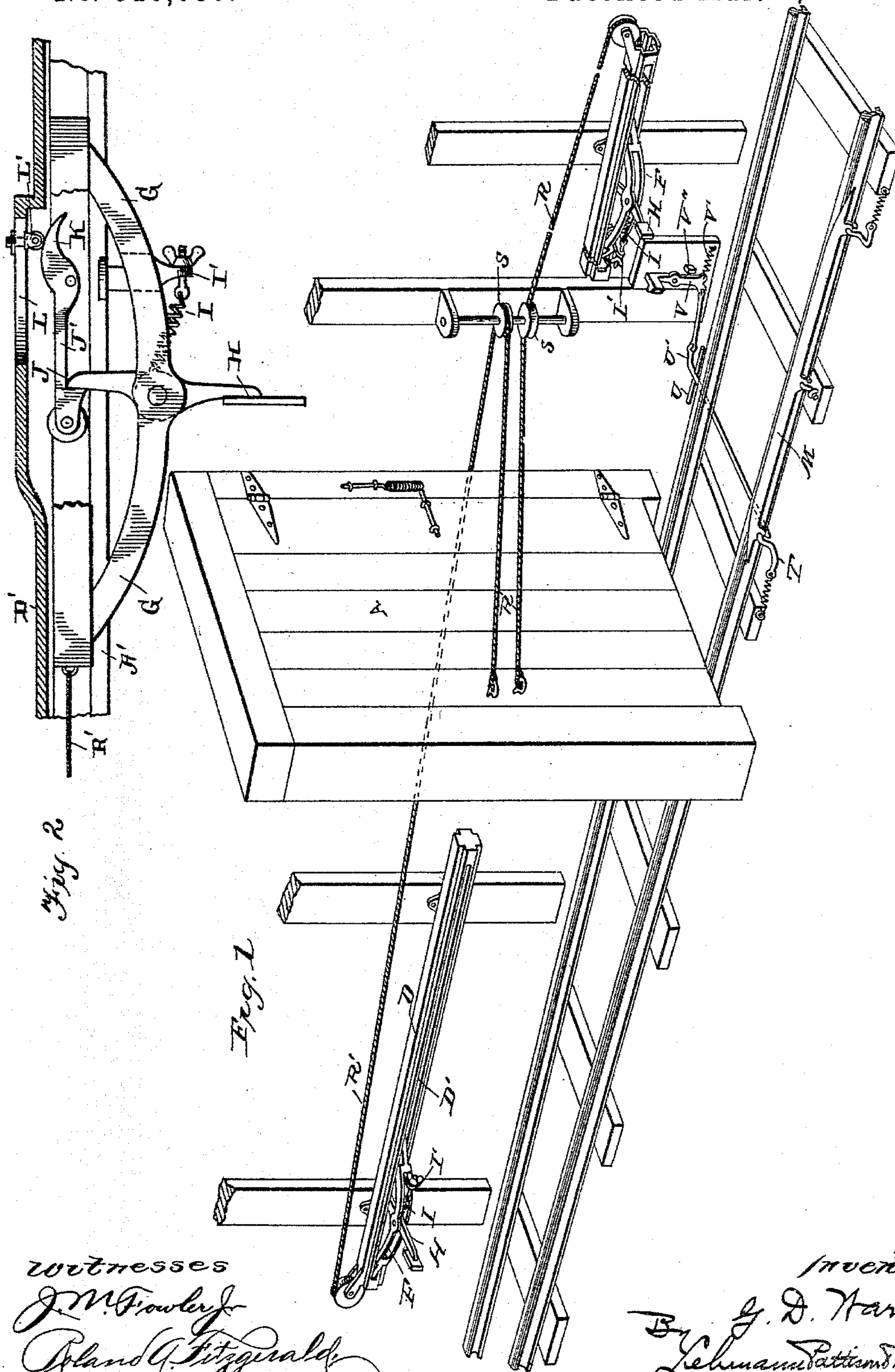


(No Model.)

G. D. WARREN.  
MINE DOOR.

No. 516,036.

Patented Mar. 6, 1894.



witnesses  
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# UNITED STATES PATENT OFFICE.

GOVERNOR D. WARREN, OF DALLAS, TEXAS.

## MINE-DOOR.

SPECIFICATION forming part of Letters Patent No. 516,036, dated March 6, 1894.

Application filed February 10, 1893. Serial No. 461,822. (No model.)

*To all whom it may concern:*

Be it known that I, GOVERNOR D. WARREN, of Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Mine-Doors; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in mine doors; and it consists in the novel combination and arrangement of parts which will be fully described and claimed hereinafter.

The object of my invention is to provide an improved mechanism, whereby mine or other doors may be opened or closed by a car or train while in motion.

Referring to the accompanying drawings,—Figure 1 is a perspective view of my improved door. Fig. 2 is a detached view of the movable stop and trip.

A designates the door and R R' the door operating lines. These lines are passed around pulleys S as shown so that when the outer end of either is drawn upon the door will swing open. The said outer ends are connected to frames F, each moving in a guideway D having an open side or slot D' through which a portion G of the said frame projects.

