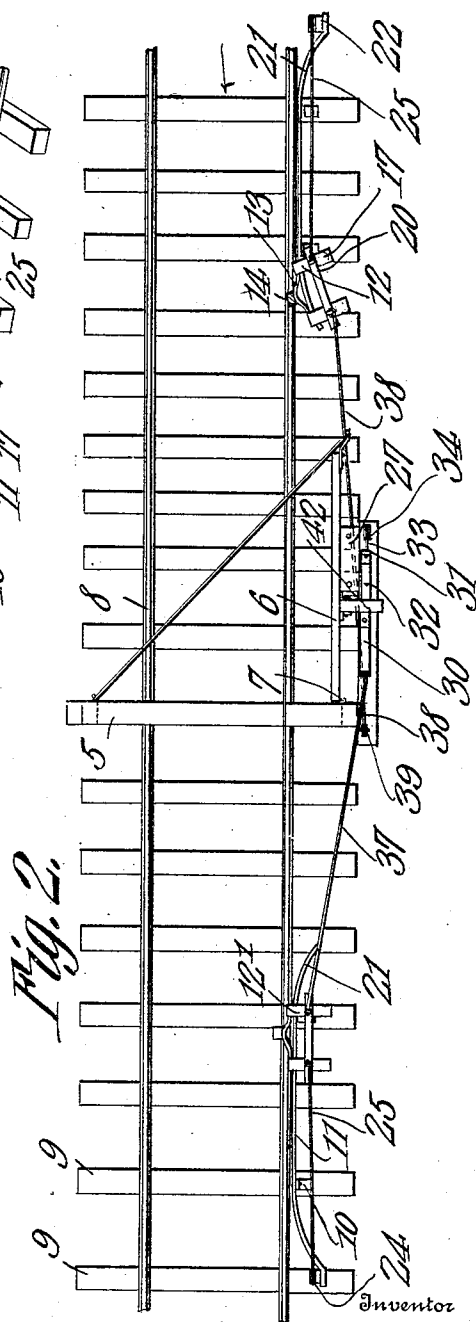
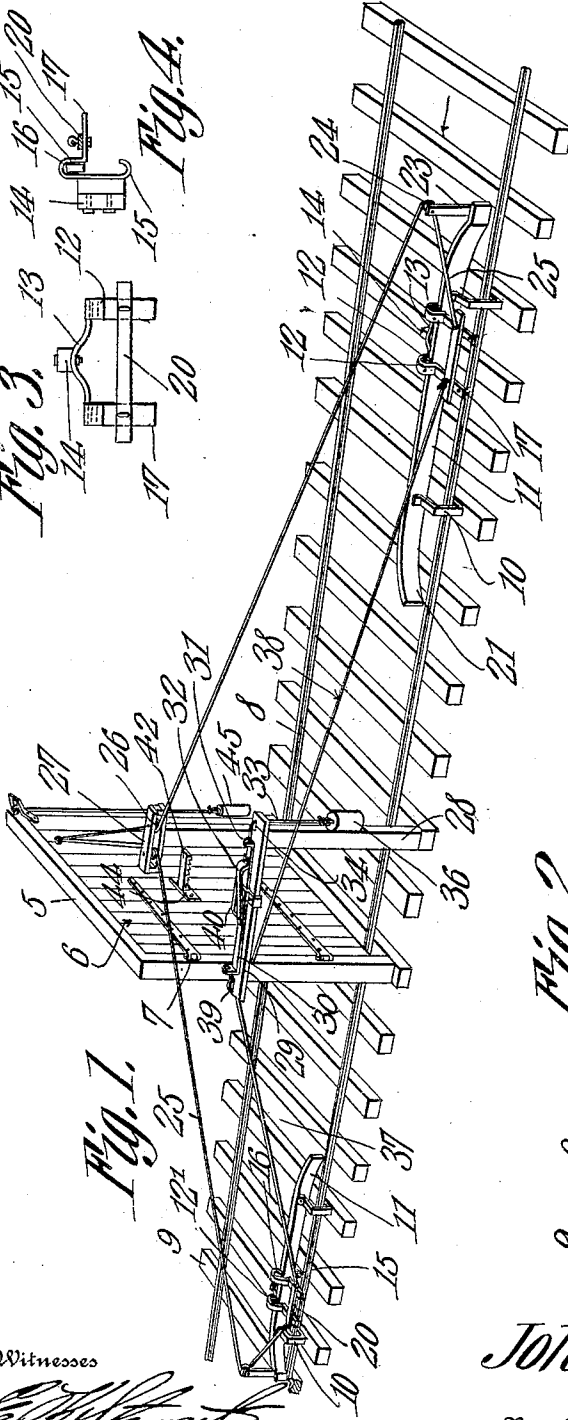
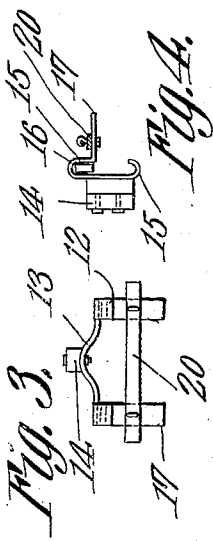


