

No. 632,299.

Patented Sept. 5, 1899.

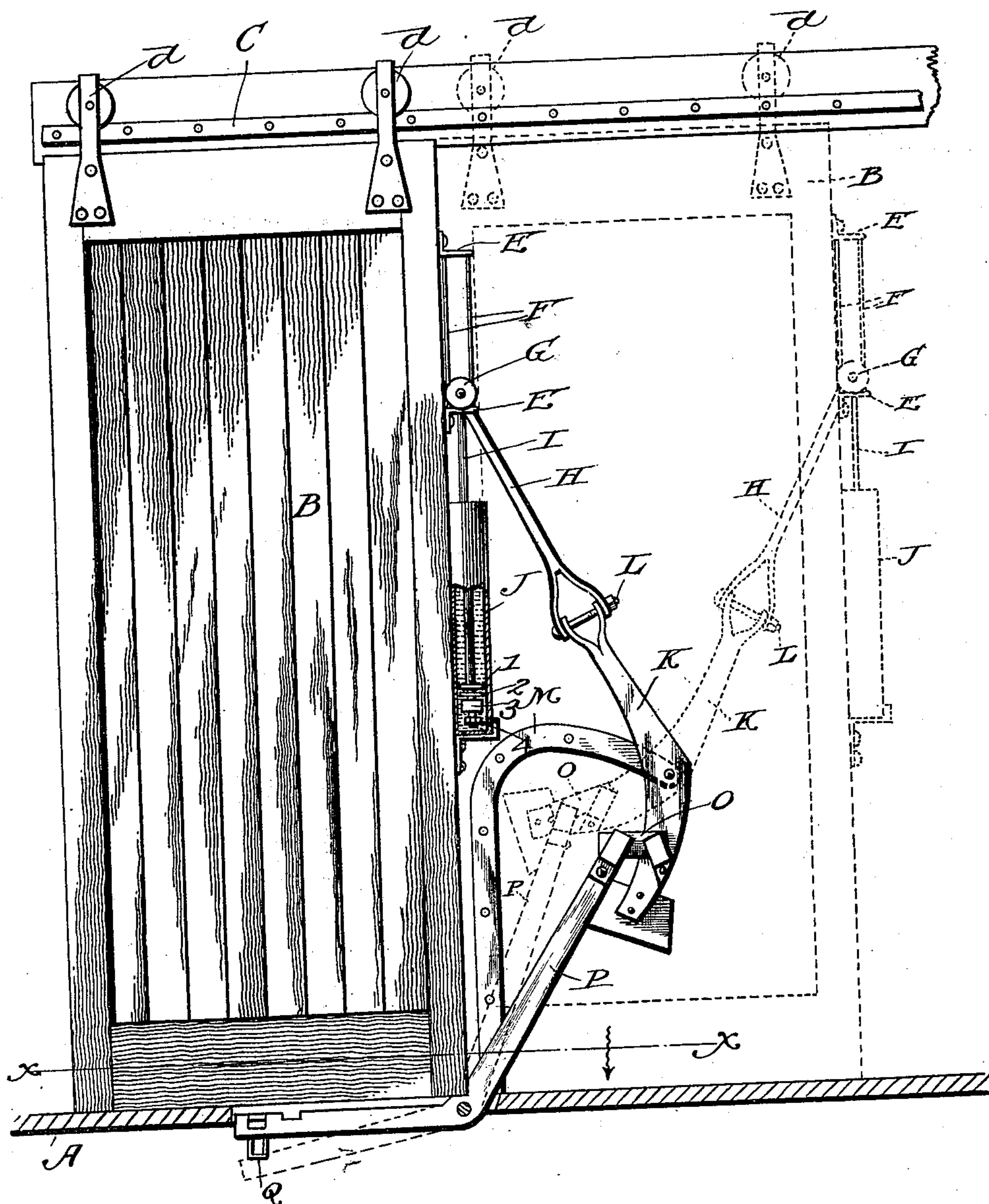
J. H. WHITAKER.
AUTOMATICALLY OPERATING DOORS.

(Application filed Apr. 28, 1899.)

2 Sheets—Sheet J.

(No Model.)

Fig. 1.



