E. J. LORING.

LUMINOUS LEVEL.

APPLICATION FILED JUNE 16, 1919.

1,318,162. Patented Oct. 7, 1919.

Fig. 1.

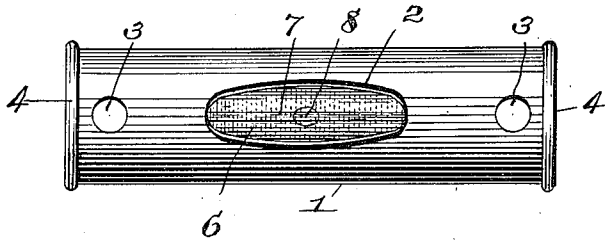
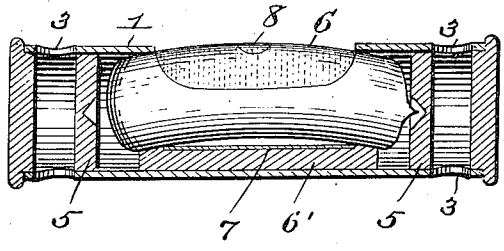


Fig. 2.



INVENTOR

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LUMINOUS LEVEL.

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To all whom it may concern:

Be it known that I, ERNEST J. LORING, a citizen of the United States, stationed at Washington, District of Columbia, have invented an Improvement in Luminous Levels, of which the following is a specification.

The invention described herein may be used by the Government, or any of its officers or employees in prosecution of work for the Government, or by any other person in the United States, without payment of any royalty thereon.

The subject of this invention is a level, and the invention relates more particularly to a level which is rendered luminous so that the same may be seen at night.

In devices for directing and controlling gun fire, it is desirable that some means be had for illuminating the level at night and such means should be of such character that, while permitting the level to be readily seen, will not emit rays of light which may be seen by the enemy. This is best accomplished by placing a strip of luminous material beneath the glass tube or vial of the level.

The tubes used in levels are of two characters, viz: The heavy glass tube used in the more expensive level, which has a slightly curved bore and which is lapped on the inside to make the bore absolutely smooth; and the bent glass tube which is the more usual commercial form, and which is made by bending an ordinary tube of thin glass and sealing the ends thereof after the tube has been filled with the liquid.

With the more expensive form of tube, the luminous strip works fairly well because of the fact that the glass has been rendered slightly cloudy by the lapping of the bore of the tube. In the usual commercial form, the glass of the tube is clear and the light emitted by the luminous strip appears so brightly that the bubble in the tube cannot be seen. These tubes are of so sharp a curve that lapping thereof is not practical.

The present invention is designed to overcome this effect and to so diffuse the light from the strip as to render the bubble easily discernible.

With these and other objects in view, which may hereinafter more fully appear, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

A practical embodiment of the invention as illustrated in the accompanying drawing, wherein:—

Figure 1 is a top plan view of a level constructed in accordance with the invention; and

Fig. 2 is a vertical longitudinal section of the same.

Referring to the drawing by numerals of reference; an ordinary tubular casing 1 is provided, formed with a sight opening 2, and having apertures 3, 3 formed diametrically thereof adjacent each end for the purpose of permitting fastening means, such as a screw, to be passed therethrough. The tubular casing is closed at each end by caps 4, 4. Within the tubular casing are the spaced apart retaining walls 5, 5, between which is located a glass tube 6 in position to underlie the sight opening 2. The tube is retained against movement longitudinally of the casing by means of the walls 5. A support 6′ may be interposed between the bottom of the tube and casing in order to retain the tube in proper position and a strip 7 of luminous material is placed beneath the tube and held in position by the support, or caused to adhere to the underside of the tube so that the light therefrom may be seen through the tube.

In order that the light from the luminous material may be properly diffused so that the bubble 8 can be readily seen, the glass of the tube is slightly clouded in any suitable manner, but preferably by etching on the inside with hydrofluoric acid or other like means.

With the tube thus etched, light passing therethrough will be so diffused that the bubble will be plainly outlined as a dark circle and easily read.

Having described my invention, what I claim is:

1. A luminous level including a tube having a movable bubble therein, said tube formed to diffuse light rays passing therethrough and a strip of luminous material positioned adjacent said tube.

2. A luminous level including a glass tube having a movable bubble therein, said tube etched on its inner surface, and a strip of luminous material positioned adjacent said tube.

3. A luminous level including a translucent tube having a movable bubble therein, and a strip of luminous material positioned adjacent said tube.

ERNEST J. LORING.