(No Model.) 2 Sheets—Sheet 1.

I. KITSEE.

FIRE DAMP ANNUNCIATOR.

No. 262,057. Patented Aug. 1, 1882.

Fig. 1

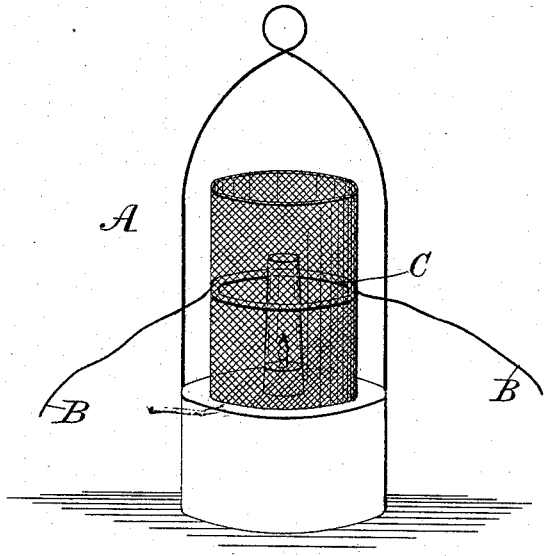
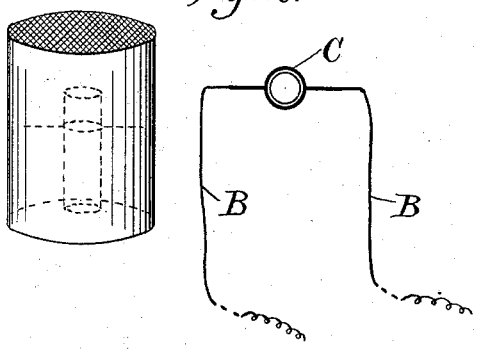


Fig. 2.



WITNESSES

J. M. Burnham.

F. C. Jacobson

Isidor Kitsee
INVENTOR

By his Attorneys Abraham and Mayer

(No Model.) 2 Sheets—Sheet 2.

I. KITSEE.

FIRE DAMP ANNUNCIATOR.

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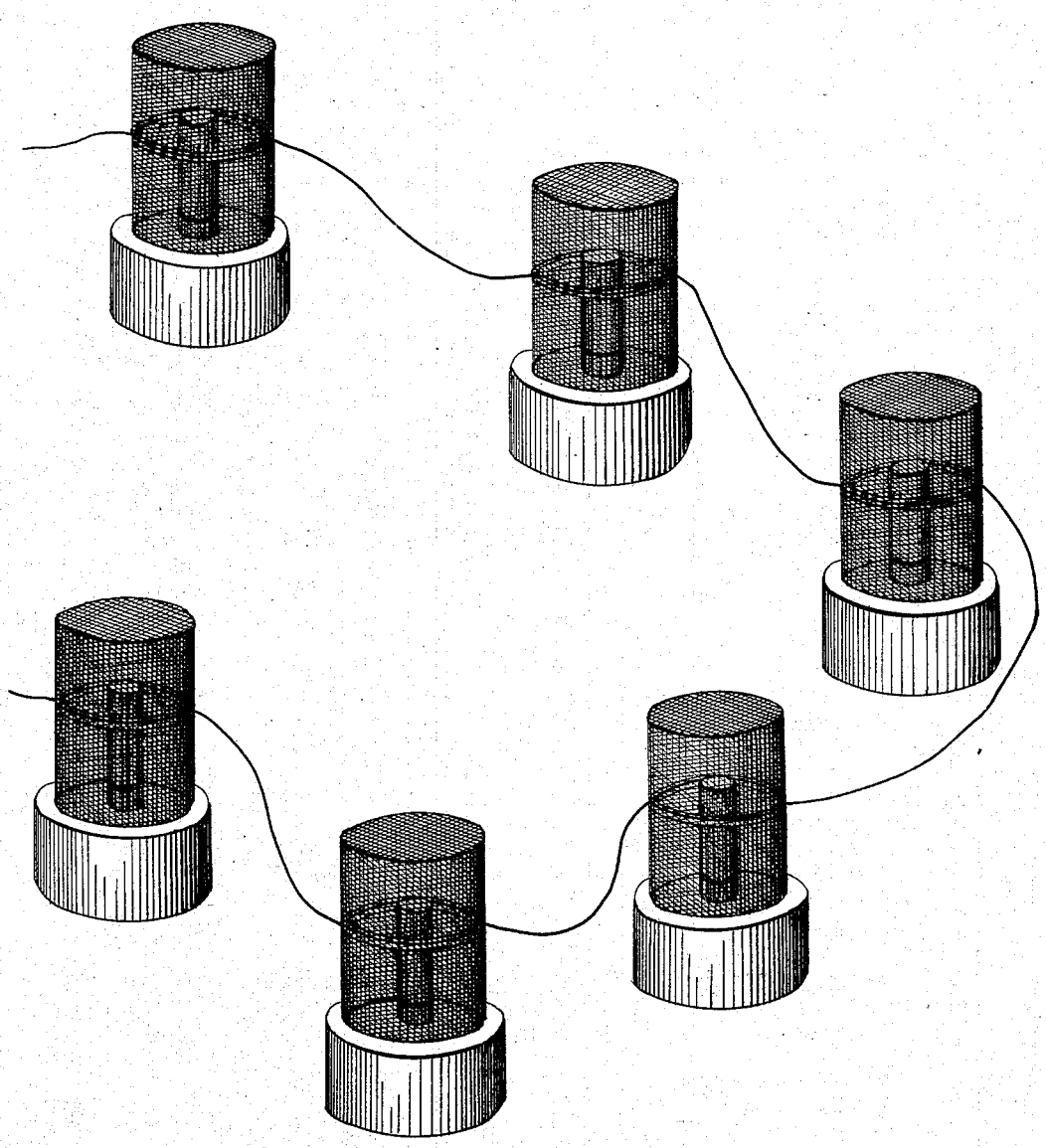
Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