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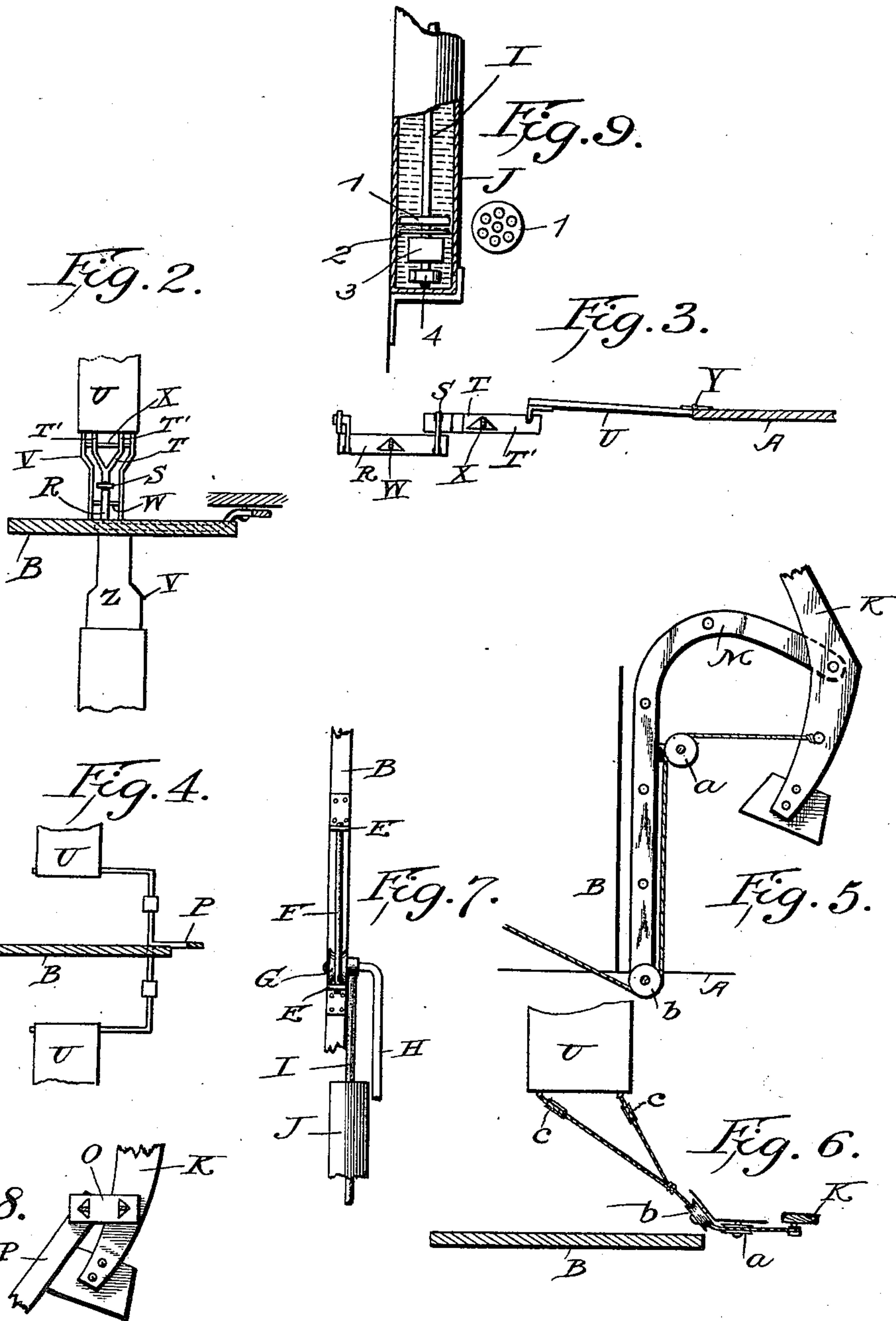
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J. H. WHITAKER.
AUTOMATICALLY OPERATING DOORS.

(Application filed Apr. 26, 1899.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JOHN H. WHITAKER, OF DAVENPORT, IOWA.

AUTOMATICALLY OPERATING DOORS.

SPECIFICATION forming part of Letters Patent No. 632,299, dated September 5, 1899.

Application filed April 26, 1899. Serial No. 714,548. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. WHITAKER, a citizen of the United States of America, and a resident of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Automatically Operating Doors, of which the following is a specification.

This invention relates to improvements in devices for operating doors automatically; and the object of the invention is to produce improvements on the mechanism covered by Letters Patent No. 505,376, dated September 19, 1893.

A further object of the invention is to arrange the parts so as to render them readily adjustable, thus enabling any ordinary purchaser to apply the devices to sliding doors of ordinary construction.

Finally, the object of the invention is to so form the elements that they will prove strong, durable, and efficient, satisfactory in use, and comparatively inexpensive to produce and sustain.

With the above and other objects in view the invention consists in the details of construction and in the arrangement and combination of parts, to be hereinafter more fully set forth and specifically claimed.

