Dec. 11, 1945. H. G. VOIGHT 2,390,756

FRONT DOOR LOCK

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Fig. 1.

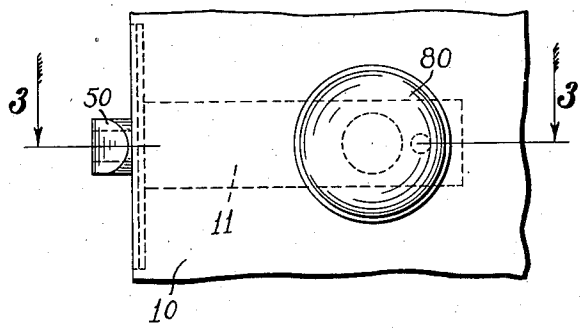


Fig. 2.

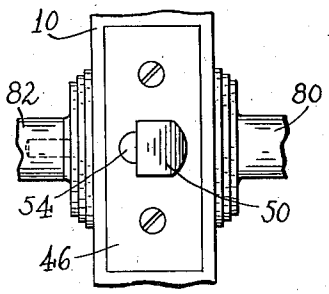


Fig. 3.

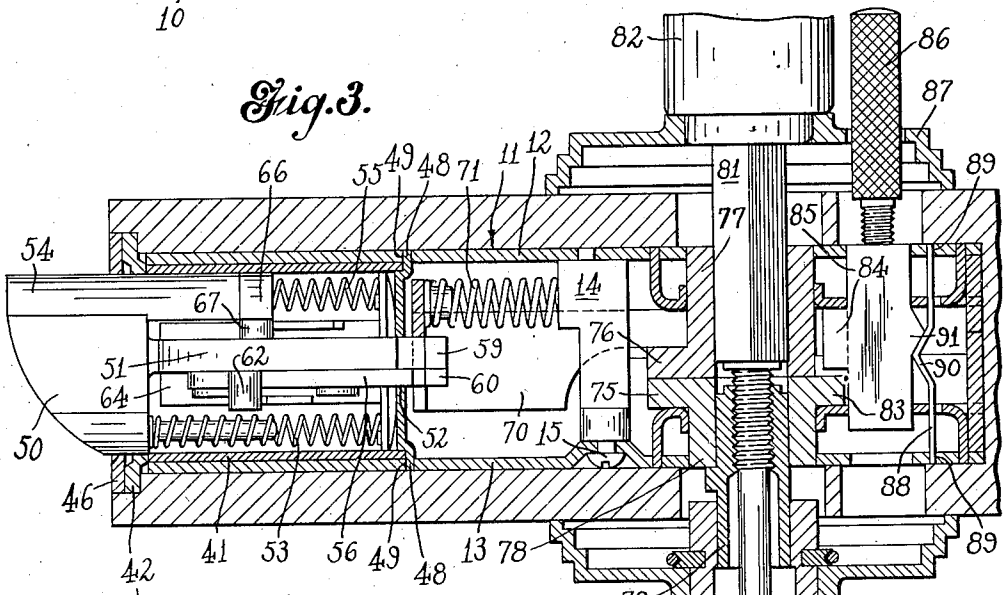
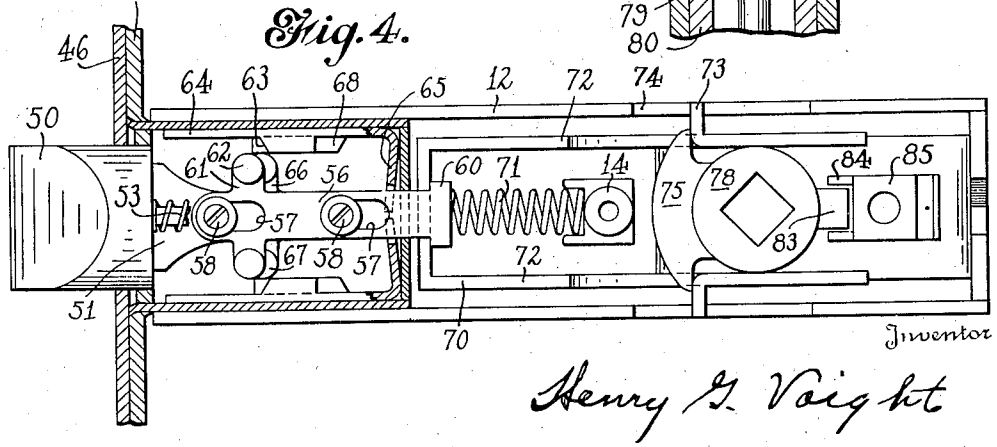


Fig. 4.



