

Apr. 17, 1923.

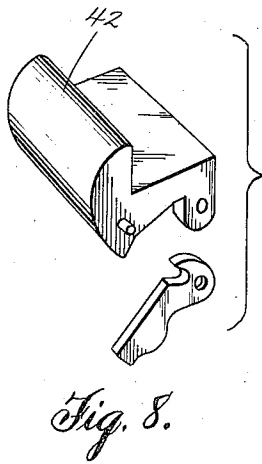
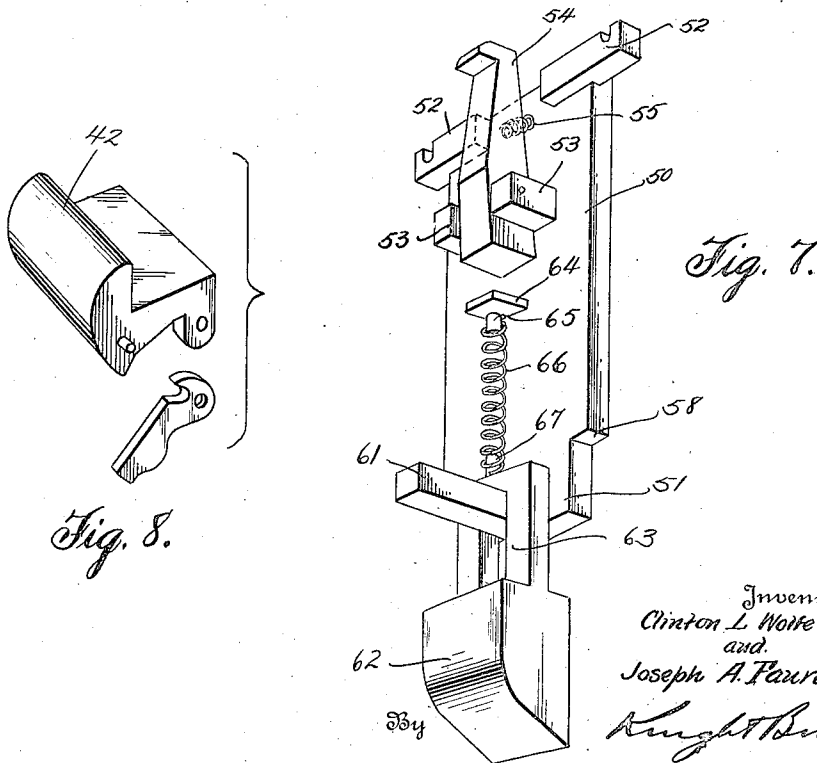
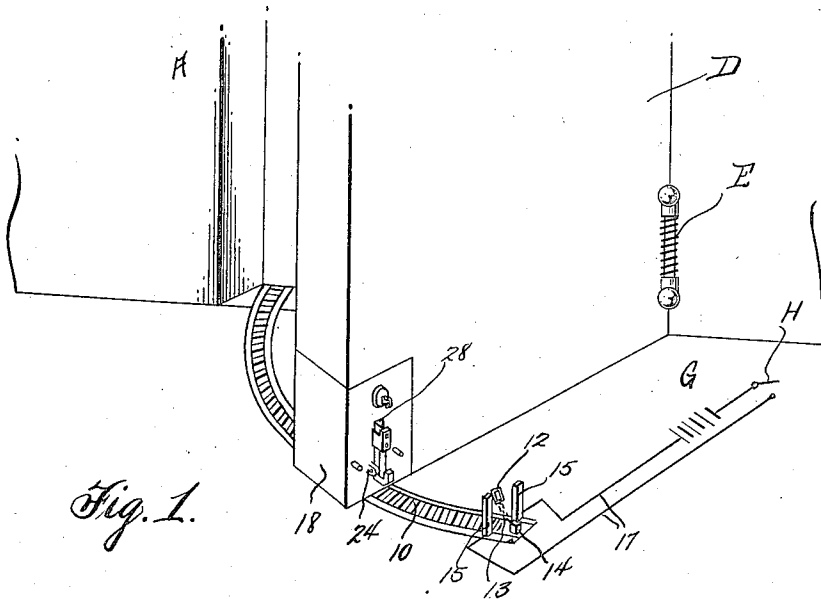
C. L. WOLFE ET AL

