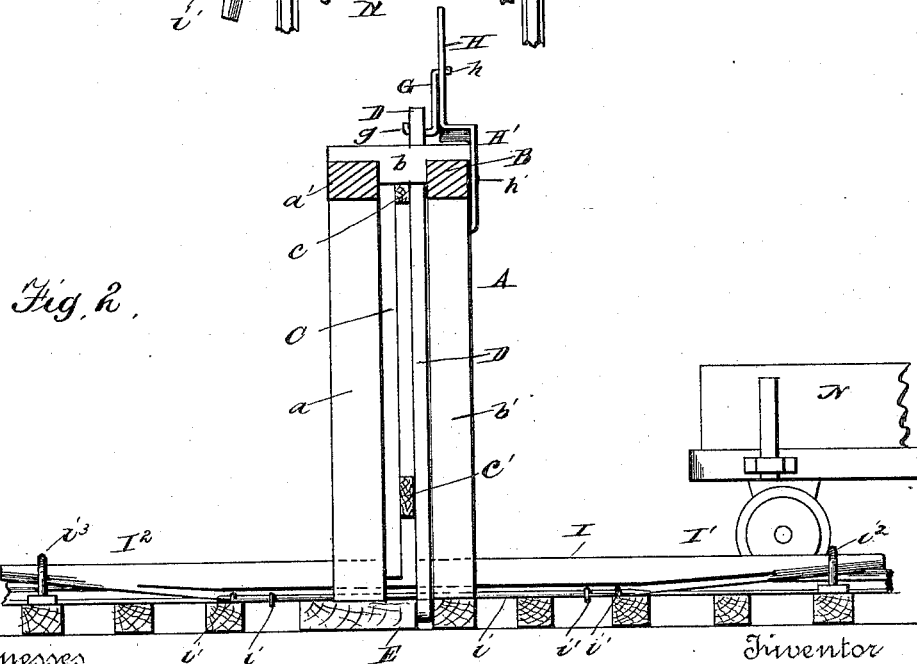
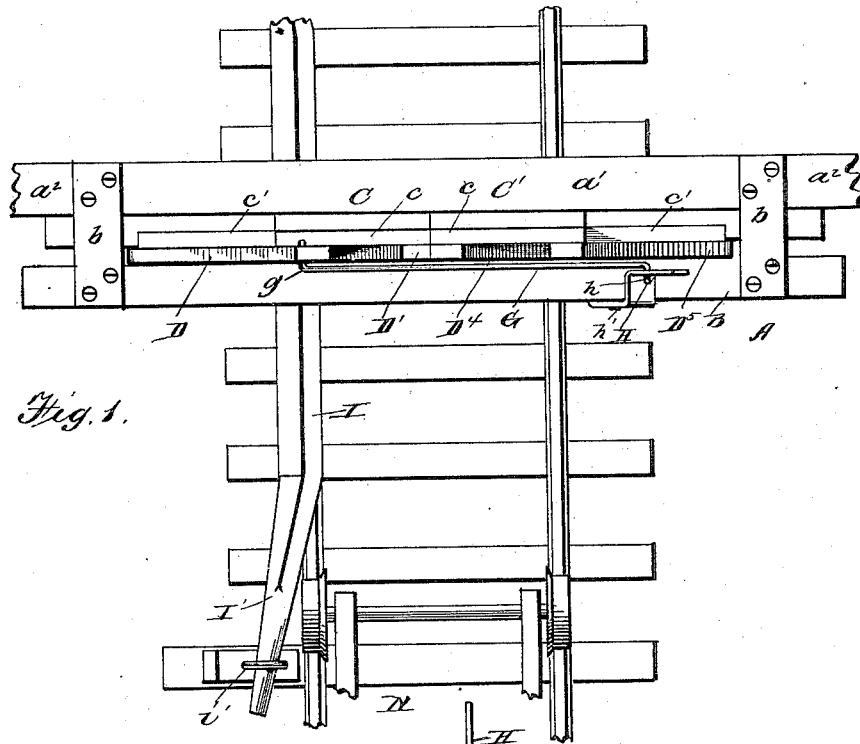


W. PALMER.

AIR SHUTTER OR DOOR.