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FRONT DOOR LOCK

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Fig. 5.

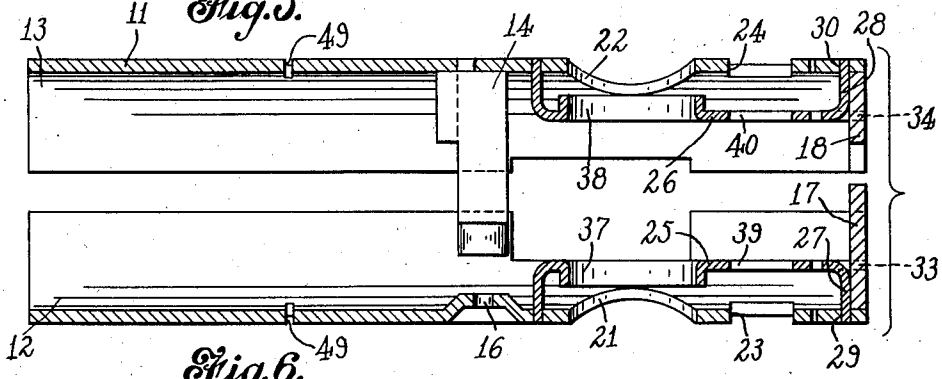


Fig. 6.

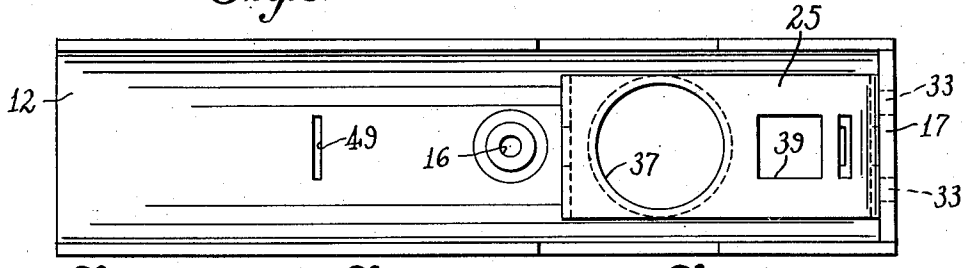


Fig. 7.

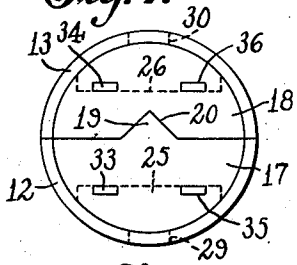


Fig. 8.

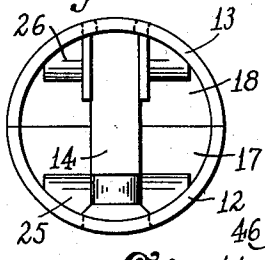


Fig. 9.

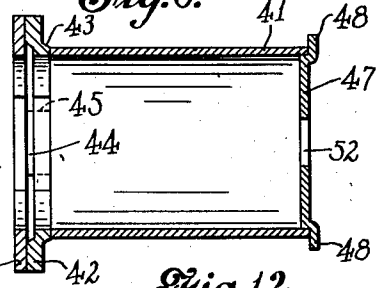


Fig. 10.

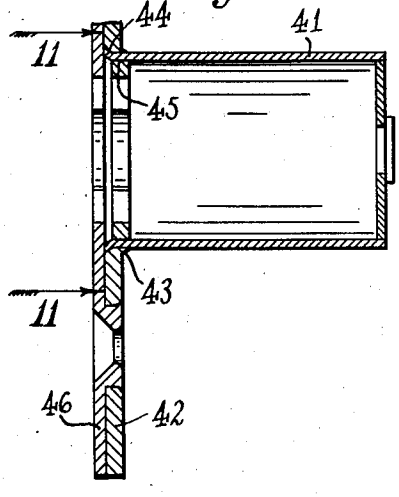


Fig. 11.

