

Sept. 13, 1932.

C. JOHNSTONE

1,877,331

DOORLOCK

Filed Aug. 3, 1931

3 Sheets-Sheet 1

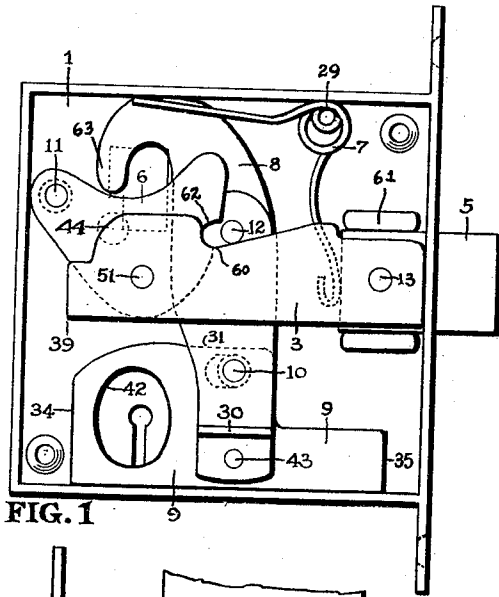


FIG. 1

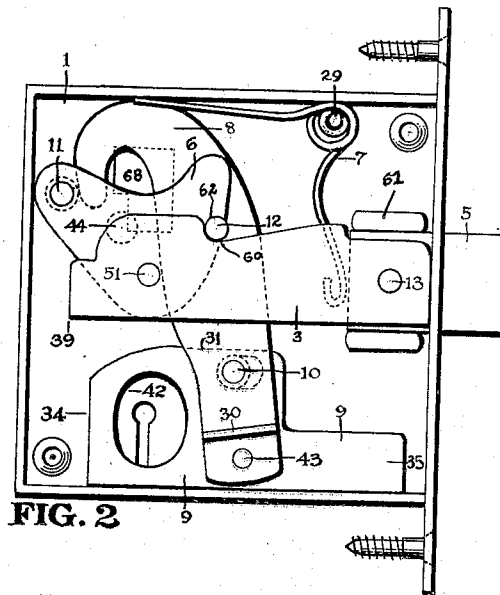


FIG. 2

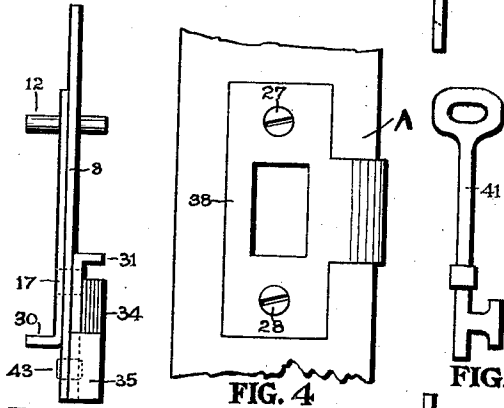


FIG. 3

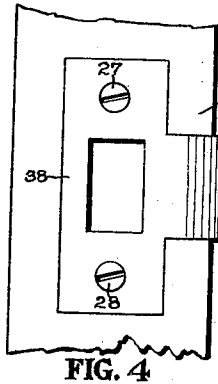


FIG. 4

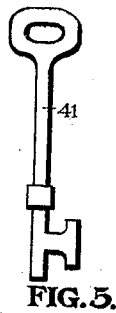


FIG. 5

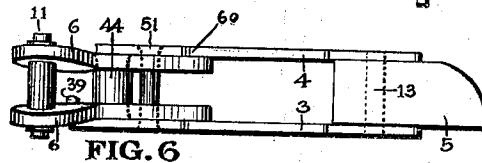


FIG. 6

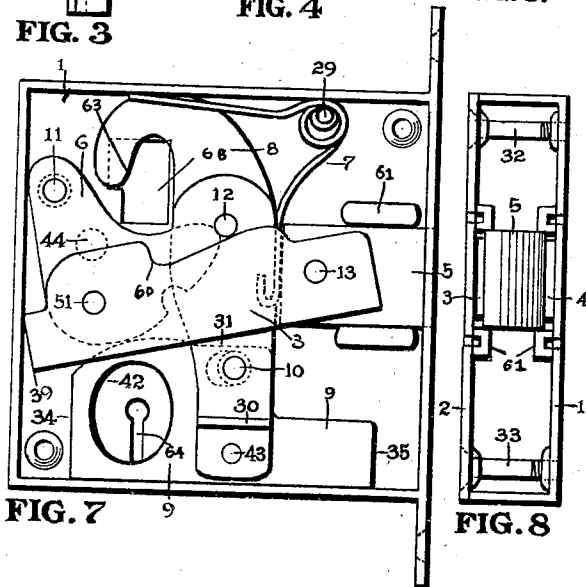


FIG. 7

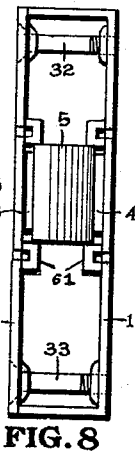


FIG. 8

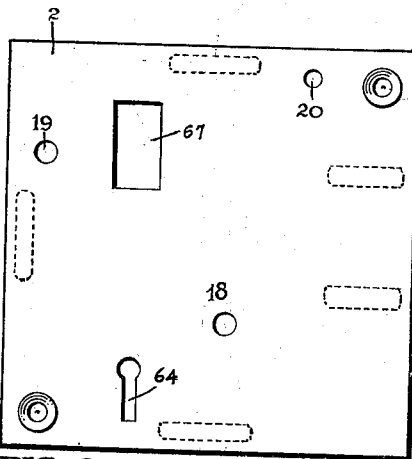


FIG. 9

Inventor
Carleton Johnstone.
Robert C. Dennison
Attorney

Sept. 13, 1932.

