

(No Model.)

2 Sheets—Sheet 1.

G. BONENBERGER. MINE TRAP DOOR.

No. 569,952.

Patented Oct. 20, 1896.

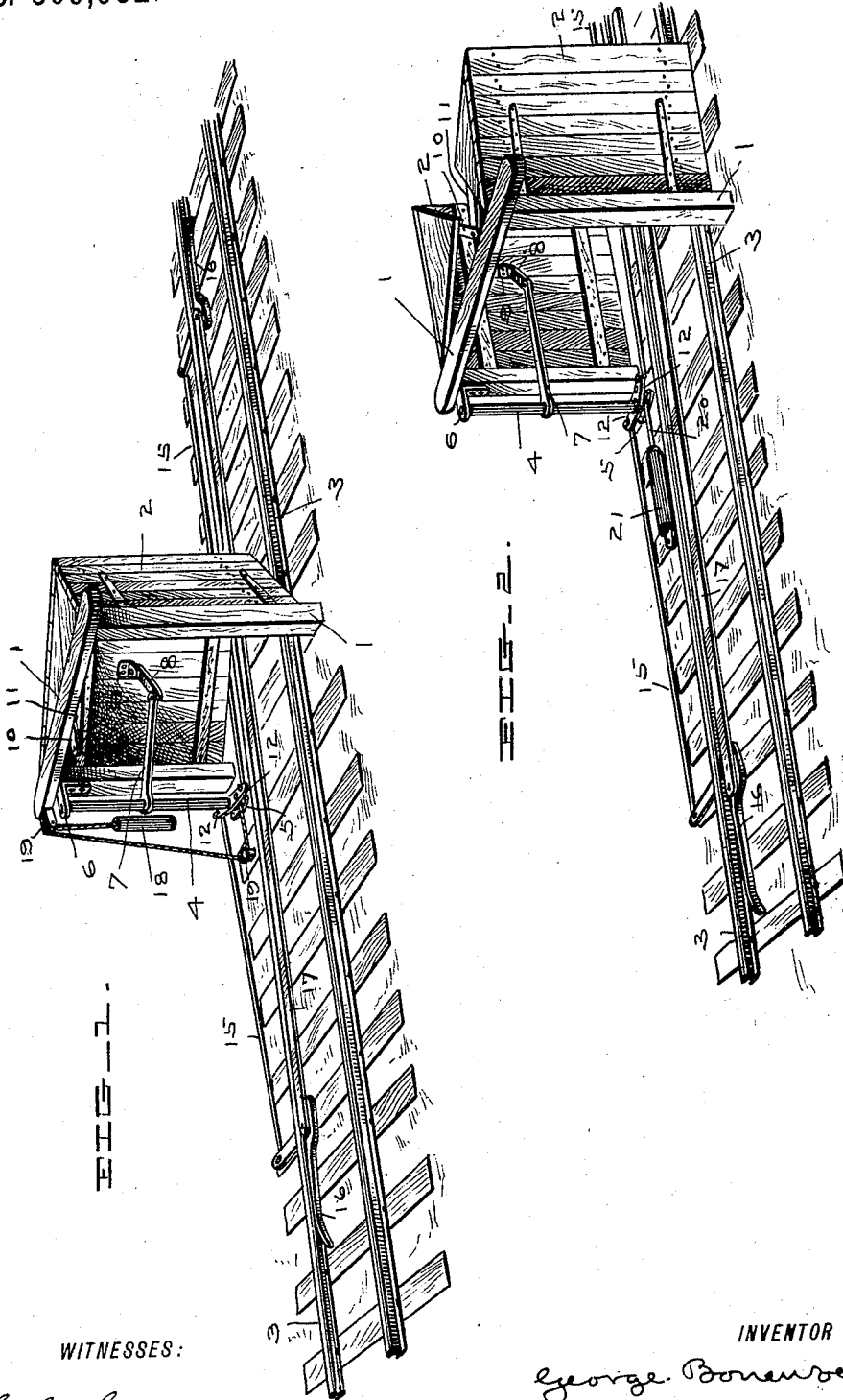


FIG. 1.

FIG. 2.

