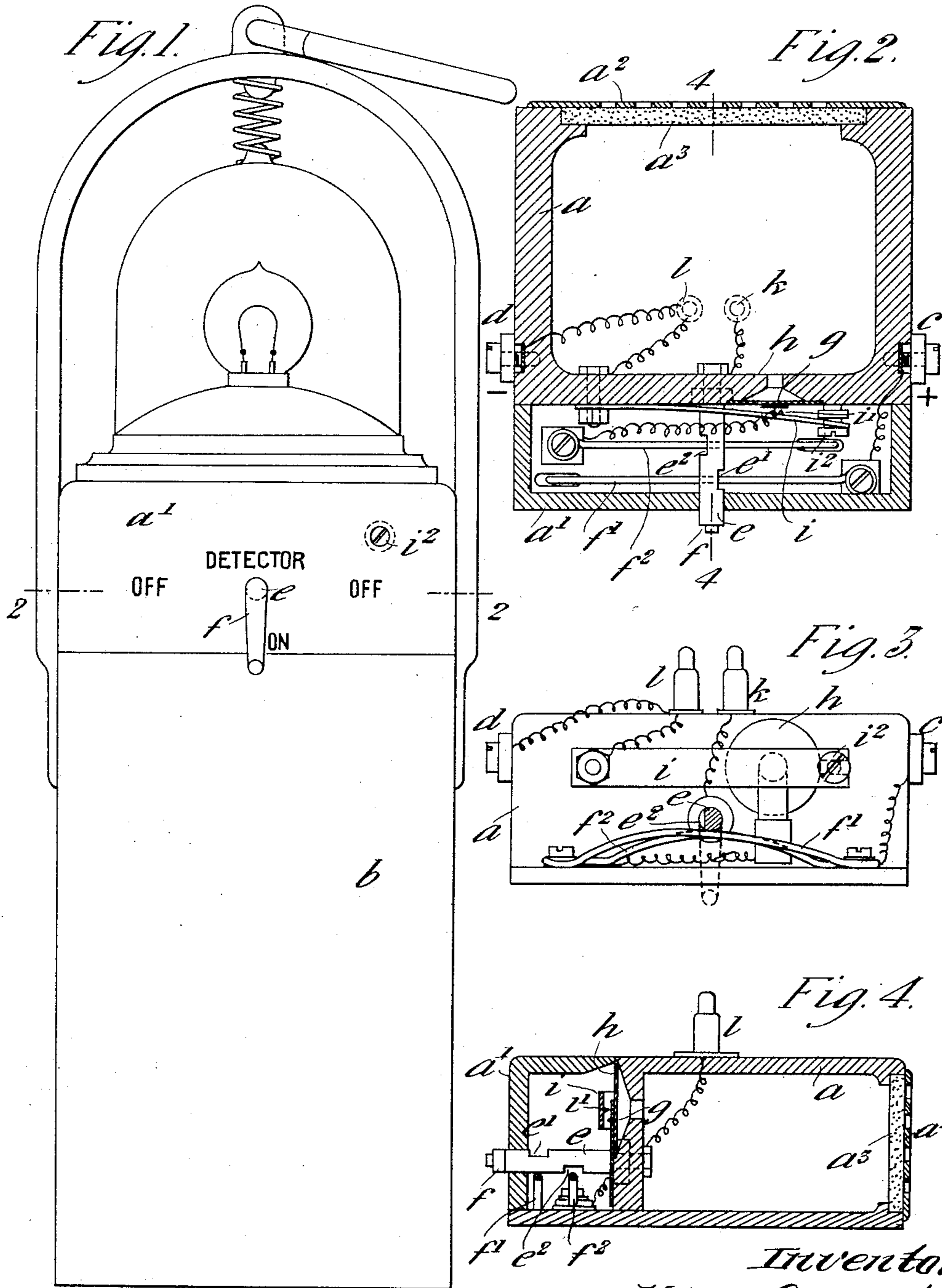


No. 749,500.

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H. G. PRESTED.
MINER'S ELECTRIC LAMP.
APPLICATION FILED FEB. 7, 1903.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

HENRY GEORGE PRESTED, OF CAMDEN TOWN, ENGLAND.

MINER'S ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 749,500, dated January 12, 1904.

Application filed February 7, 1903. Serial No. 142,406. (No model.)

To all whom it may concern:

Be it known that I, HENRY GEORGE PRESTED, a citizen of England, residing at 44 Brecknock road, Camden Town, in the county of London, England, have invented a certain new and useful Improved Miner's Electric Lamp, (for which I have applied for a patent in Great Britain, dated June 21, 1902, No. 14,112,) of which the following is a specification.

My invention relates to a miner's electric lamp the light of which becomes dim or is extinguished when the atmosphere contains combustible gas.