H is a stop pivoted between its ends to the projecting portion G and held normally in an extended position by spring I. Pivoted to the inner portion of frame F is trip J notched at one end at J' to engage the inner end of stop H so as to hold the latter rigid with the car until the door has been opened, when it will be released by the trip in the following described manner. The rear side of guideway D is bulged and slotted at L, and adjustable in this slot is friction stop L', which when frame F has been brought thereto will engage the curved end K of trip, thereby moving the latter upon its pivot and disengaging its opposite end from stop H. The latter thus loses its rigidity and is pushed aside by the car thus stopping any further forward movement of frame F in guideway D. Spring I will return stop H to position as soon as the car has passed and when frame F is drawn outward by the closing of the door trip J will again assume its normal longitudinal position and engage stop H as shown in Fig. 2. At

about the time frame F has reached the limit of its movement toward the door a tread rail M is reached and moved forward by the car wheels thereby turning a shaft T. Extending laterally from this shaft are pins U. A crank U' is formed on the shaft end which is connected to the lower end of latch V, which latter is fulcrumed as shown between its ends to a suitable support. A spring V' holds the latch normally in a vertical position, the stop V'' preventing the spring from pulling the latch back too far. The car advancing in either direction engages stop H, drawing upon either line R or R' and thus swinging open the door and the same is held in this position by latch V which automatically engages therewith. The car then reaches the tread rail which it moves longitudinally, thereby partially rotating shaft T, thus releasing the latch from the door through the connection of the former with crank U'. The door then starts to close, being actuated by the spring which holds it normally in that position, but its movement is arrested by one of the pins U extending into its path, the same having been thus placed by the partial rotation of shaft T, and by this means the door is held open until the car wheels have passed off the tread rail when the spring actuated shafts M' raise the tread rail, thereby partially rotating the shaft, turning down the pin U which holds open the door and thus allowing the latter to close. This closing movement draws backward frame F which served to swing it open, and thus every part is made ready for another operation. By means of this arrangement the door is held positively by the engaging latch when swung outward by the approaching car, no vibration of the door being possible thus preventing any undue wear of the operating parts. The latch is relieved of its hold on the door as soon as the tread rail is reached by the car wheels, but the same movement which releases the latch places before the door a stop which remains in place until the car has passed entirely through.

In addition to the advantages derived from the non-vibration of the door it may be added that if the swinging open of the door is accomplished before the tread rail is reached the latch serves to hold the same wide open until stop U has been raised by the depression of said rail.

Having thus fully described my invention,



what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a door, a movable frame, a connection between the door and frame whereby when the latter is moved toward the door the same is opened, a pivoted stop carried by the frame and extending outward therefrom in the path of a car by which it is engaged, a catch carried by the frame and adapted to hold and engage the stop in a rigid position, and a means for tripping the said catch, thus releasing the stop, substantially as shown and described.
2. The combination of a door, a slide, a frame movable therein, a connection between the door and the frame whereby when the latter is moved toward the door the same will be opened, a projecting stop pivoted between its ends to the frame and adapted to be engaged by a passing car, and an automatically operated catch for tripping said stop which engages the latter at its rear end, substantially as shown and described.
3. The combination of a door, a guideway, a frame movable therein, a connection between the door and the frame whereby when the latter is moved toward the door the same is opened, a stop pivoted between its ends to the frame and adapted to be engaged by a passing car, a notched catch carried by the frame for holding the stop rigidly extended and in engagement with the car, and a means for automatically releasing said catch from the stop, substantially as shown and described.
4. The combination of a door, a frame, a connection between the frame and the door whereby when the former is moved toward the door the latter is opened, a stop pivoted between its ends to the frame and extending normally outward therefrom into the path of a passing car by which it is engaged, a catch pivoted between its ends to the frame and adapted to engage the inner end of the stop and hold the same rigid with the car, and a projection in the guideway which the said catch engages whereby its hold upon the stop is released, substantially as shown and described.
5. The combination of a door, a guideway having a depression on its outside, a frame movable in the guideway, a connection between the frame and the door whereby when the former is moved forward the latter is opened, a stop pivoted between its ends to the frame and projecting normally therefrom, a catch pivoted between its ends to the rear of the frame and adapted at one end to engage the inner end of the stop, and a stop in the said depression of the guideway which is engaged by the opposite end of the said catch whereby the latter is turned upon its pivot and released from the said stop, substantially as shown and described.
6. The combination of a door, a guideway having on its rear side a depression, an ad-

justable stop in the depression, a stop pivoted between its ends to the frame and extending normally outward therefrom, a catch pivoted between its ends to the rear side of the frame, one end of said catch being notched to engage the inner end of the pivoted stop, and the opposite end being adapted to engage the said adjustable stop in the said depression for the purpose of releasing the hold of the catch upon the pivoted stop, substantially as shown and described.

7. The combination of a swinging door, a movable stop adapted to engage a passing car and also adapted to disengage the same at a predetermined point a rope connecting the door and stop in such a manner that when the latter is moved forward the door will be opened, a tread rail, a transverse shaft adapted to be partially rotated thereby, and stops projecting from the shaft which engage the door and prevent the same from closing while the car is passing, substantially as shown and described.

8. The combination of a swinging door, a movable stop adapted to engage the car and also adapted to disengage the same at a predetermined point, a rope connecting the door and stop in such a manner that when the stop is moved forward the door is swung open, a spring actuated tread rail, a transverse crank shaft partially revoluble thereby, a latch which engages the door when opened but which is disengaged therefrom when the tread rail is depressed, a connection between the crank shaft and latch which effects this disengagement, and projections on the shaft which are turned up in the path of the door when the shaft is rotated, substantially as shown and described.

9. The combination of a door, a movable frame a connection between the door and frame whereby when the latter is moved toward the door the same is opened, a stop pivoted to and extending laterally from the frame, a spring for holding the stop normally in said position, a catch for holding the stop rigid with the frame, and a means for automatically releasing the catch therefrom, substantially as shown and described.

10. The combination of a swinging door, a movable stop adapted to engage the car and also adapted to disengage the same at a predetermined point, a connection between the stop and door, tread rail M, crank shaft U, latch V pivoted between its ends and at its upper end adapted to engage the door when opened, and at its lower end connected with the crank of said shaft, substantially as described.

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

G. D. WARREN.

Witnesses:

IRVING R. HUSSEY,  
J. R. MCFARLAND.