C. JOHNSTONE

1,877,331

DOORLOCK

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3 Sheets-Sheet 2

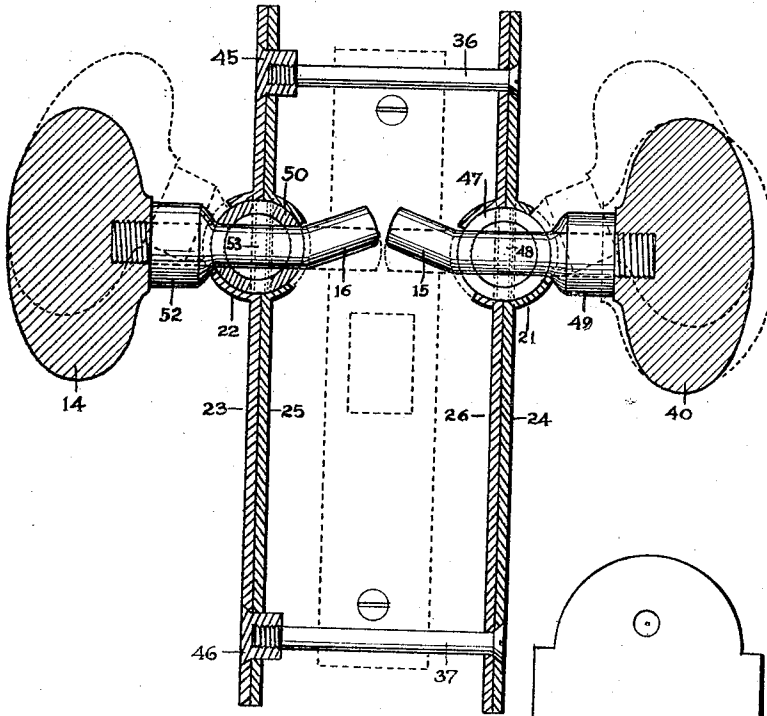


FIG. 10

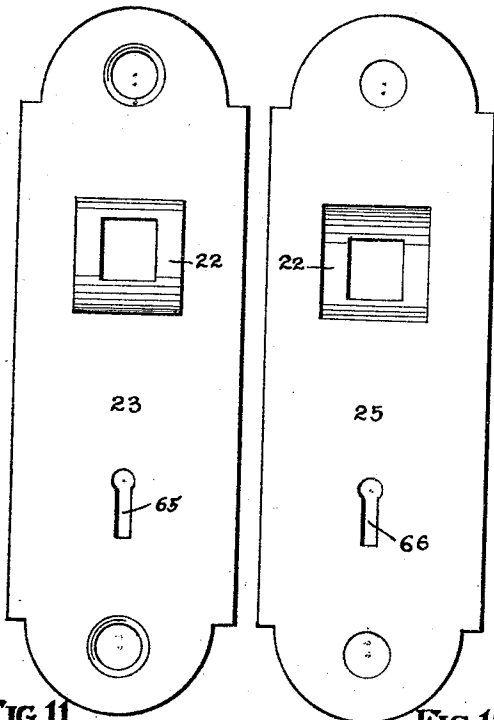


FIG. 11

FIG. 12

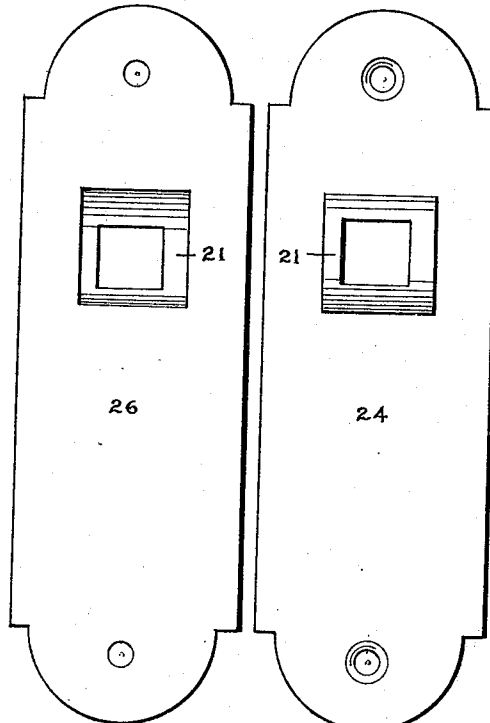


FIG. 13

FIG. 14

Inventor

Carleton Johnstone

Robert L. Hennings
attorney

Sept. 13, 1932.