1,452,014

ELECTRIC LOCK AND DOOR CONTROL DEVICE

Filed July 1, 1921

4 Sheets-Sheet 1



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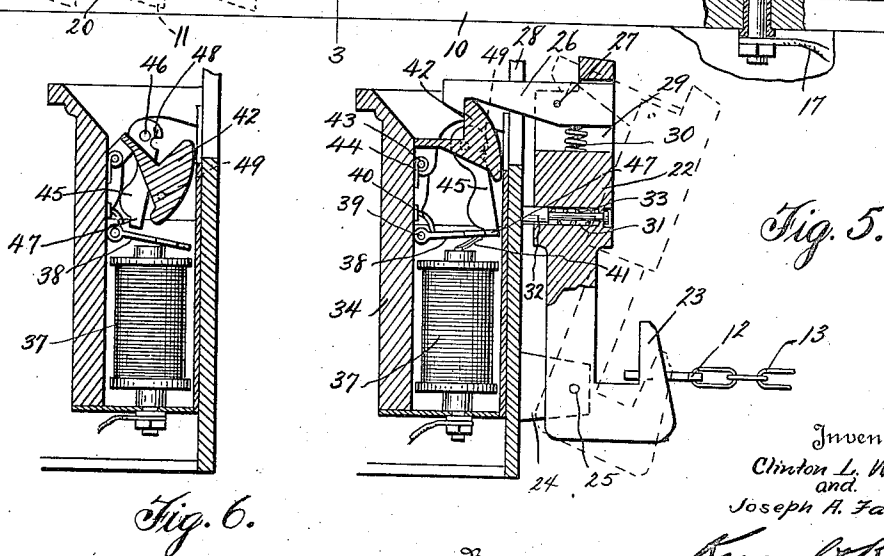
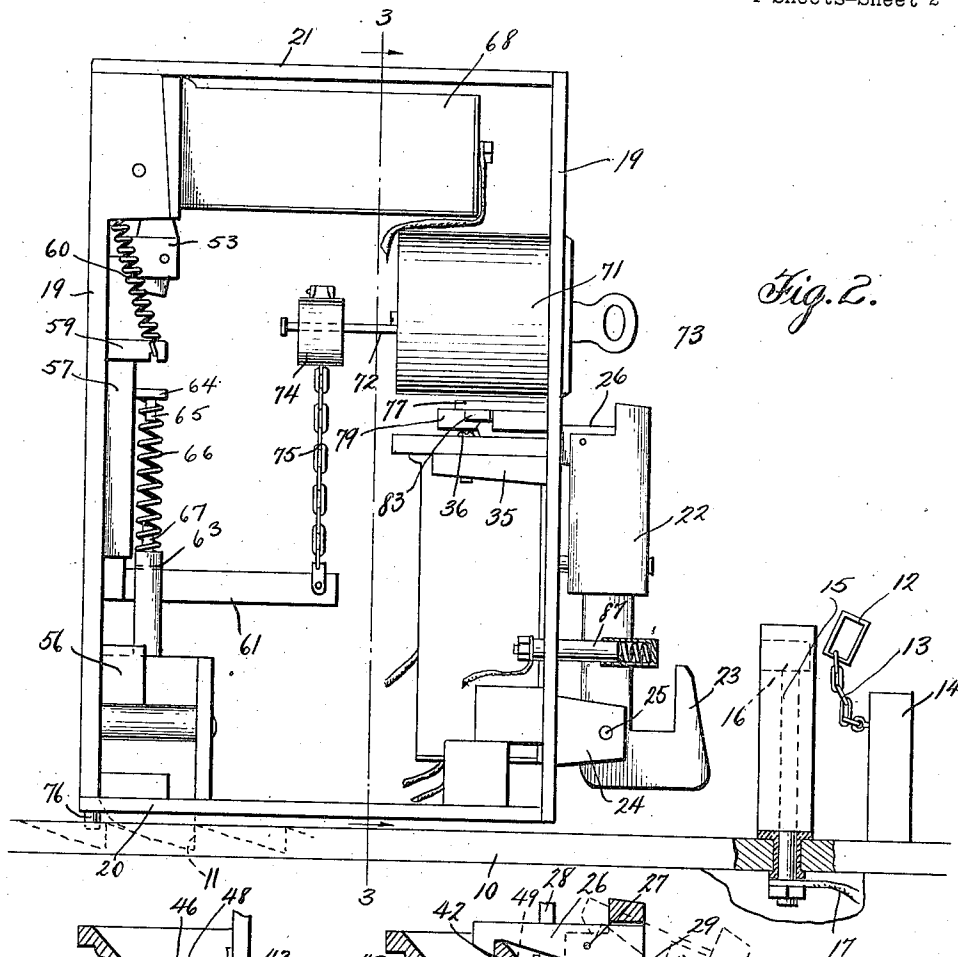
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1,452,014

ELECTRIC LOCK AND DOOR CONTROL DEVICE

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4 Sheets-Sheet 2



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ELECTRIC LOCK AND DOOR CONTROL DEVICE

Filed July 1, 1921

4 Sheets-Sheet 3

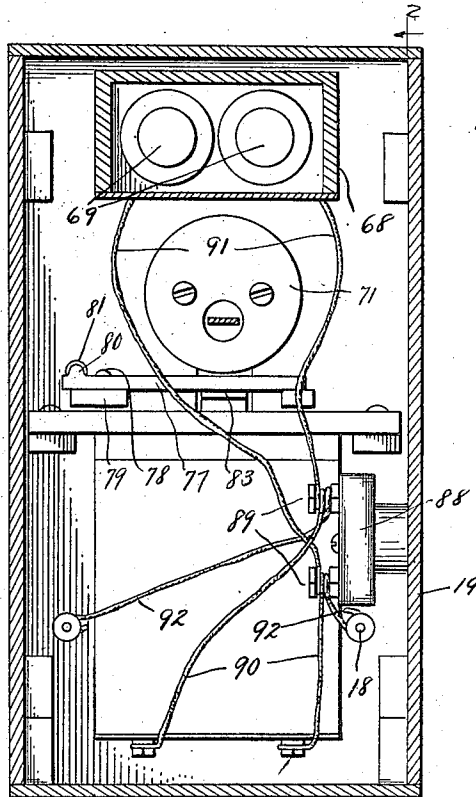


Fig. 3.

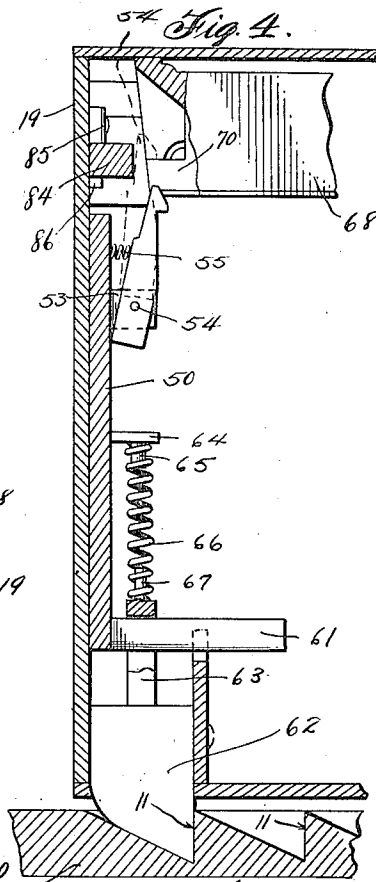


Fig. 4.

