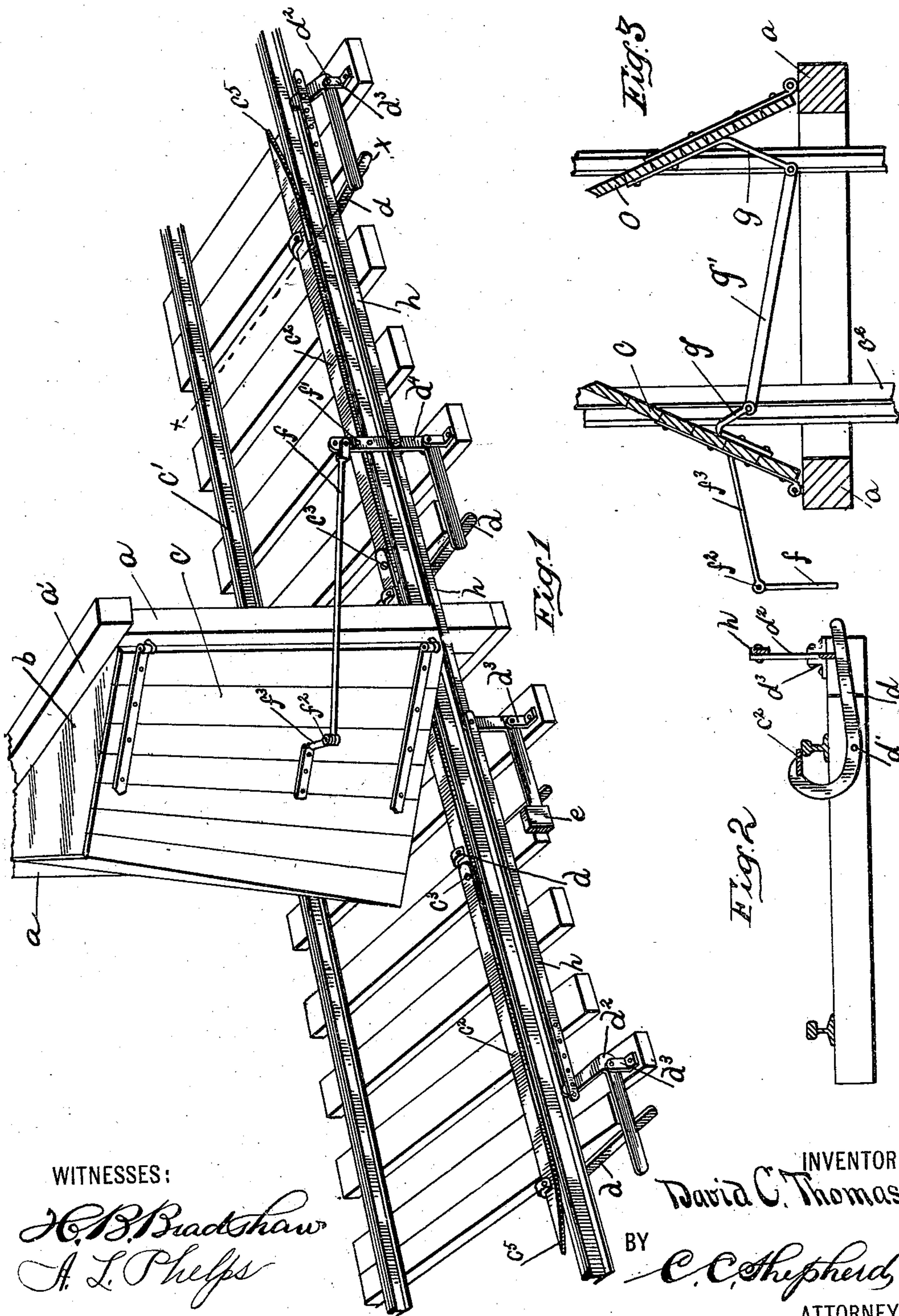


(No Model.)

D. C. THOMAS.  
MINE TRAP DOOR.

No. 556,073.

Patented Mar. 10, 1896.



WITNESSES:

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## MINE TRAP-DOOR.

SPECIFICATION forming part of Letters Patent No. 556,073, dated March 10, 1896.

Application filed October 9, 1895. Serial No. 565,141. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID C. THOMAS, a citizen of the United States, residing at Gloucester, in the county of Athens and State of Ohio, have invented a certain new and useful Improvement in Mine Trap-Doors, of which the following is a specification.

My invention relates to the improvement of mine trap-doors of that class which are adapted to cut off or control air-currents in the different entries or rooms of a mine; and the objects of my invention are to provide mine trap-doors of this class of superior construction and arrangement of parts, to provide improved means for automatically opening and closing the same, to provide an improved arrangement and construction of the operating mechanism, and to produce other improvements the details of construction of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a view, in perspective, of my improved door and operating mechanism, showing the doors in a closed position. Fig. 2 is a transverse section of the carway-track, taken on line  $xx$  of Fig. 1; and Fig. 3 is a transverse section of the doors and their frame-posts, showing said doors in an open position.

Similar letters refer to similar parts throughout the several views.

