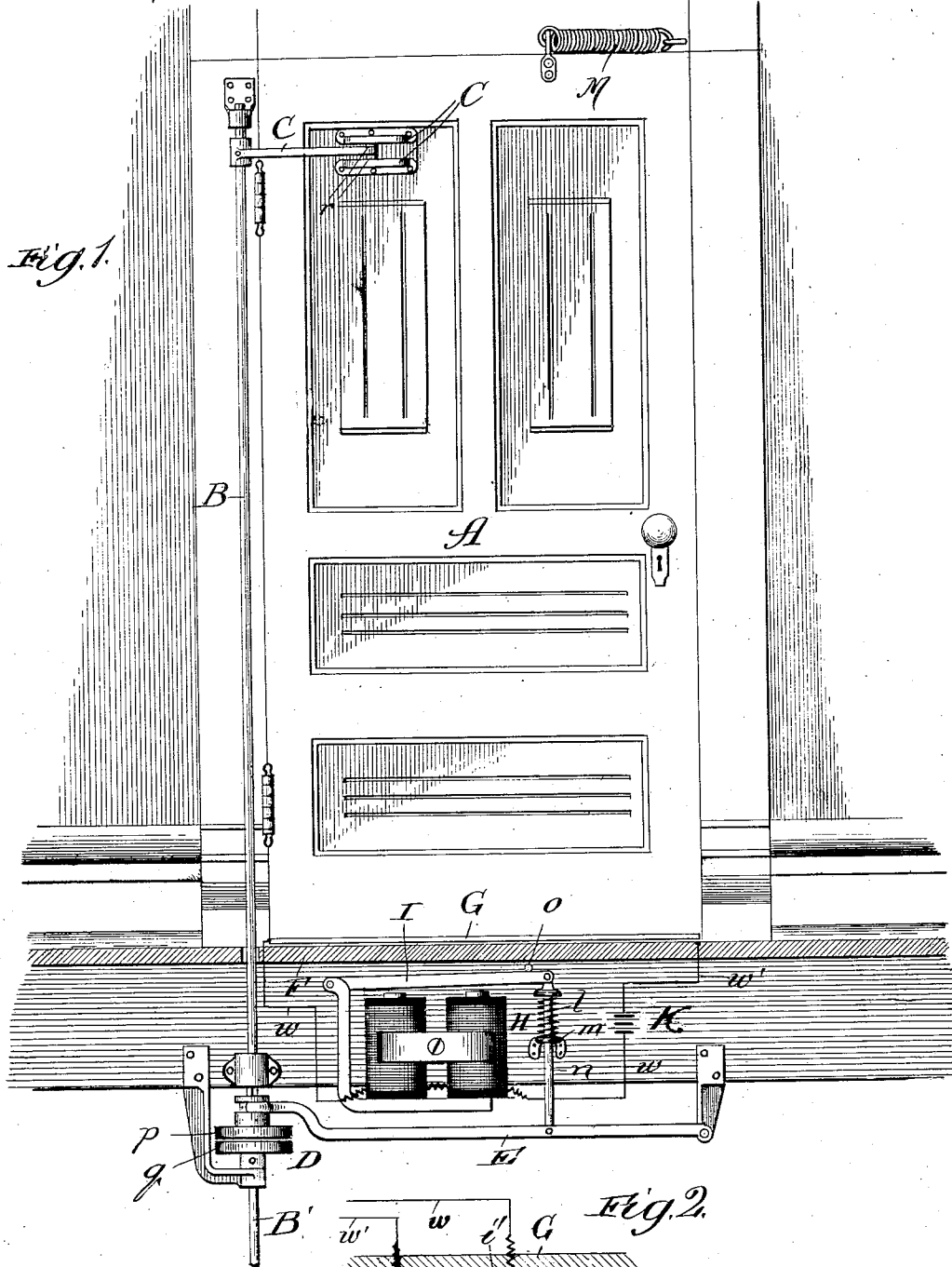


(No Model.)

O. H. HICKS.

No. 554,818.

Patented Feb. 18, 1896.



Witnesses:
C. E. Gaylord,
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Inventor:
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UNITED STATES PATENT OFFICE.

OLIVER H. HICKS, OF CHICAGO, ILLINOIS.

ELECTRIC DOOR-OPERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 554,818, dated February 18, 1896.

Application filed August 24, 1893. Serial No. 583,905. (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 Electric Door-Operating Apparatus, of which the following is a specification.

My invention relates to an improvement in the class of electric door-operating apparatus represented in Letters Patent of the United States No. 461,122, granted October 13, 1891, to R. F. Troy, in which a motor has a connection with a door and by stepping on an electric mat in the approach to the door the motor-circuit is closed to operate the door through its connection therewith.

My present improvement involves the same principle of operation as that of the said patented apparatus. It is but carried out through the medium of a different species of mechanism—namely, an electromagnet cut in and out of circuit by operating an electric mat or analogous electric primary actuating means, and causing, by the resultant movement of its armature, the operation of a motor through its connection with the door to open or close the latter.