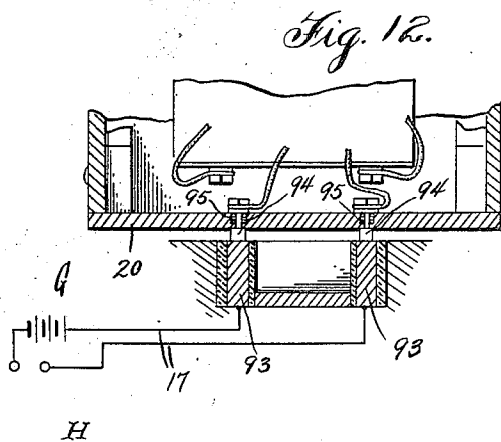


Fig. 12.

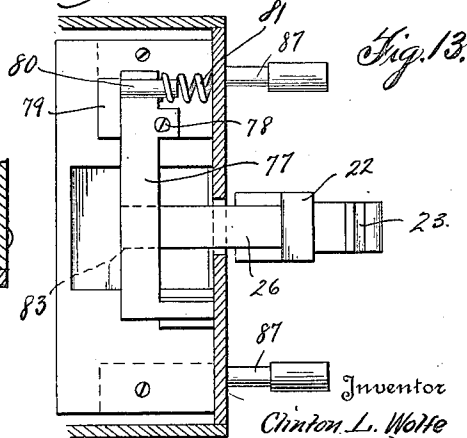


Fig. 13.

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4 Sheets-Sheet 4

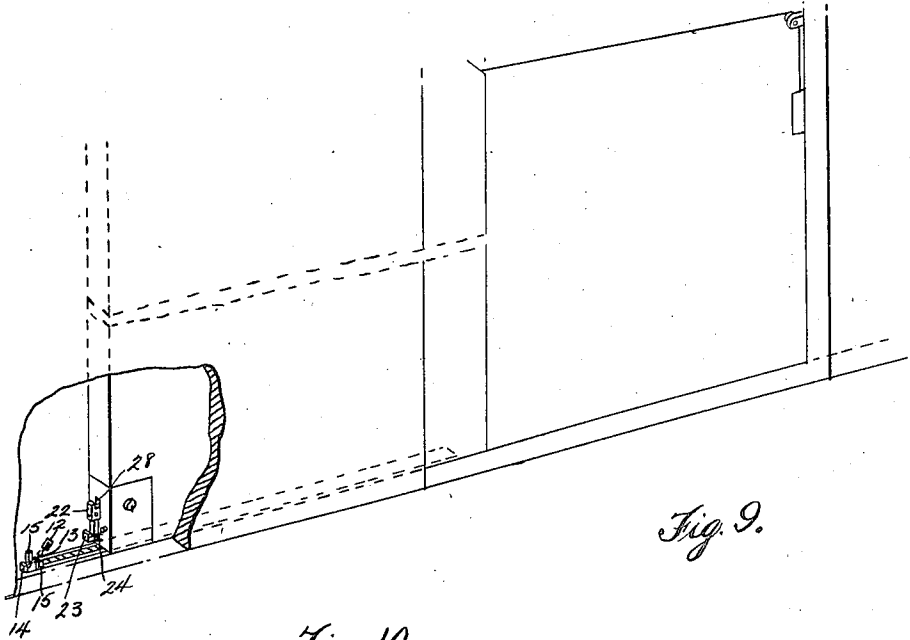


Fig. 9.

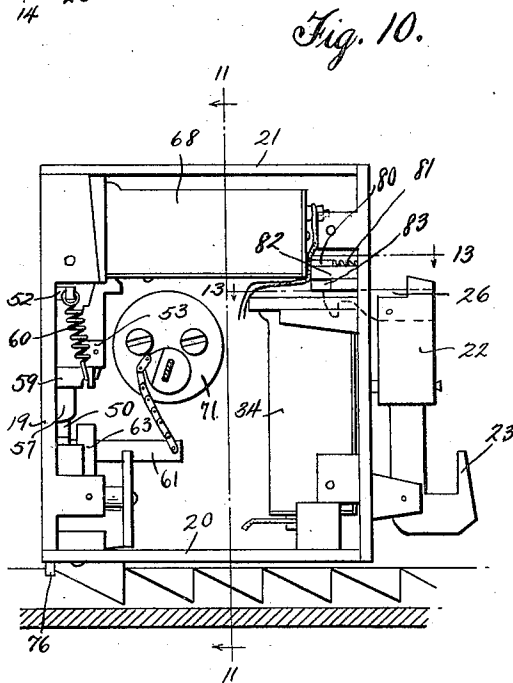


Fig. 10.

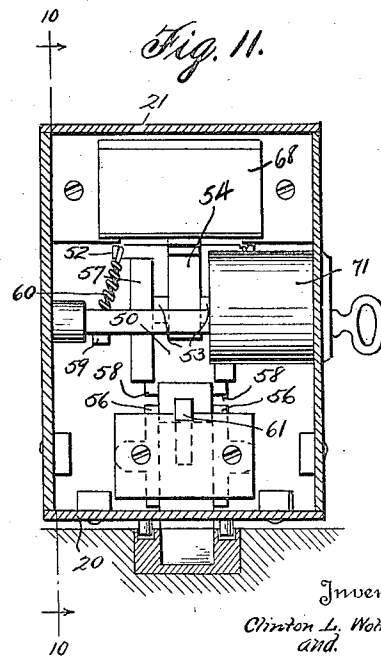


Fig. 11.

