

No. 754,268.

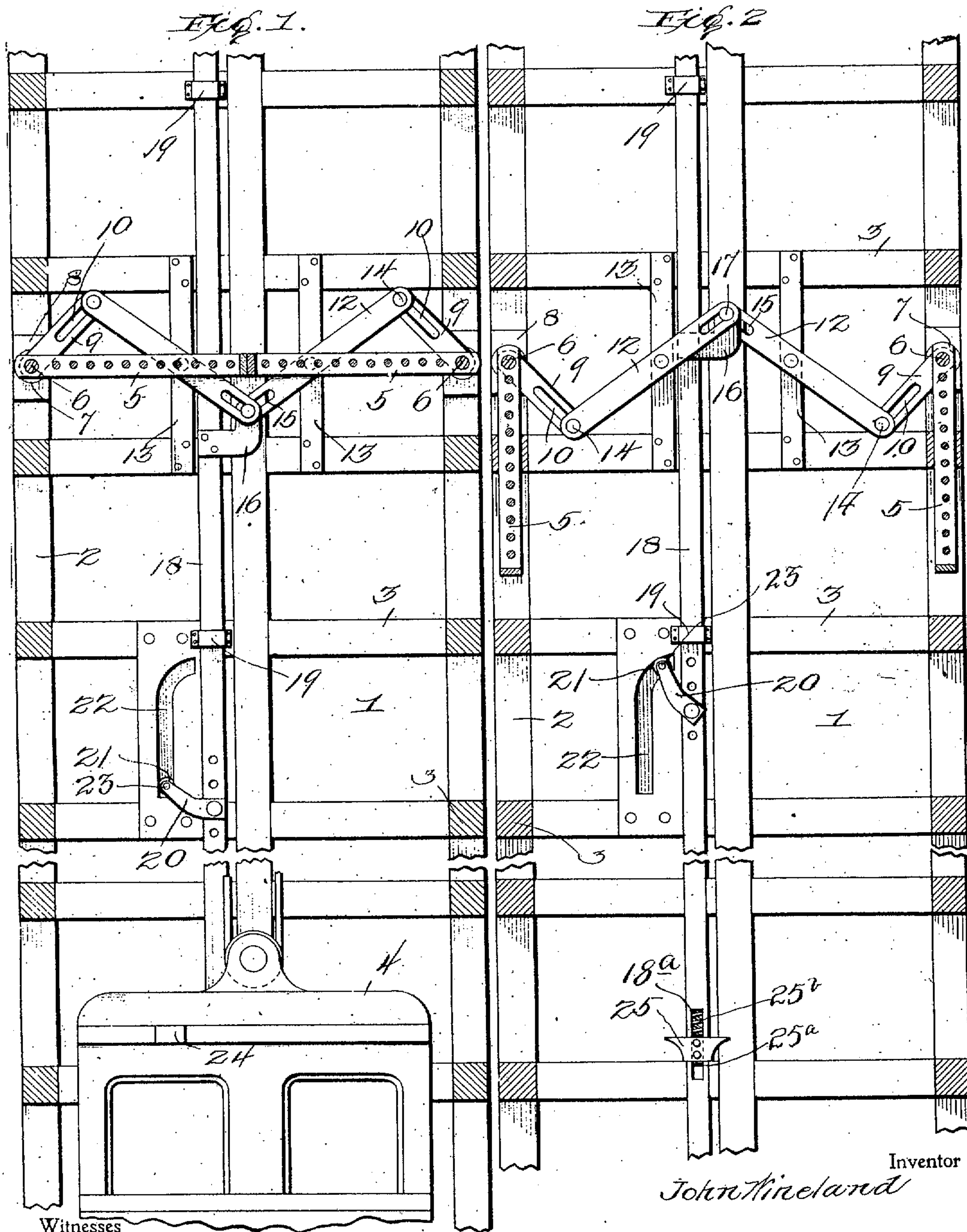
PATENTED MAR. 8, 1904.