WITNESSES:

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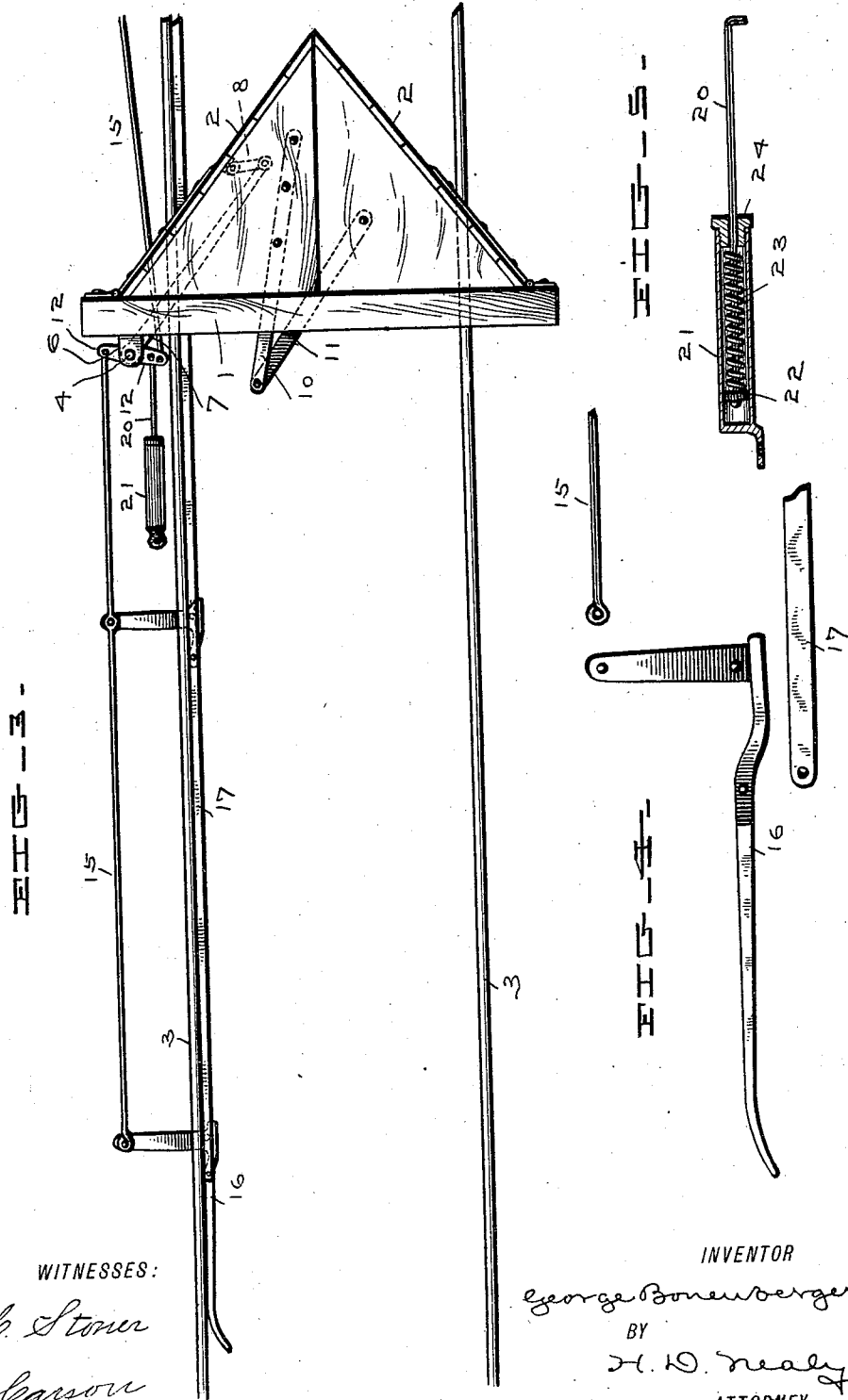
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UNITED STATES PATENT OFFICE.

GEORGE BONENBERGER, OF EVANSVILLE, INDIANA, ASSIGNOR TO THE
AUTOMATIC MINE DOOR COMPANY, OF TERRE HAUTE, INDIANA.

MINE TRAP-DOOR.

SPECIFICATION forming part of Letters Patent No. 569,952, dated October 20, 1896.

Application filed April 29, 1896. Serial No. 589,616. (No model.)

To all whom it may concern:

Be it known that I, GEORGE BONENBERGER, a citizen of the United States, residing at Evansville, in the county of Vanderburg and State of Indiana, have invented certain new and useful Improvements in Mine Trap-Doors; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to new and useful improvements in mine trap-doors, and more particularly to one that is automatically opened on the approach of a car through the entry of a mine in either direction, the car causing the door to open just before it reaches the door and causing it to close after it has passed through the same.

A further object is to provide a door whose operating mechanism will be as simple as possible and entirely above ground, and also lie very near the track.

In the drawings, Figure 1 is a perspective view of my improved trap-door and its operating mechanism, the door being closed. Fig. 2 is a similar view of the door and its operating mechanism on one side, the door being opened. Fig. 3 is an enlarged plan view of the door and its operating mechanism on one side, the door being closed. Fig. 4 is an enlarged detail plan view of one of the moving bars or trips, and also the ends of its connections. Fig. 5 is a detail sectional view of the spring device for closing the door after a car has passed.

