

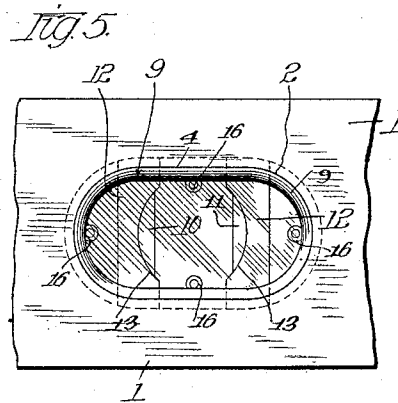
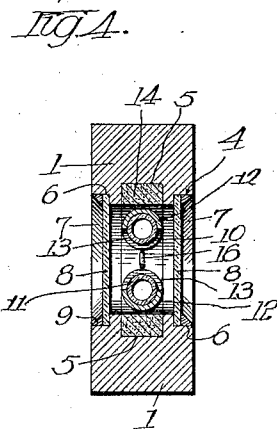
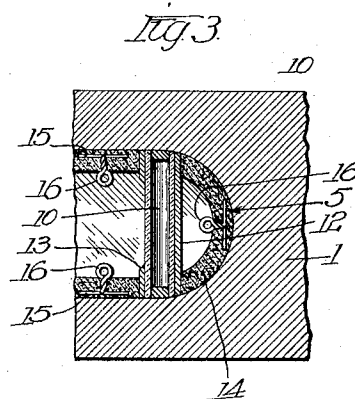
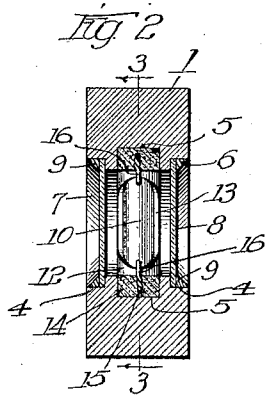
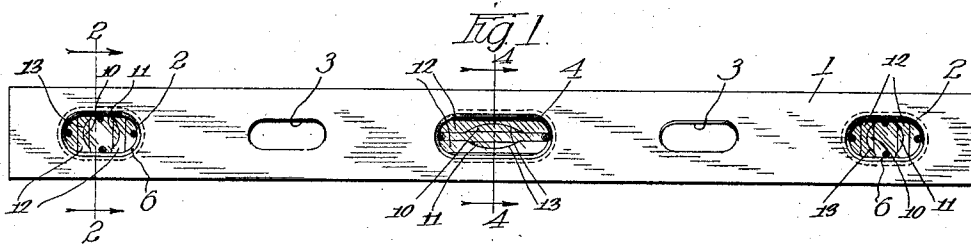
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SPIRIT LEVEL.

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1,062,964.

Patented May 27, 1913.



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UNITED STATES PATENT OFFICE.

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SPIRIT-LEVEL.

1,062,964.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CHARLES H. GESBECK and JOHN SEMMERLING, of Chicago, Cook county, Illinois, both citizens of the United States, have invented certain new and useful Improvements in Spirit-Levels; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has for its object to provide an improved spirit level in which the tubes containing the spirits are rigidly held in position by means capable of being easily removed and replaced to reset said tubes whenever desired.

Other objects of the invention will be hereinafter pointed out.

The invention consists in the features of construction and combinations of parts hereinafter fully described and particularly claimed.

In the accompanying drawings illustrating the invention: Figure —1— is a view in side elevation of a spirit level constructed in accordance with our invention. Fig. —2— is a vertical transverse section of the same on the line 2—2 of Fig. —1—. Fig. —3— is a fragmentary detail longitudinal section of the same on the line 3—3 of Fig. —2—. Fig. —4— is a vertical transverse section on the line 4—4 of Fig. —1—. Fig. —5— is a fragmentary detail view in elevation on an enlarged scale.

Spirit levels as they are usually made consist of a bar of wood provided with openings therethrough at intervals, the said openings being spanned by the tubes containing the spirits. These tubes are usually inserted into openings extending transversely of the first-named opening through one or both straight edges of the bar. Said bars are usually greatly weakened at the points at which the tubes are inserted, and by reason of their general formation are liable to warp and to break. The spirit level tubes are also apt, by reason of the warping of the bar, and also by reason of the way in which said tubes are mounted therein, to become more or less displaced so as not to accurately indicate when the straight edge of the bar is exactly vertically or horizontally disposed.

Our invention has for its objects, first, to provide a spirit level bar which is so con-

structed as to maintain it very strong, and further to provide means whereby the tubes may be very accurately adjusted therein and after such adjustment be permanently held in such positions, and which at the same time may be easily removed and replaced or re-adjusted, if necessary.

