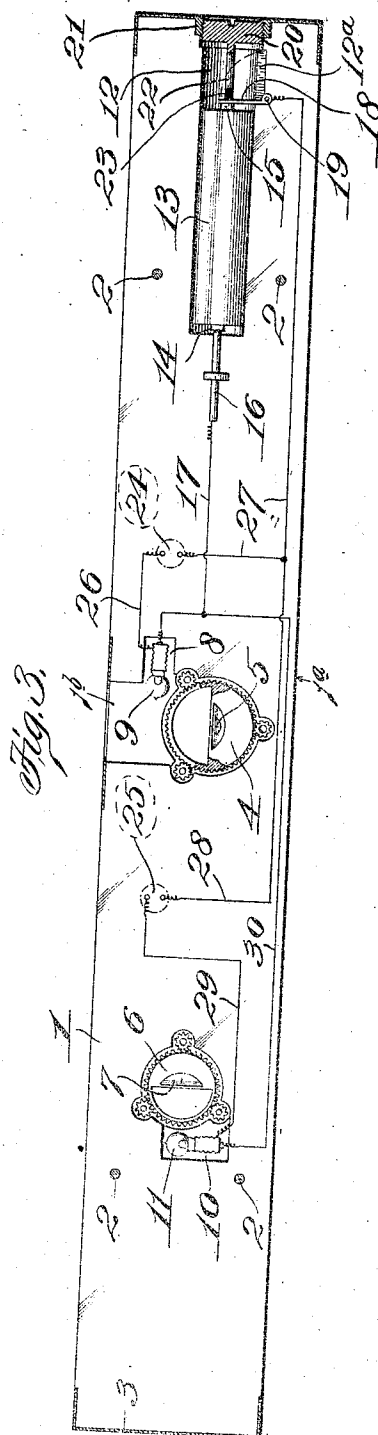
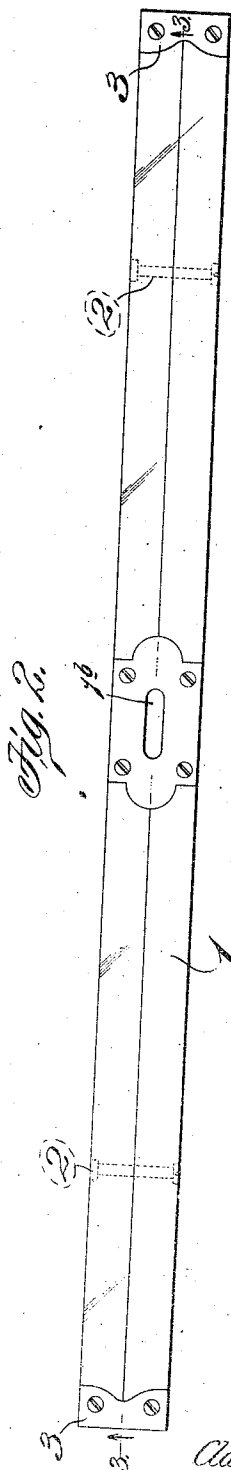
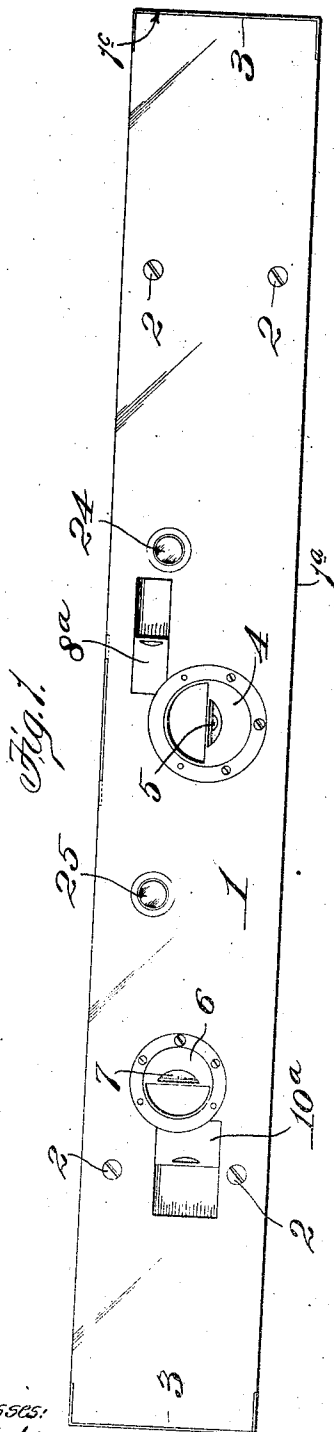


