(No Model.) 2 Sheets—Sheet 1.

I. KITSEE.

FIRE DAMP INDICATOR.

No. 262,056. Patented Aug. 1, 1882.

Fig. 1. X

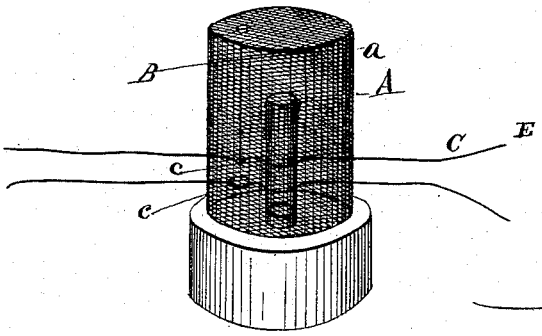


Fig. 1. Y

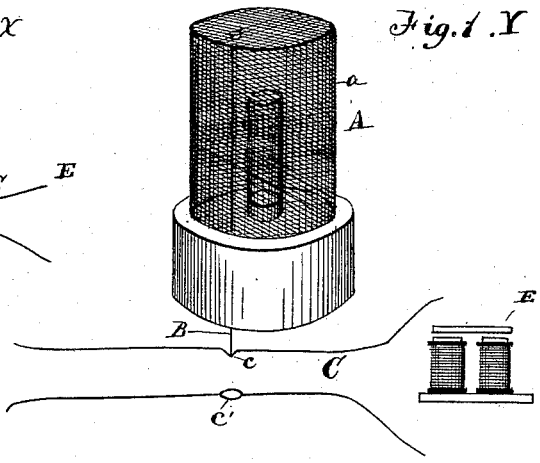


Fig. 2.

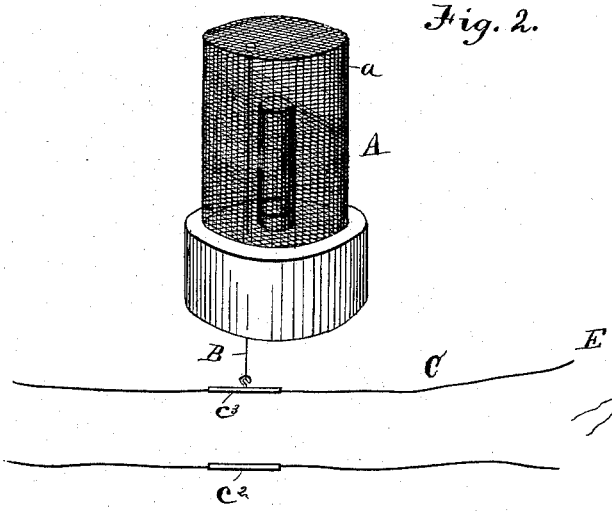
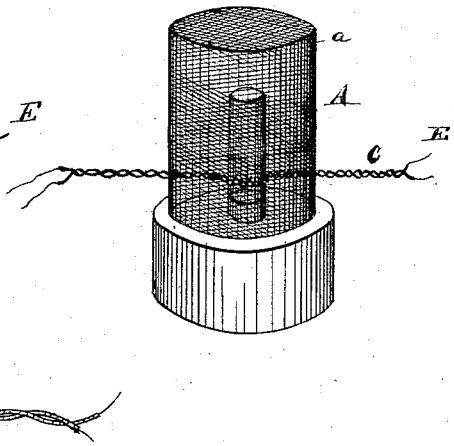


Fig. 3.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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FIRE DAMP INDICATOR.

No. 262,056 Patented Aug. 1, 1882.

Fig. 4.

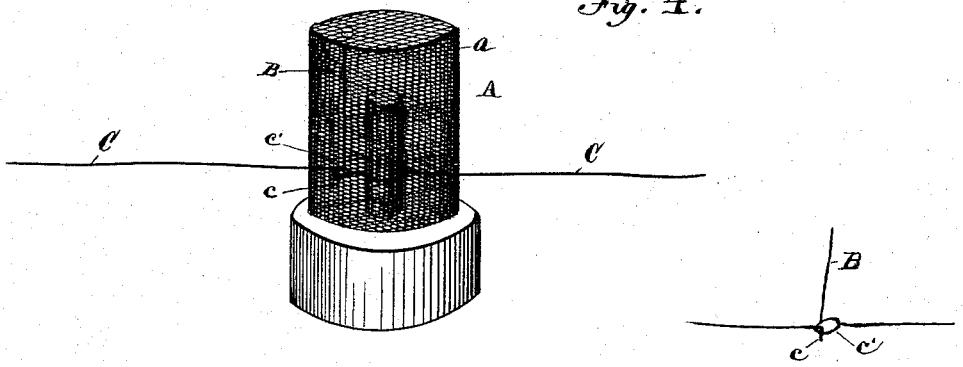


Fig. 5.