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UNITED STATES PATENT OFFICE.

CLINTON L. WOLFE, OF BROOKLYN, AND JOSEPH A. FAUROT, OF NEW YORK, N. Y.

ELECTRIC LOCK AND DOOR-CONTROL DEVICE.

Application filed July 1, 1921. Serial No. 481,764.

To all whom it may concern:

Be it known that we, CLINTON L. WOLFE, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, and JOSEPH A. FAUROT, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Lock and Door-Control Devices, of which the following is a specification.

Our invention relates to electric locks and door controlling devices and is so designed that it may be applied to doors of the swinging or sliding type.

Our invention is particularly adapted for use in connection with the doors and gates of bank vaults or the like. The control feature of our invention may be employed in connection with fire doors so as to permit the control of one or more of such doors from a distance.

In employing our invention the doors to which it is attached must be so constructed that they close automatically, this being accomplished by the provision of such means as spring hinges, weights or the like. For retaining the door in open position we provide a releasable hook adapted to engage a keeper, thus retaining the door or gate in open position against the tension of the spring hinges, weights or the like. This releasable hook is electrically controlled and upon closing of a circuit this hook will be released to permit the door to swing to a closed position.

Our invention further contemplates the provision of a locking means in the form of a pawl and ratchet mechanism. The pawl is mounted within a casing carried by the door and within which are disposed the several operative parts of this invention. The pawl is adapted to engage a ratchet secured preferably upon the floor although in some instances, it has been found desirable to mount this ratchet upon the ceiling. Obviously, when this invention is used in connection with a swinging door the ratchet must be curved on an arc described by the outer edge of the door.

The pawl is normally held in inoperative position and is released by an electrically controlled means whereby it may assume its operative position for engagement with the ratchet. The electrical means for controlling the releasable hook and the pawl may

be and are preferably operative from the same source. In this behalf, the casing containing the several parts is provided with a pair of contacts which are adapted to engage a pair of contacts mounted adjacent the keeper. When the door is in its open position the contacts mounted on the casing engage the stationary contacts adjacent the keeper and complete an electrical circuit. Hence, when it is desired to energize the electrical devices, it is only necessary to close the electric circuit whereby the electrical devices within the casing will function to release the hook thereby permitting the door to swing closed and simultaneously release the pawl so that it comes in engagement with the ratchet.

Instead of providing a pair of contacts to engage the contact carried by the casing we may provide a pair of contact segments disposed on either side of the ratchet at the end corresponding to the open position of the door. In this construction a pair of contact brushes would be mounted upon the casing at the underside thereof and in position to engage these contact segments when the door is in open position, thus completing the electrical circuit. In the two structures just described, it should be noted that it is unnecessary to run wires through the door to electrically connect the operative elements within the casing to a source of current.

The various features of our invention will be made more apparent in the accompanying specification and drawings, in which:

Figure 1 is a perspective view of the portion of a door equipped in accordance with our invention.

Figure 2 is a section through the casing containing the operative parts of our invention, on line 2—2 of Figure 3 looking in the direction of the arrow,

Figure 3 is a section on line 3—3 of Figure 2 looking in the direction of the arrow,

Figure 4 is a vertical fragmentary section of one side of the casing showing the pawl in released position and engaging the ratchet,

Figure 5 is a fragmentary vertical section through the releasable hook.

Figure 6 is a section similar to Figure 5, with the hook member omitted, showing the control device in another position,

Figure 7 is a perspective view of the pawl and some of its associated parts,

Figure 8 is a separated perspective view of the latch members associated with the electrical control means,

Figure 9 is a fragmentary perspective view of a sliding door equipped with our invention, the structure of the parts within the casing being slightly re-arranged,

Figure 10 is a vertical section of the lower edge of the door taken on line 10—10 of Figure 11, looking in the direction of the arrow,

Figure 11 is a section taken on line 11—11 of Figure 10, looking in the direction of the arrow,

Figure 12 is a fragmentary transverse section of the lower edge of the door and ratchet showing a modified form of electrical contact, and

Figure 13 is a fragmentary section taken on line 13—13 of Figure 10 looking in the direction of the arrow.

In Figure 1 is illustrated a door D provided with spring hinges E which tend to swing the door closed in the direction of arrows F. It should be understood that while we have elected to illustrate and describe our invention as used in connection with a swinging and sliding door, it may be obviously employed in connection with swinging and collapsible gates and closures of various types.

Mounted upon the floor and preferably flush with the top surface thereof, is provided a rack or ratchet 10, which in Figure 1 is shown as curved on an arc corresponding to that described by the edge of the door as it moves from open to closed position.

As clearly shown in Figures 2 and 4, this ratchet is formed with its abrupt faces 11 facing the opening which the door is adapted to close thereby enabling the pawl which cooperates therewith and which will be described hereinafter to ride over this ratchet while closing, but preventing a movement of the door toward open position. At the end of the rack corresponding to the open position of the door there is provided a keeper 12 secured by a flexible member such as a chain 13 to a stud 14 projecting from the rack. This keeper 12 is adapted to engage a releasable hook mounted on the casing which is carried by the lower edge of the door, to retain the door in open position against the tension of such closing means as the spring hinges E for instance. Projecting upwardly from both sides of the rack are a pair of contact carrying members 15 provided with contact sockets 16 to which electrical conductors 17 are connected. In Figure 1 these conductors 17 are illustrated diagrammatically and are shown as connected to a source of power G and a switch H.

