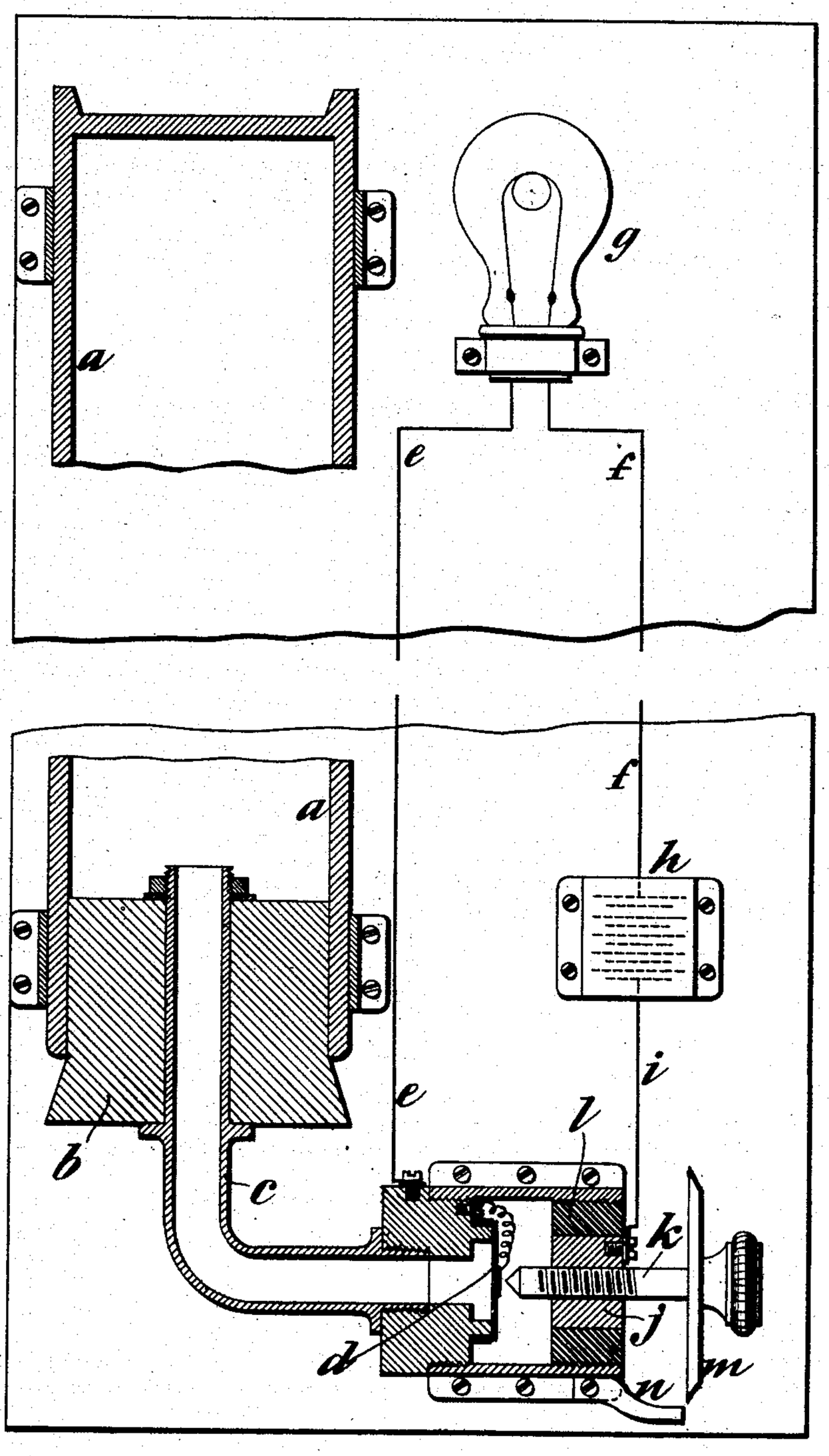
No. 675,755. Patented June 4, 1901.

H. G. PRESTED.

APPARATUS FOR INDICATING THE PRESENCE OF DANGEROUS GASES.

(Application filed Oct. 15, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

HENRY G. PRESTED, OF LONDON, ENGLAND.

APPARATUS FOR INDICATING THE PRESENCE OF DANGEROUS GASES.

