

W. GURLEY.
ROD PLUMBING LEVEL.

Patented Feb. 17, 1885.



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UNITED STATES PATENT OFFICE.

WILLIAM GURLEY, OF TROY, NEW YORK, ASSIGNOR TO HIMSELF AND
LEWIS E. GURLEY, OF SAME PLACE.

ROD-PLUMBING LEVEL.

SPECIFICATION forming part of Letters Patent No. 312,266, dated February 17, 1885.

Application filed October 7, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GURLEY, a citizen of the United States, residing in the city of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Rod-Plumbing Levels, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in levels for use in plumbing leveling-rods, flag-staffs, and aligning poles in making surveys, and in running lines or levels with a surveyor's transit or leveling instrument.

The general object of my improvements is to provide a simple, cheap, and compact rod-plumbing device having two spirit-levels on two plate-like parts that are hinged together, so that they can be opened to a proper angle to fit or be secured against two sides of a rod, pole, or staff to plumb the same, and so that the device can be at once detached from the staff, pole, or rod and its two parts folded together, so as to effectually cover and protect the two spirit-levels and render the device convenient for a rodman to carry in his hand or pocket.

In the accompanying drawings, Figure 1 is a perspective view of a portion of a rectangular leveling-rod with one of my improved plumbing-levels applied. Fig. 2 represents in full lines a top view of the same plumbing-level secured to a round aligning-pole, and illustrates by dotted lines the manner of folding up the plumbing-level. Fig. 3 is a bottom view of the same plumbing-level applied to a six-sided flag-staff. Fig. 4 is an elevation of the face side of the same plumbing device when opened to the same angle as in Fig.

Fig. 5 is an elevation of the opposite side of the same device when opened out with the two faces in one and the same plane. Fig. 6 is a side elevation, Fig. 7 a plan of the top, and Fig. 8 an elevation of the opening end of the same plumbing-level when folded. Fig. 9 is an elevation and partial section of the hinge end of the same device when folded, as in Figs. 6, 7, and 8, the section being at the line $z z$ in Figs. 6 and 7, and viewed in the direction pointed by the arrow y in the latter figures. Fig. 10 is a plan of an elastic band

for use in temporarily securing the plumbing device to a rod, pole, or staff, as indicated in Figs. 2 and 3.

A and B are two plate-like parts secured together by a hinge or pivot joint, and having on one side two flat faces, a and b , each in a plane aside from and parallel to the axial line of said joint. The parts A B also have, on the opposite side, two spirit-levels, C and D, arranged to indicate planes at right angles to said axial line and with their bodies one above the other and about parallel to the faces a and b , respectively, all in such manner that the two parts A and B can be turned open and set with their faces a and b at a proper angle to each other to fit against two sides of a standing rod, pole, or staff, W, as represented in Figs. 1, 2, or 3, with the two levels C and D fully exposed to view, and so that when the two parts are folded together, as shown in Figs. 6, 7, 8, and 9, and by dotted lines in Fig. 2, they cover and protect the two spirit-levels C D, and are separated by a space of the width required by only one of the two spirit-levels, whereby the whole device is reduced to a thin, compact, and convenient form for a rodman to carry in his vest-pocket.

To lessen the length of the whole device without shortening the length of the spirit-levels, or to have the spirit-levels of greater length without increasing the length of the whole device when either opened or folded, I extend the two adjacent end parts c and d of the levels past each other, and somewhat beyond and across the axial line $x x$ of said joint, about as shown in Fig. 5.

To cheaply provide excellent means for easily securing and adjusting the levels C and D on and to the parts A and B, each of those parts is made with a lateral projection or projections, E, fast thereon, and having a raised fulcrum bearing or seat, e , for the middle of the level, and end perforations, f , Fig. 9, through which headed screws h extend and screw into the end parts of the bodies or casings of the levels, as indicated in Figs. 5 and 9.

By opening the parts A and B to the proper angle, and applying their faces $a b$ tightly against two adjacent sides of a rod, W, set vertical, as in Fig. 1, and then properly turning in and out and tightening the two screws

h of each level until its bubble shall stand in the middle, the levels C and D will be adjusted in planes perpendicular to the axial line of the joint, by which the two parts A and B are secured together, and in proper positions for use in plumbing any square, round, octagonal, hexagonal, or other shaped rod, pole, or staff having sides that the faces a and b will fit against properly.

