

No. 631,883.

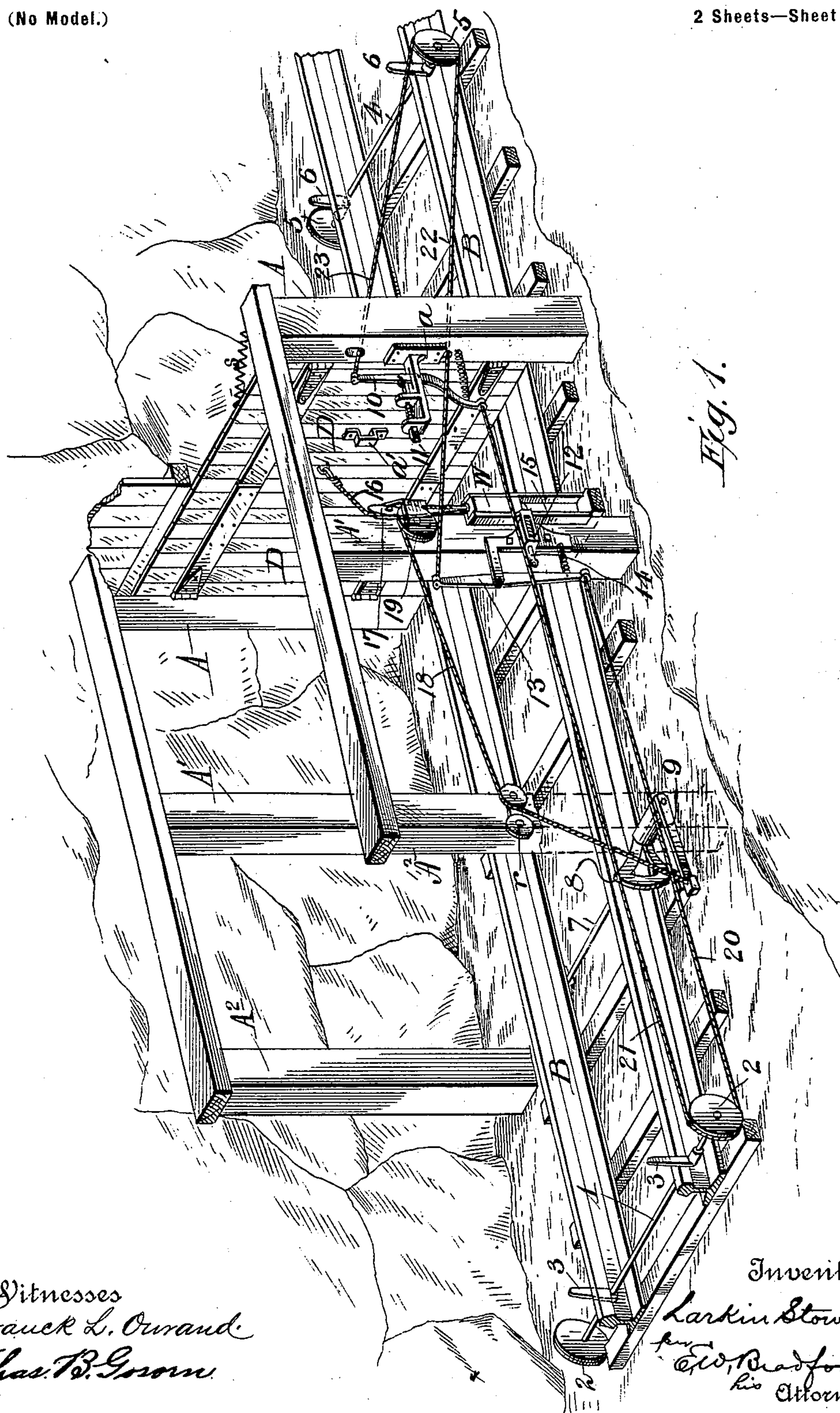
Patented Aug. 29, 1899.