ISIDOR KITSEE, OF CINCINNATI, OHIO.

FIRE-DAMP ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 262,057, dated August 1, 1882.

Application filed December 31, 1881. (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 Annunciators, of which the following is a specification.

My invention relates to automatic devices for announcing the presence of fire-damp in mines.

The object of my invention is to give automatic notice of the presence of fire damp in mines in dangerous volume; and I attain this object by connecting to an ordinary safety-lamp or similar device provided with fusible substance the wire or wires of an electro-magnet or galvanic battery, in such a manner that when the increase of fire-damp enters into combustion it will cause the fusible connection to melt, break the circuit, and actuate a connected annunciator wherever located.

My invention further consists in arranging a series of mine-lamps with my improvements attached thereto in routes or groups, and connecting them to an electric circuit in such a manner that a signal will be transmitted to a given station when the fusible substance within any one of said lamps is severed.

I will describe my invention as applicable to the ordinary miner's safety-lamp, in which the principle of the Davy lamp is utilized; but in so doing I do not desire to limit myself alone to lamps which have wire-gauze walls, as any device which has one or more of its sides supplied with minute perforations can be used without departing from the scope of my invention.

I employ the words "mine-lamp" and "miner's safety-lamp" as appropriate terms, but desire to be understood that the diffusion of light is not necessary, and is not an essential part of my invention. For its operation any substitute for a mine safety-lamp may be used which provides for the combustion of fire-damp and the confinement of the combustion.

In the ordinary safety-lamps the presence of fire-damp is shown by the flame which arises within the wire-gauze. When the volume of fire-damp equals one-sixth to one-fifth the volume of the atmosphere a flame arises within the wire-gauze, which increases in volume and intensity as the fire-damp increases. The miner carrying the lamp or other persons seeing it are thus by the appearance of the flame notified of the presence of fire-damp in the mine in dangerous quantity; but such fire-damp may exist in a part of the mine not being worked, and where no one is present, or it may be desirable not to depend solely on the miners to notify the superintendent or other officer of the mine of the presence of such dangerous fire-damp.

My device is adapted to give automatic notice at the office of the superintendent or elsewhere of the existence of fire-damp in dangerous volume in the mine. I attain this object by connecting the wire or wires of an electro-magnet or galvanic battery to fusible substance within any form of miner's safety-lamp or similar device, provided with wire-gauze or minutely-perforated surroundings, in such a manner that when, by the combustion of the fire-damp, the flame is created within the inclosed space it disrupts and severs the fusible connection and breaks the circuit. The electric apparatus with which the wires are connected is so placed as to give the alarm wherever desired. The fusible connection acted on by the flame may be so composed as to melt at a given degree of temperature, reached only when that intensity of flame exists in the lamp which is produced by a certain proportion of fire-damp in the volume of atmosphere. The electric apparatus may be so arranged as to indicate not only the presence of fire-damp in dangerous volume, but also the particular part of the mine in which it may exist.