The lower edge of the door D is cut away in order to accommodate a housing or cas-

ing 18 formed with sides 19 and a bottom and top 20 and 21 respectively.

Mounted upon the wall 19 which when the door is in open position will be immediately adjacent the outer end of the rack is a releasable hook member 22 provided with a hook end 23. A pair of ears 24 projecting rigidly from the wall 19 cooperate with a pin 25 for pivotally mounting this releasable hook member upon the casing 18. A latch 26 pivoted as at 27 to the upper end of the member 22 projects through an aperture 28 formed in the wall 19 of the casing, for a purpose to be more fully described. The member 22 is cut away as at 29 to accommodate this latch and a spring 30 disposed between the latch and the bottom of the cut away portion 29 tends to swing the outer end of the latch, as viewed in Figure 5, upwardly, against the top of this cut away portion. The member 22 is further apertured as at 31 to accommodate a plunger 32 influenced by a spring 33 which tends to project the plunger 32 outwardly so that it bears against the wall 19 of the casing (see particularly Figure 5).

Cooperating with the releasable hook member 22 for retaining it in its operative or upright position, there is provided an electro-magnetically operated latch member contained in a casing 34 secured to the inner side of the wall 19 by means of projections 35 and bolts 36. Contained within this casing are a pair of electro-magnets 37 which influence a plate 38 pivoted as at 39 to cause it to swing downwardly as indicated by the arrow (see Figure 5). This plate is retained in its raised position and against a stop 40 by a leaf spring 41. A latch 42 cooperates with the latch 26 and is pivoted on a rod 43 secured to the casing 34.

A coil spring 44 surrounds this rod 43, its ends bearing against the latch 42 and the casing 34 respectively, thereby tending to retain the latch in its raised position. A pair of hook-shaped detents 45 are pivoted as at 46 to both sides of the casing 34 and lie immediately adjacent the ends of the latch 42. These detents are each provided with a projecting end 47 and a notch 48. When the plate 38 is in its elevated position it engages the projecting ends 47 of both detents 45 and holds them in the position illustrated in Figure 5. In this position pins 49 projecting from the ends of the latch 42 are lodged in the notches 48 of the detents and prevent downward movement of the latch 42 in engagement with the latch 26. When, however, the electro-magnets 37 have been energized they attract plate 38 and cause it to swing downward in the direction of the arrow (see Figure 5), sufficiently to clear the projecting ends 47 of detents 45. With these detents thus freed, the tendency of the latch 42, caused by the pull exerted by the latch 26, to swing downwardly, rotates the detents

45 about their pivots 46 to a position illustrated in Figure 6 wherein the pins 49 clear the notches 48 and permit the latch 42 to swing to the position illustrated in Figure 6 thereby freeing the latch 26 and permitting the hook carrying member 22 to swing on its pivot 25, thereby allowing the keeper 12 to slide off the hooked end 23.

On the wall 19 opposite that upon which the releasable hook member is mounted and within the casing 18 there is slidably supported a pawl carrying member 50 (see particularly Figures 2, 4 and 7.) This pawl carrying member is in the form of a plate, cut away at its lower end to form a reduced portion 51 and provided with laterally extending projections 52 at its upper end. A pair of ears 53 pivotally support a latch 54 for a purpose to be more fully hereinafter described. A coil spring 55 interposed between the plate 50 and the latch 54 (see particularly Figures 4 and 7) tends to normally retain the latch 54 in a projected position.

The reduced end 51 of the plate 50 slides between a pair of guides 56 projecting inwardly from the side 19 of the casing (see particularly Figures 2 and 11). A second pair of vertically disposed guides 57 engage the pawl carrying plate 50 adjacent its upper end, these two pair of guides slidably mounting this pawl carrying plate upon the wall 19 of the casing so as to permit a vertical movement thereof within restricted limits. By reducing the lower ends of the plate 50 as shown at 51 a pair of shoulders 58 are formed, which about the upper end of the guides 56 to limit the downward movement of this plate 50. It is likewise obvious from an examination of Figure 11 that the lateral projections 52 about the upper ends of the guides 57 when the plate 50 has reached the limit of its downward travel. Projecting from the side 19 are a pair of studs 59 to each of which is secured one end of springs 60. The other ends are connected to the plate 50 through the projections 52. These springs 60 tend to normally retain the plate in its lower position, for a purpose to be more fully hereinafter made apparent.

The plate 50 is further provided with a stud 61 disposed centrally of the reduced end 51 as clearly illustrated in Figure 7. A pawl 62 is provided with a slotted extension 63 which straddles the projection 61 thereby permitting of independent movement between the pawl 62 and the plate 50, but providing for a simultaneous movement of the pawl 62 and the plate 50, in some instances, by reason of the engagement of the projection 61 with one or the other end of the slotted projection 63. An ear 64 projecting from the plate 50 is provided with a stud 65 which receives one end of a coil spring 66, the other end of which bears against the pawl 62 and is retained in engagement therewith by rea-

son of a stud 67, all of which is clearly illustrated in Figure 7. The purpose of this spring is to normally project the latch 62 so that the projection 61 will engage the upper end of the slot formed in the extension 70 63.

