J. J. C. ALLISON & J. WALLER.

MEANS FOR MINIMIZING THE EFFECTS OF COLLIERY EXPLOSIONS.

APPLICATION FILED DEC. 26, 1914.

1,243,377. Patented Oct. 16, 1917.

Fig. 1.

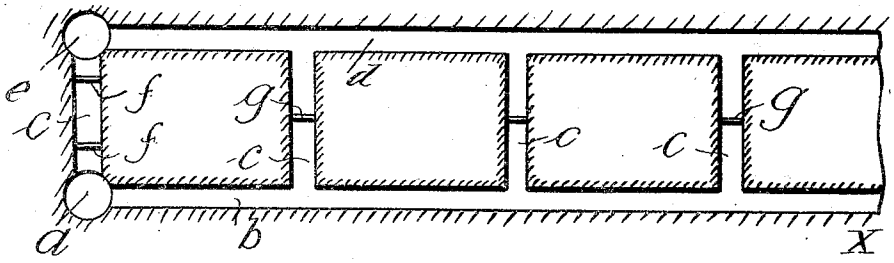


Fig. 2.

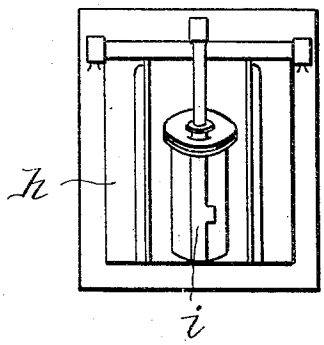
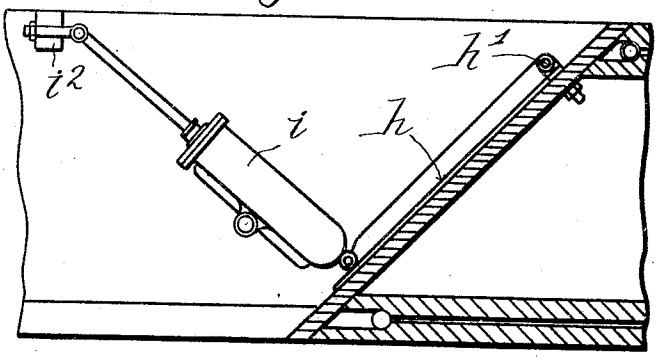


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN JOSEPH COLLINSON ALLISON, OF BUTTERKNOWLE, AND JOHN WALLER, OF WOODLANDS COLLIERY, COUNTY OF DURHAM, ENGLAND.

MEANS FOR MINIMIZING THE EFFECTS OF COLLIERY EXPLOSIONS.

1,243,377. Specification of Letters Patent. Patented Oct. 16, 1917.

Application filed December 26, 1914. Serial No. 879,165.

To all whom it may concern:

Be it known that we, JOHN JOSEPH COLLINSON ALLISON, of Lunton Hill, Butterknowle, county of Durham, England, and JOHN WALLER, of Woodlands Colliery, county of Durham, England, subjects of the King of Great Britain, have invented new Improvements in and Relating to Means for Minimizing the Effects of Colliery Explosions; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has reference to improvements in and relating to means for minimizing the effects of colliery explosions and has for its objects to provide means by which the force and effects of the explosion are limited in their effective area and the resulting noxious gases are diverted or guided so as to cause them to be less destructive.

The invention aims at providing time valve stopping for normally closing the communications between the intake and out-take or return, but so that any explosion taking place in the intake will force open the time valve stoppings in the cross passages thus returning the pressure and allowing a large portion of the noxious gases due to an explosion to pass into the return airways and so on out of the mine by way of the upcast shaft.

In the following description the invention is particularly set forth in connection with the accompanying drawings in which it is shown.

Figure 1 is a plan of the interior of a portion of a mine fitted with this invention.

Fig. 2 is a front elevation of a time valve stopping constructed in accordance with the invention.

Fig. 3 is a longitudinal section of Fig. 2.

In Fig. 1, *a* is a down-cast shaft and *b* the intake, *c c c* are the cross passages and *d* the out-take and *e* the up-cast.

The cross passages *c c c* are provided with ordinary valve stoppings *g g* or time valve stoppings as required with valve separation doors.

In the case of an explosion at X in the intake *b* instead of the shock and noxious gases penetrating to the interior of the mine, they would force open the time valve stopping and find their way into the out-take or return *d* and the up-cast *e*.

The time valve stopping is shown as comprising a door *h* pivoted at *h'*. The door is of iron or the like and is of considerable weight so as to be normally held closed by gravity. A hydraulic cylinder *i* with cataract arrangement is pivotally connected to the door *h* while the piston which slides in the cylinder is pivotally connected to a beam i^2 on the roof of the passage *c*.

By using doors as above set forth, the communication between the intake and out-take is normally closed so that the current of air passing through the mine is not interfered with as it is not sufficiently strong to force open the doors, but if an explosion should take place, it will owing to the greatly increased pressure force open these doors and rush into the return airway and up the upcast shaft, thus the gases are at once released and the effect of the explosion is greatly reduced and also its area of destruction.

It will be noted that while the door *h* is normally held closed by gravity it will, upon an explosion taking place, remain open for an appreciable time owing to the cataract arrangement of the cylinder *i*.

What we do claim as our invention and desire to secure by Letters Patent is:—

A stopping for mine passages comprising a frame mounted in the passage, a door hinged to said frame at the top of the passage for movement in a vertical plane, said door being supported by the frame when in closed position in a plane at an angle to the longitudinal axis of the passage, a hydraulic cylinder pivoted to the door relatively near the free edge of the latter, and a piston slidable in the cylinder and pivoted to a fixed support spaced from the door frame within and at the top of the passage, said piston and cylinder being disposed in a line running at an angle to the door greater than a right angle when said door is closed.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN JOSEPH COLLINSON ALLISON.
JOHN WALLER.

Witnesses:
CHAS. R. SHARP,
ROBT. STRAUGHAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."