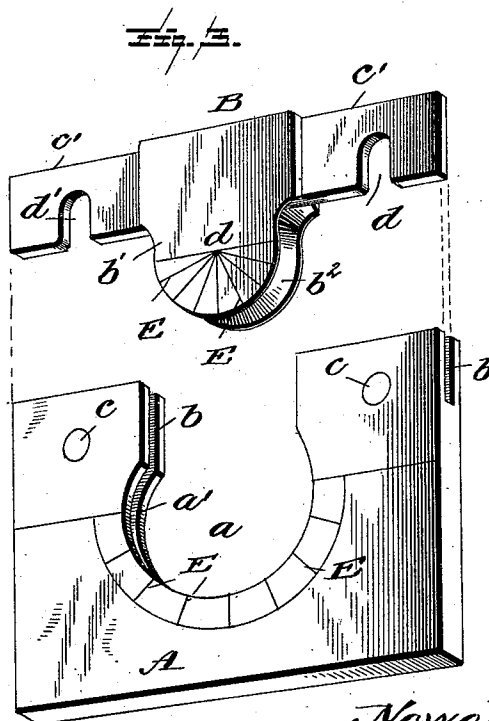
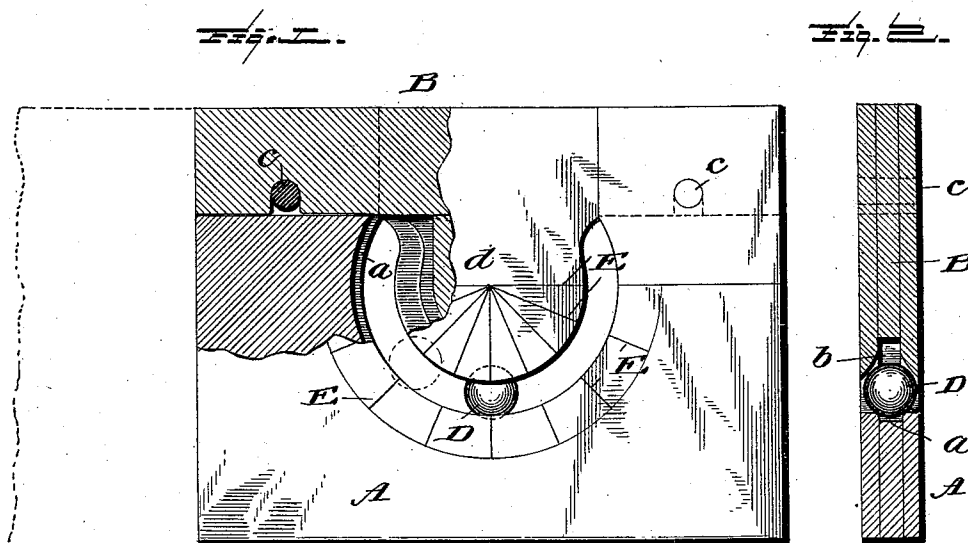


(No Model.)

N. H. SPENCER.
PLUMB AND LEVEL.

No. 466,380.

Patented Jan. 5, 1892.



Witnesses
L. C. Mills.
E. H. Bond.

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UNITED STATES PATENT OFFICE.

NEWEL H. SPENCER, OF ELMIRA, NEW YORK.

PLUMB AND LEVEL.

SPECIFICATION forming part of Letters Patent No. 466,380, dated January 5, 1892.

Application filed October 3, 1891. Serial No. 407,652. (No model.)

To all whom it may concern:

Be it known that I, NEWEL H. SPENCER, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Plumbs and Levels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

This invention pertains to plumbs and levels; and it has for its objects, among others, to provide a simple, cheap, yet efficient device which may be either permanently or detachably affixed to either or both arms of a square, to a straight-edge, and which will serve as a level. I employ, preferably, a sphere designed to travel in or upon a curved guide, the sphere being confined against accidental displacement by suitable means.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation of my improvement, with portions broken away and parts in section. Figure 2 is a central cross-section through the same. Fig. 3 is a perspective view of the two parts of the attachment separated to the better show their construction.

Like letters of reference indicate like parts throughout the several views in which they occur.

Referring now to the details of the drawings by letter, A designates one part, which may be of any suitable or desired material, with a substantially semicircular opening *a*, the inner face of which is provided with a groove *a'*, which may be of any preferred shape, the said groove terminating in parallel grooves *b*, leading from the circular groove to the edge of the part A, as seen best in Fig. 3. The grooves *b* extend also to the opposite edges of the part A, and extending across the same are the pins *c*, held in the walls thereof in any suitable manner and for a purpose which will soon appear. B is the other part,

of any suitable material and provided with central portion *b'*, which has curved edges to conform to the curvature of the opening in the part A, and with a groove *b''*, which may be V-shaped or of any other desired form. The part B is provided with the end extensions *c'*, fitted to the mortises or grooves *b* of the part A, and with recesses *d* to fit over the pins *c* when the parts are forced together, as seen in Fig. 1. This forms one convenient form of case; but I wish it distinctly understood that it is but one of the many forms that may be employed, being illustrated simply to show what I at present consider perhaps the preferable form.

D is a gravitating body, preferably a sphere, as shown, fitted to move loosely between the grooves of the two parts A and B, as seen in Figs. 1 and 2. It may be of any suitable material or combinations of materials. The frictional contact between it and the walls of the grooves in the parts A and B should be as little as possible, so as to allow it to move with the greatest freedom. Upon the face of the parts A and B are the lines E, radiating from the center of the circle, as at *d'*, and designating a horizontal line, a vertical or perpendicular line and radii, as seen clearly in Figs. 1 and 3.

The operation will be apparent. The device may be affixed or in any manner suitably connected, permanently or detachably, to the desired article, either a square, a straight-edge, or other article, and one edge placed upon the article to be leveled or of which it is desired to determine the level. The sphere will gravitate to the lowest point of the circle in a line perpendicular with the center of the circle.

Various modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as new is—

1. A level having a curved open-sided guide and a gravitating rolling body movably confined in said guide, as set forth.
2. A level having straight parallel sides and a segmental guide with indicating-lines, and a gravitating rolling sphere moving in said guide to determine the level of a given body, as set forth.
3. An attachment for the purpose specified,

consisting of a case having a curved guide and indicating-lines, and a movable rolling sphere movable in the guide and arranged to serve substantially as specified.

- 5 4. A level consisting of a two-part case with coincident curved guide-grooves, indicating-lines, and a gravitating rolling sphere, as and for the purpose specified.

- 10 5. An attachment for the purpose described, consisting of the part A, with circular grooved opening and side grooves at the opposite sides thereof, the part B, with end extensions and

central curved grooved portion, the two parts being designed to be detachably held together, and a gravitating body confined between the 15 curved portions of said parts, as set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

NEWEL H. SPENCER.

Witnesses:

A. B. GALATIAN,
THOS. W. LONG.