

(No Model.)

2 Sheets—Sheet 1

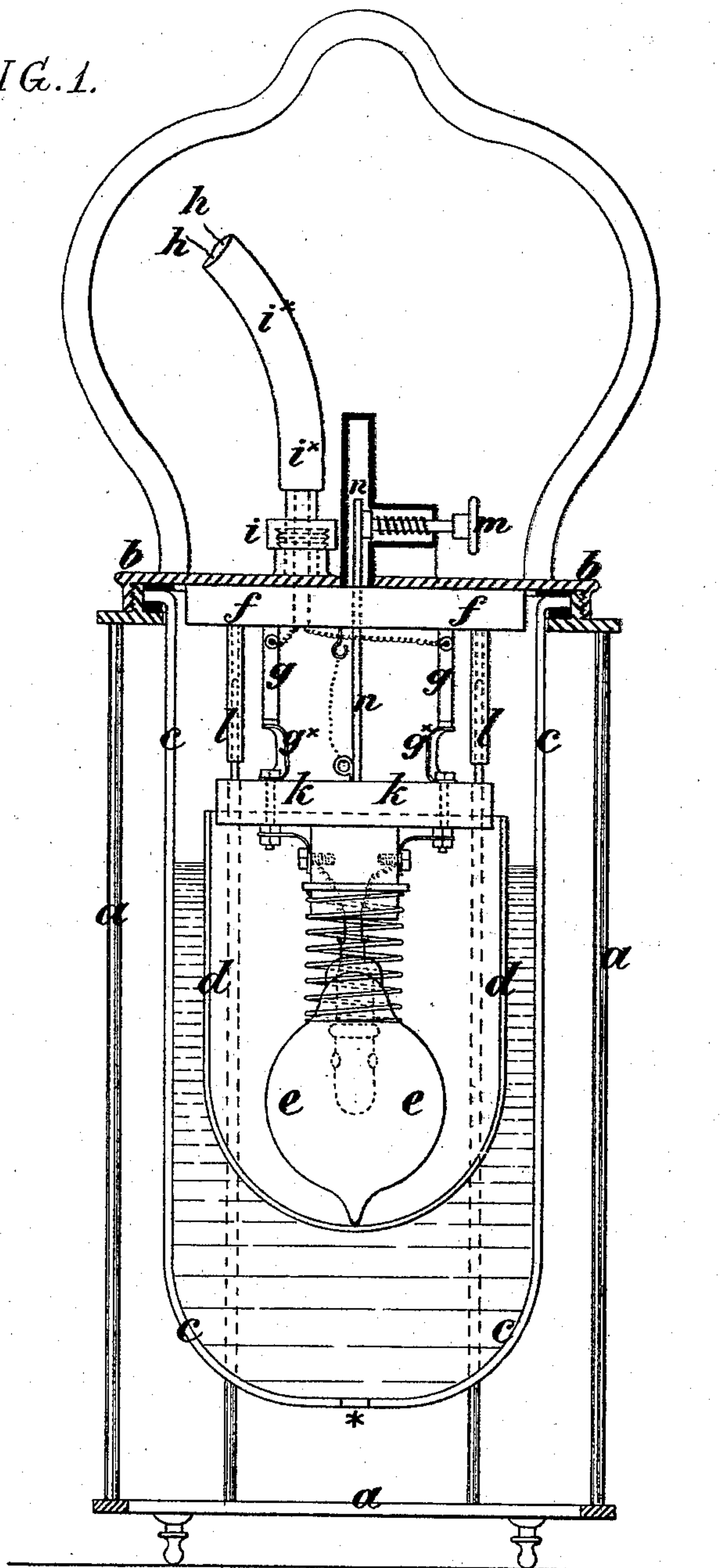
M. SETTLE.

ELECTRIC SAFETY LAMP FOR USE IN MINES.

No. 368,857.

Patented Aug. 23, 1887.

FIG. 1.



Witnesses:

William D. Bonner.  
John S. Parker

Inventor:

Miles Settle  
by his Attorneys  
Howson and Lusk

(No Model.)