J. WINELAND.
MINE SHAFT DOOR.

APPLICATION FILED SEPT. 10, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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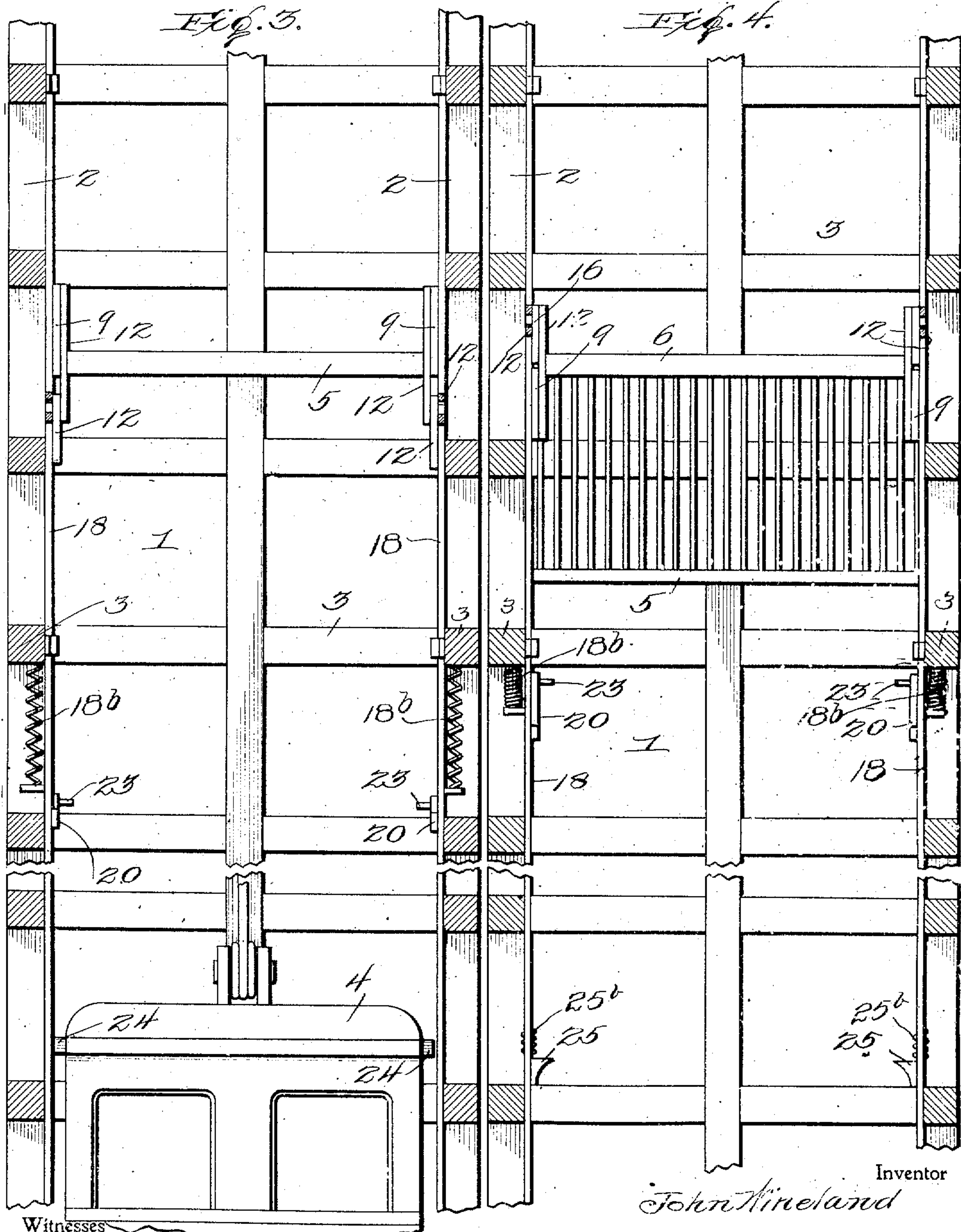
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Witnesses

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UNITED STATES PATENT OFFICE.

