Oct. 17, 1950 J. H. ALLEN ET AL 2,526,315

SWITCH FOR VENTILATING SYSTEMS

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Fig. 1

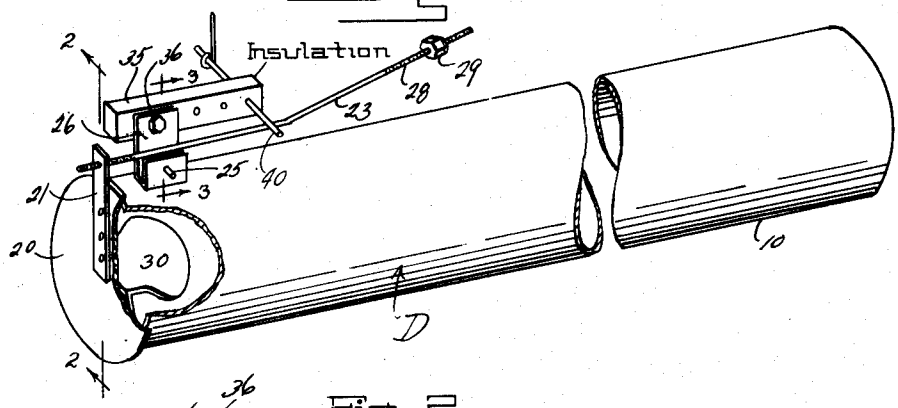


Fig. 2

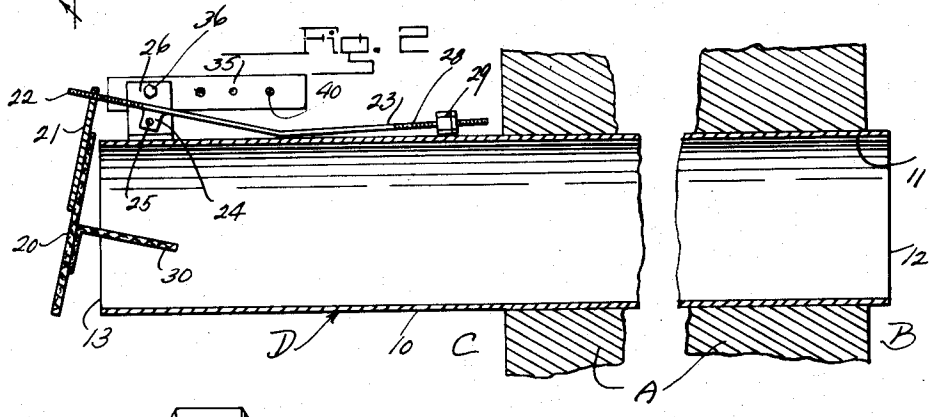


Fig. 3

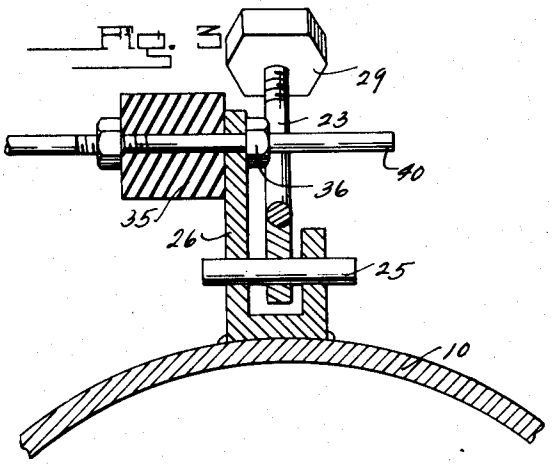
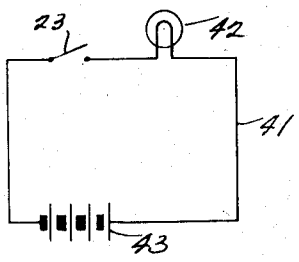


Fig. 4



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SWITCH FOR VENTILATING SYSTEMS

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2 Claims. (Cl. 200—52)

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This invention relates to improvements in signalling equipment for mine ventilating systems.

The primary object of this invention is the provision of automatically operated means for detecting failure of mine ventilating systems.

A further object of this invention is the provision of a relatively simple operating mechanism controlled thru air draft and/or pressure within mine chambers and passageways for the signal indication of failure in a mine ventilating system.

Other objects and advantages of this invention will be apparent from the following detailed description.

In the accompanying drawing, forming a part of this specification, and wherein similar reference characters designate corresponding parts thruout the several views,

Figure 1 is a perspective view of the improved device showing certain parts in section.

Figure 2 is a fragmentary cross sectional view showing the parts as they would appear in the absence of proper ventilating currents or pressure in the mine chambers or passageways; the view being taken substantially on the line 2—2 of Figure 1 but with the parts shown in different position than shown in Figure 1.

Figure 3 is a cross sectional view taken substantially on the line 3—3 of Figure 1.

Figure 4 is a diagrammatic view showing the signalling circuit.

