

No. 640,951.

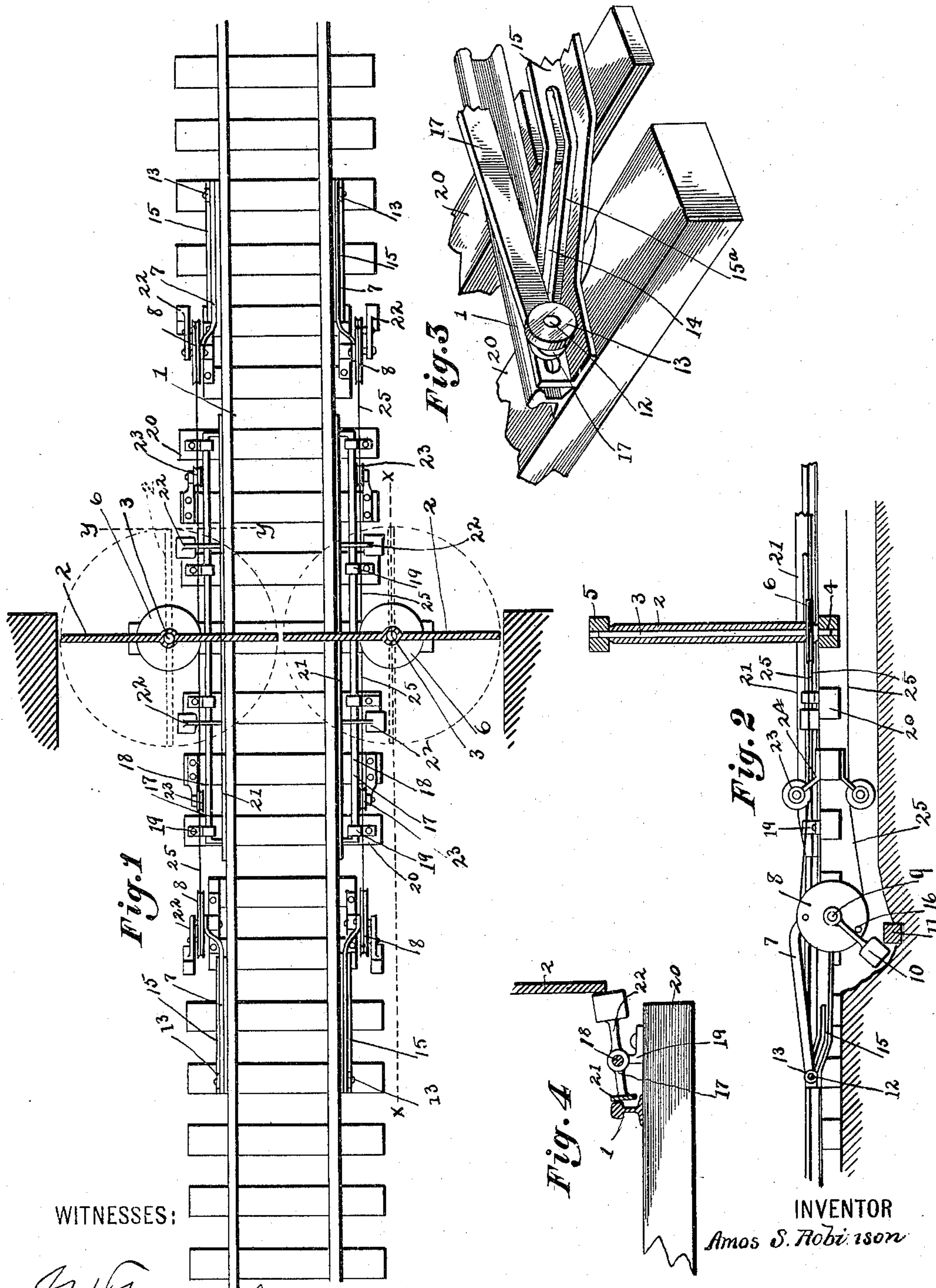
Patented Jan. 9, 1900.

A. S. ROBINSON.

MINE DOOR.

(Application filed May 3, 1899.)

(No Model.)



