

L. C. DALHOUSIE.

DOOR.

APPLICATION FILED JUNE 30, 1908.

913,269.

Patented Feb. 23, 1909

2 SHEETS—SHEET 1

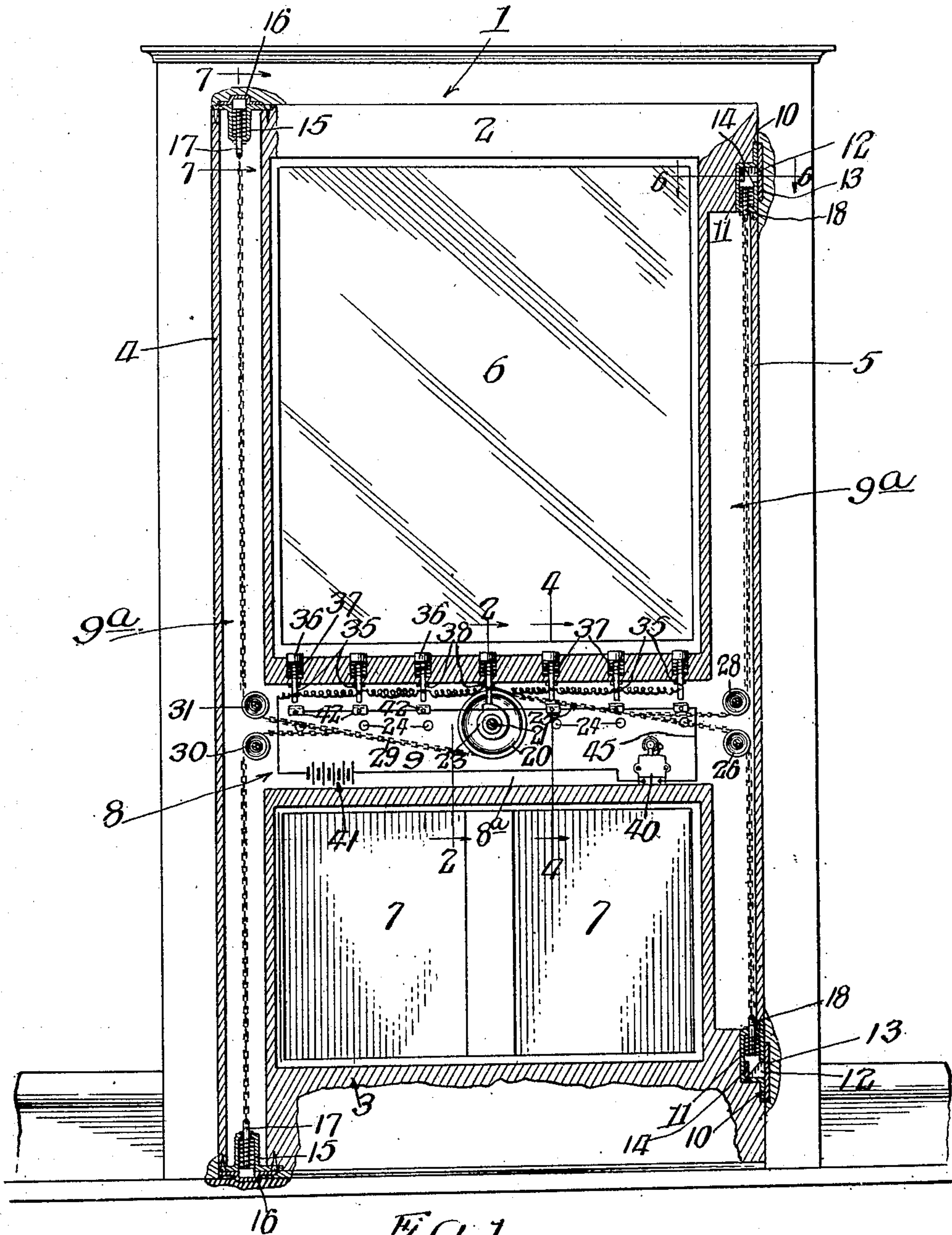


Fig. 1.