Secured immediately adjacent the top 21 of the casing is a housing 68 which contains a second pair of electro-magnets 69 similar to those previously described in connection 75 with the releasable hook member. Construction of this electro-magnetic device is precisely the same as the one hereinbefore described and a further detailed description is therefore, believed to be unnecessary. 80 This electro-magnet is provided with a latch 70 which corresponds with the latch 42 of the previously described electro-magnets. This latch 70 is adapted to be engaged by the latch 54 mounted upon the upper end of the pawl carrying member 50. In Figure 4, it will be noted that the latch 54 is out of engagement with the latch 70 it having been previously released and that the pawl 62 is in operative engagement with the ratchet 10. 85 The purpose of the latches 54 and 70 are to retain the pawl carrying plate 50 in its raised position and consequently the pawl 62 in its inoperative or retracted position.

After the electro-magnets 69 have been energized and the pawl carrying plate 50 permitted to move to its lowermost position it is necessary to again move this plate 50 to its raised position, thereby retracting the pawl 62 before the door can be opened. This is accomplished by a mechanism controlled primarily by a standard lock and in the structures illustrated herein, we have shown this lock as disposed at two different positions on the casing 18, this change being necessitated because of the different types of door to which this invention is shown as applied. In Figures 1, 2 and 3, this lock is shown as supported by the wall 19 which carries the releasable hook member 22. In Figures 9, 10 and 11, which illustrate our invention applied to a sliding door, this lock is shown as supported by a side wall immediately adjacent the wall which carries the releasable hook member. The structure and operation of the lock in both instances is similar and it is believed that a description of its operation will make its utility apparent with both arrangements illustrated. 115

Inasmuch as the lock may be of any standard construction, the details are not illustrated, the lock being indicated only as having a casing 71 and a stem or shaft 72 which may be rotated by proper manipulation of a key 73 of the usual type. Upon this shaft 72 is a drum 74 to which is secured one end of a flexible member 75 such as a chain or the like. The other end of the flexible member 75 is secured to the projection 61 formed on the lower end of the pawl 120

carrying plate 50. It is quite obvious, therefore, that in order to raise the plate 50 it is only necessary to insert the key 73 into the lock 71, rotation of the key 73 rotating the shaft 72 and the drum 74, the flexible member 75 being wound upon the drum and through the medium of the projection 61 causing the pawl carrying plate 50 to slide upwardly against the tension of springs 60 and withdrawing the pawl 62 from engagement with the ratchet 10.

The bottom 20 of the casing 18 is as clearly illustrated flush with the bottom edge of the door and only a slight clearance between the bottom 20 of the casing and the top face of the ratchet is provided. It is essential to the efficient operation of the device that when the pawl carrying plate 50 has been released that the pawl 62 be free to engage the teeth of the ratchet. In order that paper or other material which might lodge upon the ratchet may not interfere with the engagement of the pawl there is provided a pair of stud-like projections 76 secured to the bottom 20 of the casing and projecting slightly below the top surface of the ratchet 10 and running in grooves formed therein. As the door travels to its closed position these projections will brush any such foreign material off of the ratchet and permit the pawl to positively engage.

In order that the latches 26 and 42 which control the releasable hook member 22 and the latches 54 and 70 which control the pawl carrying plate 50 may not jar loose and hence effect a premature operation of this device, there is provided safety devices for retaining these latches in engagement until positively operated. In Figure 13 a bar 77 is pivoted as at 78 to an ear 79 formed on the side 19 of the casing. The short end of this bar is provided with a stud 80 which is surrounded by a spring 81 one end of which bears against the side 19 of the casing while the other end bears against the bar 77. The other end of the bar 77 is formed with a projection 82 which is caused to abut the side 19 of the casing by reason of the spring 81 which normally tends to rotate the bar 77 about its pivot 78 as will be clearly apparent. The under side of bar 77 is formed with an enlargement 83 which lies against the upper end of latch 26 as will be clear from an examination of Figures 10 and 13. It consequently follows that the latch 26 is prevented from being accidentally displaced from its engagement with the latch 42. When, however, these latches have been disengaged by an energization of their associated electro-magnet and are again caused to re-engage one another, the latch 26 will abut the enlargement 83 to swing the bar 77 on its pivot 78 and against the tension of spring 81, whereby inter-engagement of latches 26 and 42 will be permitted, the

spring 81 however, after this engagement has been accomplished, swinging the bar 77 so as to position the enlargement 83 again over the end of latch 26.

In order that latches 54 and 70 be retained in their position of engagement and prevented from becoming accidentally displaced, there is provided a bar 84 pivoted to one of the side walls 19 as at 85, and to one side thereof so that this bar 84 remains normally by gravity in a position where it rests upon a stop 86 projecting from the wall 19. This structure is illustrated in Figure 4 of the drawings and for this purpose latch 54 is illustrated in dotted lines in the position it assumes when in engagement with the latch 70. It will be noted that the bar 84 will therefore tend to retain the latch 54 in engagement with the latch 70, thereby preventing accidental disengagement of these latches. When, however, the latches have been disengaged by an energization of the electro-magnet 69 and it is again desired to cause a re-engagement of these latches, the upper end of the latch 54 will abut the bar 84, swinging it vertically about its pivot 85, thus permitting the latch 54 to engage the latch 70, the bar 84 again dropping by force of gravity into the position illustrated in Figure 4.

