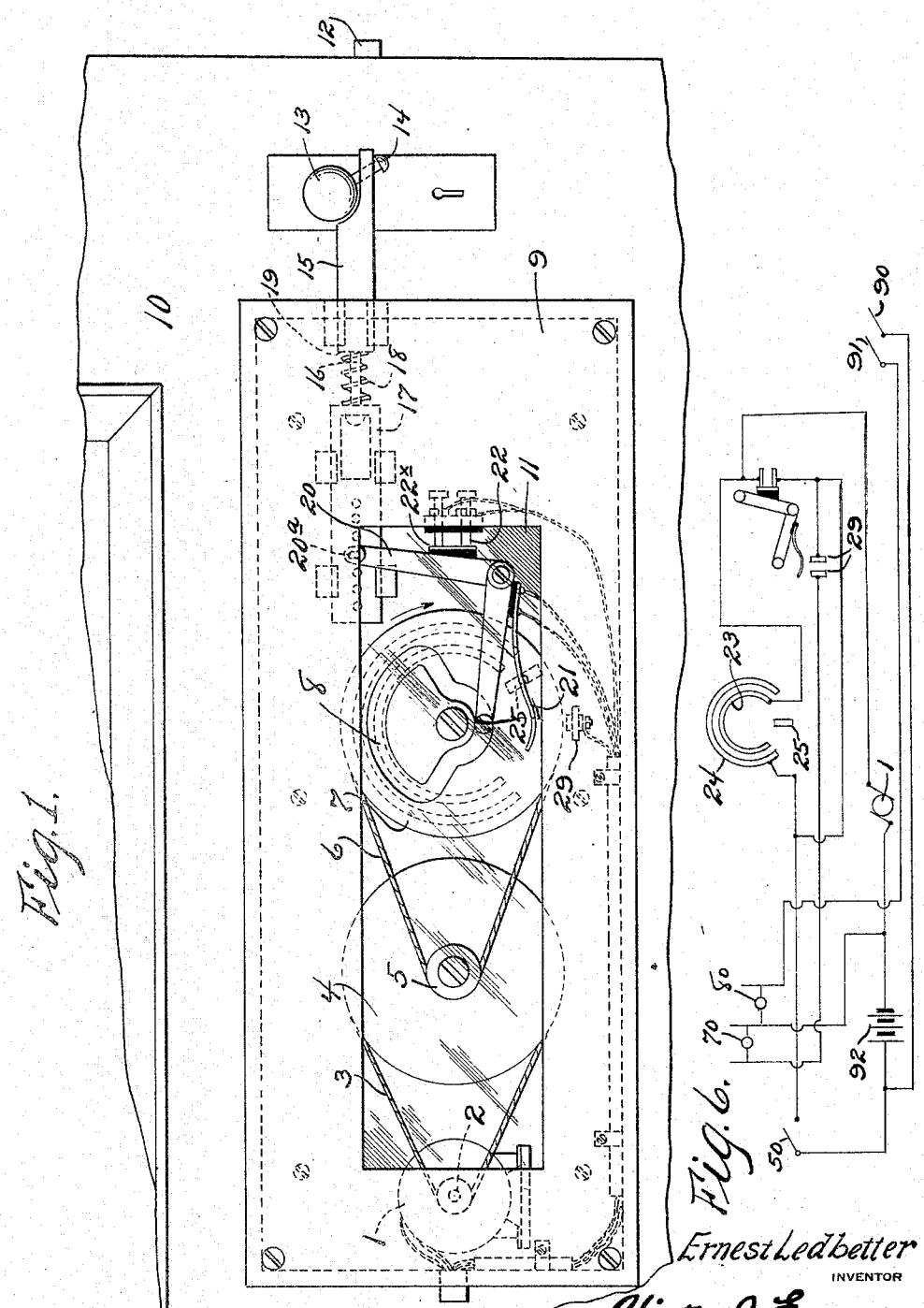
Nov. 24, 1925. 1,563,198

E. LEDBETTER

ELECTROMECHANICAL DOOR RELEASING MEANS

Filed April 4, 1925 2 Sheets-Sheet 1



Ernest Ledbetter
INVENTOR

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WITNESS: John Donovan

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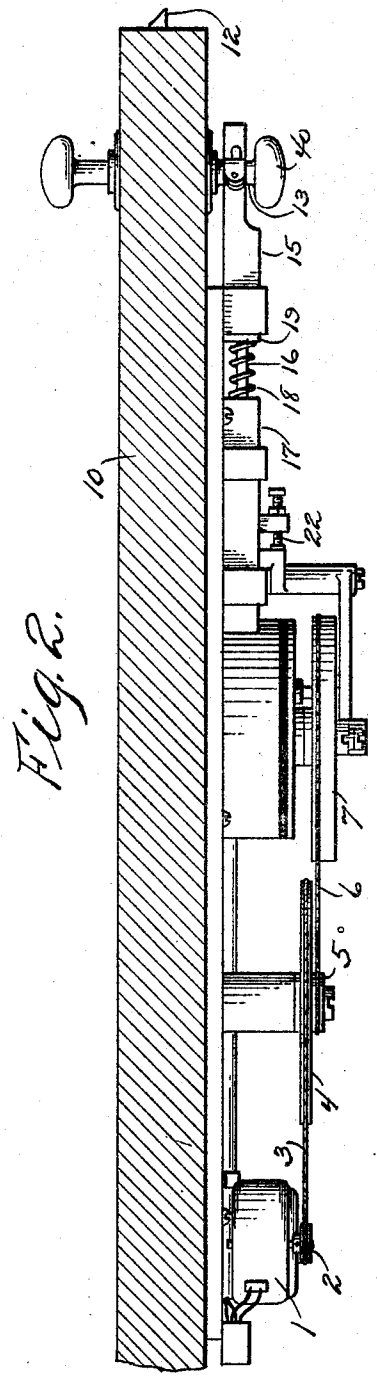


Fig. 2.

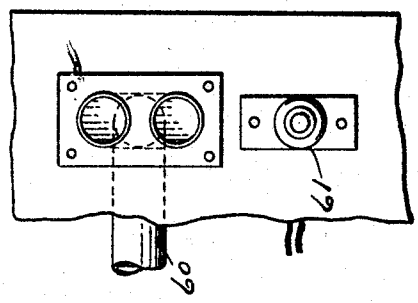


Fig. 4.

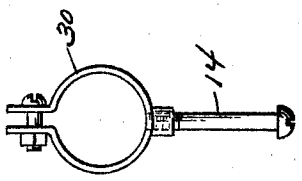


Fig. 5.

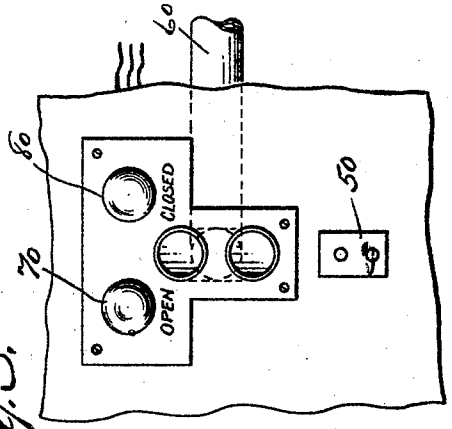


Fig. 3.

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UNITED STATES PATENT OFFICE.

ERNEST LEDBETTER, OF ST. LOUIS, MISSOURI.

ELECTROMECHANICAL DOOR-RELEASING MEANS.

Application filed April 4, 1925. Serial No. 20,876.

To all whom it may concern:

Be it known that I, ERNEST LEDBETTER, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented new and useful Improvements in Electromechanical Door-Releasing Means, of which the following is a specification.

The object of my said invention is the provision of peculiar and advantageous electromechanical means through the medium of which a person on an upper floor of a building is enabled when apprised of the identity of another person at the street door of the building to release the street door so that such other person may enter, thus obviating the necessity of the person on the upper floor descending to the street floor for the purpose of admitting the second-named person.

Other objects and practical advantages will be understood from the following description and claims when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:—

Figure 1 is a side elevation illustrating a portion of the mechanism constituting the preferred embodiment of my invention.

Figure 2 is a horizontal section of the same.

Figure 3 is a view showing the switch and signal lights designed to be located on the upper floor of a building.

Figures 4 and 5 are views of details hereinafter explicitly referred to.

Figure 6 is a diagrammatic view illustrative of the electric connection.