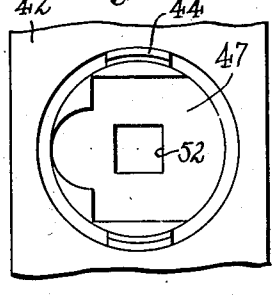
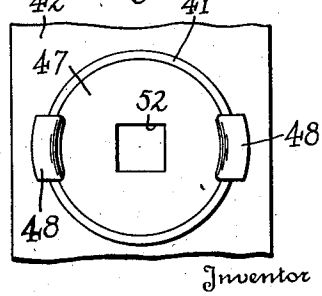


Fig. 12.



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FRONT DOOR LOCK

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Fig. 13.

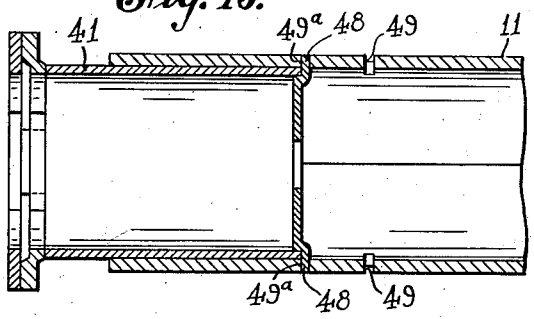


Fig. 14.

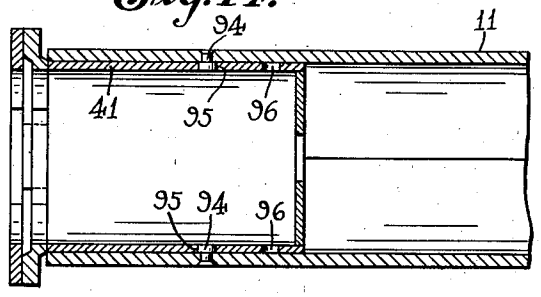
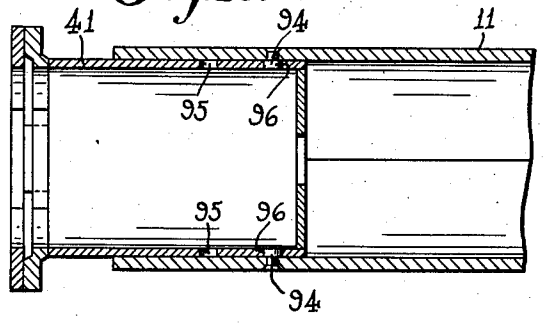


Fig. 15.



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Patented Dec. 11, 1945 2,390,756

UNITED STATES PATENT OFFICE

2,390,756

FRONT DOOR LOCK

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Application December 27, 1943, Serial No. 515,724

20 Claims. (Cl. 292—169)

This invention relates to door locks, and more particularly to a lock designed to be used in connection with a front door of a building or dwelling, although it will be understood that the principles of the invention may be applied to locks for other uses, and for doors employed in other locations.

In the manufacture of locks it is desirable to construct the lock so that it may be used with a door of either hand, regardless of which edge of the door may be the hinged edge. In the ordinary mortise lock this result is ofter achieved by so constructing the latch bolt of the lock that it may be reversed in position. However, in the case of a door which employes a so-called guard bolt or auxiliary bolt which controls a latch-dogging member, it is impossible to reverse the latch bolt as the bolt opening in the strike plate is not symmetrical, the auxiliary bolt usually being received in a portion of the same opening in which the latch bolt is received.

