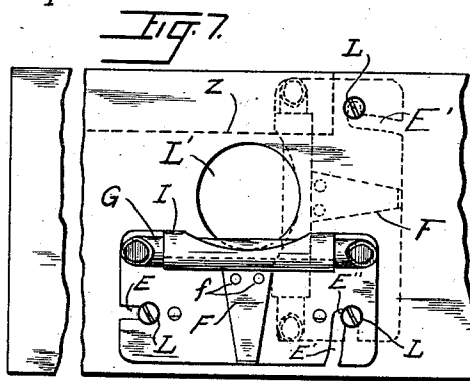
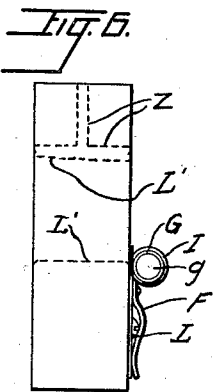
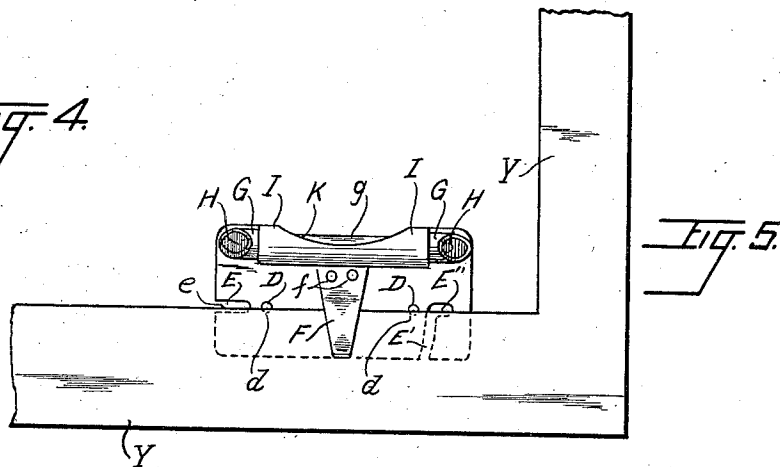
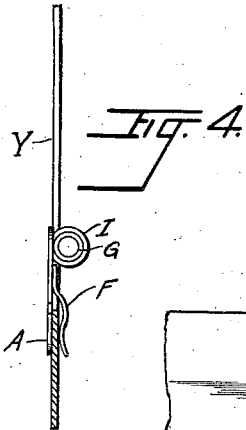
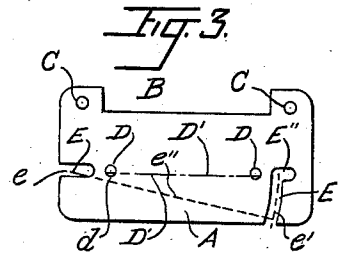
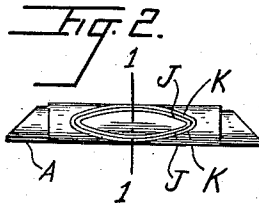
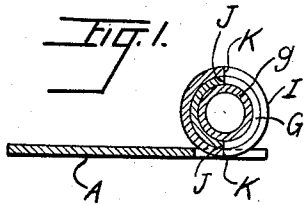


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LEVEL.

APPLICATION FILED DEC. 26, 1911.

1,066,013.

Patented July 1, 1913.



WITNESSES:

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LEVEL.

1,066,013.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed December 26, 1911. Serial No. 667,794.

To all whom it may concern:

Be it known that I, FRED HENNING, a citizen of the United States, residing at Austin, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Levels, of which the following is a specification.

This invention relates to what are termed in the art spirit levels.

The object of the invention is to obtain a spirit level which is so mounted on a base that it, together with its base, may be removably mounted on straight edges or squares, such as are used by carpenters, and masons, so that said straight edges or squares may be used to determine horizontals and verticals.

A further object of the invention is to obtain a device of the character described in which means are provided to protect the glass tube forming an element thereof from injury.

A further object is to obtain a device of the kind described which is easily manipulated, economically constructed, durable, not likely to get out of order, and not requiring much room for storage.