C. JOHNSTONE

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DOORLOCK

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3 Sheets-Sheet 3

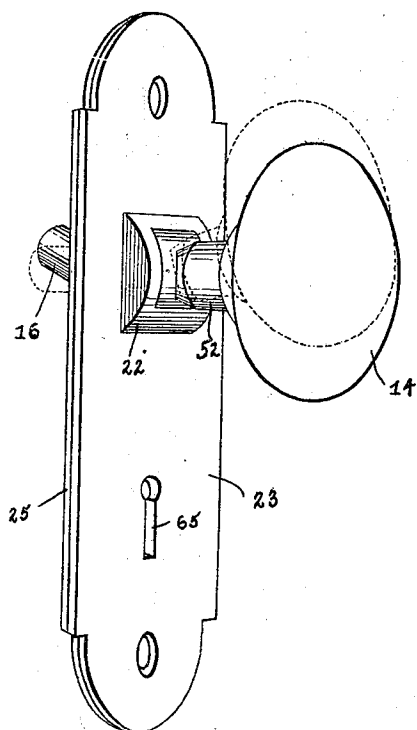


FIG. 15

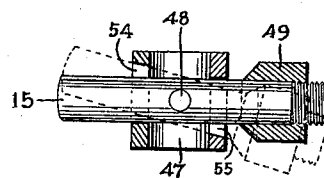


FIG. 16

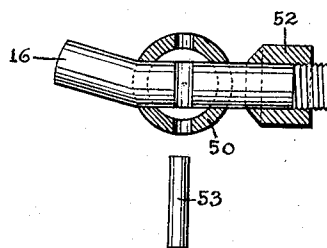


FIG. 18

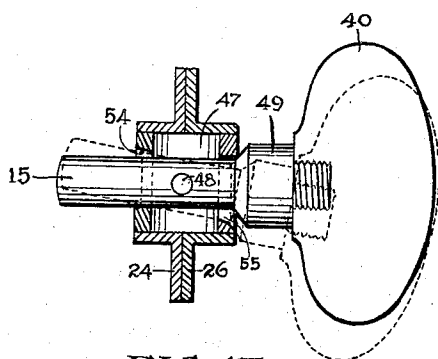


FIG. 17

Inventor

Carlton Johnstone

Robert J. Dennis
Attorney

UNITED STATES PATENT OFFICE

CARLETON JOHNSTONE, OF SAN MATEO, CALIFORNIA

DOORLOCK

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The present invention relates to improvements in door locks and has for its principal object to provide a door lock structure including swinging door knobs and spindles for actuating the bolt in lieu of the conventional rotatable door knobs and spindles, now generally in use.

A further and important object is to provide a door lock wherein the inside knob and spindle may be actuated to lock the bolt in its projected position.

A further object resides in the provision of a door lock of the above mentioned character whereby the movable bolt may be locked in its projected position by a key from the outside as well as by a swinging movement of the inside door knob in a horizontal plane.

Another salient object of the present invention is to provide a door lock of the above mentioned character that includes a bolt embodying a toggle arrangement, a pivoted dogging lever being provided for cooperation with the toggle bolt to lock the same in its projected position, said dogging lever being capable of movement to an operative position by the action of the inside knob being swung in one direction in a horizontal plane or by the locking action of a key from the outside of the door.

A further and important object is to provide a door lock of the above mentioned character that will at all times be positive and efficient in its operation, the same being further simple in construction, inexpensive, strong and durable.

Other objects and advantages of the present invention will become apparent when taken in connection with the accompanying drawings.

In the accompanying drawings, wherein like references indicate corresponding parts throughout the several views:

Figure 1 is a side elevation of the door lock showing the cover plate removed with the bolt projected and the dogging lever in its normal inoperative position.

