

(No Model.)

G. W. ARCHER.
DOOR FOR ELEVATOR WELLS.

No. 557,634.

Patented Apr. 7, 1896.

Fig. 1.

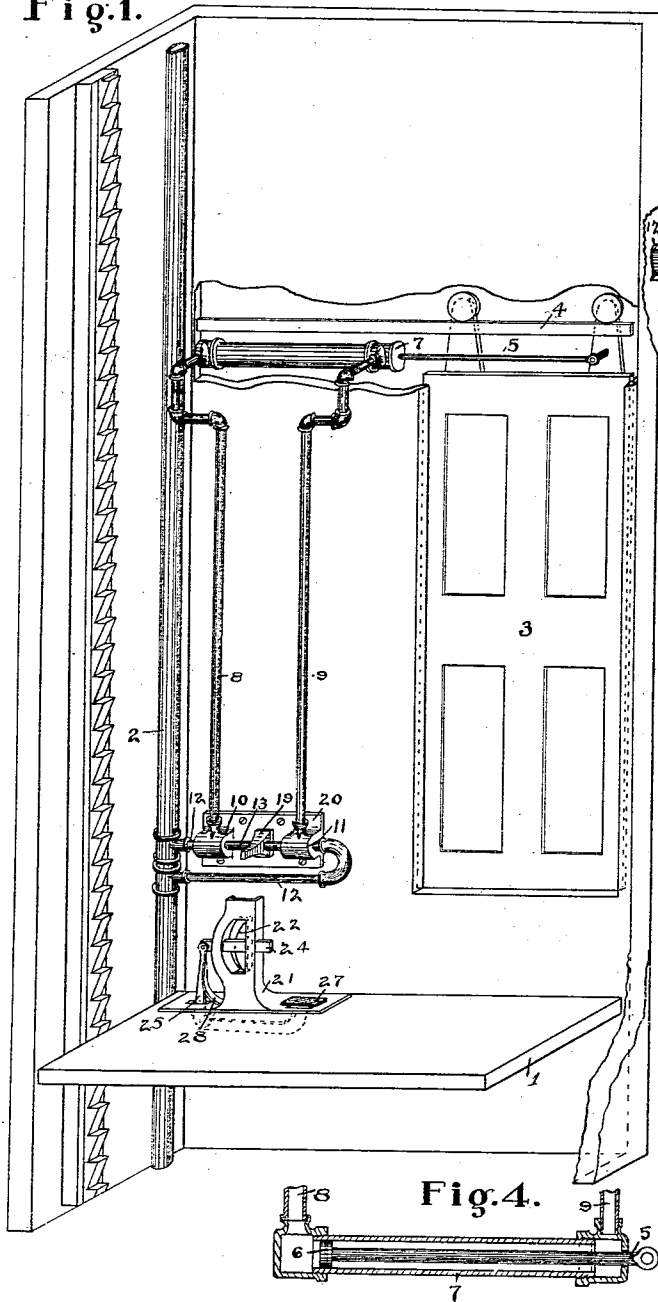


Fig. 2.

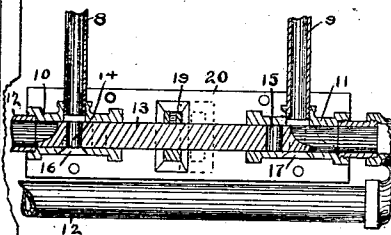


Fig. 3.

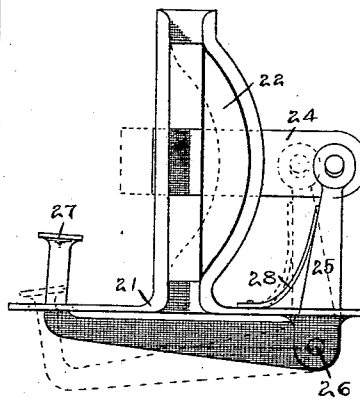


Fig. 5.

