Nov. 11, 1924. 1,515,239

H. J. COOK

SPIRIT LEVEL

Filed Dec. 9, 1922

FIG. 1

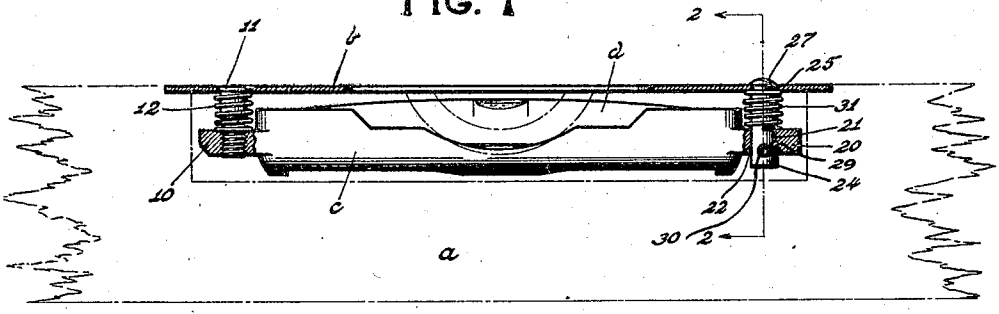


FIG. 2

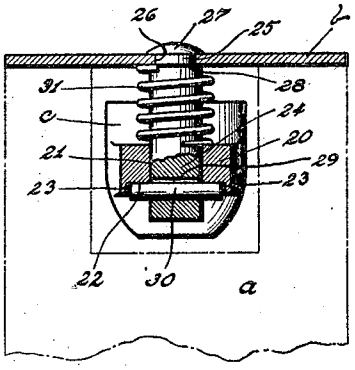
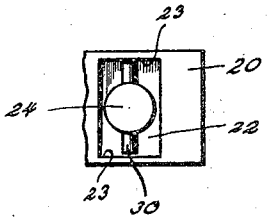


FIG. 3



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UNITED STATES PATENT OFFICE.

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SPIRIT LEVEL.

Application filed December 9, 1922. Serial No. 605,808.

To all whom it may concern:

Be it known that I, HARRIS J. COOK, a citizen of the United States, and a resident of New Britain, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Spirit Levels, of which the following is a specification.

This invention relates to spirit levels of the type having a spirit tube adapted for adjustment; and the aim of the invention is to provide a device of this sort with improved and novel means for securing the spirit level to the face plate, this means being of a very simple construction which may be cheaply manufactured; the parts thereof being capable of ready assembly and being securely locked together against accidental displacement.

Another object of the invention is to provide locking or securing means of this sort which also serves to fulcrum the spirit tube for adjustment in a small arc in an extremely delicate and precise manner.

In the accompanying drawing, wherein I have shown, for illustrative purposes, one embodiment which the present invention may take,

Fig. 1 is a side elevational view, partly in section, of a spirit tube connected to the face plate, the body portion or stock of the level being shown in dotted lines;

Fig. 2 is a transverse sectional view taken substantially on line 2—2 of Fig. 1; and

Fig. 3 is a view looking up at the bottom of the right hand end of the spirit tube case.

Referring to the drawing in detail, *a* denotes the stock of a spirit level; *b*, the face plate, and *c*, the metallic case in which is mounted the spirit tube *d*. As is usual in levels of this sort, the spirit tube is located in a recess in the stock, this recess being closed by the face plate *b*. Extending from one end of the case *c* is an ear 10 having a threaded aperture for the reception of a screw 11. About this screw and positioned between the face plate and the ear 10 is a spring 12. The arrangement so far described is old and well-known and, of course, may be varied as desired.

The present invention relates more particularly to the manner in which the opposite end of the case *c* is connected to the face plate. In the present illustrative disclosure, this opposite end of the case is provided with an ear 20 having a smooth bore 21 which terminates at its lower end in a recess 22, the end walls of which recess form abutments 23.

The numeral 24 designates a post of substantially the same diameter as the bore 21 so as to have a sliding fit therein, there being, however, sufficient clearance between the parts to permit the spirit tube to be moved through a slight arc when it is desired to adjust the level by turning the screw 11. The end of this post is of reduced diameter, as at 25, so as to fit in an opening 26 in the face plate. The protruding end of the post is swaged over so as to provide a head 27 between which and the shoulder 28, the edge of the face plate about the opening 26 is securely clamped. The inner end of the post is provided with a diametric opening 29 for the reception of a locking pin 30, the ends of which fit within the recess 22. Positioned about the post between the face plate and the ear 20 is a coiled spring 31.

The arrangement described is very simple in construction and, therefore, may be manufactured at a relatively low cost. The case *c* may be readily removed when it is desired, for instance, to replace the glass spirit tube, in the event that the latter should be broken, by merely pressing the right hand end of the case towards the face plate and then withdrawing the locking pin 30. The case may be secured in position by sliding the ear 20 over the post and then inserting the locking pin 30, whereupon pressure against the ear is relieved so that this ear will be held against the pin by the spring. It will be noted that when the parts are assembled the pin 30 lies within the recess 22 so that the abutments 23 will prevent accidental displacement of the pin.

The pin 30, in addition to serving as a lock for securing the parts together, functions as a fulcrum of considerable delicacy and precision on account of the nature of the engaging surfaces between the pin and the parts with which it is associated. It will be noted that the opening 29, which is of relatively small diameter, and the locking pin 30 are at right angles to the axis of the spirit tube and that there is a line contact between the circular surface of the pin and the flat surface provided on the coun-

tersunk portion 22 of the case, so that when the screw 11 is turned to move the spirit tube through a small arc in the process of adjusting the same, the case *c* will have a very precise pivotal movement which is especially desirable in instruments of this sort intended for extreme accuracy.

It is, of course, obvious that my invention is susceptible of various modifications and changes which are within the spirit of the invention without departing from the scope of the following claims, it being understood that the present disclosure of my invention is by way of illustration only and it is not to be taken as restrictive of my conception.

I claim as my invention:—

1. The combination with the face plate of a level, of a post secured thereto and having a transverse opening adjacent its free end, a spirit tube case provided with an aperture adapted to slidably receive said post, a spring surrounding said post between said plate and case, a circular pin in said opening having a line contact with that face of said case opposite to that against which said spring presses, the line of contact between said pin and case being disposed at right angles to the length of the spirit tube, and means for adjusting said case through a small arc about said pin as a fulcrum.

2. The combination with the face plate of a level, of a post riveted thereto and having a transverse opening adjacent its lower end, a spirit tube case having an ear provided with an aperture adapted to slidably receive said post and a recess surrounding said aperture on its lower face, a spring about said post between said plate and ear, and a pin extending through said opening and whereby said spring forces said ear along the post so that the pin rests in said recess.

HARRIS J. COOK.