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MINE DOOR OPERATING DEVICE.
APPLICATION FILED SEPT. 8, 1908.

941,102.

Patented Nov. 23, 1909.

2 SHEETS—SHEET 1.



Witnesses

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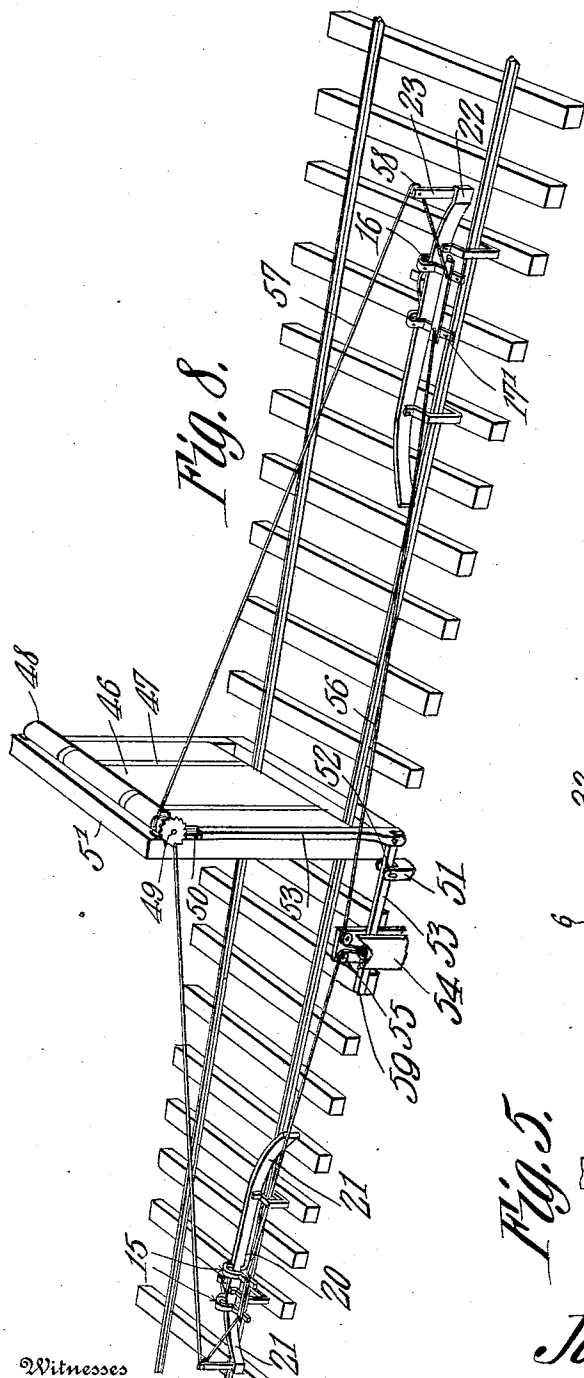


Fig. 8.