1,027,533.

C. C. FINN.
SPIRIT LEVEL.
APPLICATION FILED JUNE 19, 1911.

Patented May 28, 1912.



Witnesses:
G. C. Pilsberg

Clarence C. Finn, Inventor.
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UNITED STATES PATENT OFFICE.

CLARENCE C. FINN, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO JAMES L. HEATH, OF ST. LOUIS, MISSOURI.

SPIRIT-LEVEL.

1,027,533.

Specification of Letters Patent.

Patented May 28, 1912.

Application filed June 19, 1911. Serial No. 634,060.

To all whom it may concern:

Be it known that I, CLARENCE C. FINN, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Spirit-Levels, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof, in which—

Figure 1 is a side elevational view of a spirit-level embodying my invention; Fig. 2 is a plan view of the same; and Fig. 3 is a vertical sectional view on the line 3—3, Fig. 2.

This invention relates to a certain new and useful improvement in spirit-levels, the object of my invention being to provide an article of the kind stated with an artificial light, and more particularly to provide an article of the kind stated with an electric lighting system, including an electric lamp or lamps, whereby such article, while adapted to be used as an ordinary spirit-level in the day time or in light places when the bubble-tube or tubes may be clearly discerned or observed, is equally well adapted for use, and the bubble-tube or tubes thereof equally well discernible or observable, in the night time or in dark places or corners.

With this object in view, my invention resides in the novel construction of my new lighting-system and in the novel arrangement and combination of the same with a spirit-level, all as will hereinafter be described and afterward pointed out in the claims.

In the drawings, wherein like reference numerals refer to like parts throughout the several views, 1 indicates the body-portion of the level, which may be, and preferably is, of any well-known or approved construction, being formed preferably in two parts secured together in any suitable manner, preferably by means of transversely disposed through-bolts or other suitable securing-devices 2 and metallic end-plates 3, as shown particularly in Fig. 2. Said body-portion 1 preferably at or near the center thereof is provided with a laterally-disposed opening extending therethrough, in which any suitable bubble-tube is adapted to be arranged and mounted preferably horizontally disposed relatively to the long straight-leveling-edge, or the horizontally-disposed straight-leveling-edge, as we will call it, 1^a

of said body-portion 1. I, however, prefer to arrange in said opening my improved adjustable ring-shaped bubble carrying-member shown and fully described in a companion application filed in the United States Patent Office of even date herewith and serially numbered 634,059, this said ring-shaped member designated by the numeral 4 carrying a bubble-tube 5 and being adapted to be rotarily moved in said opening to properly adjust the position of said bubble-tube 5 and the bubble therein relatively to said long straight-leveling-edge 1^a of body-portion 1. As will clearly be seen from Figs. 1 and 3, said bubble-tube 5 is not only clearly observable or discernible from the sides of said body-portion 1, but, as said ring 4, as in said companion application fully shown and described, is also provided in its upper portion with a circumferentially-disposed slot in alinement with the longitudinally-disposed slot 1^b of said body-portion 1, is also clearly observable or discernible from the top surface of said body-portion 1. As said bubble-tube 5 is adapted to be used particularly in connection with said long leveling edge 1^a of body-portion 1 to ascertain particularly the horizontal correctness of surfaces and the like, and as it is also desirable that said body-portion 1 be provided with a second bubble adapted to be used particularly in connection with the straight edge, or vertically-disposed straight leveling-edge, as we will call it, 1^c of said body-portion 1 to ascertain particularly the vertical correctness of surfaces and the like, or the horizontal correctness of surfaces and the like of small area, said body-portion 1 is also provided with a second laterally-disposed opening at any suitable point, preferably to one side of the center thereof, in which second opening any suitable bubble-tube is likewise adapted to be arranged and mounted preferably horizontally disposed relatively to said end leveling-edge 1^c of body-portion 1. I here, however, also prefer to arrange and mount my improved adjustable bubble-tube carrying-member shown and fully described in said companion application, said member being indicated by the numeral 6 and the bubble-tube carried thereby by the numeral 7. This ring 6 is likewise provided in its upper portion with a longitudinally-disposed slot for purposes more fully hereinafter appearing.