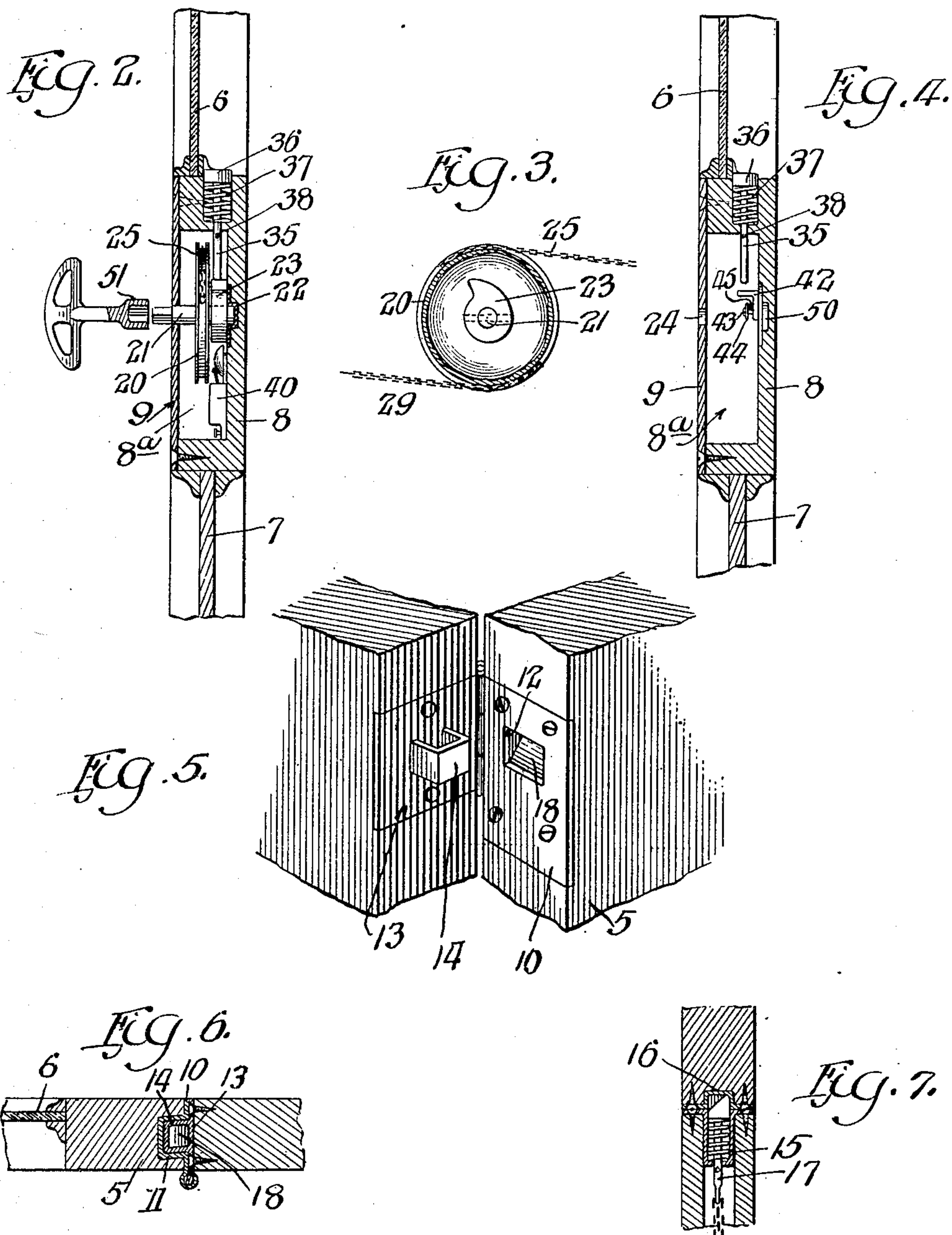
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UNITED STATES PATENT OFFICE.

LOUIS C. DALHOUSIE, OF CHICAGO, ILLINOIS.

DOOR.

No. 913,269.

Specification of Letters Patent.

Patented Feb. 23, 1909.

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To all whom it may concern:

Be it known that I, LOUIS C. DALHOUSIE, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Doors; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to a multiple bolt mechanism for doors and more particularly to a door in which is concealed an operating mechanism, which is adapted to release from their sockets a plurality of retaining bolts.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

In the drawings:—Figure 1 is a view in elevation and partially in section of a swinging door illustrating the invention applied thereto. Fig. 2 is a fragmentary view, on a larger scale, taken on line 2—2 of Fig. 1, and illustrates more in detail the operating mechanism. Fig. 3 is a detail view of a winding drum and cam disk which constitute part of the invention. Fig. 4 is a fragmentary section taken on line 4—4 of Fig. 1. Fig. 5 is a perspective view illustrating the method in which the door is locked at the hinge. Fig. 6 is a cross-section taken on line 6—6 of Fig. 1, illustrating in detail the lock. Fig. 7 is a detail section taken on line 7—7 of Fig. 1.

In the said drawings, 1 designates a swinging door comprising top and bottom rails 2 and 3, respectively, a lock stile 4, a hanging stile 5, a glass panel 6, standing panels 7, 7 and a middle or lock rail 8. The said middle or lock rail 8, which is of considerable thickness is cut away or hollowed out to provide a chamber 8^a to contain operating mechanism as will be hereinafter described. The lock stile 4 and the hanging stile 5 are also cut away or grooved near their outer margins, as shown at 9^a, to conceal parts of the mechanism. The chambered portion of the lock rail is inclosed on one side by a metal plate 9 which may be secured to the inside face of the door by means of screws or bolts.