L. STOWE.
DOOR OPERATING MECHANISM.

(Application filed June 16, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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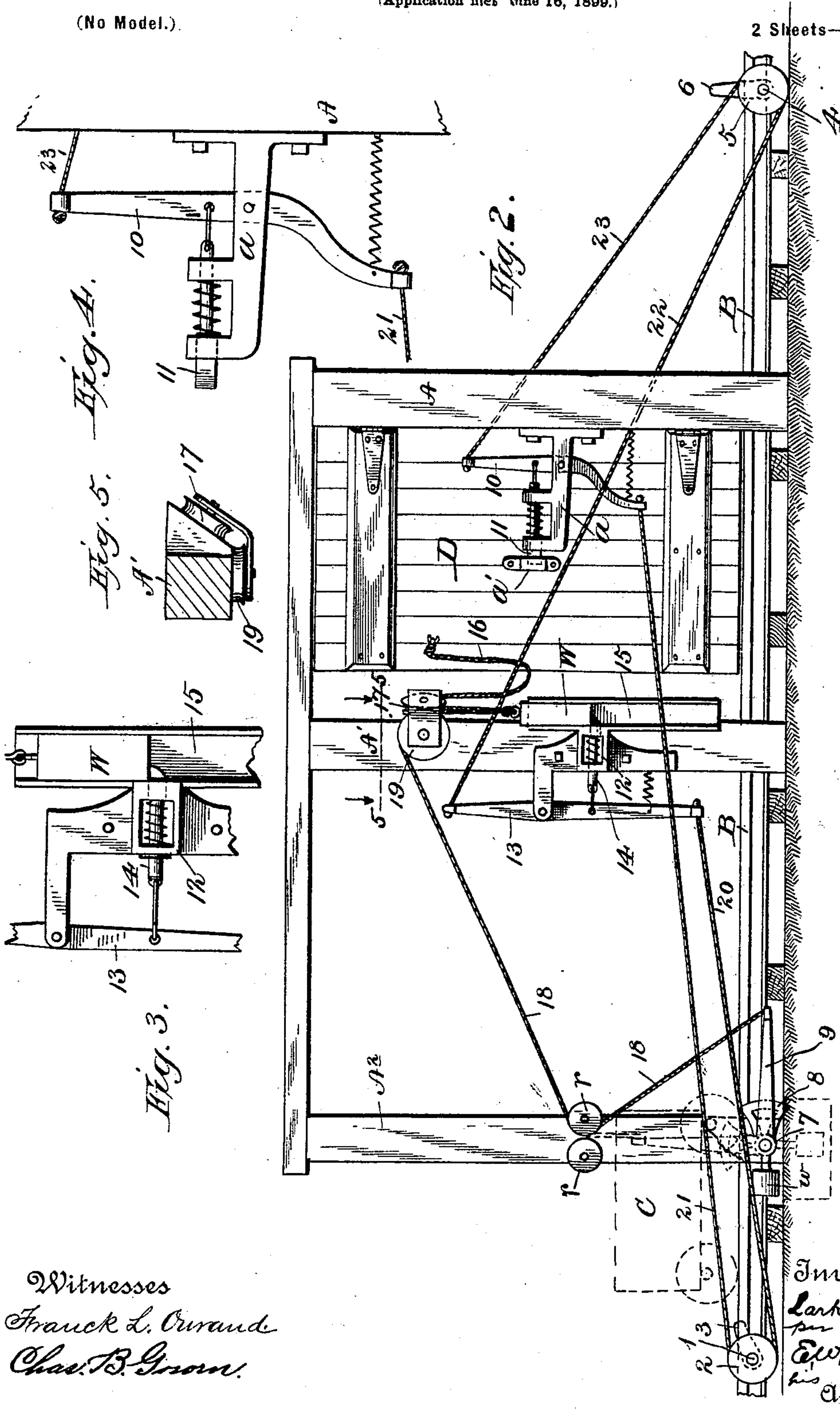
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UNITED STATES PATENT OFFICE.

LARKIN STOWE, OF KNOXVILLE, TENNESSEE.

DOOR-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 631,883, dated August 29, 1899.

Application filed June 16, 1899. Serial No. 720,838. (No model.)

To all whom it may concern:

Be it known that I, LARKIN STOWE, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented certain new and useful Improvements in Door-Operating Mechanism, of which the following is a specification.

The object of my said invention is to provide a door for mine-shafts which will be operated by the passing of the car as it approaches and leaves the doorway; and it consists in an arrangement of mechanism whereby this object may be accomplished, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters and numerals of reference indicate similar parts, Figure 1 is a perspective view of the entrance to a mine-shaft, showing the doorway, the track for the trucks leading through the same, the doors, and the door-operating mechanism; Fig. 2, a side elevation of the same. Fig. 3 is a detail view of the weight-supporting catch; Fig. 4, a similar view of the door-holding catch, and Fig. 5 a detail section on the dotted line 5 5 in Fig. 2.

In said drawings the portions marked A represent the doorway-frame, B the track, C the car, and D the doors, all of which are of the usual or any approved construction and arrangement. The doors D are hung to normally remain closed and may be actuated by the spring S or a weight or any self-closing devices found suitable. The suction of the air into the shaft will, however, ordinarily be found sufficient to close said doors and hold them closed except when opened forcibly and secured.