No. 344,853.

Patented July 6, 1886.



Witnesses

W. H. Knight

E. G. Siggers.

Inventor

Wm Palmer

By his Attorneys

C. A. Snowlee

(No Model.)

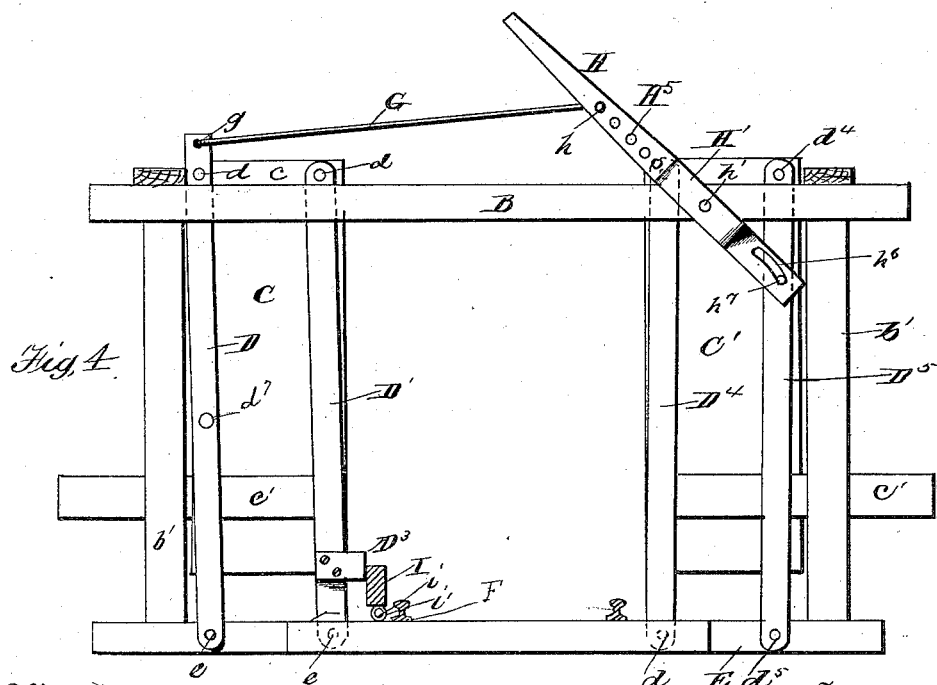
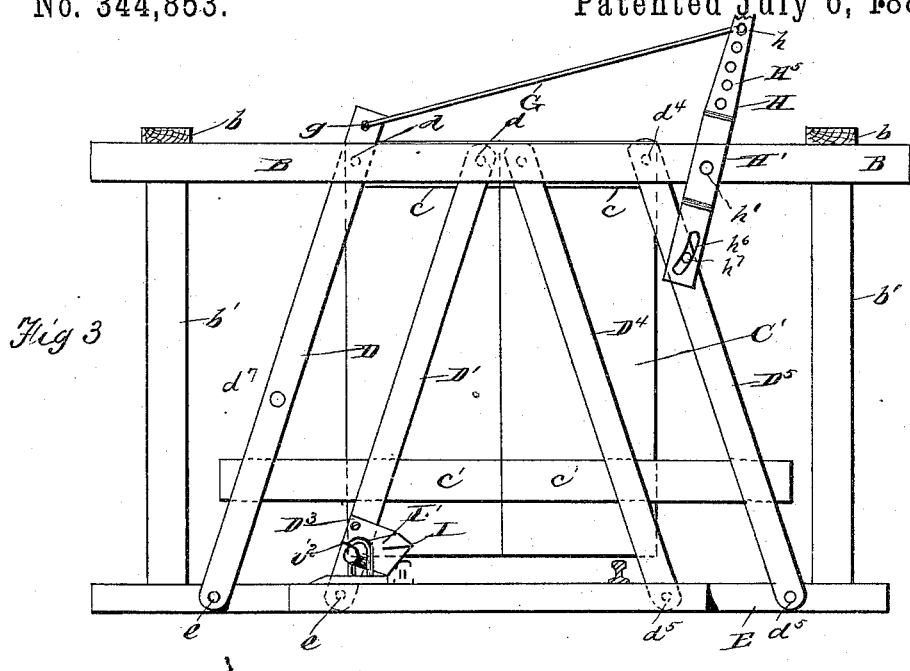
2 Sheets—Sheet 2.