In the accompanying drawings, Figure 1 is a view in elevation, partly sectional, showing a door provided with my improvement. Fig. 2 is an enlarged broken sectional view of the electric mat, showing the circuit-wire connection with its contacts.

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 rotatable 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.

B' denotes a shaft of or connected with a suitable motor. (Not shown, but which may be an engine driven by steam, compressed air or electricity.)

D is a friction-clutch, having one member, *q*, rigidly fastened on the shaft B', and the other member, *p*, fastened to slide on the shaft B, being held normally out of engagement with the member *q* by a spring-controlled lever E, fulcrumed at one end below the floor F.

G denotes the primary actuating means, shown as an electric mat 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 mat as the primary actuating means is intended, however, to be only suggestive and to represent one of various means suitable for the same purpose, such as a contact-plate on the door, a yielding contact making and breaking projection extending into the path of the approach to the door and the like, all of which are equivalents of the electric mat.

H is an electromagnet supported in convenient position with relation to the lever E to have its pivotal armature I (the movement of which away from the magnet-poles should be limited by a stop *o*) connected with the lever between its fulcrum and working end by means of a link *n*, movable in a guide *m*, and on which is confined the spring *l*, which normally maintains the lever in position to separate the clutch member *p* from its companion member *q* and also tends to withdraw the armature from the magnet.

The magnet H is in the circuit of a suitable generator K, one wire, *w*, of the circuit extending from one pole of the generator through the magnet to the spring members *i* of the normally-separated contacts L on the mat, and the other wire, *w'*, extending from the other pole of the generator to the members *i'* of the mat-contacts, the connections between which may be made in the usual and well-known manner. For convenience I indicate the electric generator by the symbol ordinarily employed for representing a galvanic battery, though that is only one form of the generator which may be used for my purpose. The source of electric energy most convenient is that for incandescent electric lighting, because quite commonly provided in buildings for use in which my improvement is intended, and then the supply of current for energizing the magnet is taken from the light-

wires by properly connecting with and leading from them the wires *w w'*.

The apparatus thus described is operated by pressure on the mat *G* (such as would be exerted by a person stepping upon it in approaching the door to pass through the doorway) sufficient to bring together the members *i* and *i'* of the spring-contacts *L*, whereby the circuit is closed and the magnet energized to attract its armature and cause it, through the medium of the link *n*, to depress the lever *E* and thus engage the clutch member *p* with its companion member *q*, whereupon the motion of the shaft *B'*, which is normally rotating, is transmitted to the shaft *B* and turns it and the arm *C* in the direction to open the door. As shown, the door opens against the resistance of a spring *M*, fastened at its opposite ends respectively to the door and the casing, which by its recoil closes the door as soon as the magnet-circuit is opened by removing the contact-producing pressure from its mat, as by the person clearing it, whereupon the armature-lever *E* and clutch member *p* resume their normal positions to permit the spring *M* to act as described. However, with the particular mechanism illustrated, no damage would be done by continuing the contact-producing pressure on the mat after the door has completely opened, because the resistance to further opening it would overcome the frictional action of the clutch, causing the members to slip on each other.

It will be quite obvious that without departure from my invention the spring *M* may be arranged to open the door by being set by its closure, then produced by a proper arrangement of the means described for effecting the opening operation, to adapt said

means to be actuated to cause closure. Then the only change (besides that in the arrangement of the spring *M*) in the described mechanism would be to cause pressure on the mat to produce separation of the then normally-engaging clutch members with the shaft *B'* carrying the sliding member and revolving in the direction opposite that described.

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

1. In combination with a door, a rotary shaft carrying a clutch member and connected with the door to operate it by rotation of the shaft, electric primary actuating means, such as an electric mat, in a generator-circuit, a normally-rotating shaft carrying a clutch member, an electromagnet in circuit with said primary actuating means and having a spring-controlled pivotal armature, and a lever engaging one of said clutch members and connected with said armature to be actuated by its movements, substantially as described.

2. In combination with a door, a spring *M* for operating the door in one direction and means for operating the door in the contrary direction comprising a rotatable shaft *B* carrying an arm *C* having a sliding connection with the door and the sliding clutch member *p*, a lever *E* engaging at its free end the clutch member *p*, an electromagnet *II* having a spring-controlled armature *I* linked to the lever, and an electric mat *G* in circuit with the magnet, the whole being constructed and arranged to operate substantially as described.

OLIVER H. HICKS.

In presence of—

L. M. FOXCROFT,
W. N. WILLIAMS.

It is hereby certified that in Letters Patent No. 554,818, granted February 18, 1896, upon the application of Oliver H. Hicks, of Chicago, Illinois, for an improvement in "Electric Door-Operating Apparatus," an error appears in the printed specification requiring correction, as follows: In the heading the words and figures "Serial No. 583,905," should read *Serial No. 483,905*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 29th day of December, A. D., 1896.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

JOHN S. SFYMOUR,
Commissioner of Patents.