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PATENTED AUG. 30, 1904.

J. P. COWING.

MINE GATE.

APPLICATION FILED DEC. 17, 1903.

NO MODEL.

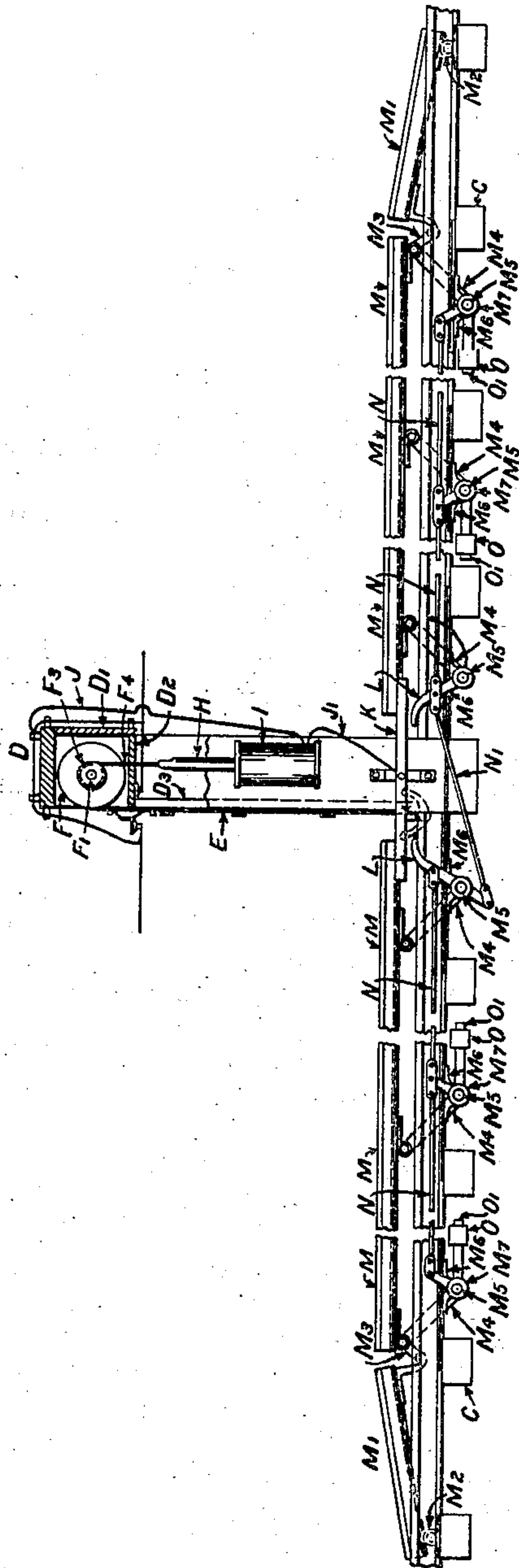


Fig. 1.