2 Sheets—Sheet 2.

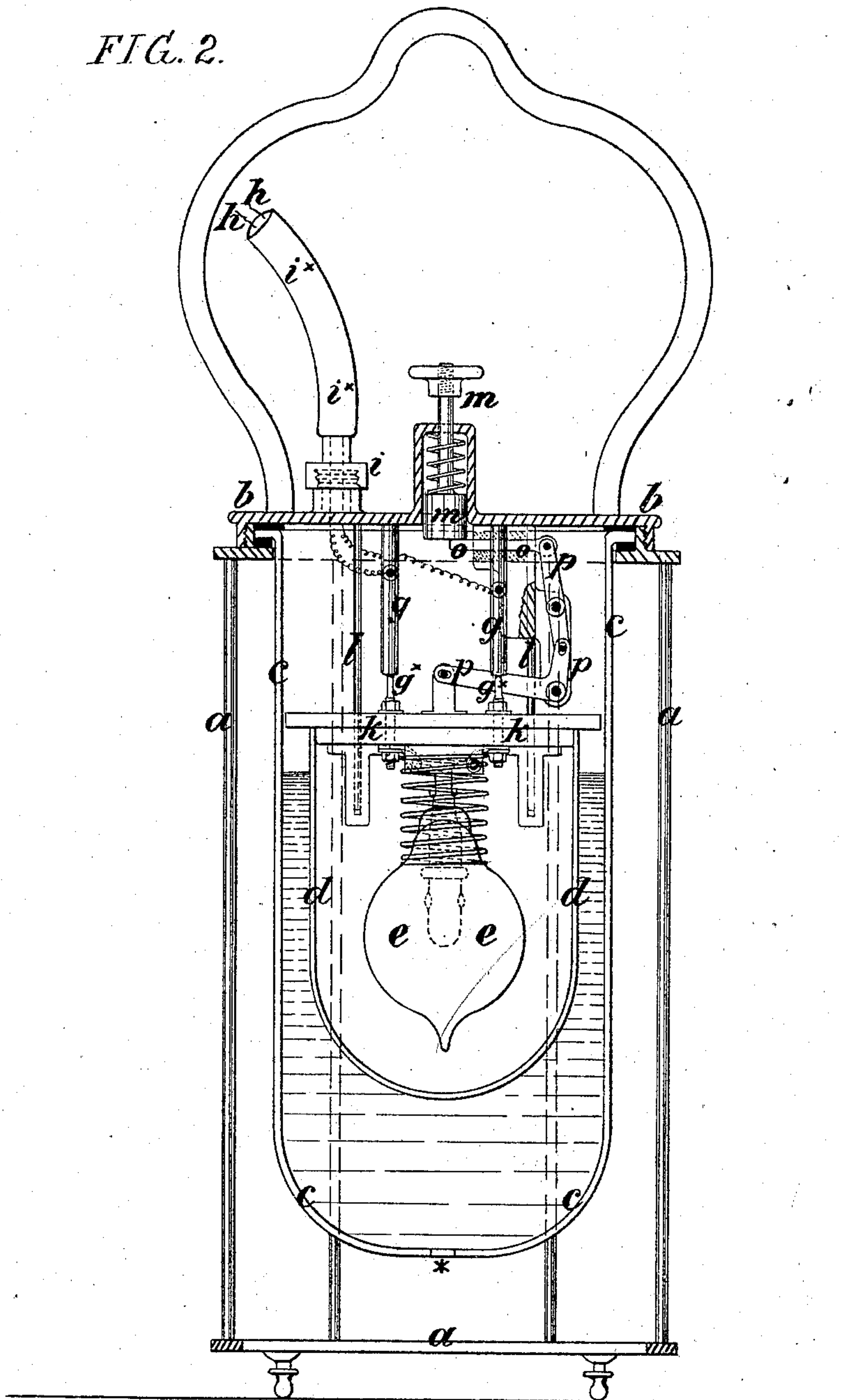
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FIG. 2.



Witnesses:  
William D. Bonner.  
John E. Parker

Inventor:  
Miles Settle  
by his Attorneys  
Horsman and Lano



# UNITED STATES PATENT OFFICE.

MILES SETTLE, OF SNOW HILL, DARCY LEVER, NEAR BOLTON, COUNTY OF LANCASTER, ENGLAND.

## ELECTRIC SAFETY-LAMP FOR USE IN MINES.

SPECIFICATION forming part of Letters Patent No. 368,857, dated August 23, 1887.

Application filed November 2, 1886. Serial No. 217,820. (No model.) Patented in England September 8, 1886, No. 11,413, and in Belgium November 11, 1886, No. 75,187.

*To all whom it may concern:*

Be it known that I, MILES SETTLE, a subject of the Queen of Great Britain, residing at Snow Hill, Darcy Lever, near Bolton, in the county of Lancaster, England, have invented Improvements in Electric Safety-Lamps for Use in Mines, (patented in England under date of September 8, 1886, No. 11,413, and in Belgium under date of November 11, 1886, No. 75,187,) of which the following is a specification.

This invention relates to improvements upon the electric safety-lamp for which I applied for Letters Patent in the United States of America on the 8th day of September, 1886, Serial No. 213,010, the object of the present invention being to simplify and improve the construction of such lamp.

The practical construction and operation of my improved electric safety-lamp will be readily understood on reference to the two sheets of drawings hereunto annexed and the following explanation thereof.

Sheet 1 of the drawings represents a vertical section of an electric safety-lamp for use in mines constructed according to my present improvements, and Sheet 2 is a similar view of a modification of the same.