10 To prevent contact of either part A or B with the level C or D on the other part when the two parts are folded together, I have one or both of the projections E extend laterally farther than the levels, as shown in Figs. 8 and 9.

15 In using this folding plumbing-level the rodman first opens it to about the proper angle, and then applies its two faces a b tightly against two sides of the standing rod, and then clasps the level and rod together by one hand, and uses his other hand in plumbing the rod and in adjusting a target thereon whenever a target is used.

25 To avoid all necessity for clasping or holding the plumbing-level against the rod by hand, I furnish the plumbing-level with various devices for securing it to different parts of the length of rods of different sizes. As one device for that purpose the plumbing-level is shown furnished in Figs. 2 and 3 with an elastic band, G, Fig. 10, which is shown in Fig. 2 by full lines, and in Fig. 3 by dotted lines, secured to the outer ends of the two parts, and extended between them in stretched condition around the sides of the rod W, that are opposite to those to which the two parts A B are applied.

40 To provide simple means for quickly securing an elastic band, G, to the parts A and B, and thereby attach the plumbing level to any desired part of the rod, I make one of those parts with a loop, hole, or perforation, i , Fig. 3, through which the band G can be looped, and thus secured at one end to the level, as shown by full lines in Fig. 3, and I also furnish or form the other part with a hook, j , Fig. 3, over which the loop of the band G can be placed when suitably stretched around the rod, as indicated by dotted lines in the latter figure, so as to thereby secure the plumbing-level to the rod and permit the level to be moved up and down thereon, and so that by simply detaching the loop of the elastic band G from the hook j , the plumbing-level will be released from the rod and the band G left attached at one end to the level, ready for use in quickly resecuring the level upon any desired part of the length of the rod.

50 In carrying out this invention the hinge or pivot joint by which the two parts are secured together is to be of any suitable construction. In Fig. 9 that joint is shown formed by two screw studs or pivots, l l , extending in line with each other through perforations in the lugs m of the part B, and screwed fast

into the lugs n on the other part. I prefer to have the joint so tight that a moderate pressure is required to open and close the plumbing-level.

I am aware that a compound level has been heretofore devised with two bars, each containing a separate spirit-level and hinged together, so as to be folded side by side and turned to an angle from each other.

I claim as my invention—

1. A folding rod-plumbing level consisting of two parts secured together by a hinge or pivot joint, and having on one side faces in planes aside from and parallel to the axial line of said joint, and on the opposite side two spirit-levels arranged one above or higher than the other and in planes at right angles to said axial line, substantially as described, so that the two parts when opened will fit against the rod and the two levels be exposed, and when closed will cover and protect the two spirit-levels.

2. A folding rod-plumbing level consisting of two parts secured together by a hinge or pivot joint, and having on one side faces in planes aside from and parallel to the axial line of said joint and on the opposite side two spirit-levels, one above the other, in planes at right angles to said axial line, and with the adjacent end parts of said levels extending past each other and across the axial line of said joint, substantially as described.

3. A folding rod-plumbing level consisting of two parts secured together by a hinge or pivot joint, and having on one side faces parallel to the axial line of said joint and on the opposite side lateral projections, and two spirit-levels secured to said lateral projections by adjusting devices, substantially as described.

4. A folding rod-plumbing device consisting of two parts secured together by a hinge or pivot joint, and having faces parallel to the axial line of said joint, and two spirit-levels in planes at right angles to said axial line and furnished with means, substantially as described, for securing the device upon a rod, pole, or staff.

5. A folding rod-plumbing level consisting of two parts secured together by a hinge or pivot joint, and having two faces parallel to the axial line of said joint, and two spirit-levels in planes at right angles to said axial line, one of said parts being formed with a perforation and the other with a hook for receiving a clasping-band, substantially as set forth.

In testimony whereof I hereunto set my hand, in the presence of two subscribing witnesses, this 4th day of October, 1884.

WILLIAM GURLEY.

Witnesses:

JNO. C. HOUSE,
LOUIS W. GURLEY.