Formed in said body-portion 1 preferably immediately above and to one side of said central opening in which said adjustable ring 4 is mounted, as shown particularly in Figs. 1 and 3, is a recess or pocket 8, in which is adapted to be removably arranged or positioned preferably a small incandescent electric lamp or bulb 9. This pocket 8 preferably does not extend laterally entirely through said body-portion 1, but is of such depth that said lamp or bulb 9, when arranged therein, will preferably be directly in alinement with said longitudinally-disposed slot in the upper portion of said ring 4, whereby the rays from said lamp, when lighted, will be radiated through said slot directly upon said bubble tube 5, and said lamp or bulb being to one side of said longitudinally-disposed slot 1^a in said body-portion 1, a clear view of said bubble-tube 5 through said slot 1^a may be had. In order that said lamp 9 may normally be hidden from view and not exposed to breakage, and yet may be readily removed and replaced by a second lamp or bulb, whenever necessary, the opening of this pocket 8 is preferably closed in any suitable manner, as by means of a plate 8^a slidably arranged, as shown, on said body-portion 1. Also formed in said body-portion 1 immediately adjacent said second opening in which said adjustable ring 6 is mounted and also adjacent the longitudinally-disposed slot in said ring, is a second pocket 10, in which is adapted to be likewise removably arranged or positioned a similar incandescent electric lamp or bulb 11. This pocket 10, similar to pocket 8, preferably does not extend laterally entirely through said body-portion 1, but is of such depth that said lamp or bulb 11 will be positioned directly in front, as it might be said, of said longitudinally-disposed slot in said ring 6, whereby the rays from said lamp or bulb, when lighted, will be radiated or thrown through said slot directly on said bubble-tube 7. Likewise in order that said lamp or bulb 11 may be normally hidden from view and not exposed to breakage, and yet may be readily removed and replaced by a second lamp or bulb whenever necessary, this pocket 10 is also normally closed in any suitable manner, as by means of a plate 10^a slidably arranged, as shown, on said body-portion 1. At one end thereof, see particularly Fig. 3, said body-portion 1 is also provided with a suitable preferably elongated pocket 12, in which is adapted to be arranged any suitable, preferably cylindrical, small electric dry battery 13 provided at its opposite ends with contact points 14 and 15. Preferably seated in said body-portion 1 at the inner end of said pocket 12 is a contact-pin 16, with which said contact-point 14 of battery 13 is adapted to removably make contact,