The present invention relates to a lock of the type in which an auxiliary or guard bolt is provided to control a latch-dogging member, and is designed to provide a lock which may be readily and cheaply manufactured, and which at the same time will be applicable to doors which open in either direction, or which are hinged at either edge. To effect this result an auxiliary case, which may be termed a bolt case, is employed, which bolt case contains the bolt mechanism, including the bolt-dogging mechanism, and which may be bodily assembled in the main case in reverse positions, so that the beveled face of the latch bolt may face in either direction. The main case of the lock is made in two parts which are substantially alike, each part comprising one half of the lock case, so that when one portion of this main case is removed the auxiliary case may be readily assembled therein and secured in place when the two parts of the main case are joined together.

It will also be noted as the description proceeds that the main case of the lock itself is of novel form and construction, so that it may readily be made of sheet material such as sheet steel, for example, and while circular in cross section so that it may be inserted in a bore made through the face of the lock, it nevertheless is provided with suitable flat guiding surfaces which cooperate with the mechanism contained in the case.

One object of the invention is to provide a new and improved door lock of simple construction, which may be economically manufactured.

A further object of the invention is to provide a door lock of the type commonly known as a front door lock, wherein the bolt and case within the bolt is mounted may be assembled in reversed positions with respect to the remaining parts of the lock.

A still further object of the invention is to provide a front door lock having a main case and a bolt case, the bolt case having the bolt mechanism assembled therein and being insertable as a unit in the main case in reversed positions whereby it may be employed with a door of either hand.

A still further object of the invention is to provide a case for a door lock of novel construction, which case may be readily and cheaply manufactured of sheet material, and which will have provision for assembly therein of a latch bolt in one of two relatively reversed positions.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a fragmentary view of a door to which is applied a lock embodying my invention;

Fig. 2 is an edge view of the parts shown in Fig. 1;

Fig. 3 is a sectional view on line 3—3 of Fig. 1;

Fig. 4 is a view of the lock case with the cover removed to show the interior parts, certain of the parts being shown in section;

Fig. 5 is a sectional view of the main case of the lock, the two parts being shown in slightly spaced positions;

Fig. 6 is an interior view of one of the halves of the case;

Fig. 7 is a rear end view of the case;

Fig. 8 is a front end view thereof;

Fig. 9 is a sectional view of the bolt case;

Fig. 10 is a sectional view of the bolt case taken at right angles to the view shown in Fig. 9;

Fig. 11 is a front view of the bolt case on line 11—11 of Fig. 10;

Fig. 12 is a rear view of the bolt case; and

Figs. 13, 14 and 15 are fragmentary sectional views of the front portion of the lock case showing modified forms of my invention.

To illustrate a preferred embodiment of my invention, I have shown a door 10 having mounted therein the case 11 of a lock of the type commonly called a front door lock. As will be apparent, the case 11 is of substantially cylindrical form from front to rear, so that it may be inserted in a cylindrical bore formed in the edge of the door.

As shown more particularly in Figs. 5 to 8 of the drawings, the case 11, which I term the main

case of the lock, consists of two substantially similar sections 12 and 13, the latter having secured thereto a post 14 to which may be secured a screw 15 passing through an opening 16 in the portion 12, to secure the parts together. At the rear end of section 12 is a substantially semi-circular end member 17 which cooperates with a member 18 of similar shape secured to the section 13 to close the rear end of the case when the two sections are secured together. The section 17 may be provided with a V-shaped lug 19 fitting into a complementally shaped recess 20 in the section 18 to assist in locating the two sections of the case.

The casing parts are provided with openings 21 and 22 for rollback hubs, to be described hereinafter, and also with openings 23 and 24 for the reception of a dogging member. Rearwardly of the post 14 a pair of U-shaped guide members 25 and 26 are secured to the respective casing portions, these members having elongated flat body portions to assist in guiding the lock mechanism, and outwardly extending leg portions 27 and 28 which space the body portion from the walls of the lock and are secured in openings 29 and 30 in the sections 12 and 13. Rearwardly projecting tongues 33 and 34 are provided upon the members 25 and 26, which tongues are secured in openings 35 and 36 in the sections 17 and 18, so that these rear-end closure members 17 and 18 are by this means secured to the respective sections 12 and 13. The members 25 and 26 are also provided with openings 37 and 38 for the rollback hubs, and openings 39 and 40 for a dogging member, as will be later described.