The door is hung upon upper and lower hinges attached to the hanging stile in the usual positions. Said hinges, as herein

shown, are of special construction to include a portion of the locking devices hereinafter to be described. Both hinges are of the same construction and the same reference characters will apply to each. The leaf 10 of each hinge which is attached to the hanging stile 5 is provided with an inwardly extending recessed portion 11 which is embedded in the hanging stile in line with the groove 9^a of said hanging stile and is provided in line with said recessed portion with an aperture 12 which opens upon the outer face of the leaf. The leaf 13 of the said hinge which is attached to the door casing is formed with an outwardly projecting socket member 14 which is adapted to pass through the aperture 12 and fit into the recessed portion 11 of the leaf 10 when the door is closed.

For locking the door in its closed position there are provided a plurality of spring bolts disposed at various locations within the door as shown in Fig. 1, although the invention in its broader sense is not limited to the particular number nor location of said bolts shown in said drawings.

Located at the top and bottom of the lock stile 4 and opening outwardly therefrom are hollow locking bolt guides 15, 15 which are provided at their outer ends with radially extending flanges through which are inserted wood screws for securing the said guides to the door. In the upper and lower door casings, and with their openings in line with the guides 15, 15, are embedded sockets 16, 16 which are secured to the casings in the same manner that the said sockets 15, 15 are secured to the door. Within the said guides 15, 15 are located spring actuated bolts 17, 17 which are adapted to project from the guides for engagement with the recesses in the sockets 16, 16 to lock the door closed. As a further means of locking the door closed, additional locking bolts may be incorporated in the hinges. When the latter are made as before described, the recessed portions 11 of the hinge leaves 10 constitute guides to receive spring actuated locking bolts 18 which engage with the socket members 14 of the hinge leaves 12 when the door is closed. All of the said spring actuated bolts 18 are of the catch bolt type and yield to pressure when the door is being closed and are automatically shot into their sockets by springs behind them, and which serve to normally

hold the bolts in their locking positions in a familiar manner.

For drawing the spring bolts from their sockets preparatory to opening the door, a mechanism is provided as follows: Within the chambered portion 8^a of the middle or lock rail 8 is located a winding drum or pulley 20 which is non-rotatively supported upon a shaft 21. Said shaft 21 is supported at one end in an end or cup bearing 22 secured to the inner side wall of the chambered portion of the lock rail (Fig. 2). The other end of the said shaft 21 extends outwardly through an opening 24 in the plate 9 and is supported thereby. Non-rotatively fixed to said shaft 21 between the drum and one wall of the hollow portion of the middle rail is a cam 23. Trained over the said drum, and having one end attached thereto, is a chain or pulley cord 25 which extends towards the hanging stile 5 where it divides, and one branch thereof is trained over a pulley 26 located within the groove 9^a of the hanging stile and extends downwardly through said groove and is attached to the spring actuated locking bolt 18 associated with the lower hinge of the door. The other branch of the said chain or pulley cord 25 is trained under a second pulley wheel 28 located within said groove 9^a and extends upwardly therefrom through said groove and is attached to the spring actuated bolt 18 associated with the upper hinge. Trained under the said drum 20, with one end attached thereto, is a chain or pulley cord 29 which extends toward the lock stile 4 near which it divides. One branch of said chain or cord is trained over a pulley 30 located within the groove 9^a of the lock stile and extends downwardly therefrom through said groove and is attached at its lower end to the bolt 17 which engages with the socket 16 in the lower door casing. The other branch of the said chain or pulley cord 29 is in like manner trained under a pulley 31 located within said groove 9^a and extends upwardly therefrom through the groove and is attached at its upper end to the spring bolt which engages with the socket 16 in the upper door casing.

The drum 20 is adapted to be turned in a direction to wind the chains or pulley cords thereon and draw the bolts from their sockets by means of one of a plurality of plungers 35, 35. The said plungers 35, 35 extend downwardly through and are guided in apertures or openings in the part of the upper margin of the middle or lock rail 8 which is on the outside of the door. The outer ends of said plungers are formed with heads or buttons 36 which are exposed at the upper margin of said lock rail, and by which said plungers may be depressed. The inner ends of the plungers extend into the chambered portion 8^a of the said lock rail 8 and are so located with respect to the cam 23, and cir-

cuit closing devices of an alarm mechanism, hereinafter to be described, that one of said plungers is always in position, when depressed, to act on said cam to withdraw the locking bolts while the other plungers are in position, when depressed, to close the circuit of the alarm device. Surrounding each of said plungers between the thumb pieces and the bottom wall of a counterbore in the opening through which the said plungers extend is a coiled spring 37 against the action of which the plunger is depressed and which serves to return the plunger to its normal or retracted position. The outward movement of said plungers are limited by pins 38 which extend transversely through the plungers within the chambered portion of the lock rail 8, and are adapted to bear against the upper wall of the chamber.

