

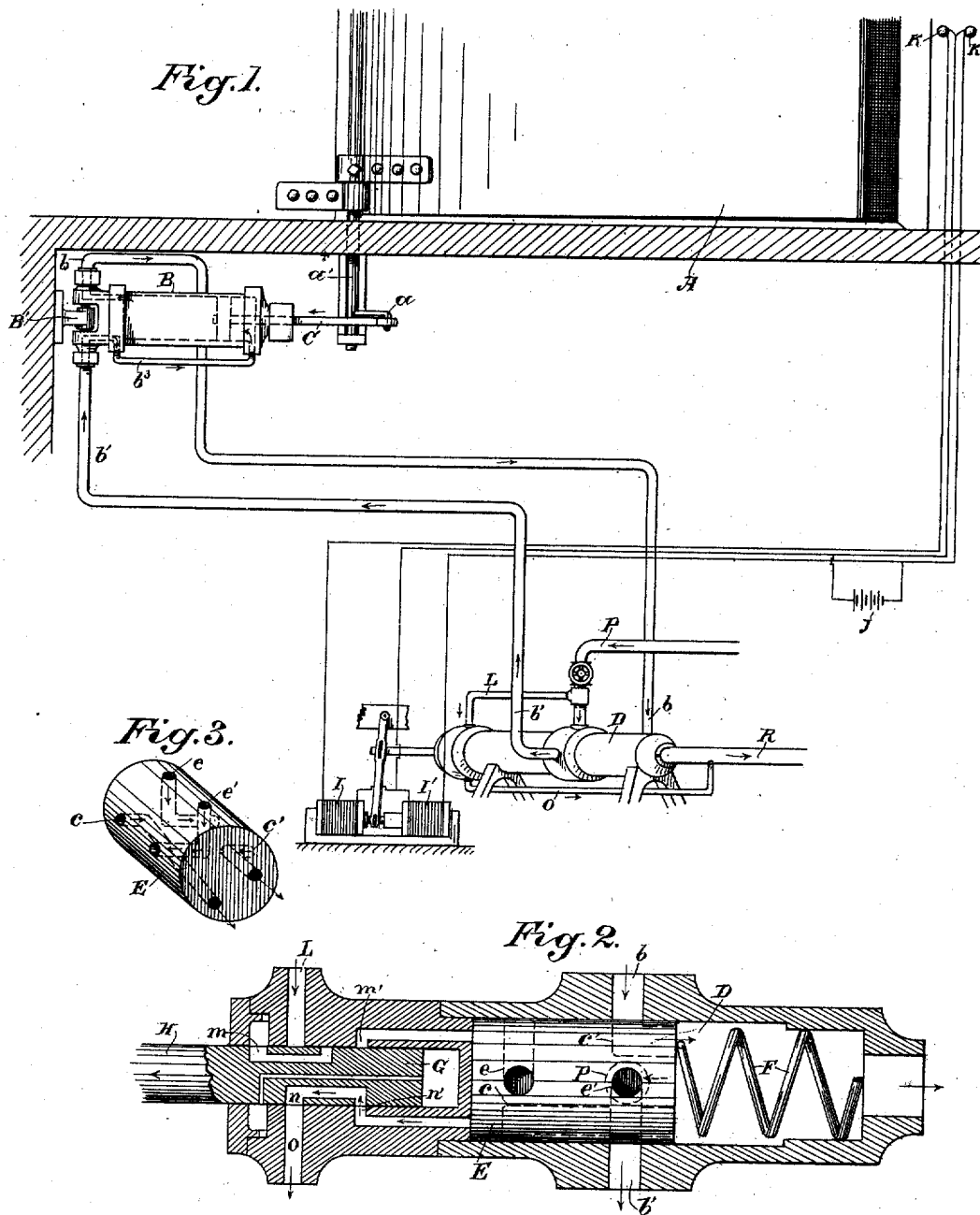
No. 647,671.

Patented Apr. 17, 1900.

M. A. DE LEW.
DOOR CONTROLLER.

(Application filed Nov. 9, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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DOOR-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 647,671, dated April 17, 1900.