WITNESSES:

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## MINE-DOOR.

SPECIFICATION forming part of Letters Patent No. 640,951, dated January 9, 1900.

Application filed May 3, 1899. Serial No. 715,468. (No model.)

*To all whom it may concern:*

Be it known that I, AMOS S. ROBINSON, a citizen of the United States, residing at Nelsonville, in the county of Athens and State of Ohio, have invented a certain new and useful Improvement in Mine-Doors, of which the following is a specification.

My invention relates to the improvement of mine-doors and means for opening and closing the same; and it consists in certain improvements in details of construction and arrangement of parts, 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 plan view of that portion of a railway-track which passes through a mine-doorway, showing a transverse section of my improved doors, the latter being shown closed in full lines and open in dotted lines. Fig. 2 is a partial side elevation and partial sectional view taken on line *xx* of Fig. 1. Fig. 3 is a detail view in perspective of a portion of one of the trip-rails, showing the guide for the same; and Fig. 4 is a sectional view on line *yy* of Fig. 1.

Similar numerals refer to similar parts throughout the several views.

1 represents a car-track of that class which is adapted to mine-cars and which passes in the usual manner through a mine-doorway. This doorway is closed in the present instance by vertically-arranged and oppositely-located doors 2, these doors being, through the medium of vertical pivot-rods 3, centrally pivoted, the lower end of each pivot-rod bearing in a suitable tie-socket 4 and the upper end thereof bearing in a cross frame-piece 5, which extends transversely over the track adjacent to the upper side of the doorway, this frame-piece being shown in cross-section in Fig. 2 of the drawings. The door pivot-rods 3 are arranged, as shown, on opposite sides of the track 1, and the doors supported thereon are of such width that when the same are turned inward over the track-rails and in horizontal alinement with each other they practically close the space between said pivot-rods. Beneath the central portion of each of the doors 2 the rod 3 carries a pulley-wheel 6. At points on opposite sides of the track 1 and on

the outer sides of the rails thereof and on the inner and outer sides of the doors 2 I provide trip-rails 7. That end of each of the trip-rails which is toward or nearest to the doorway is, as indicated more clearly in Figs. 1 and 2 of the drawings, turned downward, said downturned end being pivoted eccentrically to the inner face of a pulley-wheel 8, which is suitably journaled adjacent to the outer side of the track-rail. The journal-pin 9, on which said pulley-wheel 8 is mounted, has loosely mounted thereon one end of a weight-arm 10, the latter being adapted to bear normally against a ground-block 11, which is arranged beneath the wheel 8 and slightly out of vertical alinement with the center thereof. The outer end of each of the trip-rails 7 is provided with a transverse pin 12, the outer end portion of which carries a small roller-wheel 13 and the inner projecting end portion of which extends loosely within the longitudinally-slotted opening 14 of a guide-bar 15. This guide-bar, which is angular in cross-section, has its outer and inner end portions formed horizontally and supported at different heights, said outer and inner end portions being connected by an inclined central portion 15<sup>a</sup>. As indicated in Fig. 2, the roller-wheel 13 is adapted to bear and travel upon the outwardly-extending lower wing or flange of the bar 15. Owing to the fact that the inner end or that end of each of the bars 7 which is toward the doorway is connected with the normally upper portion of the pulley-wheel 8 and that said wheel is arranged to project slightly above the tread of the track it will be seen that said trip-bars will be normally inclined, as indicated. Each of the wheels 8 is provided in its lower portion with an outwardly-projecting pin or lug 16, which is adapted to engage the lower side of the weight-arm 10.

On each side of the track 1 and adjacent to the outer side of the rails thereof I journal a trip-frame 17, one of these trip-frames being arranged between each pair of the trip-rails 7 and extending through the mine-doorway. Each of the trip-frames 17 consists in an outer horizontal rod 18, which is parallel with the track-rails and which is journaled in suitable bearing-brackets 19, which rise from the ties



20, and further consists in an inner parallel frame-bar 21, which is arranged adjacent to the outer side of the track and which is connected with said rod 18. With each of the frames 17, formed as above described, is connected one or more outwardly-projecting weight-arms 22, the weighted outer ends of which serve to hold the frame-bars 21 at such height above the tread of the adjacent track-rail as to admit of the depression of said frame-bars by contact therewith of the projecting tread-portions of the car-wheels. As indicated more clearly in Fig. 2 of the drawings, I employ comparatively small pulley-wheels 23, which are journaled in brackets 24, one pair of which are made to project from a tie extension or end portion at points between the wheels 8 and 6.