Similar numerals of reference designate corresponding parts in all of the views of the drawings.

I show in Figures 1, 2 and 6 an electric motor 1, the armature shaft of which is equipped with a pulley 2, connected through a belt 3 with a larger pulley 4, the said pulley 4 being fixed to a smaller pulley 5 which is connected through a belt 6 with a disk 7 adapted to be rotated and provided with a cam 8. All of this mechanism is enclosed by preference in a casing 9 which is carried by a street door 10, and which preferably has a pane of glass 11, so that the working of the mechanism may be observed by a person at the inner side of the said street door 10. The door 10 referred to is provided with a rectilinearly movable latch 12 for securing it in closed position, the said latch bolt 12 being connected in the ordinary well known manner with a rotary shank 13 at the inner side of the door, and the said shank 13 being equipped with an arm 14 to which is connected a bar 15 movable through the forward wall of the casing 9. At its rear end the bar 15 is provided with a headed reduced portion 16 which extends through an aperture at the forward end of a slidable bar 17 disposed in guides within the casing 9. A coiled spring 18 surrounds the bar portion 16 and is interposed between the forward end of the slidable bar 17 and an abutment 19 on the bar 15. Manifestly when the bar 17 is moved toward the left in Figure 1 the bar 15 and the latch bolt 12 will be retracted and the door 10 released for the opening of said door 10; and it will also be noticed that the bar 15 may be moved toward the left in Figure 1 without movement of the bar 17, this in order to permit of the latch bolt 12 being retracted by a person at the inner side of the door as when such person desires to leave a building.

In addition to the elements enumerated my improvement comprises a bell crank 20 engaged with and designed to be controlled by the cam 8, and connected at 20^a with the bar 17. The said bell crank 20 is located in the casing 9 as are also terminals 21 and 22. Back of the rotary disk 7 are stationary terminals 23 and 24, designed to be engaged by a conductive shoe 25 on the disk 7 which conductive shoe 25 is electrically connected with the terminal 21. At 29 are terminals shown in Figures 1 and 6 and designed to be bridged to but insulated from the lower arm of the bell crank 20. A conductive plate 22^x is carried by but insulated from the upper arm of the bell crank 20 and is designed in one position to electrically connect the terminals 22.

In the preferred embodiment of my invention the arm 14 before alluded to is fixed on the shank 13 by a clip 30, Figures 2 and 5. It will also be noted that the said shank 13 is provided with the usual handle or knob 40, Figure 2.

In accordance with my invention an electric switch 50 is arranged near the upper floor of a building and adjacent to a speaking tube 60 which extends from such upper floor to a point outside of and adjacent to the door 10, and is designed to enable a person seeking entrance to state his name and

business to a person on the upper floor. The lower portion of the speaking tube 60 is shown in Figure 4, and is preferably arranged adjacent to a push button 61 in connection with an electric bell (not shown). Also arranged adjacent to the switch 50 and the upper end of the speaking tube 60 are incandescent electric lamps 70 and 80, the said lamps being arranged adjacent to appropriate legends and being designed to indicate when the door is unlatched and when the door is latched, respectively.

I illustrate in Figure 6 a terminal 90 carried by the frame or casing of the door 10, and I also illustrate a terminal 91 which contacts with the terminal 90 when the door is closed and is separated from the terminal 90 when the door is opened.

The electrical connections are preferably such as shown in Figure 6, the source of electric energy being designated by 92. It is to be understood, however, that any other appropriate electrical connections may be employed without departure from the scope of my claimed invention.