Figure 2 is a view similar to Figure 1 showing the dogging lever moved to its operative position whereby the bolt is locked in its projected position.

Figure 3 is an edge elevation of the dogging lever showing the dogging pin projecting laterally therefrom.

Figure 4 is a face view of the keeper plate secured in one side edge of the door frame.

Figure 5 is a detail of the key employed for locking the bolt.

Figure 6 is a detail plan view of the bolt or latch assembly.

Figure 7 is a view similar to Figure 1 showing the bolt retracted.

Figure 8 is an edge view of the lock casing for more clearly disclosing the guides for the slidable latch or nose piece.

Figure 9 is an elevational view of the cover plate for the lock casing.

Figure 10 is a vertical sectional view showing the mounting for the inner and outer door knobs.

Figures 11 and 12 are face views of the complementary plates associated with the outside door knob.

Figures 13 and 14 are similar views of the complementary plates associated with the inside door knob.

Figure 15 is a fragmentary detail of the outside door knob and the mounting therefor.

Figure 16 is a detail of the inside door knob spindle showing its mounting.

Figure 17 is also a detail of the mounting for the inside door knob spindle, and

Figure 18 is a detail of the outer door knob spindle.

In the drawings, wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numeral 1 designates the lock casing, the same being open at one side and a cover plate 2 provides a closure for the open side of the casing. Any suitable securing means may be employed for securing the cover plate on the casing as indicated at 32 and 33, respectively, of Figure 8.

Forming a salient part of the present invention is the toggle shaped bolt, the same comprising the parallel spaced arms 3 and 4, the upper edges of which are notched as indicated at 60, the purpose of which will be hereinafter more fully described. A latch or

nosepiece 5 is secured between the forward ends of the spaced arms 3 and 4 through the medium of a pivot pin 13 and suitable guides 61 are provided in the lock casing and on the inner face of the cover plate 2 for this slidable member that projects through a suitable opening formed in the forward edge of the lock casing and the door in which the casing is mounted. This nosepiece 5 is adapted to cooperate with the keeper plate 38 that is secured on the adjacent edge of the door casing A in the conventional manner.

