

H. NEUBAUER.
 DEVICE FOR SIGNALIZING THE PRESENCE OF EXPLOSIVE GAS MIXTURES IN FIRE DAMP MINES.
 APPLICATION FILED FEB. 25, 1913.

1,088,611.

Patented Feb. 24, 1914.

Fig. 1.

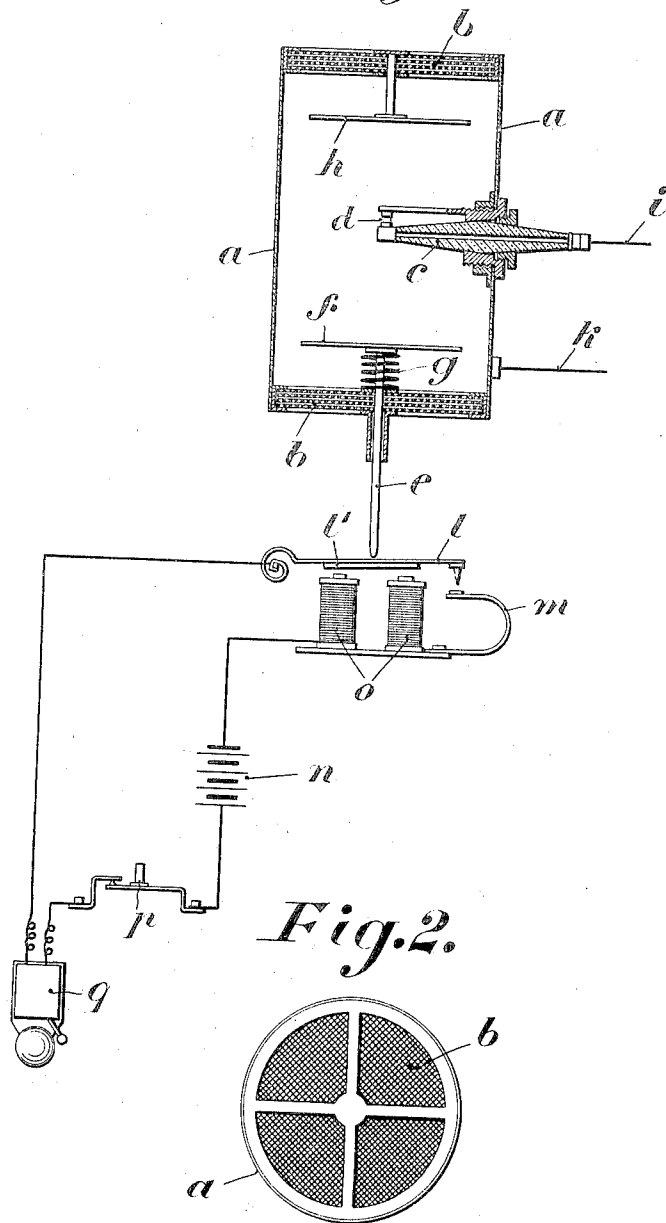
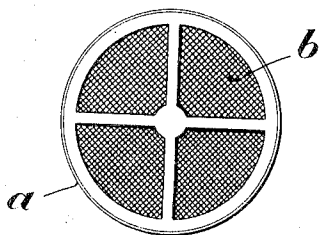


Fig. 2.



Witnesses:
 M. E. McRade.
 C. S. Kessler

Inventor
 Heinrich Neubauer
 by *Amos L. Morris*
 Attorney

UNITED STATES PATENT OFFICE.

HEINRICH NEUBAUER, OF SIEBLEBEN, NEAR GOTHA, GERMANY.

DEVICE FOR SIGNALIZING THE PRESENCE OF EXPLOSIVE GAS MIXTURES IN
FIRE-DAMP MINES.

1,088,611.

Specification of Letters Patent.

Patented Feb. 24, 1914.

Application filed February 25, 1913. Serial No. 750,571.

To all whom it may concern:

Be it known that I, HEINRICH NEUBAUER, a subject of the German Emperor, residing at Siebleben, near Gotha, Duchy of Saxeburg-Gotha, Germany, have invented certain new and useful Improvements in Devices for Signalizing the Presence of Explosive Gas Mixtures in Fire-Damp Mines, of which the following is a specification.

