

F. A. POCKOCK.

INSULATOR FOR ELECTRICAL CONDUCTORS FOR MINES.

No. 448,838.

Patented Mar. 24, 1891.

Fig. 1.

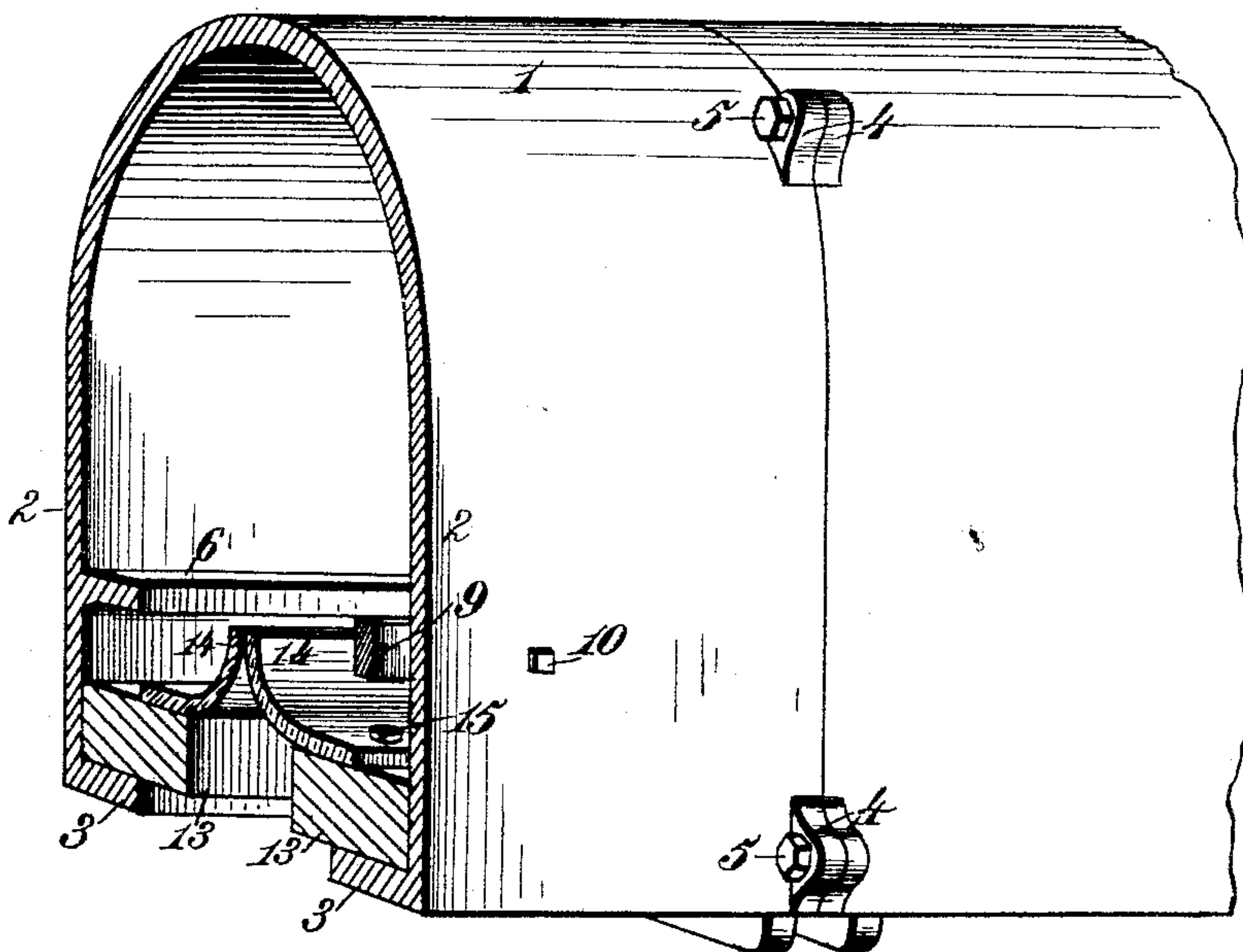
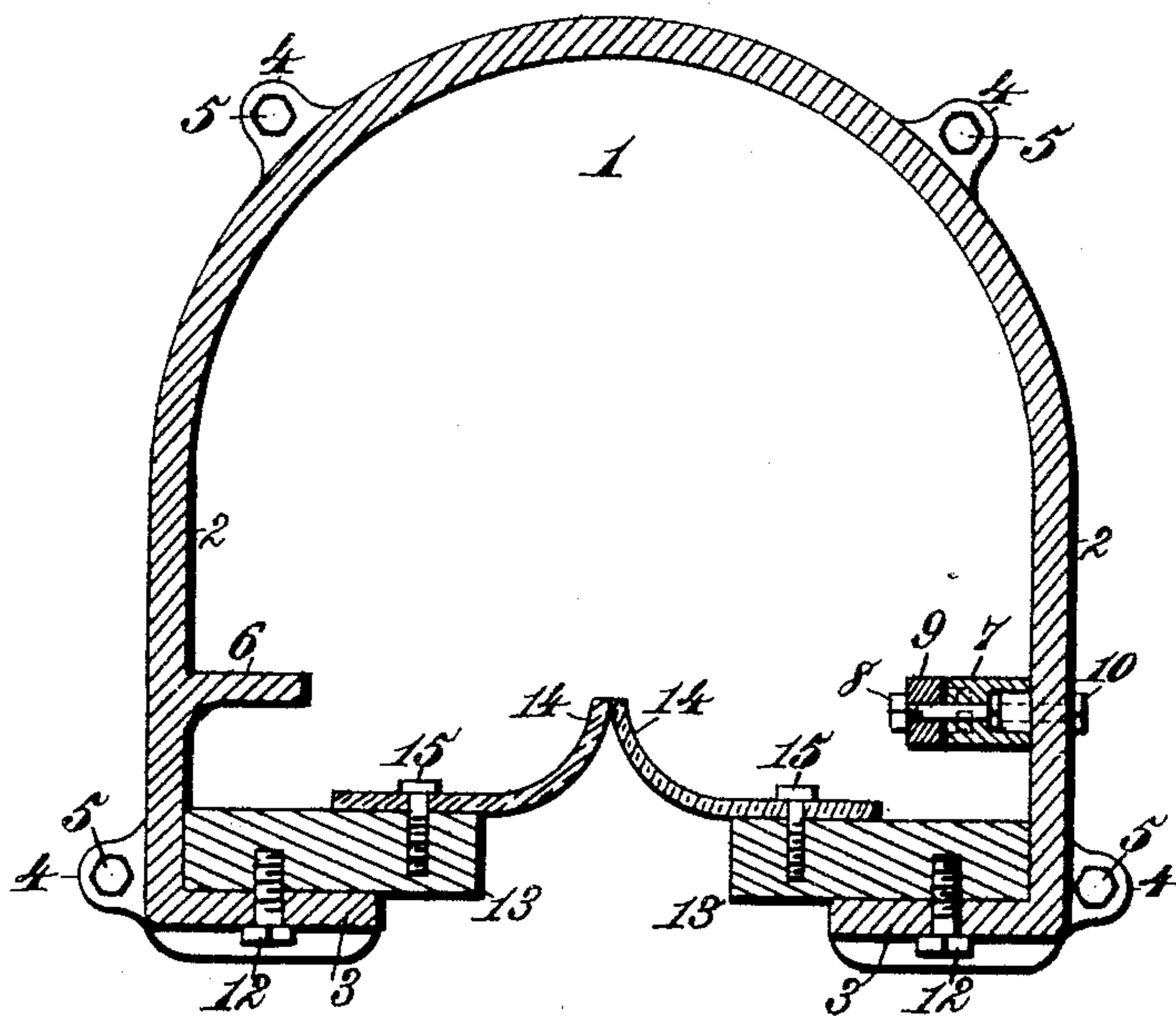


Fig. 2.



