

No. 689,427.

Patented Dec. 24, 1901.

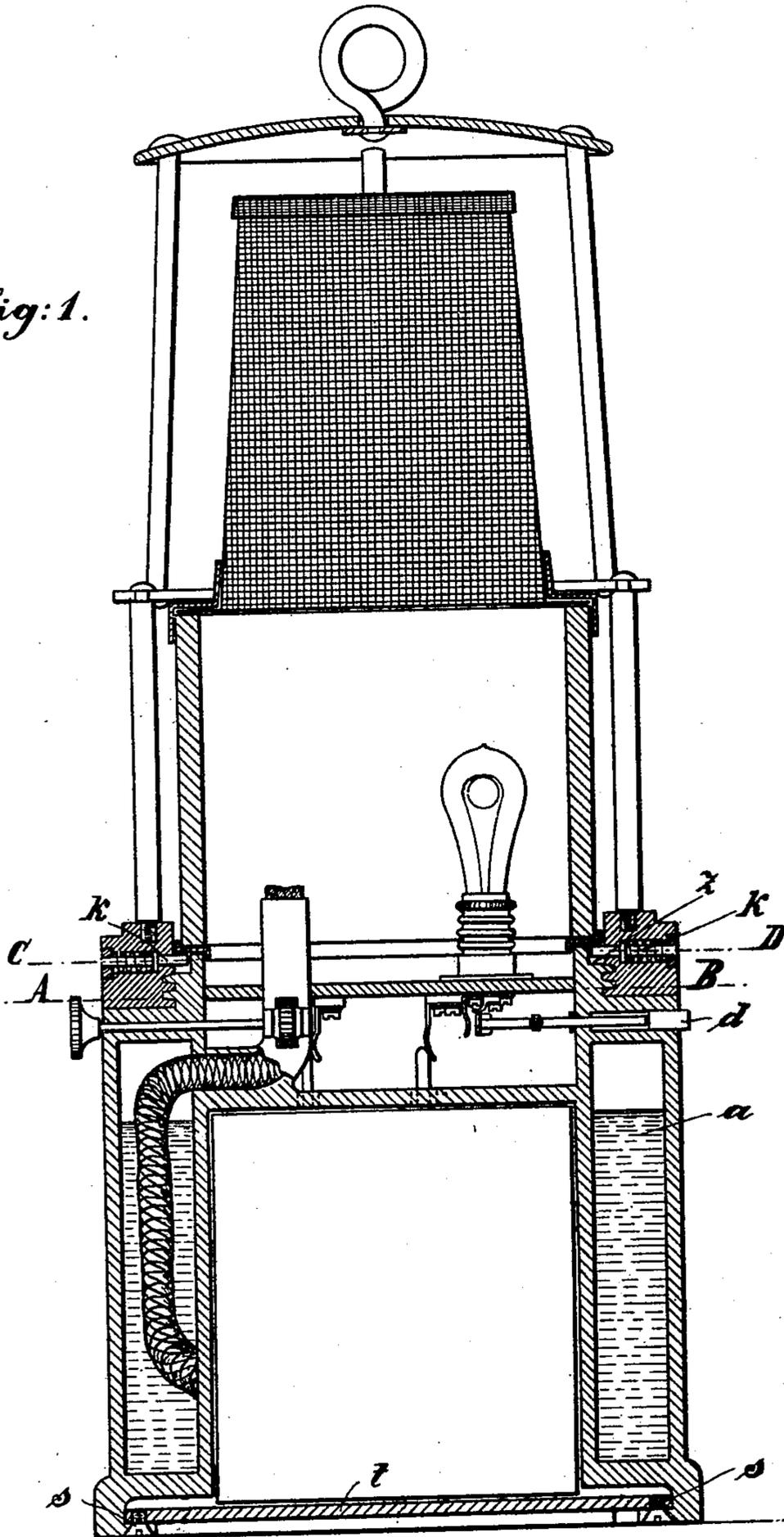
E. SIMON.
PIT SAFETY LAMP.

(Application filed July 9, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig: 1.



Witnesses:
Edward Ray.
William Schuyler.

Inventor:
Edward Simon
per Roeder & Billman Attorneys

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Fig. 2.