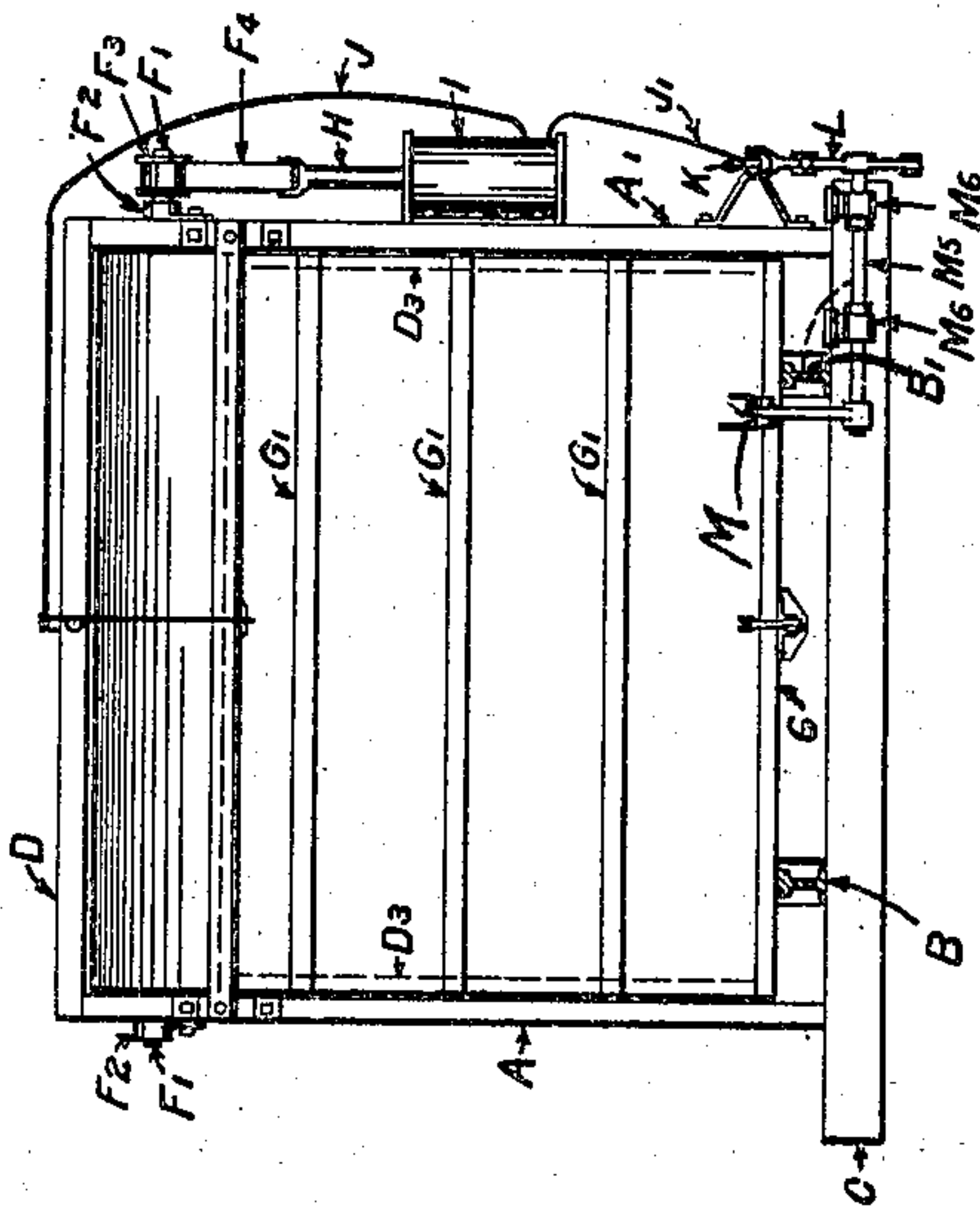


Fig. 2.