Application filed November 9, 1898. Serial No. 695,924. (No model.)

To all whom it may concern:

Be it known that I, MAURICE ALEX DE LEW, a citizen of the United States, residing at Sacramento, county of Sacramento, State of California, have invented an Improvement in Door-Controllers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device which is especially designed to open or close doors of any description, either from points closely adjacent to the door or from a distance. It is especially adapted for the opening of heavy safe, vault, and other doors which are difficult to move, the opening of doors or gates upon railroad-trains, steamboats, elevators, and in residences, and for opening and closing street-doors from floors above or from points at a distance from the doors, and generally for controlling all means for ingress and egress of a like nature.

The invention consists of the parts and the constructions and combinations of parts, which I will hereinafter describe and claim.

Figure 1 is a general view showing the application of my invention. Fig. 2 is a longitudinal horizontal section through the valve-chamber. Fig. 3 is a detail of the supply-valve.

In the present illustration I have shown my apparatus as applied for the opening and closing of a door A by means of a cylinder B, having a piston adapted to reciprocate within it, and a piston-rod C, the outer end of which is connected with the door. As shown in the present case, the connection is made and the mechanism is concealed from sight by locating the cylinder beneath the floor and connecting the piston-rod C with a crank-arm *a* upon a vertical shaft *a'*, which is fixed to the door on the turning axis of its hinges. The rear end of the cylinder is pivoted or fulcrumed as shown at B', and the journals upon opposite sides of the cylinder form inlets and outlets in line with the water supply and exhaust pipes *b b'* and also communicate with the ends of the cylinder through suitably-arranged ports. These pipes *b b'* extend from the door-actuating cylinder to the valve-chamber D, within which the valve E is movable to open or close the water supply or discharge. This valve-chamber may be situated at any

suitable or convenient point with relation to the operating-cylinder and at such a distance as may be found desirable.

Within the cylinder D is a reciprocable valve E, which moves across the water-supply passage or pipe P in such a way as to open one of the pipes connecting with the cylinder, so as to admit water to one end thereof and open the other so as to allow the water to escape at the same time. This valve is moved in one direction by the fluid under pressure, which is admitted into the cylinder by means of a valve to be hereinafter described, and when the fluid is so admitted and the valve moved by it it acts against a spring F, situated in the opposite end of the cylinder, and which is compressed by the movement of the valve. This spring acts to return the plunger to its normal position when the fluid is released from the cylinder, and these movements of the plunger bring the various ports into line with the supply and exhaust passages. These passages are well shown in Fig. 3 at *c c'* and *e e'*, the operation being as follows: *e* is a port or passage through the valve so disposed that when the valve is moved to bring this port into line with the pipe P liquid will flow through the port into the pipe *b'* and thence through the pipe or an equivalent passage *b''* to the front end of the cylinder, where it acts to force the piston to the rear and through the piston-rod and its connections to open the door. Liquid from the opposite end of the cylinder escapes through pipe *b* and port *c* to the end of valve E and thence through pipe R. When the valve E is relieved from the pressure by which it was moved forward, the spring E acts to force it back, and this brings the port *e'* into line with the pipe P. The port *e'* opens through the opposite side of the valve and then connects with the pipe *b*, so that pressure will be transmitted through it to the rear of the cylinder B and will force the piston toward the front and close the door. The exhaust-passage *c'* of valve E stands at the same time in line with pipe *b*, and as it turns so as to discharge through the end of the valve it allows liquid from the opposite end of the cylinder to escape through pipe R. In this manner the cylinder is made double-acting and the door can be opened or closed at any time by

actual pressure in either direction and the movements of the door accurately controlled.