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By his Attorney

C. A. Snow-Hill

# UNITED STATES PATENT OFFICE.

WILLIAM PALMER, OF JACKSONVILLE, OHIO, ASSIGNOR OF ONE-HALF TO  
GEORGE H. VENNING, OF SAME PLACE.

## AIR SHUTTER OR DOOR.

SPECIFICATION forming part of Letters Patent No. 344,853, dated July 6, 1886.

Application filed February 11, 1886. Serial No. 191,607. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM PALMER, a citizen of the United States, residing at Jacksonville, in the county of Athens and State of Ohio, have invented a new and useful Improvement in Air Shutters or Doors, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in air shutters or doors adapted for use at the entrance to mine-shafts, or in buildings in connection with doors that are required to be opened and closed continuously for the passage of cars, &c.

To this end the invention consists in doors or shutters provided with means whereby they are automatically opened and closed by the passage of a car, substantially as hereinafter described, and specifically pointed out in the claims.

Referring to the drawings, Figure 1 represents a top plan view of a pair of air shutters or doors embodying my improvement, showing the wheels of a car in position to open said shutters or doors. Fig. 2 represents an edge view thereof. Fig. 3 is a front elevation showing the shutters or gates closed. Fig. 4 is a similar elevation showing the gates or shutters open.

In the drawings, in which similar letters of reference denote similar parts, A designates an upright frame erected at the point at which it is desirable to locate the shutters or doors—in the present instance, transversely of a rail-track upon which cars are constantly in motion.

The frame A consists of uprights *a* at each side of the track, having a horizontal timber, *a'*, secured to their upper ends, said timber provided with projecting ends *a<sup>2</sup> a<sup>3</sup>*, as shown.

When the invention is used in connection with a building, the parts described are supplied by the side and top edges of the door or aperture formed in the side wall of said building, as will be readily understood.

B designates a horizontal timber, arranged parallel with the timber *a'* at a short distance therefrom, and connected to said timber *a'* by short blocks *b*, to permit the passage of the doors or shutters in upward direction between

said horizontal timbers *a'* and B, as will be hereinafter described.

The timber B is supported at its ends upon vertical studs *b'*, projecting upwardly from the surface of the ground or floor of the building, as the case may be.

C C' designate doors or shutters that operate between the timbers *a'* and B, and bear at their upper ends against the former.

*c c'* designate transverse cleats secured upon the outer surface of each of the doors C C', at the upper and lower ends thereof.

D D' designate the swinging bars, upon which one of the doors or shutters C is mounted. The upper ends of said bars D D' are pivoted by bolts *d* to the opposite ends of the cleat *c* of the door C, while the opposite ends of said bars D D' are pivoted by bolts *e* to the outer surface of a sleeper or sill, E, that extends transversely of the track-rails F and forms one of the bearings therefor. The upper end of the bar D projects above the upper end of the door C, and is apertured to receive a crank-arm, *g*, formed upon one end of a connecting-rod, G, that extends thence to and is connected by a crank-arm, *h*, with the upper end of a lever, H, pivoted at *h'* to the outer surface of the timber B. The remaining bar D' is provided near its bottom, and upon the side adjacent to the track-rails, with a short outwardly-projecting block, D<sup>2</sup>, that, when the gates or shutters C C' are closed, bears against the outer surface of a trip-rail, I, that is hinged by a rod, *i*, and staples *i'* to the sleepers of the track-rails, at the outer side of one of said rails, for the purpose of causing the doors to be automatically opened and closed by the passage of a car upon said track-rails. The remaining door, C', is hung upon swinging bars D<sup>4</sup> D<sup>5</sup>, the upper ends of which are pivoted by bolts *d'* to the ends of the cleats *c* upon the outer surface of said door at the top thereof, while the lower ends of said bars D<sup>4</sup> D<sup>5</sup> are pivoted by bolts *d''* to the outer surface of the sleeper E, hereinbefore described.