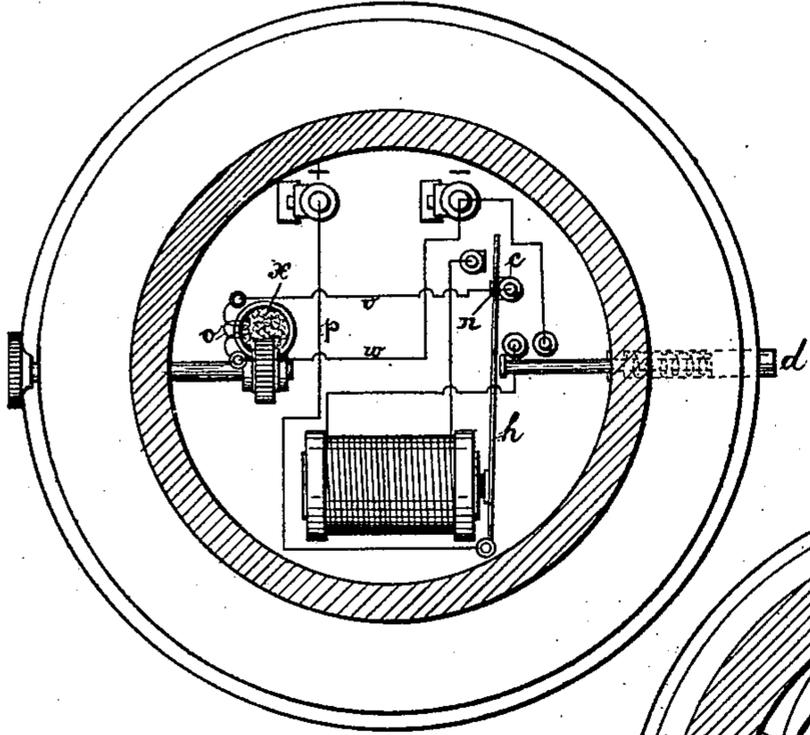


Fig. 4.

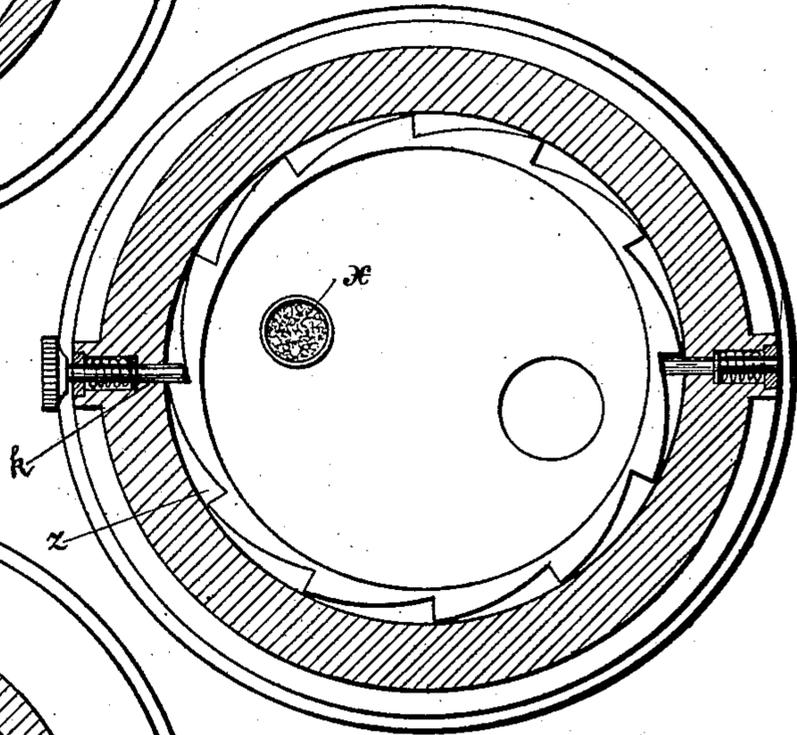
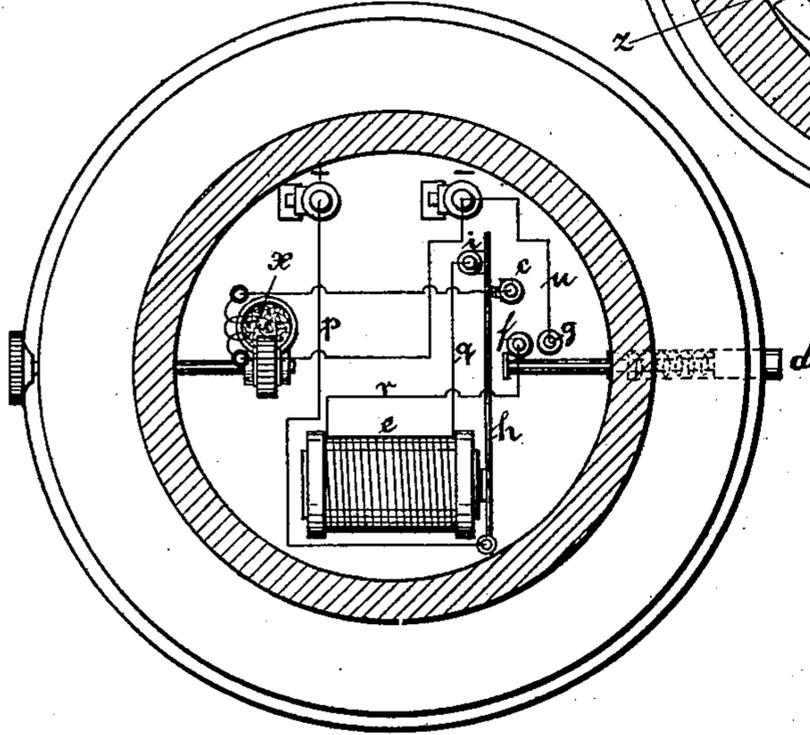


Fig. 3.