In the construction of my improved mine-doors I employ at the mine entry or doorway a frame consisting of vertical frame-posts  $a$  and a suitable cross top beam  $a'$ . Extending forward from this top beam or the upper portion of the frame is a substantially triangular doorway cover or hood  $b$ , which has its rear side or hypotenuse supported by said frame.  $c$  represents the doors, which, as indicated, are hinged to the posts  $a$  and when closed so that their upper end portions abut against the outer or inclined edges of the frame-top  $b$  their outer edges will meet, as indicated in Fig. 1 of the drawings, thus closing the framework. As indicated in the drawings, the doors thus formed are arranged immediately over a railway-track  $c'$ , on which mine-cars travel in the usual manner. On

the inner side of one of the track-rails I provide an operating bar or rail  $c^2$ , the latter partially overlapping the tread of the rail when in its normal position. This operating-bar, for reasons hereinafter stated, is formed in two or more sections, said sections being bolted or otherwise secured together, as indicated at  $c^3$ . The rail or bar  $c^2$  is supported by being connected with the inner and upwardly-projecting end portions of levers  $d$ , these levers extending outwardly beneath the track-rail and being fulcrumed, as indicated at  $d'$ , to the ties. Any desired number of the levers may be employed, and for each of said levers I provide on the outer side of said track-rail a bell-crank lever  $d^2$ , each of the latter being fulcrumed at its angle to a bracket  $d^3$ , which may project from an extension of a trackway-tie. These bell-cranks are, as shown, pivoted at a point out of alignment with the levers.

The normally horizontal arms of the bell-cranks  $d^2$  are adapted, as shown, to rest upon the upper sides of the outwardly-projecting portions of the levers  $d$ . As indicated, one of these normally horizontal bell-crank arms is provided with a weight  $e$  on its outer end portion. As shown in the drawings, one of the bell-cranks which is supported at a point within the mine-entry, and which for the sake of clearness I have designated as  $d^4$ , has its vertical arm connected with one end of a door-operating rod  $f$ , this connection being made with the desired one of a number of bolt-holes  $f'$ , formed at varying heights in said bell-crank arm. The remaining end of the rod  $f$  is jointedly connected at  $f^2$  with the outwardly-projecting end portion of an arm  $f^3$ , the inner end of which is secured to the outer face of that door  $c$  which is on the corresponding side with the operating-rail. Each of the doors  $c$  is provided on its inner side with a projecting arm  $g$ , the ends of said arms being jointedly connected in the usual manner by means of a connecting-arm  $g'$ .

As shown in the drawings, the upwardly-projecting arms of the bell-cranks are jointedly connected by connecting-bars  $h$ , the outer ends of the outer bars  $h$  being provided with a number of bolt-holes to admit of an adjustable connection with the outer bell-



cranks. The outer bell-cranks  $d^2$  preferably have their upwardly-projecting arms inclined forwardly.

As indicated in the drawings, the outer sections of the operating bar or rail have their outer ends provided with an inner side bevel bringing said ends to the points indicated at  $c^5$  and resulting in the formation of an acute angle between said beveled or pointed end portions and the track-rail.

The operation of the mechanism herein described is substantially as follows: The flanges of the wheels on one side of a car that, running upon the track  $c'$ , approaches the door  $c$  from either direction, come into contact with the beveled end of the operating-bar, which results in forcing said bar inward and off the track-rail. This inward movement of the operating-bar must result, as will readily be seen, in an upward movement of the levers  $d$  and in a consequent lifting or rocking movement of the bell-cranks. The movement thus imparted to the vertical arm of the bell-crank  $d^4$  results, through the connection of the latter with the door  $c$ , which is on the corresponding side of the track, in said door being thrown open to the position indicated more clearly in Fig. 3 of the drawings. The opening of said door results, through its jointed connection with the remaining door, in the latter being opened in the usual manner. By this operation it will be seen that the doors will remain in an open position, admitting the clear passage of the car through the doorway until the flanges of the car-wheels have passed the ends of the sectional operating-bar, when, through the action of the weight  $e$ , the bell-cranks will be dropped to their normal position and the doors will be closed.

It will be observed that in the construction of my device I have so arranged and combined the parts thereof as to admit of the operating-rail being used on the inner side of one of the track-rails, thus obviating the necessity of running said rail on the outer side of the track, which, as is well known, is undesirable.

In case the mine entry or doorway should

necessarily be arranged on the curve of the track, it will be seen that by the sectional construction of my improved operating-bar the sections may be provided with the desired curve, and if desired may be united with the straight-end sections, thus obviating the difficulty and necessity of producing the bend or curve in the entire operating-rail.

The construction which I have herein shown and described is simple and effective, and the parts of my device are so arranged as to result in a positive operation of the same.

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

1. In an automatically-operated mine-door the combination with a door-frame and doors hinged therein above a trackway, of levers  $d$  fulcrumed beneath one of the track-rails, an operating rail or bar supported at the inner ends of said levers, jointly connected bell-crank levers  $d^2$  and  $d^4$  on the outer side of said track-rail, one arm of each of said bell-cranks bearing on one of the levers  $d$  and a rod jointly connecting the upper arm of the bell-crank  $d^4$  with the door  $c$  substantially as and for the purpose specified.

2. In an automatically-operated mine-door the combination with a door-frame and jointly-connected doors hinged therein, a trackway beneath said doors, fulcrumed levers  $d$  extending beneath one of said track-rails and an operating-bar supported on the inner ends of said levers, said operating-bar adapted to partially overlap said rail, of bell-cranks  $d^2$   $d^4$  fulcrumed on the outer side of the track-rail and having their lower arms bearing on the levers  $d$ , connecting-bars between said bell-cranks, a weight carried on one of said bell-crank arms and a jointed connection between one of said bell-crank arms and one of the doors, substantially as and for the purpose specified.

DAVID C. THOMAS.

In presence of—

J. W. JONES,  
JOHN W. SAWYER.