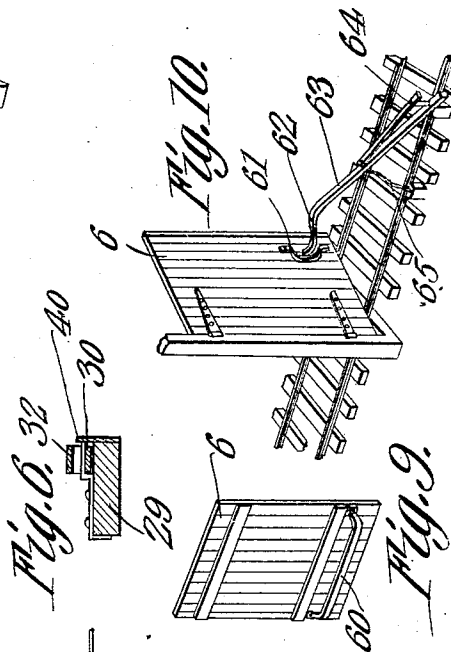


Fig. 9.

Fig. 10.

Fig. 5.

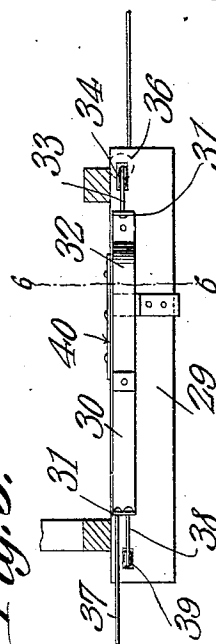
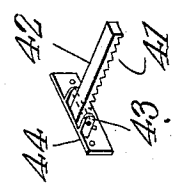


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN M. SAUSSER, OF OSNABURG, OHIO.

MINE-DOOR-OPERATING DEVICE.

941,102.

Specification of Letters Patent. Patented Nov. 23, 1909.

Application filed September 8, 1908. Serial No. 451,986.

To all whom it may concern:

Be it known that I, JOHN M. SAUSSER, a citizen of the United States, residing at Osnaburg, in the county of Stark and State of Ohio, have invented a new and useful Mine-Door-Operating Device, of which the following is a specification.

This invention relates to mine door operating devices of that general class shown and described in my former application for United States Letters Patent filed on the 6th day of May 1908, under Serial No. 431,191.

The object of the invention is generally to improve and simplify the construction of the operating mechanism and to render the same more positive and efficient in operation by the employment of longitudinally movable carriages operatively connected with the mine door and actuated by a passing train to effect the opening and closing of said door.

A further object is to provide improved means for locking the door in open position during the passage of a car through the door way, and means for automatically releasing the door locking means after the passage of the car through said door way.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings forming a part of this specification: Figure 1 is a perspective view of a mine door operating device constructed in accordance with my invention, showing the door in closed position. Fig. 2 is a top plan view of the same showing the door in open position. Fig. 3 is a top plan view of one of the carriages detached. Fig. 4 is an end view of Fig. 3. Fig. 5 is an enlarged top plan view of the door locking mechanism. Fig. 6 is a transverse sectional view taken on the line 6-6 of Fig. 5. Fig. 7 is a perspective view of the door latch or ratchet detached. Fig. 8

is a perspective view illustrating a modified form of the invention. Fig. 9 is a perspective view of one side of the swinging door, and showing means employed for opening the door should the mechanism herein set forth fail to operate. Fig. 10 is a perspective view of mechanism used for the same purpose at the other side of the door, the door being shown partly open.

Similar numerals of reference indicate corresponding parts in all of the figures of the drawings.

The improved mechanism forming the subject matter of the present invention is shown applied to a mine door of the ordinary construction in which 5 designates the door frame, 6 the swinging door or closure pivotally connected with the frame at 7 and adapted normally to extend transversely across the track 8.

Arranged on opposite sides of the door and secured in any suitable manner to the cross ties 9 are supporting brackets 10 to which are rigidly secured longitudinally disposed guides 11. Slidably mounted on the upper longitudinal edges of the guides 11 are track devices or carriages 12 and 12' having their inner faces bowed laterally at 13 and provided with suitable impact blocks or bumpers 14, which latter extend in the path of movement of a passing train, and are actuated by the latter to effect the opening and closing of the door 6, as will be more fully explained hereinafter.