Witnesses:

Arthur Zumpfe
Eduard Kay

Inventor:

Eduard Simon
by his attorneys
Roeder & Brien

UNITED STATES PATENT OFFICE.

EDUARD SIMON, OF DARMSTADT, GERMANY.

PIT SAFETY-LAMP.

SPECIFICATION forming part of Letters Patent No. 689,427, dated December 24, 1901.

Application filed July 9, 1901. Serial No. 67,601. (No model.)

To all whom it may concern:

Be it known that I, EDUARD SIMON, a citizen of Germany, and a resident of Darmstadt, Germany, have invented certain new and useful
5 Improvements in Pit Safety-Lamps, of which the following is a specification.

In order to ascertain whether fire-damp or gases are present in coal-mines, lamps with exposed flames are generally used that are in-
10 closed in a Davis net. The smaller the flame the more quickly will occur an explosion of the gases that have penetrated the gauze and which will extinguish the light. As the flame
15 must burn very low during an investigation, only a very small amount of light is emitted. This objection is overcome by the present invention, by which the safety-lamp is provided
20 with the usual adjustable open light and with an additional incandescent lamp of peculiar construction that emits a sufficient volume of light. As soon as the investigation is completed and the ventilation is installed the investigator may employ both or either one of
25 the two sources of light.

The electric lamp is provided with an automatic switch which switches off the incandescent lamp as soon as the permissible lowest
30 point of discharge of the accumulator is reached. In this way an objectionable need- less exhaustion of the accumulator, which frequently happens when the apparatus is used by an inexperienced person, is avoided.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of my improved
35 lamp. Fig. 2 is a cross-section on line A B, Fig. 1; Fig. 3, a similar section showing the parts in a different position, and Fig. 4 a cross-section on line C D, Fig. 1.

Within the well of the oil or benzene lamp
40 provision is made for the reception of one or more accumulators *a*, which may, however, also be placed sidewise above or below the well. By loosening screws *s*, which hold a lid, bottom, or cross-piece *t*, the accumulator may
45 be withdrawn downwardly. By thus withdrawing the accumulator the connections between it and the contacts of the electric lamp are broken, while by the introduction of the accumulator the connections are at once re-
50 established. If by means of a button *d* the incandescent lamp is switched in and if the accumulator is sufficiently charged, the electromagnet *e*, which is interpolated into the circuit of the lamp, will attract the spring
55 switch-lever *h* until the capacity of the accu-

mulator is nearly exhausted, Fig. 3. The following is the circuit in this case: The current passes from the + pole through the wire *p*, the lever *h*, the contact *i*, the wire *q*, the wind-
60 ings of the electromagnet *e*, the wire *r*, to the electrode *f* of the incandescent lamp, from there to the electrode *g*, and by the wire *u* to the - pole. In case of an exhaustion of the capacity of the accumulator the magnetic
65 power of the electromagnet is decreased by the reduced tension and diminution of the current until the armature of lever *h* is liberated and the current is broken, Fig. 2. In go-
70 ing to its position of rest the lever *h* touches a contact-piece *n*, Fig. 2, by which a second circuit is momentarily closed. In touching
75 the contact-piece *n* the circuit is the following, Fig. 2: The current passes from the + pole through the wire *p*, the lever *h*, the con-
80 tact-piece *n*, the wire *v*, to the platinum wire *o*, and from there by the wire *w* to the - pole. The platinum wire *o* is fixed in proximity to the open light *x* and becomes by the passage
85 of the current white hot and ignites such light. The glowing of the platinum wire also occurs when the capacity of the accumulator
90 is so far diminished that a further burning of the lamp is not desired and is prevented by the switch.

The benzene may of course be replaced by
85 any other source of light giving an open flame and formed by a gaseous or solid combustible. The upper edge of the oil-well is cogged or toothed, as at *z*, the teeth being engaged by a
90 catch *k* on the upper part of the lamp when the latter is screwed up. In this way an opening of the lamp by unauthorized persons is prevented. The catch *k* can only be with-
95 drawn by means of a powerful magnet.

What I claim is—

A pit safety-lamp composed of an accumu-
100 lator, an electromagnet, a switch-lever influenced thereby, an incandescent lamp in circuit when the switch-lever is attracted, an incandescent wire in circuit when the switch-lever is released, and an open light in proximity to the incandescent wire, substantially as specified.

Signed by me at Frankfort-on-the-Main, Germany, this 11th day of March, 1901.

EDUARD SIMON.

Witnesses:

RICHARD GUENTHER,
CARL GRUND.