In detail, 1 is a framework supported across a track in the entry of a mine.

2 are double doors which are hinged to the framework 1 and close across the track at angles to each other, 3 being the rails.

4 is a vertical rod or shaft near the framework 1, its lower end being set in a suitable bearing-block 5 and its upper end being carried in a bracket 6, secured to such framework.

7 is an arm or lever secured to the shaft 4, and its outer end is pivoted to a link 8, which

is in turn pivoted to a bracket 9 on one of the doors.

10 is an arm secured to the top of one of the doors, and 11 is a link, one of whose ends is pivoted to the end of the arm 10 and its other pivoted to the top of the other door, so that both doors will open and close simultaneously.

12 are crank-arms secured to the shaft 4 near its lower end, the cranks being shown in the drawings as formed in one piece.

To each crank-arm is pivoted an operating-rod 15, these extending alongside of the track to a suitable point on each side of the door, where each is pivoted to an outer extended arm of a trip or moving bar 16. Each of these trips is in the form of a bell-crank lever and is pivoted either to the track-flange or to a cross-tie on the inside of the rail, the short arm of each of the moving bars passing under or through the rail, as may be desired.

The longer arms of the trips 16 lie normally parallel with and close to the rail and have their long ends slightly bent or curved, so as to allow the ready entrance of the flanges of the car-wheels between the moving bar and the rail as the wheels pass over the rail.

17 is a bar pivotally connecting the two trips, and it also lies close to the rail, and, where very long, is connected at suitable points with the operating-rods by levers 14, so that no matter at what point on the rails the car or cars are so long as the wheels bear against the trips 16 or the bar 17 the doors will be held open.

I have shown two means for closing the doors and bringing all the parts back to their normal position after a car has passed through the door. The first is the weight 18, carried by a cord which passes over the pulleys 19, which weight may be placed at any suitable point, so long as the cords be connected to one of the crank-arms 12.

The second means of closing the door is by the spring device shown in Fig. 5, which consists of a rod 20, connected at one end to one of the cranks 12 and its other end working in a barrel 21, pivoted to one of the cross-ties.

The rod has a stop 22 on its end and a spring

23 coiled around said rod, the forward end of the spring bearing against the screw-plug 24, which closes the end of the barrel.

5 Having mentioned the several parts of my improved device in detail, I will now describe its operation, which is as follows: Upon the approach of a car or cars from either direction the flange of the first car-wheel on the rail adjacent to the operating mechanism will
 10 slip in between the turned end of the trip or moving bar on that side of the door and the rail and turn the moving bar on its pivot. This will, through the connecting-bar 17, operate the moving bar on the other side of the
 15 door in a similar manner and will also, through the rods 15, which are connected to the arms of the moving bars and to the cranks 12, turn the vertical shaft 4, and by it, through its connections with the doors, will open the
 20 same. These will remain open while the car or cars are passing through the doors and until the last wheel has left the moving bar on the opposite side thereof, when the weight or spring (either of which may be used) will
 25 operate to close the doors and cause the several parts of the mechanism to resume their normal positions.

It will be seen from the foregoing that the operation of my device is positive and the
 30 doors cannot close while any cars are on the rails nearer the doors than the ends of the moving bars. The operating parts are all aboveground and therefore not subject to the effects of water in the mine. They are few
 35 in number and not likely to get out of order, and if they should are so simple as to be readily repaired by an ordinary workman.

Having fully described my invention, what

I claim as new, and desire to secure by Letters Patent of the United States, is—

40 1. The combination with a mine trap-door, of two pivoted trips connected by a moving bar lying close to one of the rails and moved away therefrom when either trip is operated; and connections between the trips and the
 45 door for opening the same, substantially as set forth.

2. The combination with a mine trap-door, of pivoted trips connected by a moving bar lying close to one of the rails, and moved away
 50 therefrom when either trip is operated, short arms formed on the trips and on the moving bar, connections between such arms and the door for opening the same, and means for closing such door after the cars have passed
 55 through the same, substantially as set forth.

3. In a mine trap-door, the combination with a mine trap-door closing across a track, a vertical shaft connected with the door for opening and closing the same, such shaft provided with cranks near its lower end, two
 60 pivoted trips connected by a moving bar lying close to one of the rails, and moved away therefrom when either trip is operated, rods connecting the cranks of the operating-shaft
 65 with short arms formed on the pivoted trips and a weight or similar device connected to one of the cranks for closing the door when the moving bars are released, substantially as set forth.
 70

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

GEORGE BONENBERGER.

Witnesses:

HARVEY B. DAVIDSON,
 WILLIAM SCHLANGE.