Witnesses,
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J. A. Rutheford

Inventor,
Francis A. Pocock,
By *James L. Norris,*
Atty.

(No Model.)

2 Sheets—Sheet 2.

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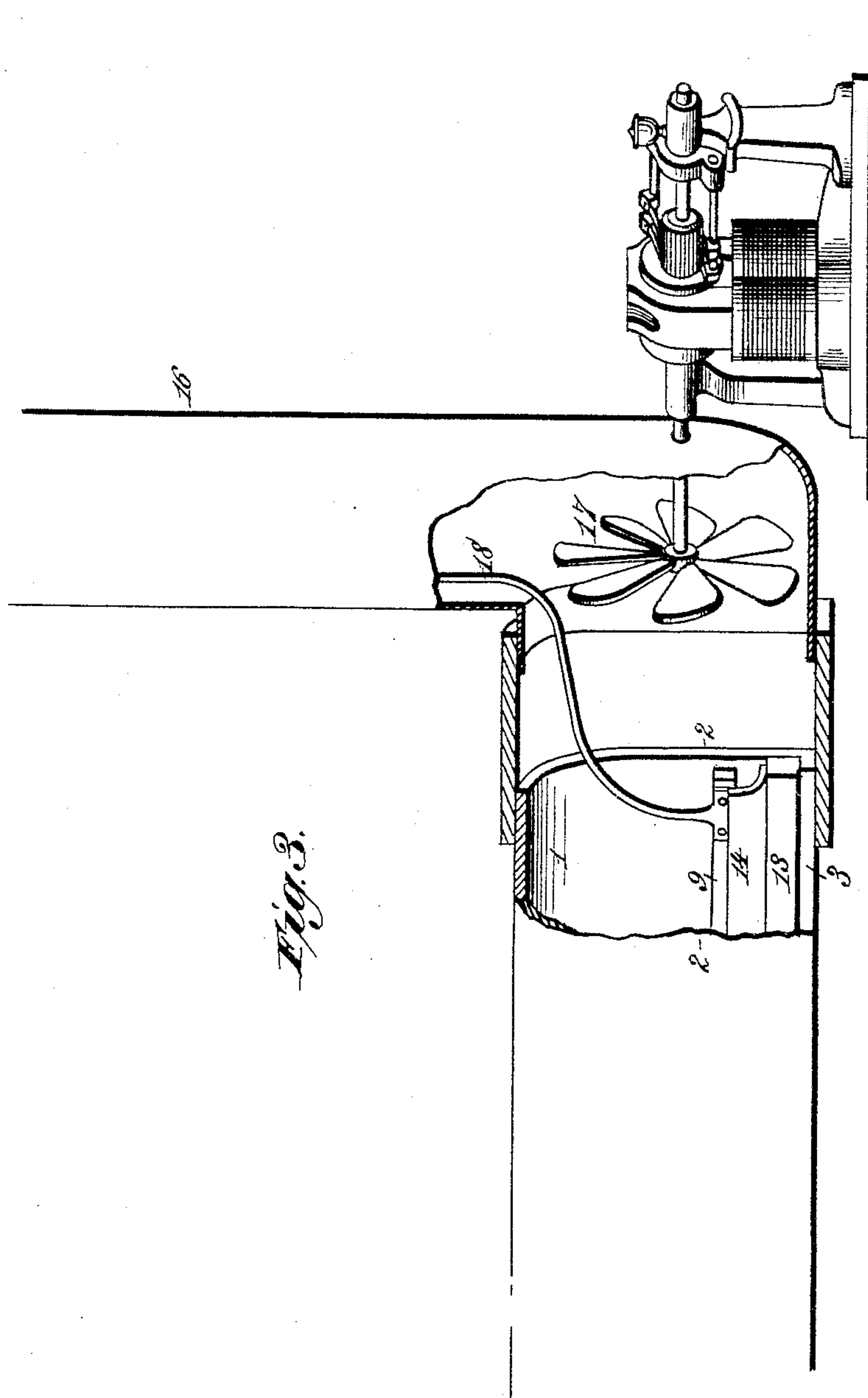


Fig. 3.