Referring to the accompanying drawings, on which similar letters denote like parts in each figure, Figure 1 represents an ordinary safety-lamp with wire-gauze covering, embodying my invention. Fig. 2 represents a device embodying my invention, showing an impermeable tube having upper and lower perforated covers. Fig. 3 represents a series of mine-lamps embodying my invention arranged in a route.

In the drawings, Fig. 1, A represents a miner's safety-lamp in which the flame produced by the combustion of the fire-damp is confined by wire-gauze. The lamp rests upon a shelf or is suspended or kept in position in any practicable way.

C is a fusible substance, shown in the drawings as a ring around the interior circumference of the gauze; but it may be a bar or plate, of any convenient shape, connected to the wire or wires, completing an electric circuit.

B B are wires joined to the fusible substance C, and connected at their other ends with an electric apparatus, to which is attached any form of annunciator or alarm mechanism.

When the fire-damp exists in dangerous volume the flame arises within the space inclosed by the wire-netting or perforated walls, which acts on the fusible connection to melt and disrupt it, thus severing the communication between the wire or wires and breaking the circuit, and the alarm is given by the mechanism actuated by the electric apparatus.

Instead of the fusible ring or other shaped fusible substance, the circuit wire or wires may be retained in direct contact with the metallic gauze or perforated walls by fusible plugs inserted therein, in which case the fusibly-plugged perforations complete the electric circuit; but I make no claim herein for this special form of arrangement and construction, as it comprises the subject-matter of another application, which I am about to make for Letters Patent, and is simply a modification which is within the scope of my invention.

I have so far described my invention as applied to a single lamp, in order that those skilled in the art to which it appertains may clearly understand its construction and principle and its manner of operation; but in practice it will be often necessary that several lamps should be located at given points within a mine, each of which is provided with a piece or pieces of substance easily fusible by heat, said substance in each lamp being connected to the wire or wires of an electro-magnetic or galvanic battery, so that each of said lamps will act independently and comprise a complete system of fire-damp indicators, said system so arranged that when either of said lamps has its fusible substance melted the consequent break of the circuit will actuate the alarm mechanism wherever located.

Having now fully described my invention and its operation, what I herein claim is—

1. In a fire-damp indicator, a safety-lamp having within its perforated inclosure a piece or pieces of substance easily fusible by heat, said fusible substance being connected to the wire or wires of an electric battery, and so arranged that when said substance is fused the circuit will be broken, substantially as described.

2. In a fire-damp indicator, an electric apparatus having its circuit-wires connected to a substance easily fusible by heat, within the perforated surroundings of a mine safety-lamp, and so arranged that when said substance is fused it will break the circuit and actuate alarm mechanism connected to said electric apparatus, as and for the purpose set forth, substantially as described.

3. In a fire-damp indicator, a mine-lamp having a perforated inclosure, provided within said perforated inclosure with a piece or pieces of substance easily fusible by heat, said fusible substance being connected to the circuit wire or wires of an electric battery, all so arranged that when said substance is fused it will break the circuit and actuate alarm mechanism operated by said electric battery, substantially as described.

4. In an automatic fire damp indicator, the combination of the mine-lamp A, having interior substance, C, easily fusible by heat, said fusible substance C being connected to the circuit-wires B B, with an alarm mechanism operated by an electric battery, all so arranged that the circuit is broken by fusing of the substance C, and thereby said alarm mechanism is set in motion, substantially as described.

5. An automatic fire-damp indicator system consisting of a series of safety-lamps, each of said series of lamps being provided with one or more pieces of substance easily fusible by heat, in combination with an electric circuit, all so arranged that when the fusible substance within any one of said series of lamps is melted the electric circuit will be broken, whereby an alarm-annunciator will be actuated and indicate the existence of fire-damp in dangerous volume, substantially as described.

ISIDOR KITSEE.

Witnesses:
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E. S. KAUFMAN.