As is well known, the existence of fire-damp in mines and the like becomes apparent by small explosions inside of the safety-lamps of the miners. In most cases, however, the miners do not pay the necessary attention to these danger-indicators, so that the necessary provisions for averting the danger are not taken in due time. In other places, as *e. g.* in gas works, frequently an explosive mixture of gas and air is formed owing to the gas flowing out in consequence of leakages or other causes. In such cases the workmen are without any signal or warning, and as they have become insensitive to the smell of the gas, they cannot determine its presence.

Now the present invention refers to a device suitable to signalize the presence of explosive gas-mixtures not only at the very place of danger but also at any required other place, as, in mines, in the miner's house, the engine-house, the track-house or the like or even at several of these places at the same time, so as to call the attention of the leading officers to the existence of a danger.

The essential feature of the invention lies in the fact that at such places where explosive gas-mixtures usually arise, an explosion-chamber, closed up by wire-gauze or the like, is provided, inside whereof an igniting device is placed which in given cases ignites the gas-mixture, which enters the explosion-chamber. Then the gas pressure, caused by the explosion, so acts on a movable plate or its equivalents so that an electric signal is produced by the movement of this plate. In this arrangement the explosion, occurring in given cases inside of the explosion-chamber cannot get transmitted to the outside due to the protecting effect of the wire-gauze enclosing the chamber.

A practical embodiment of the invention is exemplified in the accompanying drawing, in which the same characters of reference indicate the same parts in the several

views. Therein Figure 1 shows the explosion-chamber in longitudinal section and the diagram of the electric signal-device. Fig. 2 is an upper plan view of the explosion-chamber.

The cylindrical chamber *a* is closed at its front ends by wire-gauzes *b* allowing air from the atmosphere to enter said chamber, but when an explosion occurs in the chamber, transmission of the flame to the atmosphere is prevented. In the chamber *a* there is an ignition-device which in the embodied form has the shape of a sparking plug *c* as used in connection with explosion motors and their equivalents, the sparking-gap whereof lies at *d*. Midway of the lower front wall of the chamber a pin *e* is passed through. This pivot carries inside of the chamber the plate *f* which, together with the pin *e* is under the action of the spring *g*. Opposite this plate and secured to the upper front-wall of the chamber *a* is placed a rigid counter-pressure plate *h*.

Any required source of electric current, not represented in the drawing, which is capable of supplying the energy, necessary for the ignition spark, is joined up by means of the lines *i* and *k* to the one pole of the sparking plug to the casing *a*. Now the arrangement will be preferably made in such a manner that the source of current for the ignition spark is switched on by a clock-work or the like only at given intervals of time, say every 5 or 10 minutes; thus an ignition spark is produced at the sparking plug *c* inside of the explosion chamber *a* only at corresponding intervals of time. The inner space of the ignition-chamber *a* being in communication with the exterior atmosphere through the wire-gauzes *b*, there will be in the chamber *a* always the same air-mixture as that surrounding the chamber *a*. When this air-mixture is saturated with gas so that explosions are liable to arise, the spark, which is produced at the sparking plug *c*, will explode this mixture within the chamber *a*. The resulting explosion will force downwardly the movable plate *f*, against the action of the spring *g*, so that the pin *e* moves the elastic contact-lever *l* underneath it, whereby this latter engages the contact spring *m*. Thus an electric circuit, fed by the source of current *n*, will be closed through the magnets *o*, the switch *p* and the signal bell *q*. Now the contact lever *l* is

fitted with an armature-piece l' , attracted in the very moment of circuit by the magnet o , excited by the signal-current, this keeping the circuit permanently closed, though even, under the action of the spring m and after expansion of the overcharge, that has existed inside of the explosion chamber a , the plate is moving back. When the signal is to be stopped, it is only necessary to lower and thus open the switch p . In this way the electric circuit is interrupted at that point, thereby deenergizing the magnet o , so that the contact lever l can move out of contact therewith and resume its normal position.

It may be mentioned further that in using the switch arrangement as stated, a shunt alarm device can be used as a signal bell, in order that, while the alarm device is operating, the current, traversing the magnet o , will not be interrupted by such action. The

electric ignition by means of the sparking plug c can in given cases also be replaced with a permanently burning ignition flame.

What I now claim is:—

An explosive-gas detector comprising an explosion chamber having gauze-covered openings in opposite ends thereof, a pair of plates located in said chamber between said openings, one of said plates being movable, an ignition device in said chamber, and a signaling device set in operation by the movable plate when the latter is displaced by an explosion in said chamber.

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

HEINRICH NEUBAUER.

Witnesses:

ERNST EBERARDT,
ALFRED HOFFMANN.