It has frequently been suggested to make a fire-damp indicator by taking advantage of certain properties of marsh-gas to close an electric circuit, and thus give an indication by an electrical audible or visible signal. To all such devices, however, there is the serious objection that they can only be an adjunct to the miner's lamp. What is required by the miner or other user of a safety-lamp is a lamp which, like the well-known Davy lamp, will indicate the presence of the combustible gas by the dimming or even extinction of the light and at the same time may be retained in the explosive atmosphere without danger. Such a lamp has the great advantage that its indication cannot fail to be noted, because the user is sure to become aware of the diminution or extinction of the light by which he works.

By my invention I take advantage of the fact that combustible gas diffuses through a porous diaphragm at a rate different from that at which air diffuses. I apply this phenomena by making it move a contact to short-circuit the glowing lamp or to break the circuit thereof.

In the accompanying drawings, Figure 1 is an elevation of a miner's lamp having my improvements applied thereto. Fig. 2 is a sectional plan on line 2 2 of Fig. 1. Fig. 3 is an elevation of the box *a*, the casing *a'* having been removed; and Fig. 4 is a section on the line 4 4 of Fig. 2, the switch-spindle having been turned through an angle of ninety degrees.

Referring to Figs. 1 to 4, I mount a box *a* on a suitable case *b*, containing an electric

battery the terminals of which are connected with terminals *c* and *d*, respectively. The conducting-spindle *e* of the switch *f* has two opposite notches *e'* *e''* in its periphery. When the switch is in the position shown in Figs. 1, 2, and 3, the spindle *e* is in contact with both the conducting-springs *f'* *f''*. The former, *f'*, of these is in connection with terminal *c*—say, the positive terminal of the battery. The spring *f''* is in connection with a contact *g*, best of platinum or the like, carried by a flexible diaphragm *h*, which covers a hole in the side of the box *a*. Fastened to the front of the box *a* is a spring *i*, carrying a point *i'*, of platinum or the like, the distance between this point and the contact on the diaphragm being adjustable by a set-screw *i''*. When, as shown in Fig. 2, there is no contact between the point *i'* and the contact *g*, the path of the current is from *c* through spring *f'*, spindle *e*, lamp-terminal *k*, the lamp, lamp-terminal *l*, to terminal *d*. The lamp thus receives the full current and illuminates the miner's work. Now at the back of the box *a* is a perforated plate *a''*, protecting a diffusion-plate *a'''*, so that when the lamp is brought into an atmosphere containing a gas lighter than air the pressure within the box is increased by diffusion of that gas into the box faster than the air can diffuse out. Thus the diaphragm *h* is bulged outward and contact is made between *g* and *i*. The current has now another path open to it—namely, from *c* through spring *f'*, spring *f''*, contact *g*, spring *i*, lamp-terminal *l*, to terminal *d*. This portion of the current does not flow through the lamp, so that this latter becomes dim or even extinguished, according to the relative resistances of the two circuits. In order to cut out the indicator, it is only necessary to turn the spindle *e* into the position shown in Fig. 4, in which the notch *e''* breaks contact between spring *f''* and the spindle. All the current now flows through the lamp whether contact exists between *g* and *i* or not, and the indicator is therefore ineffective. The third position of the switch is that in which notch *e'* breaks contact between spring *f'* and spindle *e*. The current is then switched off altogether from the lamp.

Having thus described the nature of this in-

vention and the best means I know of carrying the same into practical effect, I claim—

1. A miner's electric lamp comprising a diffusion device, a lamp and a circuit short-circuiting the lamp so as to render the latter useless when the said diffusion device is in action, substantially as described.

2. A miner's electric lamp comprising a diffusion device, a circuit short-circuiting the lamp when the said device is in action and a switch which in one position cuts out the said circuit while still supplying current to the lamp, substantially as described.

3. In a miner's electric lamp the combination of a chamber, a porous wall to such chamber, a movable diaphragm covering an opening in such chamber, an electrical contact carried by such diaphragm, an electric circuit completed by such contact when the said diaphragm is moved, and a switch for throwing said lamp and diaphragm out of circuit and the lamp into circuit when said switch is turned in one position, substantially as described.

4. In a miner's electric lamp the combination of a chamber, a porous wall to such chamber, a movable diaphragm covering an opening in such chamber, an electrical contact car-

ried by said diaphragm, an electric circuit completed by such contact when said diaphragm is moved, and a double-acting switch arranged to throw the contact and diaphragm into circuit with the lamp, and when turned into another position to cut said contact and diaphragm out of circuit and throw said lamp into a direct circuit, substantially as described,

5. In a miner's electric lamp the combination of a chamber, a porous wall to such chamber, a movable diaphragm covering an opening in such chamber, an electrical contact carried by said diaphragm, a contact normally out of engagement with the diaphragm, a circuit including said contacts and lamp, a branch circuit passing through the lamp alone, a switch which in one position cuts out the said contacts and applies the current directly to the lamp through the branch circuit and when turned to another position breaks both said circuits, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY GEORGE PRESTED.

Witnesses:

EDWARD GARDNER,
WALTER J. SKERTEN.