The toggle shaped bolt further includes what I term as stirrup plates 6 that are secured together through the medium of a pin 44. These plates 6 are in turn pivotally connected to the rear ends of the arms 3 and 4 through the medium of a pivot pin 51 and the rear extremities of these stirrup plates 6 are in turn pivotally secured in the upper rear edge portion of the lock casing 1 by means of a pin 11.

The stirrup plates 6 are formed with suitable notches 62 in the forward edges thereof for cooperation with the notches 60 formed in the upper edges of the arms 3 and 4.

The bolt is normally maintained in its projected position through the medium of a coil spring 7 that is supported by the pin 29 in the upper portion of the lock casing 1 and upon referring to Figures 1, 2 and 7 of the drawings, it will be observed that one end of the coil spring engages with the top portion of the lock casing while the other end portion of this coil spring engages with the rear or inner end of the nosepiece 5.

Also forming a salient feature of the present invention is the dogging lever 8 that is arranged within the lock casing 1, the lower end of this lever pivotally connected to the slidable key actuated member 9 as at 43. The lever 8 extends upwardly between the spaced arms 3 and 4 and projects above the upper edges of the stirrup plates 6, the upper end of this lever terminating in the downwardly projecting hook 63. A pin 12 extends transversely through the intermediate portion of the dogging lever 8, the ends of this pin projecting beyond the respective side faces of the dogging lever for cooperation with the notches 60 and 62, respectively, to lock the bolt in its projected position in the manner also to be presently described in detail.

The slidable member 9 is formed with a key receiving and engaging opening 42, the key that cooperates with this portion 42 being shown at 41 in Figure 5 while the keyhole formed in the lock casing 1 to accommodate the key is illustrated at 64.

A transverse pin 10 is arranged in the lock casing and extends through the opening 17 provided therefor in the pivoted dogging lever 8 as well as through communicating

openings formed in the slidable member 9. Suitable guides 30, 31, 34 and 35 are provided for the dogging lever and slidable member to maintain the same against lateral movement in the lock casing.

The construction of the inner and outer door knob spindle and their mountings will now be specifically described. A pair of complementary plates 23 and 25 are arranged on the outer face or side of the door and these plates are formed with complementary socket forming portions 22. These plates are further provided with the registering keyhole designated by the numerals 65 and 66.

Similar plates 24 and 26 are arranged on the inner side or face of the door, the only difference between the pair of plates 24 and 26 and the other pair of plates 23 and 25 is that the inner plates 24 and 26 are not formed with keyholes. The inner plates 24 and 26 are however formed with complementary socket portions 21 similar to the socket portions 22 heretofore described.

The two pairs of plates are secured in proper position on their respective sides of the door through the medium of the bolts 36 and 37 and the cap nuts 45 and 46, respectively, as clearly shown in Figure 10 of the drawings.

The spindle that is associated with the inside door knob is indicated by the numeral 15, the outer end thereof being threaded to accommodate the inside door knob 40. This spindle 15 carries a roller shaped member 47 on its intermediate portions that is movable in the socket formed by the complementary members 21 whereby the spindle 15 and the door knob 40 may be moved in a vertical plane. A transverse pin 48 is carried by the roller shaped member 47 and extends through the intermediate portion of the inner spindle 15 to permit the swinging movement of the inner spindle 15 and the inside door knob 40 in a horizontal plane. It will also be observed that the roller member 47 is formed with opposed slots 54 and 55 to permit the horizontal swinging movement of the spindle 15. A bushing 49 is formed on the inner end portion of the spindle 15 and against which the inside knob 40 abuts when screwed on the outer end of the inner spindle as clearly shown in the drawings.

The spindle that is associated with the outside door knob is designated by the numeral 16 and the outer end of this spindle 16 is also threaded to accommodate the outside door knob 14, a bushing 52 being associated with the outer end portion of the spindle 16 against which the door knob 14 abuts.

A roller 50 is secured on the intermediate portion of the inner spindle 16 through the medium of the pin 53 and this roller 50 is mounted for movement in the socket forming members 22 to permit the movement of the

outside door knob 14 and its supporting spindle 16 only in a vertical plane.