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UNITED STATES PATENT OFFICE.

FRANCIS A. POCOCK, OF SCRANTON, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO ELMER H. LAWALL AND RUFUS J. FOSTER, BOTH OF SAME PLACE.

INSULATOR FOR ELECTRICAL CONDUCTORS FOR MINES.

SPECIFICATION forming part of Letters Patent No. 448,838, dated March 24, 1891.

Application filed June 26, 1890. Serial No. 356,847. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. POCOCK, a subject of the Queen of Great Britain, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented new and useful Improvements in Insulation of Electrical Conductors for Mines, of which the following is a specification.

This invention relates to the insulation of electrical conductors employed in the gangways of coal and other mines where the hauling is effected by a motor impelled by electricity.

In coal-mines where the principal part of the hauling is carried on by electricity, the electrical conductors are located near the roof at the side of the gangway, and these conductors are composed of bare copper wires stretched from insulator to insulator and soldered thereto. In consequence of this the conductors are liable at any time to be touched by the miners and others employed in the mine, and also by animals passing along the galleries. The ordinary motor is provided with an arm which is more or less flexible, and carries a wheel which is held against the bare electrical conducting-wire through the medium of springs for the purpose of obtaining contact. The current generated is of high power, and hence there is more or less spark at the contact-points. These sparks are dangerous in mines which generate inflammable gas, for the sparks will ignite the gas, if any be present, and cause an explosion of a more or less serious nature.

The main object of my invention is to so inclose the conductor that the sparks generated will be in a current of fresh atmospheric air that operates to prevent the inflammable gas from entering the inclosure containing the electrical conductor, whereby the liability of an explosion is entirely avoided.

The invention also has for its objects to reduce the loss which arises from leakage of the electrical current; to so place the electrical conductors that it will be impossible for a human being or animal to make contact with the live conductor; to provide novel means whereby the electrical conductor is

less liable to be injured by a fall of the roof, and to otherwise improve the insulation and protection of electrical conductors in the gangways of mines.

To accomplish all these objects my invention involves the features of construction, the combination or arrangement of parts, and the principles of operation hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view of a portion of my improved conduit or tubular casing for the electrical conductor of the motor-car used for the main haulage in mines. Fig. 2 is a transverse sectional view of the same; and Fig. 3 is a detail perspective, showing air-forcing mechanism to produce a constant current of fresh air in the conduit or tubular casing.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates my improved conduit or tubular casing, which is composed of cast iron or other metal or wood, or such material as the conditions require, according to the peculiarities of the mine as regards water and the quantity of free sulphuric acid in the latter. I preferably construct this conduit or casing of iron in order that it serves as the return or home conductor, and this conduit or casing is arched in a segment of a circle and has its side walls extended parallel to each other, as at 2, and projected inwardly to form longitudinal flanges or wings 3, which extend toward each other, as clearly shown in Fig. 2.

In practice the conduit or casing is composed of sections, each having at its ends a series of laterally-projecting ears or lugs 4, provided with orifices in such manner that when the ends of two sections are placed in contact with each other the ears or lugs will coincide for the passage of bolts 5, to rigidly secure the sections together and thus produce a continuous conduit or casing which is tubular and approximately semicircular in cross-section.

The conduit or casing is provided on its in-

terior along one side wall with a longitudinal extension or rail 6, and at the opposite side with inwardly-projecting blocks 7 of suitable insulating material, to which is secured by bolts 8 or otherwise the line-conductor or main feed-wire 9. The insulating-blocks may be attached by bolts 10 or by other suitable contrivances. By this construction I provide the main conductor or feed-wire, and also the return or home conductor.