and leading from said contact-pin 16 to said lamp 9 is one wire 17 of the circuit between said battery 13 and said lamp 9. 18 indicates a suitable contact-plate which is preferably, for purposes hereinafter appearing, pivoted or hinged upon a pin 19 arranged in said body-portion 1 adjacent the outer end of said pocket 12, the free end of said plate being adapted to removably make contact with said contact-point 15 of battery 13. 12^a indicates a small recess or pocket in said body-portion 1 which communicates with the outer portion of said pocket 12 and in which recess or pocket said contact-plate 18 is adapted to rest when said battery 13 is being positioned or arranged in, or removed from, said pocket 12 for purposes hereinafter appearing. 20 indicates a suitable plug which is adapted to be screw-seated in a suitable socket 21 arranged in the end-plate of said body-portion 1 in alinement with the mouth of said pocket 12, as shown clearly in Fig. 3. This plug 20 carries on its inner side a pin 22 provided at its end with suitable insulation 23 adapted to bear, when said plug 20 is fully seated, against said contact-plate 18, this plug 20 and its carried pin 22 being adapted, as shown clearly in Fig. 3, to hold said contact-plate 18 in removable engagement or contact with said contact-point 15 of battery 13 and also to hold said battery 13 removably in place in said pocket 12 with its contact-point 14 contacting with said contact-pin 16. 24 indicates a suitable push-button located at a suitable point on the side of body-portion 1 and preferably adjacent said adjustable bubble-tube carrying-member 4, and 25 indicates a second push-button located on the side of said body-portion 1 preferably adjacent said adjustable bubble-tube carrying-member 6, these push-buttons being adapted, whenever desired, to be depressed to close the normally-open circuits between said lamps 9 and 11 and said battery 13. Connected to and leading from lamp 9 to push-button 24 is a wire 26, and connected to and leading from push-button 24 to said contact-plate 18 is a wire 27, the circuit between said lamp 9 and said battery 13 being thus completed on one side through said pin 16 and wire 17, and on the other side through contact-plate 18, wire 27, push-button 24, and wire 26. Suitably connected at one end to and leading from said lamp 11 is a wire 30 suitably electrically connected at its other end to said wire 17; and connected at one end to said lamp 11 and leading therefrom to said push-button 25 is a wire 29, and connected at one end to said push-button 25 and leading therefrom and suitably electrically connected at its other end to said wire 27, is a wire 28, the circuit between said lamp 11 and said battery 13 being thus completed on one side through pin 16

16, wire 17, and wire 30, and on the other side through wire 29 to and through push-button 25, wire 28, wire 27, and contact-plate 18.

5 From the foregoing, it will clearly be seen that the said lighting-system, being substantially embedded within said body-portion 1, does not in any way interfere with or hinder the proper use of my new level as
10 an ordinary spirit-level, and that my new level is not only adapted to be used as an ordinary spirit-level in light places when the bubble-tubes 5 and 7 may be readily discerned without the aid of any artificial light,
15 but is also well adapted for use, and in this respect being a decided advance over all spirit-levels now on the market of which I am aware, in a dark place or corner or at night (and occasions for such use frequently
20 happen) when it would ordinarily be difficult, if not impossible, to discern the position of the bubble in said bubble-tube or tubes; on such occasions, however, it will be seen that, by depressing either one or both of
25 said push-buttons to close the normally-open circuit between said lamp or lamps and said battery, said lamp or lamps will be lighted and the rays therefrom directed upon said bubble-tube or tubes, when the position of
30 the bubble in said tube or tubes may be readily discerned or observed. It will be obvious that, in case either one or both of said lamps become burned out, damaged, or broken, the same may be readily disconnected
35 from said wire connections and removed from operative position in said body-portion 1, and a new lamp or lamps, in place thereof, be easily and quickly arranged in proper operative position in body-portion 1
40 and connected in circuit with said wire connections.

Now, as will be seen particularly in Fig. 3, said battery 13 is removably arranged in operative position in said body-portion 1,
45 and, as it might be said, loosely electrically engages or makes contact with said contact-members 16 and 18, being held in said pocket 12 of body-portion 1 and in contact with said contact-members 16 and 18, as
50 hereinbefore described, by means of said plug 20. Thus further, should it be required or desired to remove the battery 13 for the purpose of replacement or renewal or otherwise, it will be seen that this can
55 easily be accomplished by merely unscrewing plug 20 from its socket 21 and turning the body-portion 1 of the level on end or in an upright vertical position, with the pocket 12 at the lower end, when battery 13
60 will drop by gravity out of said pocket, and in so doing said contact-plate 18 will be swung thereby downwardly out of the path of said battery and into said recess or pocket 12. A new battery may now be easily in-
65 serted in said pocket 12, after which said