Disposed in the front portion of the main case 11 when the parts are assembled is a bolt case 41, shown in Figs. 9 to 12. This bolt case comprises a cylindrical body portion designed to fit snugly within the front open end of the main case and project therefrom. Secured to the front end of the bolt case 41 is a face plate 42, which, as shown in Figs. 9 and 10, has its end portions displaced outwardly slightly from the intermediate portion, as shown at 43, so that lugs 44 on the bolt case 41 may be passed through openings 45 in the face plate and turned over to secure the two parts together without interrupting the flat surface of the face plate, to which, if desired, a finishing plate 46 may be secured, as shown in Figs. 9 and 10.

The bolt case 41 is open at its front end but closed at its rear end by means of an end plate 47 which may be secured to the case in any desired way, such as by welding. This end plate is provided with outwardly projecting ears 48 designed to extend into openings 49 in the main casing sections 12 and 13, so as to secure the bolt case in place. It will be understood that the two portions 12 and 13 of the main case are separated when it is desired to assemble the bolt case therein. The bolt case is simply placed between the two halves, with the lugs or ears 48 registering with the openings 49, and when the casing sections 12 and 13 are secured together by the screw 15 the bolt case will be secured in place within the main case. It may also be noted that the bolt case may be secured in the main case in either one of two relatively reversed positions, as may be necessary to reverse the position of the latch bolt.

The mechanism of the lock may now be described. Within the bolt case is reciprocably mounted a bolt comprising a head 50 and a stem 51, the head being beveled, as is usual, and the stem projecting from the case through an opening 52 in the rear end closure member 47. The bolt is urged to protracted position by a spring 53. Adjacent the latch bolt just described is reciprocably mounted an auxiliary bolt or guard bolt 54, this bolt being urged to protracted position by a spring 55. Also mounted beside the stem 51 of the main bolt is a slide or plate 56, this plate being provided with elongated openings 57 receiving pins or screws 58 connected to the stem 51 so that this slide will be connected to the stem by a lost-motion connection. The stem 51 and slide 56 are provided at their rear ends with headed portions 59 and 60, respectively, and the slide is also provided with outwardly projecting arms 61 carrying laterally directed pins 62 designed to cooperate with beveled lugs 63 provided upon dogging members 64 of L-shaped form mounted in the case. It will be noted that the rear ends 65 of these L-shaped members extend inwardly toward the stem 51 and slide 56 and are provided with openings to permit the passage therethrough of these members. The springs 53 and 55 also react at their rear ends against the ends 65 of the dogging members, so as to urge the forward ends of these members inwardly.

The auxiliary bolt 54 is also provided with a crossarm 66 carrying laterally directed pins 67 designed to cooperate with lugs 68 on the members 64, so that when the guard bolt is extended the engagement of the pins 67 with the lugs 68 will hold the members 64 in the position shown in Fig. 4. When, however, the guard bolt is retracted by engagement with the strike, the pins 67 will be forced rearwardly out of engagement with the lugs 68 and permit the forward ends of the members 64 to move inwardly in the path of a latch bolt and dog it against retraction. When the parts are in this position, if the latch bolt is pressed inwardly it will strike the ends of the members 64 and be prevented from further inward movement. If, however, it is retracted by the knob mechanism, to be later described, which also draws rearwardly the slide 56, the members 64 will be cammed upwardly by the pins 62 and permit the retraction of the latch bolt.

Engaged with the headed ends 59 and 60 of the stem 51 and slide 56 is a retracting member 70 urged forwardly by the spring 71, this retracting member having rearwardly extending spaced arms 72 provided with outwardly projecting lugs 73 slidably mounted in slots 74 in the lock case. These lugs are adapted to be engaged by rollbacks 75 and 76 carried by hubs 77 and 78 rotatably mounted in the case and in the guide members 26 and 27. The rollback hub 78 will be mounted at the outer side of the door, and is adapted to be rotated by a spindle section 79 actuated by the outer knob stem 80, while the rollback hub 77 is at the inner side of the door and is rotated by a spindle section 81 operated by the inner knob 82.