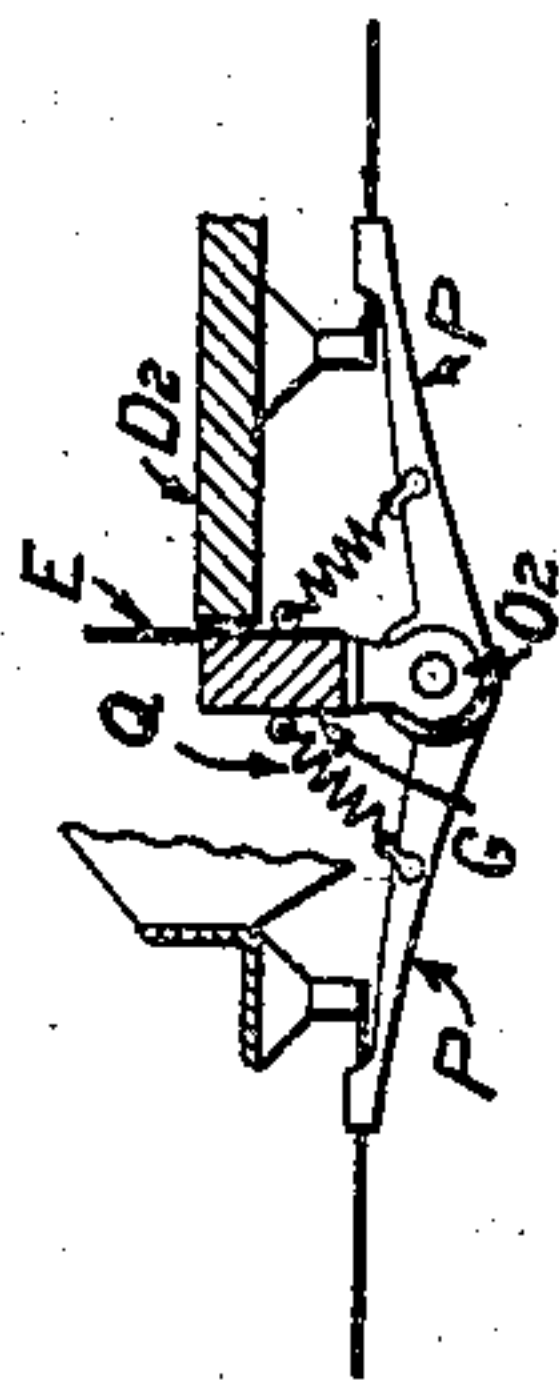


Fig. 3.

WITNESSES:

J. D. Maloy
Elvan Bondwell

INVENTOR

John Philo Cowing

BY

James A. Joyce

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN PHILO COWING, OF CLEVELAND, OHIO, ASSIGNOR TO THE AMERICAN MINE DOOR COMPANY, OF CLEVELAND, OHIO.

MINE-GATE.

SPECIFICATION forming part of Letters Patent No. 768,653, dated August 30, 1904.

Application filed December 17, 1903. Serial No. 185,576. (No model.)

To all whom it may concern:

Be it known that I, JOHN PHILO COWING, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Mine-Gates; and I do hereby 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.

My invention relates to improvements in mine-gates; and it consists in certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described and claimed.

The primary object of this invention is to provide simple, positive, and effective mechanism adapted to be operated by a car or motor to automatically open the gate and close the gate by gravity after the car or motor has passed through the gateway on electric-motor haulage-lines without interfering with the trolley or other parts of the haulage system.

The detailed objects and advantages of the invention will be pointed out in the course of the subjoined description.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view with parts shown in section. Fig. 2 is an end view. Fig. 3 is an enlarged view of the trolley-bridge which is fastened to the curtain-bar G.

A and A' represent the gate-posts, which are arranged on opposite sides of track-rails B B, laid upon cross-ties C.

D, D', and D² are the cross-pieces uniting said posts and forming housing for the curtain-roll.

The said posts A and A' have projections D³ on their inner side, which support the side edges of the gate-curtain E, which is made fast at its upper end to a roller F, mounted in a shaft F' to rotate in bearings F², fixed to the said gate-posts A and A'. The said shaft F' carries at one end a fixed pulley F³. The curtain is provided at its lower end with a bar G and smaller bars at intermediate points, which stiffen the curtain against wind-pressure and

act as a counterbalance for closing the gate by gravity, which will be more fully hereinafter described.

The gate shown is operated by a solenoid I, which is a coil of wire and having a movable core H, to which is fastened at its end a flexible strap. The said strap is also fastened to the fixed pulley F³ and so adjusted that when the curtain E is lowered it rolls the strap upon the pulley F³ and lifts the core H upwardly in the solenoid. The movable core H is made of sufficient weight to partly counterbalance the weight of the curtain E and the cross-pieces G and G' just sufficiently to allow the curtain to close. The electric current is supplied to the solenoid from the trolley-wire and the track-rails, a wire J being carried from the trolley-wire to the solenoid and wire J' being carried out of the solenoid to bar K, and bar K is so placed that when the depressible rails M are forced down by the car-wheels the forked lever L is brought in contact with said bar K, thus completing the circuit. As the lever L is wired to connect to the rail B', thus forming a circuit from the trolley-wire to the rails, which passes through the solenoid and causes the movable core H to be drawn into the solenoid I, thus unrolling the flexible strap F⁴ from the pulley and rolling up the curtain upon the curtain-roller, thus opening the gate for the passage of a car and as long as cars continue to pass over the track and keep the depressible rails down the solenoid holds the curtain up. The depressible rails M and M' are normally held up by counterweights O, which are movably placed on levers O' and so arranged that they may be in or out to just balance the depressible rails in the upward position.

