.