In mines, ventilation is effected usually thru the forcing of air thru the entire passageway of a mine. In coal mines these passageways may parallel each other or be arranged so that they are rather close to each other with a wall between them, as indicated by the wall structure A shown in Figure 2. One passageway is indicated at B to one side of the wall, and the other passageway C at the opposite side of the wall. The air passes in one direction along the passageway C and travels in the opposite direction along the other passage or chamber B.

The improved warning signal device D consists of a conduit 10 preferably horizontally positioned in a passageway 11 extending thru the wall structure A having one end 12 opening in the passageway B and the opposite end opening at 13 in the chamber or passageway C.

An insulation closure 20 is provided for the open end 13 of the conduit 10, and preferably the closure 20 is of disc-shaped formation and constructed of insulating fibre. It has a bracket arm 21 provided with a screw threaded opening therein into which is screw threaded the end

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22 of a pivoted switch arm 23. The latter has a lug portion 24, pivoted at 25, upon a J-shaped standard 26 which is welded or otherwise mounted externally upon the conduit 10 adjacent the open end 13. The switch arm 23 is bent intermediate its ends and at the end opposite the closure it is screw threaded at 28 and adapted to receive an adjustable counterweight 29 normally tending to hold the closure 20 in open position as shown in Figure 2. A fibre or other insulation tongue 30 is provided in rigid or fixed relation upon the inner surface of the closure 20 and normally projecting into the conduit passageway so that when the closure 20 is open the tongue 30 will be inclined to receive thereagainst the current of air tending to pass thru the conduit 10 and normally aiding in throwing the closure 20 into a shut position. Of course the passage of air thru the passageway B tends to create a suction thru the conduit 10 and this also aids in holding the closure 20 shut when the ventilating system is in proper working condition.

A block 35 of insulation material is bolted at 36 upon the bracket 26. It has a plurality of openings 36 therein to selectively receive a contact member 40 transversely supported upon the fibre block so as to receive the arm 23 in contact therewith when the closure 20 is in shut position and thereby to close an electrical circuit shown at 41 in Figure 4 of the drawing for the purpose of normally illuminating a signal lamp 42 thru source of power 43. So long as the lamp 42 is illuminated the ventilating system is in proper working order. However, should air draft or pressure fall below normal so as to indicate failure of the ventilating fans or short circuiting of the ventilating currents, the weight 29, due to lack of sufficient air pressure or suction, will throw the closure 20 to an open position and thus open the switch of the circuit and, of course, signalling that the ventilating system is not in working order. As soon as the ventilating draft of pressure is up to normal, the closure 20 will shut automatically as an incident of the tongue 30 and passage of current thru the conduit, and the switch arm will then close the circuit 41 and illuminate the signal lamp 42.

The weight 29 is adjustable to adapt the arrangement to sensitive operation under different conditions of air pressure, temperatures and other feature affecting mine ventilating distribution, etc.

The length of the conduit 10 is not important, as can readily be appreciated.

Various changes in the shape, size and arrangement of parts may be made to the form of the invention herein shown and described without departing from the spirit of the invention or the scope of the following claims.

We claim:

1. In apparatus for detecting failure of mine ventilating systems, an elongated, substantially horizontally disposed conduit having a passageway therethrough, a swingable closure of dielectric material for one end of the conduit, a bracket arm extending upwardly from the exterior of the closure, a pivoted switch arm of electricity-conducting material, having opposite end portions, with one end portion secured to the upper end portion of said bracket arm and extending along said conduit and away from said closure, means pivoting said switch arm to said conduit intermediate the ends of said switch arm, including an upwardly extending standard, a counterweight at the other end portion of said switch arm and having a conduit-contacting face, whereby the extent said closure opens is limited by the contact of said counterweight and conduit, a block of dielectric material extending from said standard, away from said closure and substantially paralleling the conduit, and an electric contact carried by said block and disposed in the path of travel of said arm as said closure swings to a closed position.

2. In apparatus for detecting failure of mine ventilating systems, an elongated, substantially horizontally disposed conduit having a passageway therethrough, a swingable closure of dielectric material for one end of the conduit, a bracket arm extending upwardly from the exterior of the closure, a pivoted switch arm of electricity-conducting material, having opposite end portions, with one end portion secured to the upper end portion of said bracket arm and extending along said conduit and away from said closure, means pivoting said switch arm to said conduit intermediate the ends of said switch arm, including an upwardly extending standard, a counterweight at the other end portion of said switch arm and having a conduit-contacting face, whereby the extent said closure opens is limited by the contact of said counterweight and conduit, a block of dielectric material extending from said standard, away from said closure and substantially paralleling the conduit, an electric contact carried by said block and disposed in the path of travel of said arm as said closure swings to a closed position, and a rigid tongue fixedly secured to and extending from the inner face of said closure and normally projecting into the passageway, whereby said tongue, when said closure is open, will be inclined to receive thereagainst fluid currents tending to pass through said conduit, and force said tongue upwardly to close said closure against the weight of said counterweight.

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