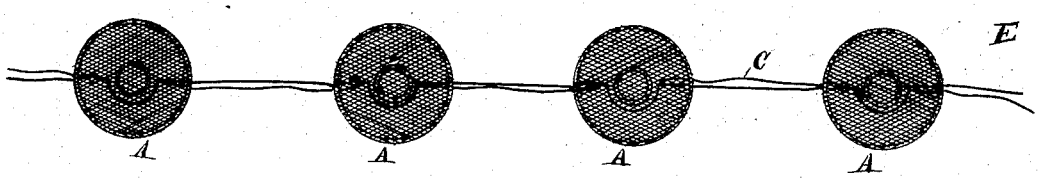
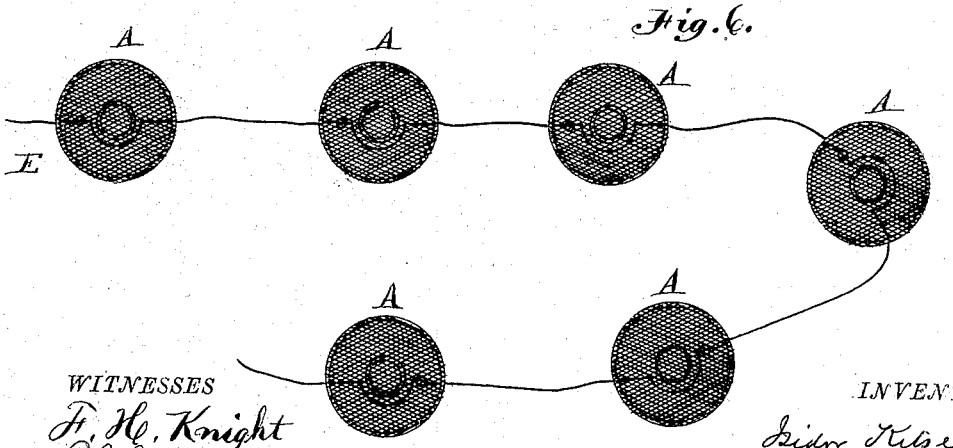


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

ISIDOR KITSEE, OF CINCINNATI, OHIO.

FIRE-DAMP INDICATOR.

SPECIFICATION forming part of Letters Patent No. 262,056, dated August 1, 1882.

Application filed April 22, 1882. (No model.)

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Fire-Damp Indicators, of which the following is a specification.

My invention relates to devices for automatically indicating and announcing the presence of fire-damp in dangerous volume in mines, and is an improvement on the inventions for which I filed applications for Letters Patent on the 31st day of December, 1881, and upon the invention described in another specification of even date hereof, which I have signed preparatory to applying for Letters Patent.

The object of my improvement is to give automatic notice at a given station of the presence of fire-damp in dangerous volume in mines, and at the same time to indicate at such station the precise point where such condition of fire-damp exists.

To the accomplishment of this end my invention consists of certain devices normally held in position by ignitible substances placed within the perforated surroundings of a mine-lamp, which will be ignited when the fire-damp within said perforated surroundings reaches that degree of intensity or volume that it becomes inflammable.

My invention further consists in the arrangement of a series of mine-lamps provided with my improvements in a field or route, each of which lamps and its attached mechanism arranged to be actuated independently, so that by the ignition of said interior substances an electric circuit will be opened or closed, as the case may be, and thereupon transmit through said electric circuit and annunciating mechanism at a terminal station a required signal. Said signal may be an audible, visible, or recording annunciator, all as hereinafter described.

