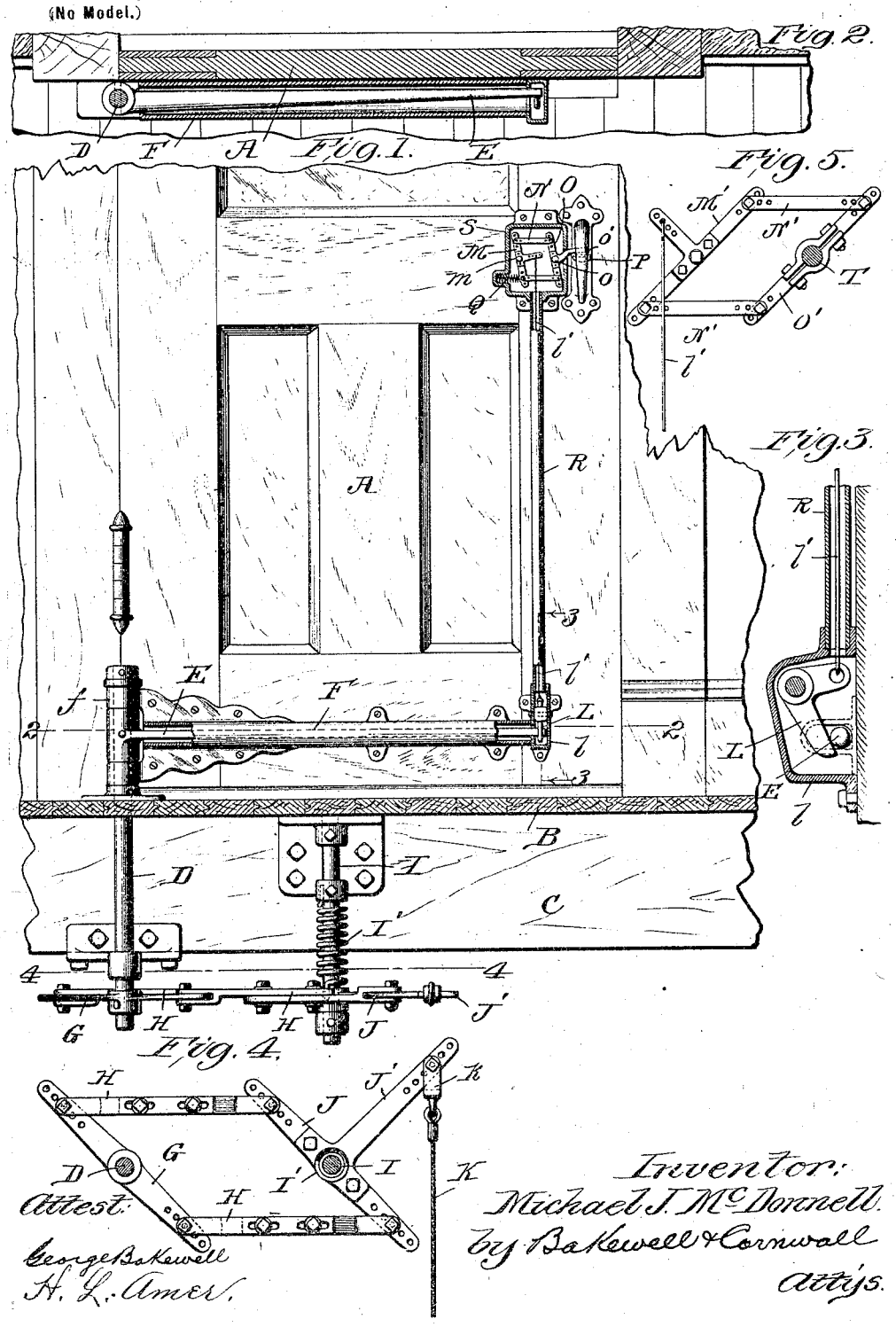
No. 676,149 Patented June 11, 1901.

# M. J. McDONNELL.

## DOOR OPERATING MECHANISM.

(Application filed Jan. 14, 1901.)

(No Model.)



# UNITED STATES PATENT OFFICE.

MICHAEL J. McDONNELL, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO THOMAS J. REID, OF SAME PLACE.

## DOOR-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 676,149, dated June 11, 1901.

Application filed January 14, 1901. Serial No. 43,196. (No model.)

*To all whom it may concern:*

Be it known that I, MICHAEL J. McDONNELL, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Door-Operating Mechanisms, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevational view, partly in section, of my improved door-operating mechanism. Fig. 2 is a horizontal sectional view on line 2 2, Fig. 1. Fig. 3 is a vertical sectional view, enlarged, on line 3 3, Fig. 1. Fig. 4 is a sectional view on line 4 4, Fig. 1; and Fig. 5 is an elevational view showing the latch-operating mechanism as applied to a rotatable knob.

This invention relates to a new and useful improvement in door-operating mechanism, the object being to provide means for opening and closing a door through suitable levers, the operator being located some distance from the door.

With this object in view the invention consists in the construction, arrangement, and combination of the several parts, all as will hereinafter be described and afterward pointed out in the claims.