In the first place, instead of having a separate reservoir above or below the lamp to contain the float, (as described in the specification hereinbefore referred to,) I place the latter in the water contained in the outer glass casing, and between it and the globe of the lamp, as shown on Sheet 1 of the drawings, and in order not to obstruct the light I make the float of glass, in the form of a cup, open at the top, (see Sheet 1,) or closed, as shown on Sheet 2 of the drawings, in which *a a* is the metallic framing of the lamp, *b b* the screw cap or head, *c c* the outer bell-glass containing the water, *d d* the internal glass or cup which forms the float, and *e e* the incandescent electric lamp. The water may be introduced by means of a funnel and tap, (not shown on the drawings,) or by unscrewing the head *b b*, and an opening may be made at \*, closed either by a tap or plug, for allowing of the escape of the water when required.

To the inside of the head *b b* of the lamp I affix a block, *f f*, Sheet 1, of wood, vulcanite, or other suitable material, to which are fixed (by screws or otherwise) two metal contact-pieces, *g g*, which are in electric contact with the main conducting-wires *h h*, which enter the lamp through a stuffing-box at *i i*, and are inclosed in an elastic tube, *i<sup>x</sup> i<sup>x</sup>*, which may be filled with water or other protective medium.

Inside the top of the internal glass cup or float, *d d*, is a movable piece of wood, vulcanite, cork, or other suitable material, *k k*, which is provided with two similar contact-pieces, *g<sup>x</sup> g<sup>x</sup>*, in electric connection with the wires of the electric lamp *e e*. This piece *k k* may be placed loosely in the mouth of the cup *d d*, as shown at Sheet 1 of the drawings, or it may be fixed liquid and gas tight therein, as shown at Sheet 2 of the same, and it works in or upon tubular or other slides *l l*, attached to the block *f f*, so as to be capable of moving toward or from the latter to make and break contact between the contact-pieces *g g* and *g<sup>x</sup> g<sup>x</sup>*.

In the modification shown on Sheet 1 the globe of the electric lamp *e e* rests upon the inside of the glass cup or float *d d* and supports the movable piece *k k*.

In the modification shown on Sheet 2 of the drawings the electric lamp is suspended from the movable piece *k k*, which closes the top of the glass float *d d*.

It will be evident that in both cases, so long as the water in the outer glass bell or case, *c c*, is at or above the normal level, the float *d d* will sustain the electric lamp *e e* and keep the pieces *g g* and *g<sup>x</sup> g<sup>x</sup>* in contact with each other, as shown on the drawings, and hence the electric current will remain unbroken and the incandescent lamp *e e* will continue to burn; but if, from breakage of the outer glass, *c c*, or from leakage or other cause, the water should escape from the outer casing, then, as the level of the water falls and lowers the float *d d*, the incandescent lamp *e e* will fall with it and will break contact between the pieces *g g* and *g<sup>x</sup> g<sup>x</sup>*, and the light will immediately be extinguished.

I would here remark that if the movable piece *k k* be made of cork or other equally buoyant substance it will act as a float, and



the glass cup *d d* may be dispensed with. I may also observe that the water employed may be impregnated with carbonic-acid gas, or other suitable liquid may be used instead thereof; or, if preferred, any suitable gas or aeriform fluid (under pressure or otherwise) which will produce the same result of sustaining the movable piece to which the incandescent lamp is suspended (so as to keep up the electric contact) may be employed in this lamp in the place of water.

In order to prevent the possibility of accidents by the contact-pieces *g g* and *g<sup>x</sup> g<sup>x</sup>* being brought together after the glass has been broken, I apply to the lamp a spring-bolt, *m m*, which, when the pieces *g<sup>x</sup> g<sup>x</sup>* have once fallen out of contact with the pieces *g g* and extinguished the light, locks them in that position until released by hand.

In the modification shown on Sheet 1 of the drawings the spring-bolt *m m* shoots above the top of the rod *n n*, attached to the movable piece *k k*, and thus holds the latter down until the bolt *m m* is withdrawn by means of the button, and in the modification shown at Sheet 2 the spring-bolt *m m* is held up by means of a pin, *o o*, which is withdrawn by levers *p p*, when the float falls and cannot be

replaced until the spring-bolt *m m* is raised up by hand.

I claim—

1. In an electric safety-lamp, the combination of an air and liquid tight vessel containing water or other suitable fluid, with a float therein supporting the incandescent lamp, and contacts for the wires carried by the float and by the vessel, whereby the escape of the fluid will break the electric connection and extinguish the lamp.

2. In an electric safety-lamp, the combination of an air and liquid tight vessel containing water or other suitable fluid, with a float therein, an incandescent lamp, contacts for the wires carried by the float and by the vessel, and an automatic locking-bolt to prevent accidental restoration of the electrical connection when once broken, all substantially as set forth.

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

MILES SETTLE.

Witnesses:

GEORGE DAVIES,  
JNO. HUGHES.