Although I describe my invention as applied to mine-lamps in which the principle of the Davy lamp is embodied, it is equally applicable to any form of lamp which has perforated surroundings in whole or in part; and although in my description I necessarily use the term "lamp" I desire to be understood that the diffusion of light for illuminating purposes forms no essential part of my invention.

Referring to the accompanying drawings, in which similar letters of reference indicate like parts on each figure, Figure 1, X Y, represents an ordinary mine-lamp provided with my improvements adapted to close a normally-broken circuit. Fig. 2 is another form thereof. Fig. 3 is another form thereof, showing parts in enlarged detail. Fig. 4 represents my improvements adapted to break a closed electric circuit. Figs. 5 and 6 represent views of a series of mine-lamps embodying my invention, arranged as a system in groups or routes.

A is a mine-lamp having perforated surroundings *a*, and an internal cord, B, which holds in suspension a downwardly-bent portion, *c*, of one of the wires C of an electric circuit. Opposite said bent portion *c*, on the other wire, is an open loop or ring, *c'*, into which the bent portion *c* of the other circuit-wire will fall and engage when released from suspension. As soon as the fire-damp within the perforated surroundings of the lamp A reaches that degree of intensity that it will become inflammable the cord B will ignite and become severed, causing the bent portion *c* of the wire C to fall into the loop *c'*, thus forming metallic contact and closing the electric circuit.

Fig. 2 is a form of my invention wherein the opposite wires of an electric circuit are each supplied with a metallic plate, c^2 c^3, opposite each other, which plates will be brought into contact when the cord B, which sustains the upper plate, c^3, is ignited and severed. It is preferable that the wires, with their operative attachments for closing the circuit, should pass within the perforated surroundings of the lamp, as shown in Fig. 1, X, although they may be arranged as shown in Fig. 1, Y, below the lamp. The lamps may be supported on a shelf or bracket, or may be suspended in any suitable form.

In Fig. 3 I show a form of operating my invention by means of twisted strands of insulated wire covered with thread or any wrappings that will ignite from the burning fire-damp. It is manifest that when the combustible wrappings of these wires are burned off at any point of said metallic strands the wires will come in contact and complete the circuit.

Fig. 4 illustrates the manner in which I open or break a closed circuit, in which construction the loop or ring *c'* is held upward by means of

the suspensory-cord B in contact with the depending bent portion *c*, and in which position the current, as will be readily understood, will be normally closed. When, however, the suspensory-cord B is ignited and becomes severed, the loop or ring *c'* will fall out of engagement with the bent portion *c*, and the circuit will be immediately broken. When the circuit is broken or closed, as the case may be, by the ignition and severance of the suspensory-cord B, or by the ignition and severance of the insulated wrappings of the twisted wires, indication thereof will be immediately transmitted over the circuit to a terminal point, E, where signal mechanism will be actuated by means of the opening or closing of the circuit.

It is my intention, also, to attach to each lamp devices that will transmit one of a code of specific signals; but it is not necessary herein to describe said mechanism, as it forms parts of other specifications embraced in other applications for Letters Patent.

Having now fully described my invention and its manner of operation, what I claim, and desire to secure by Letters Patent, is—

1. In a fire-damp indicator and annunciator, a safety-lamp or similar device provided within its perforated inclosure with an ignitible substance connected to a wire or wires of an electric circuit, which substance is so adapted that when it is severed by ignition it will allow contact devices to make or break an electric circuit, substantially as described.

2. In an automatic fire-damp indicator and annunciator, the combination of a mine-lamp or analogous device having perforated surroundings, and provided with interior substance ignitible when the fire-damp within said perforated surroundings becomes inflamed, with the wire or wires of an electric circuit, all so arranged that when said ignitible substance is burned or severed at any point the electric circuit will be broken or closed and a signal transmitted to a terminal station, as and for the purpose intended, substantially as described.

3. The within-described system of fire-damp indicators and annunciators, consisting of a series of mine-lamps or analogous devices arranged in routes, having within their perforated inclosures a piece or pieces of substance ignitible when the increase of fire-damp to a given degree enters into combustion, in combination with the wire or wires of an electric circuit, all so arranged that when any one of the devices attached to any lamp on the route is actuated a signal will be given at a terminal station, as and for the purpose indicated, substantially as described.

ISIDOR KITSEE.

Witnesses:
GEORGE SIEFKE,
W. C. FIEDELDEY.