In describing the invention in detail reference will be had to the accompanying drawing, forming part of this specification, wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 represents a front elevation of a door with the improvements applied, the wall or slideway into which the door passes being removed to disclose the operative parts. Fig. 2 is a horizontal section taken on the line *x x* of Fig. 1. Fig. 3 is a side view of parts connecting the operating-lever with the raised platform on which the weight of the person is applied. Fig. 4 is a modification of the operative lever, showing a form by which the parts shown in Fig. 3 may be dispensed with. Figs. 5 and 6 are modifications employing a cable and pulley-wheels instead of the main operating-lever and the connecting parts shown in Fig. 3. Fig. 7 is a detail of the guides. Fig. 8 is a detail of the connecting-link. Fig. 9 is a detail of the cylinder, piston, and piston-head.

In the drawings, A indicates the floor-line, and B the door, which is hung to slide on the rail C and supported on the rollers *d d* in the usual manner.

Projecting from the inner edge of the door and secured thereto near its top are two brackets E E, which support two vertical rods F F a suitable distance apart and which serve as guides or tracks for the wheel G.

H is an arm whose upper extremity is bent at right angles to the main portion and forms a spindle for the wheel G and also carries the piston-rod I. The piston-rod I has the usual head or plunger at its bottom end and is adapted to operate vertically in the cylinder or chamber J, in which it is loosely fitted. The chamber may contain oil or other suitable liquid for retarding the action of the piston-rod. The arm H is connected at its lower end to the angular arm K by means of a bolt L, which enables the parts to adjust themselves laterally to any irregularities which may arise while the device is being operated. This angular arm K is pivotally secured to the support or brace M, which is secured to the inside of the wall in any suitable manner. A weight is attached to the lower end of the arm K, and it may be as heavy as necessary and of such form as not to obstruct the passage of the door. At a point on the arm K about midway between the pivot and the weight I pivotally secure a link O, and to the other end of said link I similarly secure the upper end of the operating bell-crank lever P. Near the floor-line this lever is pivoted to some substantial piece of the wall or framework, its horizontal member terminating at about the center of the door. Near the end of such horizontal member of the lever a hook Q depends, and just underneath said lever and to the same hook is secured the bar R. At its other end said bar R is loosely connected by a ring S to the single end of the forked bar T. The ends of the branches or forks T' T' are adapted to be depressed by the platform U, when weight is applied thereto. The bar R and branches T' T' are provided with the V-shaped apertures W' and X' and are pivotally hung in the housing V by means of the bars W and X, which pass through said apertures and are rigidly secured at their ends to the housing V.

The platform U may be suitably hinged at one end to the floor, as at Y, and at the other end to the outer lever or bar T. If it is desired to have the door so equipped as to enable it to be automatically opened from either side, the same means may be employed on the other side of said door, as at Z. The parts connecting the operating-lever P with the platform U being below the floor-level, they and the frame in which they rest may be covered and entirely hidden from view. It will now be seen that a person approaching said door and stepping upon said platform will cause the front or raised portion of the platform U to be depressed. The connected ends of the bars R and Y at the ring S will be elevated. The lever P where the hook Q connects with the inner lever or bar R will be depressed. The upper end of said lever P will be drawn forward or toward the door, being connected to the weight end of the arm K, that will also be drawn forward, while that portion of said arm K above its pivotal point will be moved backward. This will of necessity begin moving it nearer a true perpendicular line and elevate the upper end, which is attached to the wheel or friction-roller G, and said wheel G being held in the guide-rods F F the door B will move backward or open. The plunger or piston-head is composed of the round perforated plate 1, fixed to or integral with the rod I. The washer 2 is loose upon the rod and may be moved up or down. 3 is a cork or any light material to serve as a floater, which also moves up and down. 4 is a nut secured to keep washer 2 and cork 3 from slipping off the lower end of rod I. When the rod I rises in the cylinder J, (which it does when the door moves backward or open,) the pressure of the oil upon the loose washer 2 and cork 3 will force those down against the nut. This will leave the holes in the plate 1 open, and as the rod rises the oil will run down through said holes, and thus there will be little or no resistance from the oil, and the upward movement of rod I and parts attached will not be retarded by the oil; but when the door has passed the half and the plunger has reached its highest point and begins to descend the oil from below pressing up against the cork 3 and washer 2 will force them up, and the washer will come against the under side of the perforated plate 1, thus closing the holes. This resistance will naturally retard the progress of the door when it has passed the half-mark and as soon as the holes are closed by the washer 2, the result being that it acts as a cushion and prevents jar when the door comes to a stop (open.) It also gives the person ample time to pass through. When the door is in open position, the tendency of the weight on arm K is to drop, and the person having passed through and the pressure on the platform having been removed such weight will force the door to close automatically. The same operation of the piston takes place when the door has

passed the half on its return, as the holes are closed, as heretofore described, and a cushion effect is produced. The cylinder and plunger do not retard the starting of the door either in opening or closing, but only when it nears its stopping-place at either end, and then it acts as a cushion and incidentally gives the person the required time to pass through.