Mechanism for dogging the outer knob is provided, which mechanism is designed to be operated at the inside of the door. For this purpose the outer rollback hub is provided with a rearwardly directed lug 83 designed to be embraced by spaced arms 84 provided upon a detent or dogging slide 85 slidably mounted in the members 25 and 26, as shown more especially in Fig. 3. Threadedly secured to the member 85 is a push button 86 which extends outwardly through the inner rose 87 so that the member 85 may be manipulated inwardly and outwardly to

engage and disengage the lug 83. The member 85 may be held in adjusted position by means of a spring 88 mounted in openings 89 in the case, and provided with an arched or V-shaped portion 90 arranged to engage a complementally shaped portion 91 on the dogging member 85.

It will be understood that the spindles 79 and 81 constitute a sectional spindle, the two sections meeting at approximately the dividing line between the rollbacks 75 and 76, and that these spindle sections are independently rotatable so that the inner knob may be rotated even though the rollback of the outer knob is dogged. The particular arrangement of the spindles may be like that shown in my prior Patent No. 2,272,101, granted February 3, 1942.

As shown more particularly in Figs. 2, 10 and 11, the face plates 42 and 46 are provided with openings of suitable shape and size to slidably receive the latch bolt 50 and guard or auxiliary bolt 54. As is usual, however, the opening in the strike plate will receive only the latch bolt head 59, so that the guard bolt will be held in retracted position when the door is closed, thus serving to permit the outer ends of the members 64 to drop inwardly behind the head of the latch bolt.

When either of the knobs is turned to rotate the rollbacks 75 or 76, the retracting member 70 will retract the latch bolt by means of its connection with the head 59 of the latch bolt stem 51. It will also draw back the slide or plate 56, which will serve by engagement of the pins 62 with the cam-shaped lugs 63 to throw the forward ends of the members 64 out of engagement with the latch bolt so as to permit the retraction of the latter. As has been previously described, the lost-motion connection between the slide 56 and the latch bolt stem permits the latch bolt to be moved inwardly a slight distance by pressure upon the end thereof before any movement of the plate 56 takes place. When, however, the latch retractor 70 is actuated, these two members move substantially simultaneously so that the dogging members 64 are moved to inoperative position before they are engaged by the rear face of the head of the latch bolt.

It will be apparent that I have provided a lock of the type usually used in connection with a front door, of novel arrangement and construction, and have arranged the bolt mechanism, including the guard bolt, in a separate case which is received and enclosed within the main case, but which may be readily mounted in the main case in either of two relatively reversed positions. In reversing the latch bolt structure the entire bolt assembly, including the case 41, is reversed with respect to the main case 11.

Moreover, the end plates or face plates 42 and 46 are secured to the bolt case 41, which projects from the forward open end of the main case 11, and these plates serve as the face plates of the lock, and are, of course, reversed with the bolt mechanism.

Also novel means are provided in the main lock case for mounting the rollback hubs, these means being constituted by the U-shaped plates 25 and 26, which not only serve this purpose but also serve to secure the end closure sections 17 and 18 to the main sections 12 and 13 of the case 11.

In Fig. 13 of the drawings I have shown a slightly modified construction wherein the sections of the main case 11 are not only provided with openings 49 but also with openings 49a, so that the lugs 48 upon the bolt case may be engaged in either pair of these openings. If engaged in the openings 49a, as shown in Fig. 13, the bolt case 41 projects from the main case 11, and thus allows a greater setback for the knob spindle, or positions the knob spindle at a greater distance from the edge of the door.

In Figs. 14 and 15 of the drawings I have shown a further modification wherein the sections of the main case 11 are provided with studs or rivets 94, and the bolt case 41 provided with a plurality of spaced openings 95 and 96, so that the rivets 94 in the main case may be engaged either in the openings 95, as shown in Fig. 14, or in the openings 96, as shown in Fig. 15. In the latter case the bolt case 41 projects forwardly from the main case and provides a greater setback for the knob spindles from the edge of the door.

In positioning the bolt case in its forwardly adjusted positions, as shown in Figs. 13 and 15, it will be necessary to employ a retracting member 70 of greater length than that shown in Fig. 3, or that employed when the parts are in the position shown in Fig. 14. This, however, would be the only change necessary to employ the lock with the knob spindles disposed at different distances from the edge of the door.

