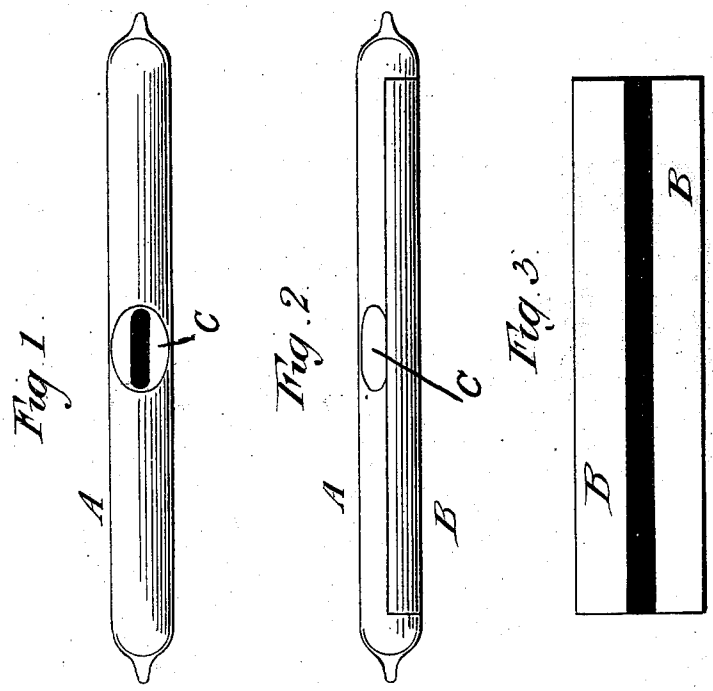
No. 692,097. Patented Jan. 28, 1902.

J. R. WOOD.

SPIRIT LEVEL.

(Application filed Oct. 30, 1899.)

(No Model.)



Witnesses:

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Inventor,

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by B. Singer

Att'y.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES ROBERT WOOD, OF GLASGOW, SCOTLAND.

SPIRIT-LEVEL.

SPECIFICATION forming part of Letters Patent No. 692,097, dated January 28, 1902.

Application filed October 30, 1899. Serial No. 735,208. (No model.)

To all whom it may concern:

Be it known that I, JAMES ROBERT WOOD, of Glasgow, Scotland, have invented certain new and useful Improvements in Spirit-Levels, (for which I have obtained Letters Patent in Great Britain, No. 7,134, bearing date the 5th of April, 1899,) of which the following is a specification.

In spirit-levels as commonly constructed with alcohol, chloroform, ether, or other colorless liquid in the tube it is sometimes very difficult during dark or foggy weather or in gloomy places to clearly discern the exact location of the air-bubble, owing to the lack of contrast in color between the liquid and the bubble.

The object of my invention is to avoid this difficulty, and this I accomplish by providing in the tube a fluorescent liquid, such as eosine or fluorescence dissolved in alcohol or water and by making a background for the air-bubble of a mirror or color contrasting with the liquid or having distinct or defined contrasting lines. By this arrangement the air-bubble, which is colorless, stands out by sharp contrast with the surrounding fluorescein surface of the liquid. Since fluorescence is an effect arising from refraction and dispersion from the first surface of the fluid on which the light falls, the air-bubble will not be effected thereby, but will be placed in strong relief thereto, the background adding to such relief. The background may be supplied by painting or otherwise coloring the tube itself or by a mirror or by applying a strip of paper bearing the desired color.

In the accompanying drawings, which form a part of this application, Figure 1 is a top plan view of a spirit-level made in accordance with my invention. Fig. 2 is a side elevation of the same, and Fig. 3 is a plan view showing a strip of paper with a colored stripe thereon suitable for use as a background for the tube.

Referring to the drawings in detail, A is the tube, B the background-strip, and C the air-bubble. The liquid being fluorescent, the epipolic dispersion from its surface will give rise to a color that is not the color of the body of the liquid and does not penetrate therein, but the bubble being non-fluorescent will not partake of such refracted color. It will be apparent that the air-bubble is without color and that as it can receive but diminishing light from the sides on account of the colored liquid which surrounds it the rays of light are focused on the bubble from the top of the tube and are contrasted by the fluorescence of the liquid. It is manifest that if merely a contrasting or reflecting background was provided on the bottom of the tube the bubble would appear plainly by contrast; but in my invention I have provided not only such contrasting or reflecting background in the manner set forth, but I have surrounded the air-bubble with a colored background—*i. e.*, the liquid at every point, except where said bubble contacts with the glass, thus greatly accentuating the contrast, and by confining the rays of the bubble increasing its transparency.

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

1. A spirit-level tube filled with a fluorescent liquid and having a background contrasting in color with the air-bubble.

2. A spirit-level tube containing a colored fluorescent liquid and having a background bearing a mark of a color contrasting with the air-bubble.

3. A spirit-level tube containing a colored fluorescent liquid surrounding the air-bubble.

In testimony whereof I affix my signature in the presence of two witnesses.

JAMES ROBERT WOOD.

Witnesses:
JOHN LIDDLE,
EDITH M. EDMONDSTONE.