As stated hereinbefore, disposed at the end of the ratchet corresponding to the open position of the door are a pair of stationary electrical contacts connected to a suitable source of current. Cooperating with these stationary contacts are a pair of spring contacts 87 disposed upon the side of the casing 18 which lies adjacent the end of the ratchet when the door is in open position. As will be apparent from the examination of Figures 1, 2 and 9, the contacts upon the casing are adapted to enter the contact sockets 16 of the stationary contact posts 15 when the door is in its open position. As has been previously explained, the door is retained in its open position by reason of the engagement of the keeper 12 with the hook 23. Within the casing there is a terminal block 88 made of suitable insulating material and secured to one of the walls 19. This terminal block 88 is provided with a pair of connecting posts 89. Connected to these posts 89 are a pair of wires 90 from the electro-magnet 37, a pair of wires 91 from the electro-magnets 69 and leading from these posts to the ends of spring contacts 87 are a pair of wires 92. Consequently, when the contacts 87 are in engagement with the contact sockets 16 the electro-magnets 37 and 69 will be included in the circuit shown diagrammatically in Figure 1 which includes wire 17, source of power G and switch H. This electrical circuit is closed by proper manipulation of switch H thereby energizing the electro-magnets 37 and 69, causing

them to function. It is obvious, however, that immediately after the electro-magnets have functioned and the door started on its closing movement, the contacts 87 will leave the contact sockets 16 and the circuit broken at this point. By the arrangement just described it is unnecessary to insert any wiring whatsoever in the door, because the circuit which is necessary for operating the electro-magnets is accomplished when the door is in its open position, which is the only time that a completion of this circuit is necessary.

Instead of mounting the stationary contacts in positions disposed at the end of the ratchet, it may be found desirable to replace these posts by a pair of sector-shaped contact tracks 93 disposed at either side of the ratchet at the end corresponding to the open position of the door and suitably insulated therefrom as clearly illustrated in Figure 12. These contact tracks would be connected by wires 17 as in Figure 1 to source of current G and switch H. Cooperating with these contact tracks there would be provided a pair of contact brushes 94 projecting downwardly from the bottom 20 of the casing, in position to engage these contact sectors. Suitable compression springs 95 would be interposed for the purpose of insuring positive engagement of the brushes 94 with the contact sectors 93.

The operation of the device will now be briefly described:

In Figure 1 as has been stated hereinbefore the invention is shown as applied to a swinging door which is provided with means such as spring hinges which tend to normally close the door. When the door has been swung to open position, the contacts 87 carried by the casing which contains the operative parts of this invention enter the sockets 16 of the contact posts 15. These contact posts are in circuit with a suitable source of current such as batteries or the usual lighting circuit and the circuit is further provided with a switch which likewise may be of any standard or convenient type. For retaining the door in its open position the keeper 12 fastened to the stud 14 is placed over the hooked end 23 of the releasable hook member 22. Normally the releasable hook member 22 is retained in its vertical position by the inter-engagement of its latch 26 with the latch 42 of the electromagnetic device 37. Likewise the pawl 62 is held in retracted position by engagement of latches 54 and 70.

Let it be assumed that occasion arises wherein it is desired to release the door so that it may close. The switch H is operated, thereby completing the circuit through wires 17, contact sockets 16, contacts 87, wires 92 to the connecting posts 89 and thence through wires 90 and 91 to the electro-mag-

nets 37 and 69 respectively. These electro-magnets when energized permit latches 42 and 70 to move to released position, thereby releasing cooperating latches 26 and 54. This release permits the hook member 22 to rotate on its pivot 25 as suggested by dotted lines in Figure 5 so as to disengage the keeper 12 therefrom and simultaneously permits the pawl carrying plate 50 to slide downwardly causing the pawl 62 to engage the ratchet 10. Inasmuch as the abrupt faces of the ratchet face the doorway and the pawl is oppositely disposed to correspond with the ratchet, it follows that when the pawl has once been released so as to come into engagement with the ratchet even should the door be intercepted in its closing it cannot be further opened, the only movement being permitted being that in the direction of its closing. When the door has finally closed the pawl which is still in engagement with the ratchet prevents opening of the door and hence the door is locked in its closed position.

When therefore, it is desired to open the door and reset the mechanism the key 73 is inserted in the lock and the shaft 72 rotated, which rotation winds the flexible member 75 upon the drum 74 and through the medium of the projection 61 slides the pawl carrying plate upwardly. The projection 61 by reason of its engagement with the upper end of the slot formed in the extension 63 of the pawl, will raise the pawl upwardly to its retracted position, thereby permitting the door to again be swung open and secured in its open position by passing the keeper 12 over the hook 23.

In Figure 9 a sliding door is illustrated as equipped with our invention and it should be noted that in this type of door a counterweight for closing the door is illustrated. When adapting our invention to this type of door the lock 71 is disposed in the side wall so that it may be conveniently operated. The re-arrangement of the lock is a matter of but slight importance, it functioning precisely the same as the arrangement illustrated in Figure 1. It is likewise obvious that in a sliding door a straight ratchet replaces the arched ratchet illustrated in Figure 1.

Our invention is adaptable for use in connection with fire doors, in which event however, it is usually unnecessary to provide the ratchet and its corresponding pawl. Without further description, it will be immediately obvious that a multiplicity of fire doors for instance, could be controlled by a single switch if each fire door were equipped with the releasing mechanism herein illustrated and described. In such an arrangement the stationary contacts could all be included in the same circuit whereby upon closing of the circuit the releasable hook

member on each door could be caused to function thereby simultaneously releasing all of the doors. This feature is of extreme importance and we specifically reserve the right to so modify the structure as to permit it to be thus employed.

While the arrangement of parts illustrated in the drawings and described hereinbefore have been found to be efficient in every respect, we do not wish to be limited specifically to the details thereof but reserve the right to make such changes and modifications as will come within the purview of the accompanying claims.

Having thus described our invention, what we claim is:

1. An arrangement of the class described for use in connection with a door comprising a casing secured to the door, a releasable hook member mounted upon said casing, means secured to the floor and adapted to engage the releasable hook member when the door is in open position, a pawl carrying member and pawl mounted within said casing, a ratchet secured to the floor and in position to be engaged by said pawl, electric means within said casing for releasing said hook member and said pawl and an electric circuit completed when said door is in open position for supplying current to said electric means.