Upon referring to Figure 10 of the drawings, it will be observed that the inner ends of the spindle 15 and 16 are slightly offset and are positioned for cooperation with the upper edges of the respective stirrup plates 6 and also for cooperation with the downturned hook 63 of the dogging lever 8.

The cover plate 2 is formed with an opening 67 through which the inner end of the outside door knob and spindle 16 projects while the opposite side of the casing 1 is formed with an angular opening 68 to accommodate the inner end of the inner spindle 15.

The operation of my improved door lock may be briefly stated as follows: When the parts are arranged as shown in Figure 1 of the drawings, the spring 7 holds the toggle bolt in its projected position so that the nose-piece 5 engages with the opening in the keeper plate 38 thereby holding the door in its closed position. The bolt may be retracted to the position shown in Figure 7 by raising either of the door knobs to the position shown in the dotted lines in Figure 10. Such action will result in the stirrup plates 6 being forced downwardly and rearwardly and simultaneously actuating the arms 3 and 4 to retract the nosepiece 5 against the tension of the coil spring 7. As soon as pressure on the raised door knob is released, the coil spring 7 will return to the movable parts to their normal position to that shown in Figure 1.

When it is desired to lock the door from the inside, the inside door knob 40 is moved in a horizontal direction toward the free edge of the door. This will result in the inner end of the spindle 15 being moved toward the rear or inner end of the lock casing 1 and into engagement with the hook 63 whereby the lever 8 will be swung rearwardly to position the pin 12 in locking engagement with the coacting notches 60 and 62 as clearly shown in Figure 2. When the parts are arranged in this position, it will be impossible to retract the bolt by merely raising upwardly on the outside door knob 14.

The bolt may be unlocked by returning the horizontally movable inner door knob 40 to its normal position or by inserting the key 41 through the keyhole 64 and actuating the member 9 so that the pin 12 is moved out of engagement with the notches 60 and 62, whereupon the outer door knob 14 may be moved upwardly causing the inner end of the spindle 16 to move downwardly into engagement with the stirrup plates 6 and causing the parts of the bolt to assume the position shown in Figure 7 whereupon the bolt will be retracted.

The pin 12 may be brought into locking engagement with the notches 60 and 62 by the use of a key from the outside of the door as is readily obvious from the construction

disclosed. Thus, it will be seen, that the door locking bolt may be retracted when in its unlocked position by merely swinging either of the door knobs in a vertical plane in lieu of having to rotate the door knobs and spindles as is now customarily done. Furthermore, the bolt may be locked in its projected position merely by moving the inner door knob in a horizontal plane in one direction or by the use of a key from the outside. The locking mechanism may be unlocked by actuating the inner door knob or by the use of the key from the outside of the door as is found necessary.

The simplicity of my improved door lock enables the same to be manufactured at a very low cost and the door lock will at all times be positive and efficient in carrying out the purposes for which it is described.

While I have shown the preferred embodiment of the invention, it is to be understood that minor changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of the invention and the scope of the appended claims.

Having thus described the invention what is claimed is:

1. In a door lock, a latch bolt, operating mechanism therefor, inner and outer door knob supporting spindles mounted for swinging movement in a vertical plane for selectively actuating the bolt operating mechanism to retract the bolt, spring means for normally holding the latch bolt in its projected position, the inner door knob supporting spindle being further capable of swinging movement in a horizontal plane, and means controlled by the movement of the inner door knob spindle in a horizontal plane for locking the bolt in its projected position.

2. In a door lock, a latch bolt, operating mechanism therefor, inner and outer door knob supporting spindles mounted for swinging movement in a vertical plane for selectively actuating the bolt operating mechanism to retract the bolt, spring means for normally holding the latch bolt in its projected position, the inner door knob supporting spindle being further capable of swinging movement in a horizontal plane, and means controlled by the movement of the inner door knob spindle in a horizontal plane for locking the bolt in its projected position, said last mentioned means including a dogging member, the bolt being provided with means to interlock the dogging member therewith.