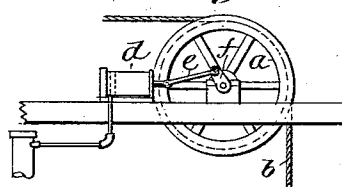
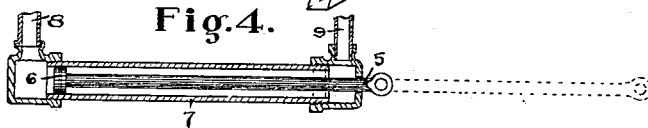


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

GEORGE W. ARCHER, OF ROCHESTER, NEW YORK.

DOOR FOR ELEVATOR-WELLS.

SPECIFICATION forming part of Letters Patent No. 557,634, dated April 7, 1896.

Application filed January 11, 1896. Serial No. 575,058. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. ARCHER, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Doors for Elevator-Wells; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference letters and numerals marked thereon.

My present invention has for its object to provide an improved means for operating the doors leading into elevator-shafts, whereby the operator on the car may cause the automatic opening and closing of the doors as the car approaches and leaves the floors; and it consists in certain improvements, all as will be hereinafter fully described, and the novel features pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is a perspective view of the interior of an elevator well or shaft, showing a portion of the car and the door-operating devices; Fig. 2, a vertical sectional view showing the valve controlling the operation of the door; Fig. 3, a front view of the valve-actuating device located on the car; Fig. 4, a sectional view of the door-actuating piston and cylinder. Fig. 5 is an elevation of the preferred means for supplying air or fluid to the door-controlling devices.

Similar reference letters and numerals in the several figures indicate similar parts.

The general idea of my present apparatus is to cause the opening and closing of the doors leading into the elevator-shaft by means of fluid, preferably air under pressure, the admission and exhaust of the fluid to the actuating-cylinder being caused directly by the movement of the car and indirectly by the operator on the car.

In the drawings I have shown a portion of the elevator shaft or well and have indicated but one door; but it will be understood that the door at each floor or station is constructed and arranged substantially like the one shown.

1 indicates the floor of the elevator-car, and 2 a pipe or main extending the length of the well and normally containing air or other fluid under pressure, which pressure may be

supplied by means of a pump operated in any suitable manner from the operating parts of the elevator, but preferably by means of a small pump actuated by one of the sheaves or rollers over which the lifting-rope of the car passes, as in Fig. 5. The doors 3, leading into the well from the floors, are supported upon suitable hangers, such as 4, and each has connected to it a piston-rod 5, having a piston-head 6 thereon operating in a cylinder 7, arranged on the outside of the well, or otherwise, as shown in Fig. 1.

8 and 9 indicate pipes connected to the outer and inner ends of the cylinder 7 and leading to suitable casings 10 and 11, respectively, both of which are connected by pipes 12 with the main pipe 1. Operating in the casings 10 and 11, which are preferably arranged in line, is a sliding rod or valve-stem 13, having transverse passages or ports 14 and 15 near its ends adapted to insure communication at certain times between the pipe 8 and the exhaust-port 16 and between the pipe 9 and the exhaust-port 17, the relative arrangement being such that when the valve is moved to the position shown in Fig. 2 fluid is admitted from the main, through the pipe 9, to the cylinder 7, operating the piston and opening the door, the fluid on the opposite side of the piston being exhausted through the port 16, as will be understood, and when the valve is moved in the opposite direction the fluid will be admitted to the other side of the piston and the exhaust from the pipe 9 will be permitted through the port 17. Mounted upon the stem 13, between the casings 10 and 11, is a block 19, which has a bearing on the supporting-plate 20, and is also provided with an arm extending into the shaft or well and serves as the means for actuating the valve.

Arranged upon the platform of the elevator-car is a frame or casting 21, provided with a groove or channel on the front side of the well, the casting 21 and the arm on the block 19 being so relatively arranged that one of the sides of the channel forms a substantially straight passage or guide, the other side of the passage or channel in the frame 21 being formed by the straight side of a switch or block 22, having beveled ends and normally fitting in a recess at one side of the channel 21, as shown in Fig. 3, and this block is con-

nected to a sliding bar 24, to which is pivoted one arm of a bell-crank lever 25, pivoted at 26 and having a treadle 27.