In order to admit the fluid to operate the plunger-valve E, I have shown a small supplemental valve G, which is actuated by a
5 rod or stem H, and this rod or stem is connected with the armatures of two solenoids I I', so disposed with relation to each other that when one of the solenoids is energized the rod
10 H and its connected valve will be moved in one direction and when the other is energized it will be moved in the opposite direction. The wires connecting with the solenoid and with the battery J or other source of electric
15 energy may be led to any point more or less distant from the valve mechanism or the door-opening mechanism, and by means of push-buttons K K' either one or the other of the solenoids will be energized and its arma-
20 ture caused to move the valve-stem H. This valve-stem and its valve G are very small and light and are intended only to control a supply of water which will operate the piston-valve E, and thus control the supply for the
25 main cylinder. By reason of the lightness and ease of movement of the supplemental valve it takes comparatively-small electrical energy to operate this valve and through it to control the larger valve and plunger.
30 The valve G has ports made through it, as shown, and a small pipe L leads from the main supply-pipe P to an inlet-port in the chamber in which this valve moves. When this valve is moved so as to bring the ports
35 *m m'* into communication, fluid under pressure will be admitted into the cylinder D, and will thus act to move the plunger-valve E, as previously described. By reversing the movement of the valve G the ports *n* and *n'* are
40 brought into line with the discharge-passage O, and the fluid under pressure will thus be exhausted from the valve-chamber D and the plunger E allowed to be returned to its position by the action of the spring F. By this
45 construction I am enabled to control the operations of a powerful cylinder and as heavy a pressure therein as may be needed to move any door or closure, and by means of the supplemental electrically-actuated valve the supply of fluid under pressure for the purpose of
50 operating within the main cylinder is easily and accurately controlled.

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

1. A door opening and closing device, consisting of a cylinder journaled and turnable about a fixed point and having a piston, a shaft extending in line with the pintles of
60 the door-hinges, and connected with the rod of the piston, inlet and outlet pipes connecting with ports and with the opposite ends of the cylinder, a fluid-supply to said pipes, a valve and means whereby it is moved in one
65 direction by fluid-pressure, and means by which said valve is returned when said fluid-pressure is removed.

2. In a door opening and closing device, a vertically-hinged door, a shaft connected therewith in line with the hinges, and having
70 a rocker-arm projecting therefrom, a cylinder pivoted at one end having a piston movable therein and a piston-rod connecting with the rocker-arm, a valve-chamber having a valve with ports therethrough, pipes connect-
75 ing said chamber with ports by which water is admitted to either end of said cylinder, a pipe connecting the main-pressure supply-pipe with one end of the valve-chamber whereby the valve is moved in one direction
80 by liquid-pressure, and a spring by which the valve is returned when said pressure is removed.

3. In a door opening and closing apparatus, a vertically-hinged door, a shaft projecting
85 from one end in line with the hinges and having a rocker-arm fixed thereto, a cylinder fulcrumed at one end, a piston movable therein and a piston-rod connecting with the rocker-arm, ports or passages by which liquid under
90 pressure is admitted to opposite ends of the cylinder, pipes connecting said ports with a valve-chamber, a valve movable in said chamber having ports therethrough adapted to connect with the supply and discharge pas-
95 sages of the cylinder, a pipe by which liquid under pressure is admitted to one end of the valve-chamber, a supplemental electrically-actuated valve by which the liquid to move the valve in one direction is controlled, and
100 a spring by which the valve is returned to its normal position when pressure upon the opposite end is removed.

4. In a door opening and closing apparatus, a vertically-hinged door, a shaft projecting
105 from one end in line with the hinges and having a rocker-arm fixed thereto, a cylinder fulcrumed at one end, a piston movable therein and a piston-rod connecting with the rocker-arm, ports or passages by which liquid
110 under pressure is admitted to opposite ends of the cylinder, pipes connecting said ports with a valve-chamber, a valve movable in said chamber having ports therethrough adapted to connect with the supply and dis-
115 charge passages of the cylinder, a pipe by which liquid under pressure is admitted to one end of the valve-chamber, a supplemental valve, controlling-ports by which liquid is admitted to and exhausted from one end of
120 the main valve chamber, electrically-actuated solenoids and a lever connection between them and the supplemental-valve stem whereby the latter is moved to admit liquid to the main valve, and a spring by which
125 both valves are returned to their normal position when the electric circuit is cut off.

In witness whereof I have hereunto set my hand.

MAURICE ALEX DE LEW.

Witnesses:

HORACE A. CROCKER,
RICHARD C. MAY.