SPECIFICATION forming part of Letters Patent No. 675,755, dated June 4, 1901.

Application filed October 15, 1900. Serial No. 33,124. (No model.)

To all whom it may concern:

Be it known that I, HENRY GEORGE PRESTED, a citizen of England, residing at No. 44 Brecknock road, Camden Town, London, England, have invented certain new and useful Improvements in Apparatus for Indicating the Presence of Dangerous Gases, (for which I have applied for a patent in Great Britain, dated March 17, 1900, No. 5,125,) of which the following is a specification.

Apparatus have been proposed for indicating the presence of explosive gases in mines and elsewhere based on the following principle: A porous vessel when exposed to such gases allows passage of the gas inward more rapidly than passage outward of the air contained in the vessel, as the gas and air tend to diffuse, and thus a flexible diaphragm closing a passage from the vessel becomes more or less bulged and makes an electrical contact whereby an alarm is operated.

My invention relates to an apparatus acting on this principle, comprising a porous vessel with flexible diaphragm, a battery, and a glow-lamp connected with the battery through a contact adjustable by a delicate screw, the point of which nearly meets a small platinum plate fixed on the flexible diaphragm, the distance between the points of contact being set to correspond with such percentage of explosive mixture as it may be desired to detect. When this percentage is reached, the diaphragm is bulged so that contact is made and the small lamp is lighted. The diaphragm and contact-screw are inclosed in an air-tight chamber, so that no spark at break of contact can ignite the surrounding explosive atmosphere.

The apparatus can be applied for indicating the presence of choke-damp or gas denser than air, in which case the diaphragm is bulged inward and not outward, breaking contact and extinguishing the lamp.

Instead of employing a vessel having its whole surface porous I find it is better to employ one which has considerable capacity, but has a considerable part of its surface rendered impervious by coating it with wax or other suitable material.

The accompanying drawing is an elevation, partly in section, showing on a considerably enlarged scale apparatus according to my invention.

a is the porous vessel, having a plug *b*, through which passes a tube *c*, leading to the flexible diaghragm *d*, having fixed on its center a piece of platinum electrically connected to one of the wires *e*, leading to a glow-lamp *g*, the other wire *f* of which is connected to one pole of a battery *h*. The other pole of the battery is connected by a wire *i* to the nut *j* of a platinum-pointed adjusting-screw *k*, this nut being held in a plug *l*, of insulating material, fitted in the chamber. On the screw is fixed a graduated disk *m*, so that when the screw is turned any division on the disk may be brought around to a fixed index *n*.

The diaphragm and end of the contact-screw are inclosed in an air-tight chamber, so that no spark can ignite the surrounding atmosphere should it be combustible and no resisting substance can enter to interfere with the contacts.

The porous vessel may have its surface coated with impervious material to a greater or less extent, according as the apparatus is intended to be less or more sensitive or rapid in its indications and the contact-screw *k* is adjusted more or less near the diaphragm.

When by the entrance of a gas lighter than air more rapidly into the vessel than air issues from it the diaphragm *d* is bulged, so that its platinum makes contact with the screw *k*, then the lamp *g* becomes lighted, apprising the observer that the apparatus is in an atmosphere which may be explosive.

The same apparatus may be employed to indicate the presence of gas heavier than air, such as choke-damp. For this purpose the screw *k* is advanced to make contact with the platinum on the diaphragm, the lamp *g* being thus lighted. As air issues more rapidly from the vessel *a* than the heavier gas enters, the diaphragm *d* becomes bulged inward, leaving the screw *k*, so that the lamp *g* becomes extinguished, showing the presence of the choke-damp.

Having thus described the nature of this invention and the best means I know for carrying the same into practical effect, I claim—

In an apparatus of the class specified, a porous vessel having a plug at its lower end, a tube extending through said plug, a flexible diaphragm at the outer end of the tube, having a piece of platinum on its outer face, a chamber surrounding the diaphragm having a plug of insulating material in one end of the same, a nut fitted in said last-mentioned plug, a screw passing through said nut, having a platinum point, and a battery electrically connected respectively with said diaphragm and screw, the connections including a signal.

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

HENRY G. PRESTED.

Witnesses:
OLIVER IMRAY,
GERALD. L. SMITH.