H designates a lever having an offset portion, H', at or near its middle, the side, top, and bottom of which are parallel with the outer surface, top, and bottom of the timber B, said offset being formed for the purpose of

permitting the lever H to be pivoted at its middle upon the outer surface of the timber B, while the inner surfaces of its top and bottom ends lie in the plane of the inner surface of said timber B, as shown.

$h'$  designates the pivotal point of the lever H.

$H^5$  designates a series of apertures formed through the upper end of the lever H, to receive the crank-arm  $h$  of the rod G in its various adjustments. The lower end of the lever H is provided with a curved slot,  $h^6$ , through which passes a pivotal pin,  $h^7$ , whereby it is connected to the swinging bar  $D^5$ . The upper end of the lever H is formed with a handle, whereby the doors may be opened from above the timbers B  $a'$ .

One of the swinging bars, D, is provided with a handle,  $a'$ , that projects outwardly therefrom, whereby to open the doors or shutters when standing upon the ground.

The trip-rail I is provided at its opposite ends with outwardly-inclined portions  $I^1$   $I^2$ , the outer ends of which are held within loops or staples  $i^2$   $i^3$ , in order that said rails may not be displaced by pressure brought to bear against their inner surfaces by the passage of a car for the purpose of opening the doors or shutters C C'.

The operation of my invention is as follows:

The wheels of a car, N, in motion upon the track-rails at either side of the doors C C', strike against the inclined face of one or the other of the inclined portions  $I^1$   $I^2$  of the trip-rail I, thereby causing said bar to swing or turn upon its pivotal bar  $i'$ , and thus through the block  $D^3$  and swinging bars D D'  $D^4$   $D^5$  and their connections automatically open the gate, as will be readily understood.

Modifications in details of construction may be made in the herein-described invention without departing from the spirit or sacrificing the advantages thereof—as in lieu of the gates closing by gravity, as is the case in the present invention, said gates may be closed by positive motion received from a car through trip-rails similar in action to that described.

Having thus described my invention, I claim—

1. In an air shutter or door adapted to be automatically opened for the passage of a car, two or more doors or shutters, C C', hung upon the upper ends of inclined swinging bars connected together at their tops, in combination with a trip-rail mounted upon bearings upon one side of the track-rails, the track-rails, and a car moving thereon, substantially as described.

2. In an air shutter or door, two or more doors, C C', mounted upon inclined swinging bars D D'  $D^4$   $D^5$ , in pairs, said pairs connected together by a connecting-rod, G, and lever H, in combination with a trip-rail, I, extending at the side of a track-rail, whereby the passage of a car will cause said doors to be automatically moved in opposite directions, substantially as described.

3. In an air shutter or door, the combination of laterally and upwardly moving doors or shutters C C', pivoted to the upper ends of swinging bars D D'  $D^4$   $D^5$ , that are hinged at their bottoms to the track-sleepers with said bars, connecting-rod G, lever H, having offset portion  $H'$ , blocks  $D^3$ , projecting from bar D', and trip-rail I, having inclined ends  $I^1$   $I^2$ , substantially as described.

4. In an air shutter or door adapted to be opened by the passage of a car, the combination of the following elements, viz: frame A, having uprights  $a$  and horizontal timbers  $a'$ , horizontal timber B, uprights  $b'$ , doors C C', provided with transverse cleats  $c$   $c'$ , swinging bars D D' and  $D^4$   $D^5$ , connecting-rod G, lever H, having offset  $H'$ , trip-rail I, having inclined portions  $I^1$   $I^2$ , substantially as described, for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM PALMER.

Witnesses:

J. H. HARVEY,  
J. N. McVAY.