3. In a door lock, a latch bolt, operating mechanism therefor, inner and outer door knob supporting spindles mounted for swinging movement in a vertical plane for selectively actuating the bolt operating mechanism to retract the bolt, spring means for normally holding the latch bolt in its projected position, the inner door knob supporting spindle being further capable of swing-

ing movement in a horizontal plane, means controlled by the movement of the inner door knob spindle in a horizontal plane for locking the bolt in its projected position, and key controlled means for releasing the locking means.

4. In a door lock, a latch bolt, operating mechanism therefor, inner and outer door knob supporting spindles mounted for swinging movement in a vertical plane for selectively actuating the bolt operating mechanism to retract the bolt, spring means for normally holding the latch bolt in its projected position, the inner door knob supporting spindle being further capable of swinging movement in a horizontal plane, means controlled by the movement of the inner door knob spindle in a horizontal plane for locking the bolt in its projected position, said last mentioned means including a dogging member, the bolt being provided with means to interlock the dogging member therewith, and key controlled means for also actuating the dogging member.

5. In a door lock, a latch bolt, operating mechanism therefor, inner and outer door knob supporting spindles mounted for swinging movement in a vertical plane for selectively actuating the bolt operating mechanism to retract the bolt, spring means for normally holding the latch bolt in its projected position, the inner door knob supporting spindle being further capable of swinging movement in a horizontal plane, means controlled by the movement of the inner door knob spindle in a horizontal plane for locking the bolt in its projected position, said last mentioned means including a dogging member, the bolt being provided with means to interlock the dogging member therewith, and key controlled means for also actuating the dogging member, said dogging lever being moved to inoperative position by either the inner door knob spindle or the key controlled member.

6. In a door lock, a casing, a toggle bolt construction including an arm, a nosepiece slidable through the edge portion of the casing and being pivotally connected to the forward end of the arm, a stirrup member pivotally connected at its intermediate portion to the rear end of the arm and also pivotally secured at its rear end in the casing, spring means engaging the nosepiece for normally holding the bolt projected in an operative position, opposed inner and outer door knob supporting spindles extending into the casing and mounted for swinging movement in a vertical plane, the inner ends of the spindles selectively engaging the top of the stirrup member to swing the same downwardly and rearwardly to retract the bolt.

7. In a door lock, a casing, a toggle bolt construction including an arm, a nosepiece slidable through the edge portion of the cas-

ing and being pivotally connected to the forward end of the arm, a stirrup member pivotally connected to the rear end of the arm and also pivotally secured in the casing, spring means for normally holding the bolt projected in an operative position, opposed inner and outer door knob supporting spindles extending into the casing and mounted for swinging movement in a vertical plane, the inner ends of the spindles selectively engaging the stirrup member to swing the same downwardly and rearwardly to retract the bolt, and means for locking the bolt in its projected position and preventing the downward and rearward swinging movement of the stirrup member by the outside door knob spindle.

8. In a door lock, a casing, a toggle bolt construction, including an arm, a nosepiece slidable through the edge portion of the casing and being pivotally connected to the forward end of the arm, a stirrup member pivotally connected to the rear end of the arm and also pivotally secured in the casing, spring means for normally holding the bolt projected in an operative position, opposed inner and outer door knob supporting spindles extending into the casing and mounted for swinging movement in a vertical plane, the inner ends of the spindles selectively engaging the stirrup member to swing the same downwardly and rearwardly to retract the bolt, and means for locking the bolt in its projected position and preventing the downward and rearward swinging movement of the stirrup member by the outside door knob spindle, said last mentioned means including a dogging lever, the stirrup member being provided with means for coaction with the dogging lever when the latter is in its operative position.