Each carriage is provided with oppositely disposed curved arms 15 which embrace the upper and lower longitudinal edges of the adjacent guide 11 and serve to prevent accidental displacement of the carriage, there being suitable anti-friction rollers 16 journaled in the upper arms and arranged to bear against the upper longitudinal edge of the adjacent guide to prevent friction between the parts. The upper set of curved arms of each carriage are extended laterally to form horizontally disposed fingers 17.

The carriage is preferably reinforced and strengthened by a longitudinally disposed bar 20, which connects the fingers 17 and serves to maintain the latter in the proper spaced relation and also assists in prevent-

ing buckling of the parts when subjected to intense heat or cold.

The opposite ends of the guides 11 are bent rearwardly to form curved terminals 21 so that one of said carriages may be arranged out of the path of movement of the car, while the other carriage is in position to receive the impact of said car, as best shown in Fig. 2 of the drawings. One of the curved terminals 21 of one of the guides 11 is extended laterally in parallel relation to the track, as indicated at 22 to form a support for a post or standard 23 on which is mounted a pulley or roller 24. Secured to one of the fingers 17 of said carriage is one end of a cord or other flexible medium 25, the opposite end of which passes over the pulley 24 and thence over a similar pulley 26 for attachment to the door so that when the carriage 12 is moved in the direction of the door a longitudinal pull will be exerted on the adjacent cable and thus move the door to open position thereby to permit the passage of a car through the door way.

The pulleys 26 are mounted in a casing 27 secured to a post or standard 28 arranged on one side of the door 6, the cables 25 being so arranged with respect to the pulleys 26 and carriages 12 and 12' that when either carriage is moved in the direction of the door the cables will be operated to effect the opening movement of said door.

It will here be understood that the extensions 22 may be dispensed with and both ends of the guides 11 made alike, in which event suitable posts having rollers similar to the rollers 24 will be arranged adjacent the track for engagement with the cords or cables 25.

Secured to the door frame and standard 28, respectively, is a horizontally disposed bar 29 on which is mounted for longitudinal movement a locking member 30. The locking member 30 is in the form of a bar having its opposite ends bent upwardly to form terminal ears 31 and its intermediate portion provided with a curved or bowed surface constituting a cam 32.

Secured to one of the ears 31 is the adjacent end of a cord or cable 33, the opposite end of which passes over a pulley 34 journaled in the horizontal support 29 and is provided with a terminal weight 36 which serves to normally and yieldably support the locking member 30 in operative position.

Secured to the opposite ear 31 of the locking device are two cords or cables 37 and 38 one of which is attached to the adjacent finger 17 of the carriage 12', while the other cable 38 passes over a roller or pulley 39 similar in construction to the pulley 34 for engagement with the adjacent finger 17 of the carriage 12.

Secured to the horizontal support 29 in advance of the bar 30 is a plate 40, the free edge of which extends above the upper surface of the support 29 for engagement with the ratchet teeth 41 of a catch 42, thereby to lock the door in open position.

The catch 42 is pivotally mounted at 43 in a bracket 44 secured to one face of the door 6, said catch being so arranged that when the door is moved to open position, the teeth 41 will engage the plate 40 and thus hold the door in open position during the passage of a car through the door way.

In operation a car traveling in the direction of the arrow, indicated in Fig. 1 of the drawings will strike the impact block or bumper 14 of the adjacent carriage 12 and move said carriages longitudinally of the guide 11 and in doing so will cause the adjacent cable 25 to exert a longitudinal pull on the door and thus move said door to open position. As the door is swung laterally to open position, the catch 42 will engage the plate 40 at the rear of the cam face and thus hold the door in open position during the passage of the car through the door way. After the car passes through the door way, said car will strike the impact block or bumper 14 of the carriage 12' and move said carriage longitudinally of the adjacent guide 11. As the carriage 12' is moved in a direction away from the door the cable 37 will exert a longitudinal pull on the locking bar 30 thus causing the cam face 32 to pass beneath the serrated face of the catch 42 and disengage the latter from the plate 40, the weight 45 serving to return the door by gravity to closed position. After the car has passed the carriage 12', the weight 36 will return the locking bar 30 to the position shown in Fig. 1 of the drawing, and in which position it will again engage and release the catch 42 when the carriage 12' is actuated.