JOHN WINELAND, OF ATHENS, ILLINOIS, ASSIGNOR OF THREE-FOURTHS
TO GEORGE, SETH, AND JOHN FREDRICK WINELAND, OF ATHENS,
ILLINOIS.

MINE-SHAFT DOOR.

SPECIFICATION forming part of Letters Patent No. 754,268, dated March 8, 1904.

Application filed September 10, 1903. Serial No. 172,706. (No model.)

To all whom it may concern:

Be it known that I, JOHN WINELAND, a citizen of the United States, residing at Athens, in the county of Menard and State of Illinois, have invented certain new and useful Improvements in Mine-Shaft Doors; and I do 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.

This invention relates to improvements in doors for closing elevator-shafts and means for automatically opening and closing the same.

The object of the invention is to provide doors and mechanism which will be automatically operated to open or close the same upon the raising or lowering of the elevator car or cage.

Another object is to construct the doors of grating or open-work which while preventing the falling of rock and debris into the shaft will not exclude the air, so that the ventilation of the shaft and mine will not be impaired.

A further object is to provide operating mechanism for automatically actuating the doors which will be simple in construction, strong and durable, efficient and positive in operation, and well adapted to the purpose for which it is designed.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view through a mine-shaft, showing the car at the bottom and the doors closed. Fig. 2 is a similar view showing the doors open and the operating mechanism in the position it occupies after the car has passed up. Fig. 3 is a vertical sectional view of the shaft, taken at right

angles to Fig. 1, showing the parts in the position they occupy in that figure; and Fig. 4 is a similar view showing the parts in the position they occupy in Fig. 2.

Referring more particularly to the drawings, 1 denotes the shaft of a mine the walls of which are suitably braced by a structural framework of upright and cross timbers 2 and 3. Within the shaft 1 is adapted to travel a car or cage 4 of any suitable form and construction.

5 denotes doors which are suitably hinged to the structural framework of the shaft so as to be swung up or down to open or close the shaft. The doors are double, and each section or half of the door consists, preferably, of a barred or grated frame, so that when closed the light and air will not be shut out from the shaft, but which will prevent any rock or other debris from falling into the shaft and injuring persons in the car or at the bottom of the shaft. One of the side bars of the frame of each door-section forms a hinge-bar 6, the ends of which are reduced and rounded to form trunnions that engage bearings 7, formed on plates 8, which are securely bolted to the uprights of the shaft-framework.

9 denotes a short arm fixed to the bar 6 at one side of each of the door-sections. The arm 9 is arranged at an acute angle to the door-section and forms a crank-arm by which the section is raised and lowered. In the outer ends of the arms are formed slots 10.

12 denotes levers pivoted midway their length to bars 13, which are suitably bolted to the shaft-framework, as shown. One end of the levers 12 has a pivotal sliding engagement with the slotted end of the arm 9 by means of a pin or stud 14. The opposite ends of the levers are provided with slots 15 and are adapted to lie in the forked end of a bracket 16 and to be slidably pivoted to said bracket by means of a pin or bolt 17. The bracket 16 is fixed to a vertically-reciprocating bar 18,

which is slidingly mounted in guide-brackets 19 on the sides of the shaft-framework.

20 denotes an angularly-bent arm pivoted to the bar 18 and carrying at its outer end a roller 21, which is adapted to engage a guideway or track 22, fixed to the shaft-framework. The upper end of the guideway or track 22 is curved inwardly toward the side of the shaft and away from the side of the car.

23 denotes a pin or rod which projects laterally from the arm 20 and is in position to be engaged by a bracket-plate 24, projecting from the side of the car, said pin or rod forming the shaft or axle of the roller 21.