In the drawings, A indicates a door, B the floor, and C the joist, such parts being of usual construction. Mounted in a suitable bracket bolted to the joist under the floor is a shaft D, which projects up through the floor, preferably in axial alinement with the hinge-pintle of the door. This shaft carries an arm E fixed to its upper end, which arm is located in a housing F, bolted or otherwise secured to the door A. Housing F at its inner end is preferably provided with lugs or ears *f*, which embrace the rod D for the purpose of strengthening the parts. The lower end of rod D carries a lever G, the outer extremities of which are preferably perforated for the purpose of receiving links H. These links may be adjusted along the arms of lever G for the purpose of regulating the throw, as is well understood. Links H are also extensible for the purpose of adjusting their length, the sections composing said links being slotted and receiving screw-bolts, as shown.

I indicates a shaft mounted in a suitable bracket on the joist C, the lower end of which shaft carries a lever J, the arms of which are perforated and have secured to them the links H. The perforations in the ends of these arms of lever J enable the links to be adjustably mounted therein for well-understood purposes. Shaft I also has mounted upon it a torsional spring I' for the purpose of restoring the lever J to its normal position, the said lever being rotatably mounted on the shaft I for this purpose.

J' indicates an extension of lever J, the outer end of which is provided with a series of perforations for an adjustably-mounted clip *k*, arranged on the end of an operating-cable K. This cable K extends back into the building to any point from which it is desired to operate the door.

The manner in which the door is opened from shaft D is primarily through the arm E, which engages the housing F and forces said door inwardly. However, as latches are usually provided to hold the door in its closed position, it is necessary to operate the latch previously to opening the door, and to accomplish this the arm E has a slight lost motion in the housing F, which lost motion is utilized in operating the latch preparatory to swinging the door on its hinges.

Referring to Fig. 3, it will be seen that bell-crank lever L is mounted in a suitable housing *l*, into which housing the outer end of arm E is received. The normal position of arm E is against the door, due to the tension of spring I'; but when the rod D is operated it moves outwardly in the housing F, operating the bell-crank lever L until said arm strikes the housing and is in readiness to apply its power in opening the door. During this time the operation of lever L, through a link *l'*, actuates a lever M, said lever being pivoted at *m* and consisting of three arms or members, each of which is provided with a series of perforations for the purpose of adjustably connecting the associate parts thereto. The link *l'* is connected to one of these

arms, as shown in Fig. 1, while to the other of these arms are adjustably connected links N, the other ends of said links being adjustably connected to a lever O, pivoted at *o*, said lever O carrying an arm *o'*, which extends over a depressible thumb-latch P. A spring Q coöperates with one end of lever M for the purpose of elevating the arm *o'* and restoring the parts to their normal positions when the arm E is restored to its normal position against the door A. A housing R is preferably provided for the link *l'* and a housing S is also arranged to inclose the link N and its associate parts.

By referring to Fig. 5 it will be seen that the lever M', the links N', and the lever O', corresponding in all respects to the levers M and O and the links N, heretofore described, are arranged to rotate a knob, lever O being provided with a clamping device for encircling the shank T of the knob, which shank also forms the fulcrum for the lever.

From the above it will be seen that my improved door-operating mechanism enables an operator to stand some distance within the building and open the door at will by the manipulation of a lever, the door-operating mechanism first withdrawing the bolt of the door and then swinging the door on its hinges. When the mechanism is released by the operator, it is restored to its normal position by appropriate springs and the door is closed. The presence of my improved mechanism on a door does not prevent the manual opening and closing of the door by the proper manipulation of the thumb-latch or knob. By the arrangement of the parallel links the strain is equally distributed, and the liability of the parts becoming disarranged is thus lessened.

I am aware that minor changes in the arrangement, construction, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. In a door-operating mechanism, the combination with a power-shaft in axial alinement with the hinge-pintles of the door, an arm extending laterally from said po er-shaft, a housing F secured to the door and into which said arm extends, a latch mechanism which is operated by the initial movement of said arm, while a continued movement of said arm will cause the same to contact with said housing F and effect the opening of the door, and mechanism for operating said power-shaft; substantially as described.

2. In a door-operating mechanism, the combination with a power-shaft in axial alinement with the hinge-pintles of the door, an arm extending laterally from said power-shaft, a housing F secured to the door and into which said arm extends, a latch mechanism which is operated by the initial movement of said arm, while a continued movement of said arm will cause the same to contact with said housing F and effect the opening of the door, a lever secured to the lower end of said power-shaft, a torsional spring for holding said power-shaft and its carried parts in a given position, and means for operating said power-shaft; substantially as described.

3. In a door-operating mechanism, the combination with the door, of a housing mounted thereon, a shaft carrying an arm projecting into said housing, a bell-crank lever having one member in the path of said arm, and a latch-operating mechanism actuated by said bell-crank lever prior to the engagement of the arm with said housing; substantially as described.

4. In a door-operating mechanism, the combination with the door, of a housing mounted thereon, a shaft, an arm extending from said shaft into the housing, a bell-crank lever designed to be operated when the arm is moving in said housing, a latch-operating mechanism comprising levers M and O and links N, and a rod connecting the bell-crank lever with lever M; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 11th day of January, 1901.

MICHAEL J. McDONNELL.

Witnesses:
WM. H. SCOTT,
GEORGE BAKEWELL.