The drawings illustrate an alarm mechanism which is arranged to be actuated by all of the plungers, except the one which engages the cam 23 to turn the drum and withdraw the bolts is located within the chamber 8^a of the middle or lock rail, and is made as follows: An electrical bell 40 which is located within said chamber 8^a is electrically connected at one side with a source of electrical energy as a battery 41, located also within said chamber. To the other side of said battery is connected by a flexible conductor, all of the plungers 35, 35 except the one which is directly over and engages the cam 23. Directly below the inner end of the said plunger are located a series of contact pieces 42, 42 of angle shape as herein shown, which are adapted for contact by the lower ends of the said plungers when the latter are depressed. Said angle contact pieces are secured to the wall of the chambers by means of screws 43, 43. From the side of the bell opposite to that which is connected with the battery 41 leads an electrical conductor 45 which is electrically connected to each of the series of contact pieces 42, 42 by being clamped between washers 44, 44 surrounding the screws 43 and the outer faces of said contact pieces. With the electrical connections arranged as described the circuit will be completed or closed through the bell when any one of the plungers, except the one which engages the cam 23 is depressed far enough to come into contact with its associated contact piece. Though shown in the drawings the electrical alarm forms no part of this invention.

In the use of the locking and alarm mechanism described it will become necessary to occasionally change the location of the cam and winding drum and the connection of the plungers in the bell circuit and thereby prevent unauthorized persons from opening the door from the outside. To this end the inner plate 9 of the middle rail chamber is provided with a plurality of bearing open-

ings 24 located one beneath each plunger, and the rear wall of said chamber is provided with a like number of similarly located recesses 50 which separately receive the end bearing for the shaft 21. Thus the cam may be located beneath either of the plungers. When necessary or desirable to change the position of the winding drum and its cam, the plate 9 is removed and the shaft carrying the drum and cam is shifted to any of the other locations provided therefor beneath one of the plungers. The change necessary in electrical connections may be made by simply removing the screw which secures one of the contact pieces in place and moving it to a position under the plunger which previously engaged the cam.

In order that the door may be readily opened by a person inside the house, the end of the shaft 21 which extends through the front plate of the chamber is made square and adapted for engagement by a socket wrench or key 51 by means of which the drum may be turned to withdraw the locking bolts.

I claim as my invention:—

1. The combination with a door provided with locking bolts and a chamber, of a winding drum located within the said chamber, means connecting the said winding drum with the locking bolts, and a row of plungers extending from outside the door into said chamber, one of which is adapted to rotate the drum to draw the locking bolts, said drum being removably mounted whereby it may be brought into operative engagement with, and to be separately operated by any one of said plungers.

2. The combination with a door provided with a chambered lock rail, grooved lock and hanging stiles, and locking bolts, of a winding drum located within the chambered lock rail, chains attached to the said drum and extending oppositely therefrom and provided with branches which extend along the

grooved stiles and are attached to the said locking bolts, and means for turning the said drum for winding the chains thereon.

3. The combination with a door and hinges for swingingly supporting the door from the door casing, of locking bolts carried by leaves of hinges attached to the door, sockets carried by the hinge leaves attached to the casing adapted to be engaged by said bolts, and means for withdrawing said bolts from their sockets.

4. The combination with a door and hinges for swingingly supporting the door from the door casing, of locking bolts carried by the leaves of hinges attached to the door, sockets carried by the hinge leaves attached to the casing adapted to be engaged by said bolts, a winding drum, and means connecting said drum with said bolts for withdrawing the said bolts from their sockets.

5. The combination with a door provided with a chambered lock rail, grooved lock and hinging stiles and hinges by means of which the door is swingingly supported on the door casing, of locking bolts carried in recessed portions provided in the parts of the hinges secured to the door, said bolts being adapted to engage with sockets carried by the parts of the hinges which are attached to the door casing, other locking bolts adapted to engage with sockets in the door casing, a winding drum located within the lock rail, chains attached to the said drum, said chains being provided with branches which extend along the grooved stiles and are attached to the locking bolts, and means for rotating the said drum to draw the said locking bolts.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 25th day of June A. D. 1908.

LOUIS C. DALHOUSIE.

Witnesses:

W. L. HALL,
G. R. WILKINS.