In the drawing Figure 1 is a section of a device embodying this invention on line 1—1 of Fig. 2. Fig. 2 is a perspective view of a device embodying the invention. Fig. 3 is a top plan view of the base forming an element of the device. Fig. 4 is an end view of a portion of a square set on edge, and of a device embodying the invention removably attached thereto. Fig. 5 is a front elevation of the square illustrated in Fig. 4, set on edge, and with the device embodying the invention removably attached thereto. Fig. 6 is an end view of a straight edge having a device embodying the invention removably attached thereto, and Fig. 7 is a front elevation of the straight edge and device illustrated in Fig. 6.

Similar letters refer to similar parts throughout the several views.

A represents the base of the device.

B is a recess in one edge of base A.

C, C, are apertures in base A.

D, D, are abutments on one side of base A.

E, E', E'', are slots in base A. Slots E and E'' are substantially parallel with the edges of base A. The center line of slot E' (lettered e' in Fig. 3), is a section of a

curve having the radius e'' around the point e , in slot E. Slot E'' communicates at one end thereof with slot E'.

F is a spring which is rigidly secured to base A by rivets f, f .

G is a metal tube and g is a glass spirit tube in tube G. Tube G is rigidly attached to base A, by means of rivets H which extend through the holes C in said base A and through corresponding holes in tube G. The tube g is secured in tube G so that the visible face thereof is parallel with the axial line of slots E and E'' and also parallel to a line D' (Fig. 3) between faces d of projections D.

I is a metal tube rotatably mounted on tube G. The length of tube I is slightly less than the length of recess B in base A and when the tube G is mounted on and attached to base A, by means of rivets H said tube I is in said recess so that no end motion of the tube I on tube G is permitted but said tube I may be manually rotated thereon. The tube G is cut away, in the ordinary way, as indicated by lines lettered J, and a corresponding portion of the tube I is also cut away as indicated by lines lettered K. When the tube I is turned on tube G so the aperture in the cylindrical wall thereof which is indicated by the lines lettered K registers with the aperture in the cylindrical wall of tube G which is indicated by the line lettered J, one face of the tube g is exposed to view. When said tube I is turned so that said apertures do not register the tube g is not exposed to view, but is protected by tube I from breakage or other injury. When the device is in storage the relation of tubes G and I is such that tube I protects tube g from injury, such relation being established by turning said tube I on tube G so that the apertures through which the tube g may be viewed do not register.

L, L, are round headed screws secured in the straight edge which is illustrated in the drawing so as to project from one face or side thereof, and L' is an aperture through said straight edge. Said straight edge and screws L constitute a base provided with abutments, and base A forms an additional base.

Y is a metal square. The device is attached to one arm of square Y by interposing said square between spring F and base A and forcing said base thereonto until the

faces d , d , of pins D, D; are in contact with one edge of one of the arms of the square.

The device is attached to the face of a straight edge from which screws L project, 5 by engaging any two of said screws in slots E, E', and then turning the base A around the screw which is in slot E until said base can be slid on the screws so that one thereof is in slot E and another one in slot E''. Said 10 screws L are, as hereinbefore described, properly placed on one side or face of the straight edge so that the tube g is in proper relation to the lower edge of said straight edge when the device is attached thereto as 15 above described, and hence when the tube g indicates that said tube g is horizontal the lower edge of the straight edge is horizontal.

To remove the device from the square and from the straight edge the above named operations are, respectively, reversed. 20

The device can be attached to the straight edge in the same manner as hereinbefore described relative to the square by cutting a portion of the straight edge away, as is 25 illustrated by the broken lines lettered Z in Figs 6 and 7, so as to leave a thin wall, substantially of the same thickness as the square. The base A is then slid on one side of the thin wall which is obtained in the manner 30 described in the preceding paragraph, with the spring F on the opposite side of said wall.

I claim:—

A base, abutments on said base, an additional base provided with co-axially arranged slots, one of said slots positioned in the body of said additional base and the inlet of the other slot positioned in one of the ends thereof, said additional base also provided with an additional slot substantially at right angles to and communicating with said slot in said body and with its inlet in an edge which is at right angles to said first named slotted end, the sides of said additional slot substantially parallel and positioned at less distance from said first named slotted end than is the distance between said abutments, in combination with a tube provided with an aperture on one side thereof and attached to said additional base, a tube of transparent material, liquid in said transparent tube, said transparent tube positioned in said first named tube and exposed to view through the aperture therein, and arranged so that when the transparent tube indicates that the instrument is in a horizontal position the longitudinal axis of said co-axially arranged slots will also be in a horizontal position. 35 40 45 50 55

FRED HENNING.

In the presence of—

CHARLES TURNER BROWN,
CORA A. ADAMS.