2. An arrangement of the class described for use in connection with a door which comprises a casing secured to said door, a ratchet secured to the floor adjacent said door, a releasable hook member mounted upon said casing, means adjacent one end of said ratchet adapted to engage said releasable hook means, a pawl carrying member mounted in said casing, a pawl carried thereby and adapted to engage said ratchet, electro-magnetic means disposed within said casing and operatively connected to said releasable hook member and said pawl carrying member and an electric circuit which is completed when the door is in open position for supplying current to said electro-magnetic devices.

3. An automatic door closing and locking device comprising the combination with a self-closing door of a casing mounted upon said door, a releasable hook member pivotally secured to the outer side of said casing, a ratchet secured to the floor adjacent said door, a keeper secured at the end of said ratchet which corresponds to the open position of the door, said keeper being adapted to engage said releasable hook member for retaining the door in its open position, a pawl carrying member slidably mounted within said casing, a pawl carried by said member, latches mounted upon said releasable hook member and said pawl carrying member, electro-magnetically operated latches cooperating with said first men-

tioned latches for retaining said releasable hook member and said pawl carrying member in their inoperative positions, a pair of stationary contact devices adjacent the end of the ratchet corresponding to the open position of the door, a pair of cooperating contacts upon said casing adapted to engage said stationary contacts, a circuit including a switch for connecting said stationary contacts to a suitable source of current whereby when said door is in open position the contacts carried by said casing will engage said stationary contacts and upon operation of said switch, said electro-magnetic devices will be energized to cause said releasable hook member and said pawl carrying member to function.

4. A door releasing device of the class described comprising the combination with a door of a casing secured thereon, a releasable hook member pivotally secured to said casing, a hook formed on said releasable hook member, stationary means secured to said floor and adapted to engage said hook for retaining the door in open position, a latch carried by said releasable hook member, an electro-magnetically operated latch within said casing adapted to engage said first mentioned latch, a pair of electrical contacts carried by said casing and connected to said electro-magnetic latch, a pair of stationary contacts secured to the floor in a position to be engaged by the contacts on said casing when the door is in open position, an electric circuit including said stationary contacts, a source of current and a switch whereby when said door is in open position said electro-magnetic latch may be caused to function by closing said switch and said releasable hook member permitted to move to release said door.

5. An automatic door closing and locking device for use in connection with a self-closing door comprising a casing secured to the door, a ratchet mounted on the floor adjacent the door, a pawl for engagement with said ratchet, a pawl carrying member mounted within said casing and carrying said pawl, a releasable hook member pivoted to said casing, means on said releasable hook member tending to move it to released position, means secured to the floor adapted to engage said releasable hook member when the door is in open position and for retaining the door in its open position, a pair of electro-magnetically operated latches mounted upon said casing, cooperating latches carried by said pawl carrying member and said releasable hook member respectively, a pair of electrical contacts mounted upon said casing and electrically connected to said electro-magnetically operated latches, a pair of stationary contacts secured to the floor and in position to be engaged by the contacts carried by said

5 casing when the door is in open position, a
circuit including a source of current and a
switch connected to said stationary contacts
whereby when said door is in open posi-
10 tion and said switch operated, said electro-
magnetically operated latches will be caused
to function, permitting the operation of
said pawl carrying member and said re-
leasable hook member, said circuit being
15 thereafter broken by movement of said door.

6. An arrangement of the class described
for use in combination with a self-closing
door comprising a casing secured to said
door, a releasable hook member pivotally
15 mounted upon said casing, a keeper secured
to the floor adjacent said door and in posi-
tion to engage said releasable hook mem-
ber when said door is in open position, a
pawl carrying member and pawl mounted
20 within said casing, a ratchet secured to the
floor and adapted to be engaged by said
pawl during the closing movement of said
door, a latch carried by said releasable hook
member and pawl carrying member respec-
25 tively, a pair of cooperating latches, electro-
magnetic means for operating said last
mentioned latches, a pair of contacts carried
by said casing, and electrically connected to
said electro-magnets, a pair of stationary
30 contacts positioned so as to be engaged by
the contacts on said casing when the door is
in open position, a circuit connecting said
stationary contacts to a source of current
and a switch interposed in said circuit, a
35 lock mounted on said casing and means con-
trolled by said lock for retracting said pawl
from engagement with said ratchet.

7. An arrangement of the class described
for use in combination with a self-closing
door comprising a casing secured to said 40
door, a releasable hook member pivotally
mounted upon said casing, a retaining mem-
ber secured to the floor in position to en-
gage said releasable hook member when the
door is in open position, means tending to 45
move said releasable hook member to a posi-
tion where it will release said retaining
member, a pawl carrying member mounted
in said casing for vertical movement, a pawl
carried by said pawl carrying member and 50
movable independently thereon, a spring en-
gaging said pawl carrying member and said
pawl and tending to normally project said
pawl, means tending to normally move said
pawl carrying member downwardly, a 55
ratchet secured to the floor and adapted to
be engaged by said pawl during the closing
movement of the door, the teeth of said
ratchet permitting said pawl to ride over
the same during the closing movement of 60
the door but preventing an opening move-
ment of the same, electro-magnetically oper-
ated latching devices associated with said
releasable hook member and said pawl car-
rying member for retaining them in an in- 65
operative position, electrical means oper-
atable only when said door is in open posi-
tion for releasing said latching mechanisms
and studs carried by said casing and dis-
posed adjacent said ratchet for removing 70
foreign matter therefrom, substantially as
and for the purpose described.

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