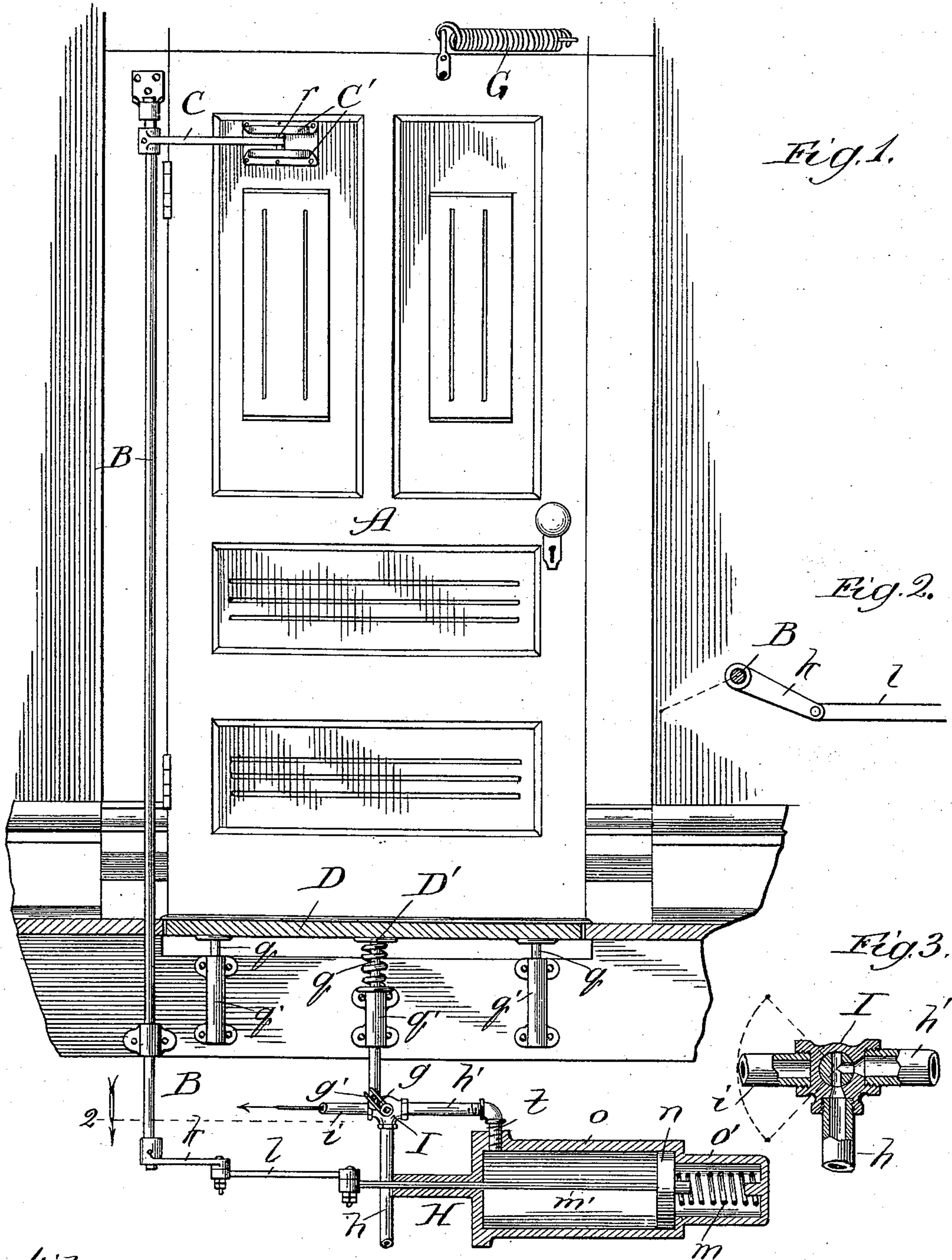


(No Model.)

O. H. HICKS.
DOOR OPERATING APPARATUS.

No. 572,300.

Patented Dec. 1, 1896.



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UNITED STATES PATENT OFFICE.

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ELECTRIC DOOR COMPANY, OF SAME PLACE.

DOOR-OPERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 572,300, dated December 1, 1896.

Application filed March 18, 1895. Serial No. 542,186. (No model.)

To all whom it may concern.

Be it known that I, OLIVER H. HICKS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Door-Operating Apparatus, of which the following is a specification.

The object of my invention is to provide a mechanically-working in contradistinction to an electrically-working door-operating apparatus, meaning thereby an apparatus connected with a door and actuated to open it by a person or object on approaching the door exerting such a pressure on a platform, mat, plate on the door, or other primary actuating means convenient to the path of such person or object or in the approach to the door as will cause operation of a door-opening motor to open the door by said pressure controlling elastic actuating means, such as fluid-pressure or fluid and spring pressures, against piston mechanism connected with the door.

My invention consists in the general as well as the more specific construction of my improved door-operating mechanism.

Referring to the accompanying drawings, Figure 1 is a broken view showing in elevation a door provided with my improved mechanism for operating it; Fig. 2, a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow, and Fig. 3 a broken view showing a three-way valve detail in section.