To each of the inwardly-projecting flanges 3 are secured, by bolts 12 or otherwise, a series of strips 13, of wood or other material, which are closed at their ends next the side walls of the conduit or casing by a suitable joint of white lead or other packing. These wood or other blocks 13 extend toward each other from the edges of the inwardly-projecting flanges and serve as continuous supports for two flexible sheets 14, each of which is attached along one longitudinal edge to the wooden blocks by bolts or other fastenings 15. These sheets are preferably composed of rubber, and at their adjoining edges they are curved inwardly toward the center of the conduit or casing and rest one against the other, as clearly shown in Fig. 2, whereby the opening at the side of the conduit or casing is effectually closed.

In practice the collector of the motor is drawn along between the edges of the flexible sheets in such manner that the collector, as it travels, will force the rubber sheets apart and such sheets will instantly close against each other after the passage of the collector.

To prevent inflammable gas generated in the mine from entering the casing or conduit, I extend the main conductor 18 from some dry place on the surface of the ground through an air-pipe 16, and continue this pipe to the foot of the shaft or mouth of the drift, where such pipe connects with the tubular casing, and the main conductor 17 is connected electrically with the live conductor or feed-wire 9, secured to the insulated blocks 7 inside of the casing or conduit, the return or home conductor being attached to the said casing or conduit. A continuous current of fresh dry air is passed within the conduit or casing through the medium of an air-forcing means, such as a forcing-fan 17. This forced current of air will leak out through any interstices along the length of the casing or conduit, and where it leaks out it will prevent the gas from entering into the casing or conduit, whereby I effectually exclude the inflammable gas from the interior of the conduit or casing, and thereby avoid the possibility of an explosion arising from the inflammable gas being ignited through the medium of sparks generated by the live conductor or main feed-wire inside of the conduit or casing. The continuous current of fresh dry air prevents moisture, and thereby increases the efficiency of the insulation of the main conductor.

It will be obvious that by inclosing the live conductor or main feed-wire within a conduit or casing of the character described it is impossible for a human being or animal to make accidental contact with such conductor, thereby avoiding the serious results which arise from contact with the live conductor in the gangway of a mine.

The segmental arched form of the conduit or casing will deflect objects that fall from the roof of a mine, and, furthermore, if the roof should fall, the conduit or casing would protect the inclosed conductor and other elements. In addition to this feature, if a fall of the roof should cause a break in the system, the air escaping will blow away any gas that may be in the neighborhood until after the arc is broken, and thereby avoid igniting the inflammable gas of the mine.

Having thus described my invention, what I claim is—

1. In the insulation of electrical conductors for the gangways of mines, the combination, with a conduit or casing having a longitudinal extension or rail for supporting the collector of the motor, of insulating-blocks secured within the conduit or casing and supporting the main conductor or main feed-wire, and flexible sheets which close an open side of the conduit or casing and permit the passage of the collector-arm, substantially as described.

2. In the insulation of electrical conductors for mines, the combination, with a conduit or casing having inwardly-extending flanges or wings and provided on its inside with a longitudinal extension or rail for the travel of one side of the collector of a motor, of internal insulating-blocks carrying the live conductor or main feed-wire and flexible sheets connected at one edge to the flanges or wings of the casing or conductor and having their opposite edges bearing against each other to permit the passage of the collector-arm and instantly close against each other, substantially as described.

3. In the insulation of electrical conductors for mines, the combination of a conduit or casing containing the live conductor or main feed-wire and provided with flexible sheets or mediums which are opened by the passage of the collector-arm and close in rear thereof, an air-pipe to lead from the surface of the ground and communicate with the conduit or casing, and air-forcing mechanism for creating a current of air through the air-pipe and conduit or casing which by leaking through any interstices in the latter excludes inflammable mine-gases, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

FRANCIS A. POCOCK.

Witnesses:

FRED. C. HAND,
HOWARD M. STREETER.