In the practical operation of my improved mechanism when a person at the street door presses against the push button 61, Figure 4, or otherwise rings an alarm bell on an upper floor of the building, the occupant of the upper floor calls through the speaking tube 60 and then if such occupant desires to permit the entrance of the party at the street door he or she closes the switch 50. This puts in motion the electric motor 1 and brings about turning of the disk 7 in the direction indicated by arrow in Figure 1. When this is done the bar 17 and the latch 12 will be retracted for the release of the door, and it will be understood that the latch 12 will be maintained in retracted position incident to the turning of the disk 7 through a complete revolution, and at the end of such revolution the parts will be restored to the illustrated positions and the door will be again latched. This is advantageous because it makes necessary a momentary closure of the switch 50 and also because it makes it incumbent on the person at the street door to promptly enter upon actuation of the mechanism. When the disk 7 is turned in the direction indicated it will be noted that the lamp 70 will be lighted and that the terminal 21 will bridge and electrically connect the terminals 29, and it will also be noted that the conductive plate 22× on the bell crank 20 will be moved away from the terminals 22 thereby breaking the circuit at that point. It will further be noted that incident to the turning of the disk 7 the conductive member 25 thereon will electrically connect the arcuate terminals 23 and 24 so that current will pass between said terminals and through the same. When after a revolution of the disk 7 the parts resume the positions shown in Figure 1 it will be noted that the electrical connections between the terminal 21 and the terminals 29 and between the conductive member 25 and the terminals 23 and 24 will be interrupted while the electric connection between the terminals 22 will be reestablished. From this it follows that the mechanism after retraction of the latch bolt 12 and after the maitnenance of the said bolt 12 in a retracted state for a limited time will electrically reseat itself and be in readiness for another operation. Manifestly when the terminal 91 is in contact with the terminal 90 the filament of the lamp 80 will be caused to glow to indicate that the door 10 is closed, the circuit for that purpose being from the plus pole of the source of energy 92 through wire to and through the filament of the lamp 80 and then through wire to and through the terminals 91 and 90 and then through wire back to the negative pole of the source of energy. When the switch 50 is closed the current will pass from the plus pole of the source of energy through the motor and through wire to one of the terminals 22, then through the plate 22× to the other terminal 22, and then through wire to and through the switch 50 and back through the source of energy 92. Following the rotation of the disk 7 the electric connection between the terminals 22 will be interrupted and electric connection will be established between the terminals 29 and also between the terminals 24 and 23 by the means and for the purpose described. On the initial movement of the disk 7 in the direction indicated by arrow the connection between the terminals 22 will be interrupted and electrical connection will afterward be established between the terminals 29, and thereafter electric connection will be established between the terminals 23 and 24, the latter connection being maintained during a considerable portion of the revolution of the disk 7, and it being noticed in this connection that the sole province of the element 21 is to electrically connect the terminals 29, and that said element 21 has no electric connection with the conductive member 25.

I have specifically described the preferred embodiment of my invention in order to impart an exact understanding of said embodiment. I do not desire, however, to be understood as confining myself to the specific construction and relative arrangement of parts, the scope of my invention being defined by my appended claims within which changes may be made without departure from my invention.

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

1. Electromechanical door releasing means

comprising a latch bolt complementary to a door, a bar connected with and adapted on movement thereof in one direction to retract said bolt, and a rotor, a cam movable therewith and a bell crank for retracting said bar, said rotor being operable by an electric motor, and said motor being arranged in a normally interrupted circuit with a source of electric energy and switch means, and means being provided on the rotor and on the bell crank for interrupting and reestablishing the electric circuit.

2. Electromechanical door releasing means comprising a latch bolt complementary to a door, a bar connected with and adapted on movement thereof in one direction to retract said bolt, and a rotor, a cam movable therewith and a bell crank for retracting said bar, said rotor being operable by an electric motor, and said motor being arranged in a normally interrupted circuit with a source of electric energy and switch means, and means being provided on the rotor and on the bell crank for interrupting and reestablishing the electric circuit; the said latch bolt being combined and movable with a supplemental rectilinearly movable bar, and the said bar being provided with a reduced and headed portion movable in one direction independently of the first-named bar, and a coiled spring surrounding said reduced portion and interposed between opposed portions of said bars.

3. In electromechanical door releasing means, the combination of a latch bolt carried by and movable in a door, a bar connected with and adapted when moved in one direction to retract said bolt, a disk or rotor, an electric motor arranged in a normally open circuit with a source of electric energy and circuit making and breaking means and connected with and adapted to turn said disk or rotor, a bell crank connected with said bar and equipped with circuit closing means, a cam carried by the disk or rotor and connected with and adapted to actuate said bell crank, a conductive member carried by the disk or rotor, stationary spaced terminals for cooperation with said conductive member, terminals for cooperation with one of the circuit closing means of the bell crank and terminals adapted for cooperation with the other circuit closing means of the bell crank; the said terminals and circuit closing means being electrically connected with the source of electric energy and the motor and switch means substantially as described.

In testimony whereof I affix my signature.

ERNEST LEDBETTER.