While I have shown and described some preferred embodiments of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What I claim is:

1. A door lock comprising a main case having bolt-retracting mechanism therein, a bolt case adjustably secured within the forward end of the main case, and a bolt mounted in, and supported by, the bolt case for adjustment as a unit therewith and connected to said retracting mechanism, said main case being of cylindrical shape and open at its forward end, and said bolt case also being cylindrical and fitting snugly within the main case with its axis substantially coinciding with that of the main case.

2. A casing for a door lock, said casing being of substantially cylindrical shape and comprised of two substantially identical half sections, a substantially semi-circular closure member at one end of each of said sections, and a guide plate secured to each of said sections and spaced from the wall thereof, said plates being substantially parallel when said sections are assembled.

3. A casing for a door lock, said casing being of substantially cylindrical shape and comprised of two substantially identical half sections, a substantially semi-circular closure member at one end of each of said sections, and a guide plate secured to each of said sections and spaced from the wall thereof, said plates being substantially parallel when said sections are assembled, and each of said plates being secured to one of the sections and to the corresponding closure member to hold the latter in place.

4. A casing for a door lock, said casing being of substantially cylindrical shape and comprised of two substantially identical half sections, a substantially semi-circular closure member at one end of each of said sections, and a guide plate secured to each of said sections and spaced from the wall thereof, said plates being substantially parallel when said sections are assembled, and each of said plates having end portions secured in openings in the respective sections.

5. A casing for a door lock, said casing being of substantially cylindrical shape and comprised of two substantially identical half sections, a substantially semi-circular closure member at one end of each of said sections, a guide plate secured to each of said sections and spaced from the wall thereof, said plates being substantially parallel when said sections are assembled, and each of said plates having end portions secured in openings in the respective sections, and a rearwardly projecting tongue secured to an end closure member.

6. A casing for a door lock, said casing being of substantially cylindrical shape and comprised of two substantially identical half sections, a substantially semi-circular closure member at one end of each of said sections, a guide plate secured to each of said sections and spaced from the wall thereof, said plates being substantially parallel when said sections are assembled and being provided with openings, rollback hubs rotatably mounted in said openings, and a latch bolt in the casing operated by said hubs.

7. A door lock comprising a main case having bolt-retracting mechanism therein, a bolt case resting within the forward end of the main case, and a bolt mounted in the bolt case and connected to said retracting mechanism, said main case being formed of separable sections, and said bolt case being clamped between said sections when the latter are secured together.

8. A door lock comprising a main case having bolt-retracting mechanism therein, a bolt case resting within the forward end of the main case, a bolt mounted in the bolt case and connected to said retracting mechanism, said main case being formed of separable sections, and means on the bolt case engaging said sections when the latter are secured together to retain the bolt case in assembled relation with the main case.

9. A door lock comprising a main case having bolt-retracting mechanism therein, a bolt case resting within the forward end of the main case, and a bolt mounted in the bolt case and connected to said retracting mechanism, said main case being formed of separable sections each of which is provided with an opening, and said bolt case having projecting lugs engaging in said openings when the casing sections are secured together.

10. A door lock comprising a main case having bolt-retracting mechanism therein, a bolt case resting within the forward end of the main case, and a bolt mounted in, and supported by, the bolt case and connected to said retracting mechanism, said bolt case being adjustable with respect to the main case in a direction longitudinally of the movement of the bolt, and the bolt being carried with said bolt case in its adjustments.

11. A door lock comprising a main case having bolt-retracting mechanism therein, a bolt case resting within the forward end of the main case, a bolt mounted in, and supported by, the bolt case and connected to said retracting mechanism, and means for connecting the bolt case to the main case comprising an opening in the wall of one of said members and a projecting part upon the other member engaging said opening.

12. A door lock comprising a main case having bolt-retracting mechanism therein, a bolt case resting within the forward end of the main case, a bolt mounted in, and supported by, the bolt case and connected to said retracting mechanism, and means for connecting the bolt case to the main case comprising a plurality of spaced openings in one of said members and a projecting element on the other member engageable in either of said openings whereby the bolt case and the bolt supported thereby may be adjusted with respect to the main case.