As shown in the accompanying drawings, the bar 1, preferably made of wood, and which is rectangular in cross-section, as shown in Figs. —2— and —4—, is provided with a plurality of openings 2, 3 and 4. There are preferably two of said openings 2 and two of said openings 3, the latter being disposed between the openings 2 and the central opening 4. All of said openings are substantially elliptical and the central opening 4 is preferably of considerably greater length than the openings 2, the latter and the opening 4 being adapted to contain the spirit level tubes. In the peripheral walls bordering said respective openings 2 and 4 there is provided midway between the side faces of the bar 1, a groove 5 of considerable depth and preferably having a bottom wall and two side walls extending at right angles to each other. The side walls of said grooves 5 are also preferably cut away at their outer corners, as at 6. Thus two parallel peripheral flanges 7 are provided for each opening between which the end portions of the spirit level tubes are received and held against lateral displacement. Against the outer faces of the flanges 7 panes 8 of glass rest, the latter being held in place similarly to window panes by putty in the usual and well-known manner. The spirit level tubes 10 and 11 employed are of the usual well-known construction, each thereof being preferably inclosed in a metallic housing or tube 12 having an opening 13 through which the bubble is visible.

The tubes 10 with their housings are adapted to extend transversely of the openings 2 and are preferably of a length substantially equal to the width of the opening between the bottom walls of the grooves 5 therein. The said grooves 5 into which the ends of the tubes 10 and their housings 12 project are adapted to be filled with a suitable substance, as for example plaster of Paris in plastic condition, the ends of said tubes and their housings becoming embedded in said filling and being adjusted to proper position while the same is still

plastic and after being so adjusted the said filling is permitted to set thus permanently retaining said tubes and their housings in their adjusted positions in said openings 2. In the drawings we have illustrated the filling at 14.

If by reason of warping of the bar 1, or from other causes, the tubes should become displaced so as to no longer truly indicate when the straight edges of the bar are vertically disposed, the filling 14 may be easily removed and said tubes re-adjusted by inserting a new filling in the grooves 5, as will be obvious. To more readily effect such removal of said filling we prefer to embed therein between each pair of tubes in the openings 2 and 4, small pieces of wire, each of which is bent by twisting the end portions 15 about each other to form a loop 16, the twisted portion and the end portions of the wire being embedded in the filling and the said ends being bent to extend in opposite directions therein, while the loop is exposed for engagement by a suitable tool for withdrawing the same from the filling. By withdrawing said loop and its shank, formed as above described, the portion of the filling 14 in which the same is embedded will obviously be fractured and whatever thereafter remains in the said groove 5 may be removed by means of a suitable sharp instrument. After that portion of the filling disposed between the tubes in each of said openings 2 has been removed said tubes may obviously be readily removed and the balance of the filling then similarly fractured and removed by removing loops having their shanks similarly embedded therein. A further improvement consists in providing the bar 1 with two of said openings 2 disposed contiguous to the respective ends of the bar and disposing in each of said openings 2 of said tubes 10 with their housings 12, and so placing the latter that the openings therein through which the bubbles are visible oppose each other. Thus the operator may, in using the level, read either of two of said tubes 10, depending upon which is most conveniently exposed to his view. Similarly two of the tubes 11 are disposed in the opening 4 and their housings so arranged that the openings therein are opposed to each other so that either straight edge of the bar 1 may be disposed upon the surface to be leveled, or the level of which is to be ascertained, and the reading taken.

The said tubes 11 and their housings are preferably made of the same length as the greatest diameter of the free portion of the opening 4 so that they may be readily inserted in said opening and then moved toward one of the straight edges of the bar and adjusted in position so that their axes are parallel with said straight edges and then held in such positions by the plastic filling 14, as will be obvious.

By reason of the fact that the openings are provided in the bar 1 only midway between the straight edges thereof there is less liability of the bar to warp and all of the tubes are well protected against fracture. Furthermore, the bar is weakened laterally to a very much less extent than usual so that its liability to break is greatly reduced.

We claim as our invention:

1. A spirit level comprising a bar having a lateral opening therethrough, the peripheral wall of said opening having a peripheral groove therein in which is placed a plastic material capable of setting to become hard, and a spirit level tube embedded at its ends in said plastic material and held rigidly in place thereby, and means partly embedded in said plastic material adapted, when withdrawn therefrom after it has set, to fracture the same and permit ready removal thereof for releasing said tube.

2. A spirit level comprising a bar having a lateral opening therethrough adapted to receive at least one spirit level tube, a spirit level tube disposed to span said opening and engaged at its ends between peripheral flanges bordering the deepest portion of said opening between the ends thereof, a plastic material disposed between said flanges embedding the end portions of said tube and adapted, when set, to hold said tube rigidly in place in said opening, and devices partly embedded in said plastic material and projecting therefrom, adapted when said material has become set, to be withdrawn therefrom to fracture said material and release said tube.

In testimony whereof we have signed our names in presence of two subscribing witnesses.

CHARLES H. GESBECK.
JOHN SEMMERLING.

Witnesses:

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