A is a door, shown as of the variety hinged to swing in a horizontal plane, for which particular variety my improvement is primarily intended, though not necessarily limited to use therewith.

B is a rock-shaft, shown as supported in vertical position, in suitable bearings, adjacent to the hinged edge of the door, with which it is connected through the medium of an arm C, rigidly fastened at one end to the shaft to turn with it and having at its opposite end a sliding connection with the door through the medium of a slotted guide C' thereon, which confines an antifriction-roller *r* on the end of the arm.

As the primary actuating means I show a platform D, yieldingly supported at the threshold and extending along the approach to the door, (at both sides, if desired, though it

is only shown at one side, owing to the nature of the view selected for illustration.) The platform as the primary actuating means, though preferred, is intended to be only suggestive and to represent one of various means for the same purpose, such as a yielding plate on the door, a yielding projection extending into the path of the approach to the door, and the like, all of which are equivalents of the platform.

The platform D is of adequately stiff material and is yieldingly sustained by a resilient support, shown as a spring D', confined about a post *q*, extending from the lower side of the center of the platform through a vertical guide-socket *q'*, and a number of the posts *q* and guides *q'* therefor are provided to tend the better to cause pressure on the platform at any point to depress it equally throughout.

As the piston mechanism actuated by elastic means for operating the door I show a motor H, comprising a cylinder *o*, containing a piston *n*, and having a rear extension *o'*, in which is confined against the piston a spring *m*, set by the backward stroke of the piston and operating by its recoil to drive the piston forward. The piston-rod *m'* is connected by a link *l* with a crank *k* (off a dead-center with the link) on the lower end of the shaft B. A three-way valve I, located between the exhaust *i* and pipe *h*, leading from the compressed-air supply (not shown, but which may be a suitable reservoir) to a branch *h'*, which enters the cylinder at *t*, is engaged at its bifurcated handle *g* by a stud *g'* on the lower end of the extended central guide-rod *q* of the platform.

The normal position of the valve I is that represented in Fig. 3, wherein the supply through the pipes *h* and *h'* into the cylinder *o* is open to maintain normally the pressure in the cylinder against the piston, which holds it at the end of its backward stroke and compresses the spring *m*, besides holding the door A closed.

By stepping on the platform D, and thus depressing the guide-posts *q*, the valve I is turned to a position in which the supply through the pipe *h* is cut off and the cylinder is opened through the valve to the exhaust,

thus permitting the spring *m* to act by its recoil to force the piston *n* forward and, through its connection with the shaft B, turn the latter in the direction necessary to swing the arm C outward and open the door. When the pressure on the platform is removed, the spring *q* returns the valve to its normal position, wherein the exhaust *i* is closed and the compressed-air supply to the cylinder opened to admit therein the pressure which drives back the piston *n*, the operation of the mechanism in closing the door being assisted, if desired, by a spring G, fastened at its opposite ends, respectively, to the upper end of the door and the door-casing, and which is distended in opening the door by the recoil action of the motor-spring *m*.

As will be seen, the door will readily reopen from any point in closing by pressure on the platform, so that a person need not await complete closure of the door before it may be operated to reopen.

The details shown and described may be variously modified and even departed from without thereby departing from my invention. Hence I do not wish to be understood as limiting my improvement to such details, except where the intention so to do is manifest from the terms of the appended claims.

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

1. In combination with a door, a stem or rod, a depressible pressure-plate engaging said stem or rod, a pressure-cylinder containing a piston, a valve mechanism operated by said stem or rod, supply and waste pipe connections to the valve and pressure-cylinder, and mechanism operated by said piston to open or close a door, substantially as described.

2. In combination with a door, a vertically-supported rock-shaft connected with the door,

a cylinder containing a piston connected with the rock-shaft to actuate it by movement of the piston, said cylinder having valve-controlled communication with a fluid-pressure supply, and a spring-controlled yielding platform in the approach to the door and operatively connected with the valve to control the supply of fluid-pressure to the cylinder, substantially as described.

3. In combination with a door, a vertically-supported rock-shaft connected with the door, a cylinder containing a piston connected with the rock-shaft to actuate it by movement of the piston, said cylinder having valve-controlled communication with a fluid-pressure supply and with the outer air, a spring confined in the cylinder against said piston in opposition to the fluid-pressure against it, and a spring-controlled yielding platform in the approach to the door and operatively connected with the valve to open and close said cylinder to the supply of air-pressure and to the outer air by the movements of the platform, substantially as described.

4. In combination with a door, a rock-shaft B, an arm C connecting said shaft with the door, a motor comprising a cylinder containing a spring *m*, a piston *n* opposing said spring and having its rod connected with the shaft B to turn it, a fluid-pressure supply-pipe leading into the cylinder and containing a three-way valve controlling communication of said cylinder with the fluid-pressure supply and with the outer air, and yielding primary actuating means, such as the platform D controlled by a spring D' and carrying a post connected with said valve, substantially as and for the purpose set forth.

OLIVER H. HICKS.

In presence of—
M. J. FROST,
J. H. LEE.