25 represents an endless pulley rope or cord, one of which is employed on each side of the track, said pulley-rope passing over the pulley-wheels 8, thence against the smaller pulley-wheels 23, and having its central portion provided with one turn about the central pulley-wheel 6. This cord is connected at one point with each of the pulley-wheels 8 and 6.

The normal positions of the doors 2 is that indicated in Fig. 1, in which figure said doors are shown closed or turned inward across the track. In order to illustrate the operation of my door-opening mechanism, we will assume that a mine-car is approaching on the track and in either direction. The contact of the wheels of this car with the upwardly projecting and inclined trip-arms 7 results in imparting a partial rotation to the wheels 8, with which said depressed trip-arms are connected, and through the connection of the operating rope or cord 25 with the wheels 6 and 8 it is obvious that a rotary movement will be imparted to said wheels 6, which results in a swinging of the doors 2 to positions parallel with the track-rails, such as are shown in dotted lines in Fig. 1 of the drawings. In this manner the doors are automatically swung open to admit of the passage of the car through the doorway from either direction. Before the rear wheels of the truck have left the trip-rails 7 the forward wheels thereof are in contact with and have depressed the frame-bars 21, which results in a tipping of the frame 17 until the weight-arms 22 are elevated to the position indicated in Fig. 4 of the drawings, in which position said weight-arms will come in contact with the inner sides of the lower portions of the doors 2 and prevent the latter from swinging back to their former positions until the car has passed through the doorway.

It is obvious that in the partial rotation imparted to the pulley-wheels 8, as above described, the contact of the weight-arms 10 of said wheels with the projecting pins 16 there-

of must result in said weight-arms being raised during the depression of the trip-rail 7; but when the car has passed or is out of contact with said trip-rails and out of contact with the frame-bars 21 it will be seen that the dropping of the weight-arms 10 will serve to return the operated pulley-wheels 8 and 6 to their normal positions, which results in the doors again being returned to the closed positions indicated in Fig. 1. It is evident that the depressing of the trip-rails 7 through contact of the car-wheels therewith must also result in an inward or forward movement of said trip-rails, and in this movement the roller-wheels 13 will serve as antifrictional bearings for the normally low ends of said trip-rails.

From the construction herein shown and described it will be seen that simple, reliable, and effective means are provided whereby the opening and closing of mine-doors may be quickly and effectively accomplished.

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

1. In a mine-door, the combination with a car-track extending through a doorway, of door-sections 2 pivoted on opposite sides of said track, a pulley-wheel carried on each of said door-sections, pulley-wheels 8 journaled adjacent to the track-rails, trip-rails 7 one of which is eccentrically connected with each of said pulley-wheels 8 at one end and at its remaining end is provided with a sliding support and an operating-rope connecting said door-wheels and pulley-wheels 8, substantially as specified.

2. In a mine-door, the combination with a car-track running through a doorway, door-sections 2 pivoted on opposite sides of said track and adapted to swing over the rails of said track, a pulley-wheel carried on each of said door-sections, pulley-wheels 8 journaled adjacent to the track-rails on the inner and outside of said doorway, a weight-arm loose on the shaft of each of said pulley-wheels and adapted to engage a projection of the latter, trip-rails each of which has one of its ends eccentrically connected with one of said wheels 8 and its remaining end provided with a sliding bearing and operating-ropes connecting the wheels 8 and said door-wheels, of frames 17 fulcrumed on the outer sides of the track-rails and extending through the doorway, each of said frames having an inner trip-bar adjacent to the track-rail and outwardly-projecting weight-arms, substantially as specified.

AMOS S. ROBINSON.

In presence of—

JOHN L. ROBINSON,  
W. G. HICKMAN.