25 denotes a plate or bracket fixed to a block 25^a, slidably mounted in a slot 18^a, formed in the lower end of the bar 18. A coiled spring 25^b is arranged in the slot 18^a, having one of its ends connected to the upper wall of said slot and the other end connected to the upper end of the block 25^a. The plate or bracket 25 is located at the base of the shaft 1 and projects into the path of downward movement of the bracket 24 on the car, and as the car approaches the limit of its downward movement the same will be brought into engagement with the plate or bracket 25 and actuate the bar 18, the spring 25^b serving as a buffer to relieve the sudden jar of the car when the bracket thereon engages the bracket 25 on the bar 18.

A spring 18^b is arranged between a projection on the bar 18 and one of the cross-pieces 3 of the supporting-framework and serves as a buffer for the bar 18 to relieve the car of jar when the projection on the same engages the pin 23 on the arm 24, which is connected to the bar 18.

The doors 5 may be arranged at any level in the shaft, but are preferably near the upper end, while the operating mechanism is at the lower end of the same.

The operation is as follows: Assuming that the car is at the bottom of the shaft and the doors closed, as the car ascends the plate 24 on the car will be brought into engagement with the laterally-projecting pin or rod 23 on the arm 20, raising said arm and the bar 18 until the roller 21, carried by the arm 20, runs into the curved upper end of the track or guideway 22, which will disengage the rod 23 from the plate 24 and allow the car to pass on up the shaft. The upward movement of the bar 18, as just described, will cause the bolt 17 in the bracket 16, carried by the upper portion of the bar, to force the inner ends of the levers 12 upwardly and the outer ends of the same downwardly, which will cause the doors 5 to be opened by reason of the slotted and pivotal connection of this end of the levers with the crank-arms 9 of the door-sections. The parts remain in the position they are now

in until the car descends, which when it reaches the lower end of the shaft will engage the plate 25 and draw the bar 18 downwardly, which will cause a reverse action of the operating mechanism and close the doors, as will be understood.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In a door for closing elevator-shafts, the combination with a structural framework, of swinging door-sections hinged to said framework, a crank-arm fixed to each of said door-sections, pivoted levers having a pin-and-slot connection with said crank-arms at one end and having a pin-and-slot connection with a vertically-reciprocating bracket at their opposite ends, and means actuated by the raising or lowering of a car in said shaft to actuate said levers and open or close said door-sections, substantially as described.

2. In a door for closing elevator-shafts, the combination with a structural framework, of swinging door-sections hinged to said framework, a crank-arm fixed to each of said door-sections, pivoted levers having a pin-and-slot connection with said crank-arms at one end and having a pin-and-slot connection with a bracket, a vertically-reciprocating bar fixed to said bracket, a pivoted arm carried by said bar, means carried by the elevator-car to engage said arm and raise said bar to actuate said levers and open said door-sections, means for disengaging said arm from said car after said door-sections have been opened, and means whereby said door-sections may be closed when said car is lowered to the bottom of the shaft, substantially as described.

3. In a door for closing elevator-shafts, the combination with a structural framework, of swinging door-sections hinged to said framework, a crank-arm fixed to each of said door-sections, pivoted levers having a pin-and-slot connection with said crank-arms at one end and having a pin-and-slot connection with a bracket, a vertically-reciprocating bar fixed to said bracket, a pivoted arm carried by said bar, a roller and a laterally-projecting rod carried by said arm, a bracket-plate carried by the elevator-car to engage said rod and raise said bar upon the upward movement of the car, a fixed guideway or track engaged by said

roller and having a curved or offset upper end,
whereby said roller will be guided from said
car to remove said rod-bar from engagement
with said bracket-plate, a bracket-plate yield-
5 ingly connected to the lower end of said re-
ciprocating bar and in the path of downward
movement of the bracket-plate on said car
whereby said bar is lowered upon the descent
of the car, and buffer-springs connected to said

reciprocating bar whereby the jarring of the 10
car is obviated, substantially as described.

In testimony whereof I have hereunto set my
hand in presence of two subscribing witnesses.

JOHN WINELAND.

Witnesses:

CHAS. SWAN,

E. M. MATHEWS.