I prefer to make all my pivotal bearings ball-bearings, such bearings reducing friction to a minimum.

By constructing the lever P about as shown in Fig. 4 I can omit the connecting parts shown in Fig. 3. By fastening a line or cable to the arm K, as shown in Fig. 5, and placing a pulley-wheel *a* on the brace M and running the cable over such wheel, then downward and under a like wheel *b*, placed, however, at an angle to the wheel *a*, then branching two lines to the wheels *c c*, said wheels being supported by brackets secured to the under side of the floor, over which wheels the lines run and are attached to the front under side of the platform U, I can accomplish the same result and dispense with the lever P and all the parts connecting it with the platform.

The arrangement of the details for successfully carrying my invention into practice may be variously modified to meet particular requirements, as will be obvious to those skilled in the art.

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

1. In combination, a sliding door, brackets on the edge thereof, guide-rods extending from one bracket to the other, a grooved wheel guided by the rods, a lever having an angular extremity on which a wheel is mounted, said lever comprising two members pivoted centrally, a weight on the lower member below its fulcrum, a bell-crank connected with the lever, and means whereby the bell-crank is operated, substantially as described.

2. In combination with a cylinder, piston and piston-rod, a lever having an angular extremity to which the piston-rod is connected, a grooved wheel mounted on the extremity of the lever, upright rods forming a guide for the lever, brackets attached to the door and supporting the rods, a weight on the end of the lever below the fulcrum, a bell-crank suitably pivoted, a link connecting the bell-crank and lever, and means for manually operating the bell-crank, substantially as described.

3. In combination with the cylinder, piston and piston-rod, a lever having an angular extremity to which the piston-rod is connected, a grooved wheel mounted on the extremity of the lever, upright rods forming a guide for the wheel, brackets attached to the door and supporting the rods, a weight on the end of the lever below the fulcrum, a bell-crank suitably pivoted, a link connecting the bell-crank and lever, a series of levers having V-shaped

apertures, a plurality of bars passing through said apertures and supporting said levers, and a platform connected to the outer end of the outer lever, substantially as described.

5 4. In combination with the cylinder, piston and piston-rod, a lever having an angular extremity to which the piston-rod is connected, a grooved wheel mounted on the extremity of the lever, upright rods forming a guide for
10 the wheel, brackets attached to the door and supporting the rods, a weight on the end of the lever below the fulcrum, a bell-crank suitably pivoted, a link connecting the bell-crank and lever, a series of levers pivoted in a suitable housing, and a platform connected with
15 the outer lever, the bell-crank being connected with the inner lever, substantially as described.

5 5. In combination with a sliding door, a lever for operating the door comprising two sections loosely joined, a wheel mounted on an angular extremity of the pivoted arm and operating in a suitable guide on the door, a weight on the end of the lever below the fulcrum, and weight-operated means for actuating the lever in one direction, substantially as
20 described.

6. In combination with a sliding door, a lever for operating the door, a wheel mounted
30 on an angular extremity of the lever and operating in a suitable guide on the door, said lever comprising two sections loosely joined,

a weight on the end of the lever below the fulcrum, a bell-crank suitably pivoted, a link connecting the bell-crank and lever, a housing embedded on a line with the floor, levers
35 mounted on rods arranged transversely in the housing, a hook connecting the inner end of the inner lever with the end of the horizontal member of the bell-crank, and a platform having its end resting on the outer end of the
40 outer lever, substantially as described.

7. In combination with a door, a cylinder, a piston comprising a perforated plate, a washer loosely arranged on the piston-rod, a float on the rod below the washer, means for
45 holding the parts on the rod, a lever having an angular extremity to which the piston-rod is connected, a grooved wheel mounted on the extremity of the lever, upright rods supported on the door forming a guide for the
50 wheel, a weight on the end of the lever below the fulcrum, a bell-crank suitably pivoted, a link connecting the bell-crank and lever, a series of levers pivoted in a suitable housing and a platform connected with the levers, substantially as described.
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Signed by me at Davenport, Iowa, this 8th day of April, 1899.

JOHN H. WHITAKER.

Witnesses:

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T. A. MURPHY.