I have illustrated in the drawings the door-operating mechanism as applied to but one door on one side of the doorway, and the following description will refer specifically to but the one set of such mechanism; but it will be understood, of course, that both doors are similarly equipped and operated in the same manner; and while the invention is shown and described as applied to mine-shaft doors it can be readily applied to other doors or gates, as will be readily understood. On the outside of said doorway, a sufficient distance therefrom, a rock-shaft 1 extends across the

track, provided with a wheel 2 on each outer end and a trip-arm 3 alongside each rail of the track. At a suitable distance inside the doorway a similar rock-shaft 4 extends across the track and has similar wheels 5 and trips 6, similarly located. Between rock-shaft 1 and the doorway is another rock-shaft 7, journaled under the track and having segment-shaped trips 8 alongside the rails and outwardly-extending arms 9 on the outer ends thereof. On each side of the doorway on the post A, forming part of the framework, a bracket *a* is secured, carrying a vertically-extending pivoted lever 10 and a horizontally-sliding spring-catch 11, connected to said lever at one side of its pivot. Said spring-catch is arranged to automatically engage a keeper *a'* on the door when it is swung back against it by the operating mechanism, as will be presently described. On a second post A', situated a suitable distance out from the doorway on each side of the track, is mounted a bracket 12, carrying a vertically-extended pivoted lever 13 and a spring-supporting catch 14, which is connected to said lever at one side of its pivot. A weight W is mounted to slide in a vertical way 15 on the side of said post and be supported by said spring-catch 14, which extends into said way in the path of said weight. A flexible connection (as a rope) 16 runs from said weight over a sheave 17 on said post A' and connects with the door, and another similar connection 18 runs over another sheave 19 on said post and connects with the outer end of lever 9 on rock-shaft 7. A cord or other suitable connection 20 runs from the under side of wheel 2 and connects with the lower end of lever 13. A similar connection runs from the top of said wheel and connects with the lower end of lever 10. A suitable connection runs from the bottom of wheel 5 to the top of lever 13 and another from the top thereof to the top end of lever 10.

Instead of the wheels 2 and 5 cross-heads or crank-arms may of course be used and other such modifications in the form of mechanical parts made without departing from my invention.

In operation, as the car approaches from the outside to enter the mine, the doors being closed and the parts in the position indicated by whole lines in Fig. 1, the wheels of the

truck first strike the trip - arms 3, which through the connection 20 operate to pull back the lower end of lever 13 and withdraw the supporting-catch 14 from under weight W, permitting said weight to fall and through the connection 16 pull open the door back against bracket *a*, when spring-catch 11 engages with keeper *a'* on the door and secures it in open position. The same operation pulls the segment-shaped trips 8 and arms 9 on shaft 7 to an upright or operative position. The car-wheels next strike said segment-shaped trips 8, rocking said shaft 7 and through the lever 9 and connection 18 raising weight W to above said catch 14, which then springs out under said weight and again supports it. After the car has passed the doorway the wheels strike the trips 6 and through the wheel 5 and connection 23 withdraw spring-catch 11 from engagement with keeper *a'* on the door and permit said door to close. On the return trip the car operates the trips 6 in the opposite direction, which through the connection 22 withdraws the catch 14 from under weight W, again permitting it to fall and open the door for the car to pass out. The weight is again lifted and set by the car passing over shaft 7, and the door-holding catch withdrawn by the car passing over shaft 1, through the trips 3, wheels 2, and connection 21, all as will be readily understood by reference to the drawings.

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

1. In a mine-door, the combination, of the track, the doors, a weight connected to the door for opening it, a catch for holding said

door after being opened, mechanism for raising said weight and supporting it from drawing against said door by the passing of the car after said door has been secured, and mechanism operated by the car for releasing said door and permitting it to close after the car has passed substantially as set forth.

2. The combination, of the track, the doorway, the doors, the weight connected to each of the said doors to open them, the mechanism for supporting said weights from operating except when desired, the trips arranged to be operated by the car at the proper point to release said weights and open said doors, the securing mechanism, the mechanism arranged to be operated by the passing of the car over it for again lifting and setting said weights, and the mechanism for releasing the securing devices after the car has passed, to permit the doors to close substantially as set forth.

3. A door-operating mechanism, comprising a weight connected to the door and supported on a catch when not in use to relieve the door of its weight, mechanism to be operated by a trip mechanism for releasing said weight and permitting it to open said door, a catch arranged to engage and hold said door open, mechanism for again setting said weight, and other mechanism for releasing said holding device and permitting the door to close, all substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Knoxville, Tennessee, this 12th day of June, A. D. 1899.

LARKIN STOWE. [L. S.]

Witnesses:

T. G. RICE,
EDNA W. WEBBER.