13. A door lock comprising a main case having bolt retracting mechanism therein, a bolt case resting within the forward end of the main case, a bolt reciprocably mounted in the bolt case and connected to said retracting mechanism, said bolt case and contained bolt being reversible as a unit in said main case about an axis parallel to the movement of the bolt, and means for securing said bolt case to the main case in either of said reversed positions.

14. A door lock comprising a main case having bolt retracting mechanism therein, a bolt case resting within the forward end of the main case, a bolt reciprocably mounted in the bolt case and connected to said retracting mechanism, said bolt case and contained bolt being reversible as a unit in said main case about an axis parallel to the movement of the bolt, means for securing said bolt case to the main case in either of said reversed positions, and means restraining said bolt against rotation relatively to the bolt case.

15. A door lock comprising a main case open at its forward end, a bolt retracting mechanism movably mounted in said case, a bolt case snugly received in the forward end of the lock case, bolt mechanism in the bolt case including a reciprocable bolt and bolt dogging means, said dogging means being moved to inoperative position by movement of the retracting mechanism, said bolt mechanism and bolt case being reversible as a unit about an axis parallel to the direction of movement of the bolt, means for fixedly securing said bolt case to the main case in either of said reversed positions, and means connecting said latch bolt and dogging means with the retracting mechanism for operation thereby in either of said positions.

16. A door lock comprising a main case of generally tubular shape, bolt retracting mechanism movably mounted in said case, a bolt case of generally tubular shape snugly received in the forward end of the lock case, bolt mechanism mounted in the bolt case including a latch bolt and bolt dogging means, said dogging means being moved to inoperative position by movement of the retracting mechanism, said bolt case and contained mechanism being bodily reversible as a unit about the longitudinal axis of the main case, means for securing said bolt case to the main case in either of said reversed positions, and means connecting said latch bolt and dogging means with the retracting mechanism for operation thereby in either of said positions.

17. A door lock as set forth in claim 16 in which a face plate is provided on the bolt case through which the bolt projects, and a guard bolt for said dogging mechanism is mounted within the bolt case and projects through said face plate.

18. A door lock comprising a main case open at its forward end, bolt retracting mechanism movably mounted in said case, a bolt case snugly received in the forward end of the lock case and secured thereto, bolt mechanism mounted in the bolt case including a reciprocating latch bolt and a bolt dogging means, said dogging means being moved to inoperative position by movement of the retracting mechanism, said bolt case and bolt mechanism being reversible as a unit in the main case about an axis parallel to the movement

of the bolt, means connecting said latch bolt and dogging means with the retracting mechanism for operation thereby in either of said reversed positions, said bolt case having a rear wall provided with an opening, and said connecting means comprising a stem on the bolt to extend through said opening for engagement with the retracting mechanism.

19. A door lock comprising a main case open at its forward end, bolt retracting mechanism movably mounted in said case, a bolt case snugly received in the forward end of the lock case and secured thereto, bolt mechanism mounted in the bolt case including a reciprocating latch bolt and a bolt dogging means, said dogging means being moved to inoperative position by movement of the retracting mechanism, said bolt case and bolt mechanism being reversible as a unit in the main case about an axis parallel to the movement of the bolt, means connecting said latch bolt and dogging means with the retracting mechanism for operation thereby in either of said reversed positions, said bolt case having a rear wall provided with an opening, said connecting means comprising a stem on the bolt to extend through said opening for engagement with the retracting mechanism, and a bolt-protracting spring in said bolt case acting against the rear wall thereof.

20. A door lock comprising a main case of substantially tubular shape having bolt retracting mechanism mounted therein, a bolt case resting within the forward end of the main case, bolt mechanism in said bolt case comprising a reciprocable latch bolt and spring means for protracting said bolt, said bolt case and mechanism therein being reversible as a unit about the axis of the main case, and means securing said bolt case to the main case in either of said reversed positions to face the bolt in either of two opposite directions.

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