body-portion 1 of the level is turned or moved so that contact-plate 18 will swing by gravity into contact with point 15 of said battery 13, and said plug 20 again seated in its socket 21, when, as hereinbefore de-
70 scribed, said new battery will be held in operative position in body-portion 1 with said contact-plate 18 and contact-pin 16 in electrical engagement or contact with, respectively, said contact-points 15 and 14 thereof,
75 the wiring of the circuit being, as will be clear, undisturbed during the removal or replacing of a battery.

The body-portion 1 of said level being preferably made in two parts, as hereinbefore stated, it is obvious that it is a comparatively easy matter when constructing my new level to arrange the various parts of the lighting-system therein, and it will further be seen that after the several parts of
85 the level and the lighting system have been properly assembled together and the level ready for use, there are no exposed conductors or parts to interfere with the free use and operation of my new level. It will
90 also be seen that my invention is applicable to practically all forms of spirit-levels, provides a simple and comparatively inexpensive means whereby the bubble-tube or tubes can readily be observed at practically all
95 times or in all places, and that minor changes in the arrangement, construction, and combination of the several parts of my new level may be made and substituted for those herein shown and described without in
100 the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A spirit-level comprising a body-portion provided with a bubble-tube and a pocket adjacent one end thereof, an electric lamp carried by said body-portion adjacent
110 said bubble-tube, a fixed battery-contact-member carried by said body-portion adjacent the inner end of said pocket, a pivotally-movable battery-contact-member carried by said body-portion adjacent the outer
115 end of said pocket, said contact-members being electrically connected in a normally open circuit with said lamp, an electric battery removably fitting in said pocket, a plug threaded in said body-portion adapted to
120 removably hold said pivoted contact-member in contact with said battery and also removably hold said battery in said pocket and in contact with said fixed contact-member, and means on said body-portion adapted to close the circuit between
125 said lamp and said contact-members; substantially as described.

2. A spirit-level comprising a body-portion provided with a bubble-tube and a pocket adjacent one end thereof, an electric
130

lamp carried by said body-portion adjacent said bubble-tube, a fixed battery-contact-member carried by said body-portion adjacent the inner end of said pocket, a pivotally-movable battery-contact-member carried by said body-portion adjacent the outer end of said pocket, said contact-members being electrically connected in a normally open circuit with said lamp, an electric battery removably fitting in said pocket, a plug removably threaded in said body-portion and having an inwardly-extending pin adapted to removably hold said pivoted contact-member in contact with said battery and also removably hold said battery in said pocket and in contact with said fixed contact-member, said pivoted contact-member being adapted to be pivotally swung into or out of contact with said battery, and a push-button on said body-portion adapted to close the circuit between said lamp and said contact-members; substantially as described.

3. A spirit-level comprising a body-portion provided with a plurality of bubble-tubes and with a pocket adjacent one end thereof, a plurality of electric lamps carried by said body-portion adjacent said bubble-tubes, a fixed battery-contact-member

carried by said body-portion adjacent the inner end of said pocket, a pivotally-movable battery-contact-member carried by said body-portion adjacent the outer end of said pocket, said contact-members being electrically connected in a normally open circuit with each of said lamps, an electric battery removably fitting in said pocket, a plug removably threaded in said body-portion and having an inwardly-extending pin adapted to removably hold said pivoted contact-member in contact with said battery and also hold said battery in said pocket and in contact with said fixed contact-member, said pivoted contact-member being adapted to be pivotally swung into or out of contact with said battery, and a separate push-button on said body-portion for each of said lamps adapted to independently close the circuit between said contact-members and its respective lamp; substantially as described.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CLARENCE C. FINN.

Witnesses:

RUTH PETERSON,
JAMES L. HEATH.