28 indicates a spring operating upon the
 5 arm, or, if desired, upon the slide 24, to keep
 the block 22 in the position shown in full lines
 in Fig. 3. Normally the controlling-valve is in
 the position shown in dotted lines in Fig. 2,
 and the door is maintained closed by pressure
 10 on the outer end of the piston 6, and the arm
 on the block 19 passes through the vertical
 channel in the frame 21 as the car is raised
 and lowered; but when the operator desires
 to stop at any floor and cause the door to open
 15 he presses upon the treadle 27, throwing the
 block 22 to the position shown in dotted lines
 in Fig. 3, thereby providing a curved channel
 for the arm 19 connected to the valve, the
 movement of the car either way throwing the
 20 valve to the position shown in full lines in
 Fig. 2 and admitting fluid to open the door,
 the fluid from the rear side of the piston be-
 ing exhausted through the port 16. This will
 insure the door being held open as long as the
 25 car remains at the floor, the valve being posi-
 tively held by means of the switch-block 22 and
 the curved side of the channel in the frame,
 and when the car leaves the floor said valve
 will be positively operated in the opposite di-
 30 rection, admitting fluid to close the door and
 keep it closed. This arrangement is simple
 and can be applied to the door of the shafts of
 elevators now in operation without great ex-
 pense, and I find that the amount of pressure
 35 required for actuating the doors is very slight
 and can be readily supplied to the main by
 means of a small air-pump actuated from any
 of the operating parts of the elevator; but I
 prefer, as stated, to cause its operation by
 40 means of one of the sheaves over which the
 lifting cable or cables pass, preferably at the
 top of the shaft or well, as shown in Fig. 5, *a*
 indicating the sheave, *b* the lifting-cable
 passing over it, and *d* a small pump, the pis-
 45 ton of which is actuated by the piston-rod *e*
 and a crank *f* on the axle of the sheave.

While I prefer to employ precisely the ar-
 rangement shown I do not desire to be con-
 fined to exactly this construction of parts, as

modifications will readily occur to those 50
 skilled in the art.

I claim as my invention—

1. The combination with a door leading
 into an elevator-well, a cylinder, an actuat-
 ing-piston connected to the door, a valve for 55
 admitting fluid under pressure to opposite
 sides of the piston alternately, and an actu-
 ating projection connected to the valve, of
 an elevator-car having a vertical way thereon
 for the valve projection, and a movable 60
 switch-block for coöperating with the valve
 projection, substantially as described.

2. The combination with a door leading
 into an elevator-well, a cylinder, an actuat-
 ing-piston connected to the door, a valve for 65
 admitting fluid under pressure to opposite
 sides of the piston alternately, and an actu-
 ating projection connected to the valve, of
 an elevator-car having a vertical way thereon
 for the valve projection, a switch-block hav- 70
 ing beveled ends and normally retracted, and
 a foot-lever for projecting said block across
 the way, substantially as described.

3. The combination with the frame 21
 adapted for attachment to an elevator-car 75
 having the way therein with one curved side,
 of the switch-block, the guide-bar 24, the
 spring and the treadle-lever connected to the
 bar, substantially as described.

4. The combination with the main or pipe 80
 containing fluid under pressure, two valve-
 casings having exhaust-passages, pipes lead-
 ing from the main to each casing, a cylinder,
 an operating-piston therein, an elevator-door
 connected to the piston, pipes leading from 85
 opposite ends of the cylinder to the valve-
 casings, two valves connected for simultane-
 ous operation, and an actuating projection
 for them, of an elevator-car having a way
 thereon for the valve-actuating projection, 90
 and a switch-block having a straight and a
 curved side, and means for actuating it, sub-
 stantially as described.

GEO. W. ARCHER.

Witnesses:

F. F. CHURCH,
 G. W. RICH.