Attention is here called to the fact that by forming the opposite ends of the guide 11 with the curved terminals, the latter serve to direct the carriages to a position out of the path of movement of the cars.

In Fig. 8 of the drawings there is illustrated a modified form of the invention in which a flexible roller curtain 46 is employed, the latter having its upper end attached to the door frame 5' and its lower edge provided with cords 47 which extend along one face of the curtain and are secured in any suitable manner to a roller 48. The roller 48 is journaled in suitable brackets on the door frame and is provided with a terminal ratchet 49, the teeth of which are engaged by a locking pawl 50. Arranged near the door frame 5' is a bracket 51 in which is pivotally mounted at 52 an angu-

larly disposed lever 53 on the long arm of which is secured the pawl 50, there being a pair of spaced standards 54 mounted on the ground near the short arm of the lever 53 and having rollers 55 journaled thereon, as shown. Secured to the short arm of the lever 53 are cords or cables 56, which latter pass over the pulleys 55 for attachment to one of the fingers 17' of each track device or carriage, there being a similar cord or cable 57 secured to the mating finger of each track device or carriage and having an intermediate portion thereof extended over a pulley 58 with its terminal wrapped around the drum or roller 48. It will thus be seen that a car traveling in the direction of the curtain 46 will engage the impact block or bumper on the adjacent carriage and actuate the cord 57 to elevate the curtain, the weighted end 59 of the lever 53 causing the pawl 50 to engage the teeth on the ratchet wheel 49 and thus prevent downward movement of the curtain during the passage of the car through the door way. After the car has passed through the door way, said car will engage the bumper on the opposite carriage and move said carriage in a direction away from the door, thus exerting a longitudinal pull on the cable 56 and elevating the weighted end 59 of the lever 53, thereby disengaging the pawl 50 from the ratchet wheel 49 and permitting the curtain 46 to drop by gravity to lowered position.

It is to be understood that the weights 36 and 45 not only operate to pull the releasing member back to its place, but also returns the carriages to their normal position after they have been shifted by the car.

In Figs. 9 and 10 means has been shown whereby the gates can be swung open by the car, even though the mechanism herein described should not properly work, it being merely necessary for the door to be open a sufficient distance to permit the mule to pass therethrough. In order that the opening of the door may be effected in this manner, a strap 60 is arranged transversely upon one side of the door, while the other side of said door has a loop 61 thereon, designed to be engaged by the curved end 62 of a lever 63. This lever is mounted to swing upon a vertical axis, as indicated at 64, the movement of the lever being limited in any preferred manner, as by means of a flexible connection 65. The bend in the lever extends beyond the free vertical edge of the door when the door is partly opened, so that when a car approaches the door the wheel thereof will strike the bent portion of the lever 63, and force said lever laterally, so that the curved end portion 62 thereof will pass into the loop 61 and cause the door to swing entirely open. When a car approaches the door

from the other side, the wheel thereof will strike the transversely extending strap 60, 65 so as to force the door open.

From the foregoing description it is thought that the construction and operation of the device will be readily understood by those skilled in the art and further description thereof is deemed unnecessary.

Having thus described the invention what is claimed is:

1. The combination with a track, of a door forming a barrier for the track, a guide disposed near the door and having its intermediate portion disposed substantially parallel with the track and its opposite ends curved laterally in a direction away from said track, a carriage slidably mounted on the guide and operatively connected with the door, said carriage being actuated by a passing car to effect the opening of said door.

2. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door and having their intermediate portions disposed substantially parallel with the track and their terminals curved laterally in a direction away from said track, carriages slidably mounted on the guides, a flexible medium forming a connection between the carriages and door, said carriages being actuated by a passing car to effect the opening and closing of the door.

3. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door, carriages slidably mounted on the guides and operatively connected with the door for moving the latter to open position, means for locking the door in open position, one of said carriages being actuated by a passing car to release the locking means, and means for returning the door to closed position.

4. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door, carriages slidably mounted on the guides and operatively connected with the door, one of said carriages being operable by a passing train to effect the opening movement of the door, means for locking the door in open position, the other carriage being operable by the car to release the locking means, thereby to permit the door to return to closed position.

5. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door and provided with curved terminals, carriages slidably mounted on the guides, means for locking the door in open position, a flexible connection between each carriage and door, a connection between each carriage and the

locking means, one of said carriages being actuated by a passing car to effect the opening movement of the door and the other carriage being actuated by the car to release the locking means, thereby to permit the door to return to closed position.

6. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door and having their opposite ends curved laterally in a direction away from the track, carriages slidably mounted for longitudinal movement on the guides, a roller secured to one end of each guide, cables connecting the carriages and passing over the rollers on the adjacent guides for connection with the door, means for locking the door in open position, and a flexible connection between each carriage and the locking means.

7. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door and having their opposite ends deflected laterally, carriages slidably mounted on the guides and operatively connected with the door, a support adjacent the door, a locking plate secured to the support, a catch pivotally mounted on the door and adapted to engage the locking plate, a longitudinally movable releasing member slidably mounted on the support for engagement with the catch, and flexible connections between the releasing member and the adjacent carriage.

8. The combination with a track, of a door forming a barrier for the track, longitudinally disposed guides disposed on opposite sides of the door and having their opposite ends deflected laterally, carriages slidably mounted on the guides and operatively connected with the door, a catch for locking the door in open position, and a releasing member operatively connected with both carriages and operable by the latter for releasing the catch.

9. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door, carriages slidably mounted on the guides and operatively connected with said door, means for locking the door in open position, a releasing member operatively connected with both carriages for releasing the catch, and gravity operated means for normally supporting the releasing member in inoperative position.

10. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door, carriages slidably mounted on the guides and operatively connected with the door, means for locking the door in open position, longitudinally movable releasing means operatively connected with both carriages, and

means for supporting the releasing means normally in inoperative position.

11. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door, longitudinally movable carriages slidably mounted on the guides and operatively connected with the door, a support, a locking plate secured to said support, a catch carried by the door and arranged to engage the plate for locking the door in open position, and a releasing device mounted for longitudinal movement on the support and operatively connected with both carriages for releasing the catch to permit closing movement of the door.

12. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door, carriages slidably mounted on the guides and operatively connected with the door, a support disposed adjacent the door, a locking plate carried by the support, a catch pivotally mounted on the door and provided with teeth adapted to engage the locking plate, a longitudinally movable releasing bar having a cam face for engagement with the catch, flexible connections between the releasing bar and both carriages, one of said carriages being actuated by a passing train to effect the opening movement of the door and the other carriage being actuated by the car to operate the releasing device.

13. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door, carriages mounted for longitudinal movement on the guides and operatively connected with the door, a support arranged near the door, a locking plate secured to the support, a catch pivotally mounted on the door and adapted to engage the locking plate for holding the door in open position, a longitudinally movable releasing member operatively connected with both carriages, and a weight suspended from one end of the releasing member for normally holding the latter in inoperative position.

14. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door, carriages slidably mounted on the guides and operatively connected with the door, a support arranged near the door, a locking plate secured to the support, a catch carried by the door and arranged to engage the plate for locking the door in open position, a longitudinally movable releasing member mounted on the support and provided with a cam face for engagement with the catch, cables extending from one end of the releasing member to both carriages, a pulley journaled on one end of the support, and a cable

secured to the opposite end of the releasing member and provided with a weight for normally holding the releasing member in inoperative position.

- 5 15. The combination with a track, of a door forming a barrier for the track, guides disposed on opposite sides of the door and having their intermediate portions arranged substantially parallel with the track and
10 their opposite ends curved laterally in a direction away from said track, carriages slidably mounted on the guides and operatively connected with the door, said car-

riages being actuated by an approaching car to move the door to open and closed positions, and means disposed to be actuated by said car to open the door in event of the failure of the first mentioned means. 15

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses. 20

JOHN M. SAUSSER.

Witnesses:

W. O. WENTZ,
ANNA A. SEYMOUR.