9. In a door lock, a casing, a toggle bolt construction including an arm, a nosepiece slidable through the edge portion of the casing and being pivotally connected to the forward end of the arm, a stirrup member pivotally connected to the rear end of the arm and also pivotally secured in the casing, spring means for normally holding the bolt projected in an operative position, opposed inner and outer door knob supporting spindles extending into the casing and mounted for swinging movement in a vertical plane, the inner ends of the spindles selectively engaging the stirrup member to swing the same downwardly and rearwardly to retract the bolt, and means for locking the bolt in its projected position and preventing the downward and rearward swinging movement of the stirrup member by the outside door knob spindle, said last mentioned means including a dogging lever, the stirrup member being provided with means for coaction with the dogging lever when the latter is in its operative position, the inner door knob spindle

being also capable of swinging movement in a horizontal plane for moving the dogging lever to its inoperative position to permit the bolt to be retracted.

5 10. In a door lock, a casing, a toggle bolt construction including an arm, a nosepiece
slidable through the edge portion of the
casing and being pivotally connected to the
forward end of the arm, a stirrup member
30 pivotally connected to the rear end of the
arm and also pivotally secured in the cas-
ing, spring means for normally holding the
bolt projected in an operative position, op-
posed inner and outer door knob supporting
15 spindles extending into the casing and mount-
ed for swinging movement in a vertical
plane, the inner ends of the spindles selec-
tively engaging the stirrup member to swing
the same downwardly and rearwardly to re-
tract the bolt, means for locking the bolt in
20 its projected position and preventing the
downward and rearward swinging movement
of the stirrup member by the outside door
knob spindle, said last mentioned means in-
cluding a dogging lever, the stirrup mem-
ber being provided with means for coaction
25 with the dogging lever when the latter is
in its operative position, the inner door knob
spindle being also capable of swinging move-
ment in a horizontal plane for moving the
dogging lever to its inoperative position to
30 permit the bolt to be retracted, and a key
actuated member operatively associated with
the dogging member for moving the same
35 into an operative or inoperative position.

11. In a door, lock, a casing, a toggle bolt construction including an arm, a nosepiece
slidable through the edge portion of the cas-
ing and being pivotally connected to the
40 forward end of the arm, a stirrup member
pivotally connected to the rear end of the
arm and also pivotally secured in the cas-
ing, spring means for normally holding the
bolt projected in an operative position, op-
posed inner and outer door knob supporting
45 spindles extending to the casing and mount-
ed for swinging movement in a vertical plane,
the inner ends of the spindles selectively en-
gaging the stirrup member to swing the same
downwardly and rearwardly to retract the
50 bolt, means for locking the bolt in its pro-
jected position and preventing the down-
ward and rearward swinging movement of
the stirrup member by the outside door knob
55 spindle, said last mentioned means including
a dogging lever, the stirrup member being
provided with means for coaction with the
dogging lever when the latter is in its op-
erative position, the inner door knob spindle
60 being also capable of swinging movement
in a horizontal plane for moving the dogging
lever to its inoperative position to permit
the bolt to be retracted, and a key actuated
member operatively associated with the dog-
65 ging member for moving the same into an

operative or inoperative position, the parts
being so arranged as to permit the movement
of the dogging lever to an inoperative po-
sition by the actuation of the inner door knob
spindle in a horizontal plane when said dog-
ging lever has been moved to an operative
position by the key actuated member. 70

12. In a door lock, a bolt, operating mech-
anism therefor, a pair of opposed inner and
outer spindles, door knobs secured on the
75 outer ends of the spindles, the inner ends of
the spindles having cooperative engagement
with the bolt actuating mechanism, means for
mounting the spindles for swinging move-
ment in a vertical plane, additional means
80 for mounting the inner door knob spindle
for swinging movement in a horizontal plane
as and for the purpose described.

13. In a door lock, a bolt, operating mech-
anism therefor, a pair of opposed inner and
outer spindles, door knobs secured on the
85 outer ends of the spindles, the inner ends of
the spindles having cooperative engage-
ment with the bolt actuating mechanism,
means for mounting the spindles for swing-
ing movement in a vertical plane, rollers car-
ried by the intermediate portions of the
90 spindles, sockets for receiving said rollers
and permitting the swinging movement of the
spindles in a vertical plane, and additional
95 means associated with the inner door knob
spindle and its roller to permit the swinging
movement thereof in a horizontal plane as
and for the purpose described.

In testimony whereof, I affix my signature. 100
CARLETON JOHNSTONE.

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