The depressible rails M and M' are preferably of the U shape, but may be of any convenient shape, and are placed at one side of the track, but may be placed on both sides. I have here shown them on the inside and adapted to be engaged by the flange and effect an opening of the gate, as fully hereinafter described. The depressible rails M are nearest to the gate, and the inclined depressible rails M' are placed adjoining the depressi-

ble rails M. The outer ends of depressible rails M' are pivoted in bearings M², which securely hold the same in position to receive the flange of the wheels. The inner ends of
 5 depressible rails M' are pivotally joined to depressible rails M by a swing-link M³, which takes up the longitudinal movement due to the levers swinging in an arc in depressing the said rails.

10 The depressible rails M are pivotally supported on levers M⁴. The levers M⁴ are securely fastened to rock-shafts M⁵, which are supported by bearings M⁶. At the outer ends of all rock-shafts except the two adjacent to
 15 the curtain are securely fastened short levers M⁷. At the outer end of rock-shafts adjacent to the curtain there is a longer lever L, which has a forked end arranged to straddle bar K, and intermediate the end and the rock-shaft
 20 there is a hole for connecting the rods N, which joins this lever with levers M⁷, and by this means the rock-shafts are made to operate simultaneously, and this movement is transposed from one side of the gate to the
 25 other by means of rod N', connected as shown.

The curtain-bars G and G' are sufficiently heavy to overcome the weight of the solenoid-core and allow the curtain to close by gravity, and the depressible rails M and M' are counterweighted to stand normally above the car-rails, and in this way they work very easily.

When the curtain-bar G is raised up, the trolley-bridge (shown in Fig. 3) is brought up in contact with the trolley-wire and forms a
 35 continuous trolley-wire over the gate-opening. The trolley-bridge in Fig. 3 is composed of two arms P P, pivoted at O² and having the ends of said arms substantially V-shaped, so as to straddle the trolley-wire. The said arms
 40 are provided with a spring Q, which provides for any variation in the curtain and so as to insure a good contact.

Having thus described my invention, what I claim as new, and desire to secure by Letters
 45 Patent, is—

1. In a device of the character described, the combination with a trolley-wire and car-rails, of depressible rails carried by the car-rails, a gate-frame mounted adjacent the rails and supporting said trolley-wire, a rotatably-mounted curtain carried in said frame, a contact member mounted near the base of the frame, means actuated by the depressible rails being electrically connected with the car-rails adapted
 50 to contact with said member upon depressing the depressible rails, and electrically-operated

means in circuit with the trolley-wire adapted to raise the curtain upon the depression of the last-named rails, substantially as set forth.

2. In an electrically-operated mine-gate, the combination with a trolley-wire, car-rails, and depressible rails, a contact member carried by the gate-frame, means actuated by the depressible rails adapted to close a normally open circuit through said member and the rails upon
 65 depression of the depressible rails, an electrically-operated means mounted on the gate-frame in circuit with the trolley-wire and contact member adapted to elevate the gate upon closing the circuit, and means carried by the
 70 gate for bridging the trolley-wire upon raising the gate, substantially as and for the purpose set forth.

3. In a device of the type set forth, the combination with a trolley-wire and car-rails, of a
 75 mine-gate comprising a frame supporting the trolley-wire and a curtain rotatably mounted therein provided with means for lowering the same by gravity, depressible rails pivotally mounted upon the car-rails and adapted to be
 80 depressed by the wheels of a car, pivotally-mounted members in circuit with the car-rails adapted to be operated by the depressible rails, means adapted to be engaged by said members to close a circuit, a solenoid electrically
 85 connected with the last-named means and with the trolley-wire, and means connecting the core thereof with the curtain to raise the same upon closing the circuit between the trolley-wire and car-rails, substantially as set forth.
 90

4. In an electrically-operated mine-gate, the combination with the trolley-wire, car-rails, and depressible rails having adjustable counterbalancing means thereon, of members electrically connected with the car-rails adapted to
 95 be actuated by the depressible rails, conducting means adapted to be engaged thereby to close a normally open circuit between the trolley and car-rails, electrical means in circuit with the conducting means and trolley-wire whereby on closing the circuit through
 100 the car-rails and trolley-wire the curtain of the gate is raised, substantially as and for the purpose set forth.

In testimony whereof I have signed my name
 105 to this specification in the presence of two subscribing witnesses.

JOHN PHILO COWING.

Witnesses:

MAMIE O. BETZ,

HENRY HENRICHSON, Jr.