

Aug. 18, 1942.

M. FALK

2,293,645

AUXILIARY LATCH

Filed May 17, 1940

3 Sheets-Sheet 1

Fig. 1.

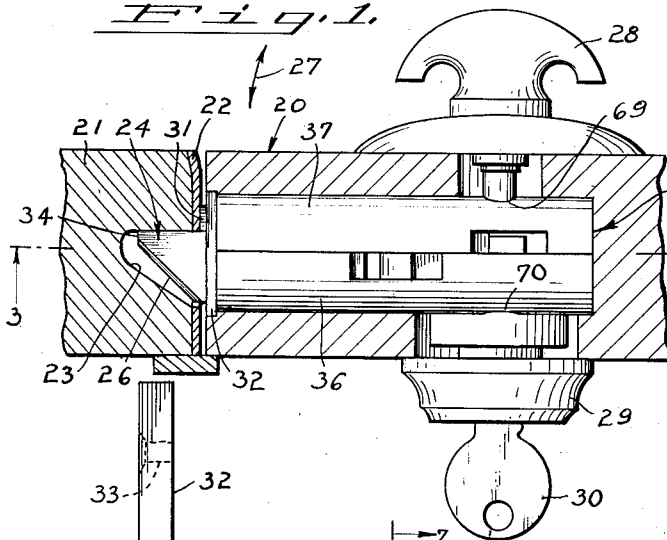


Fig. 2.

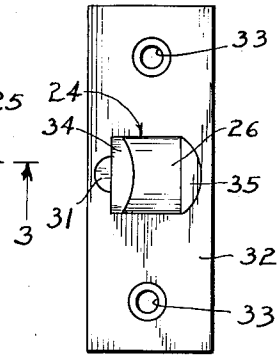


Fig. 3.

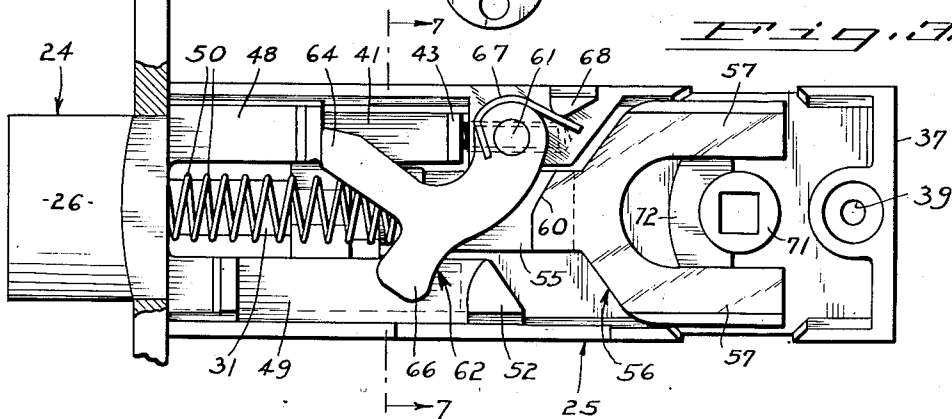
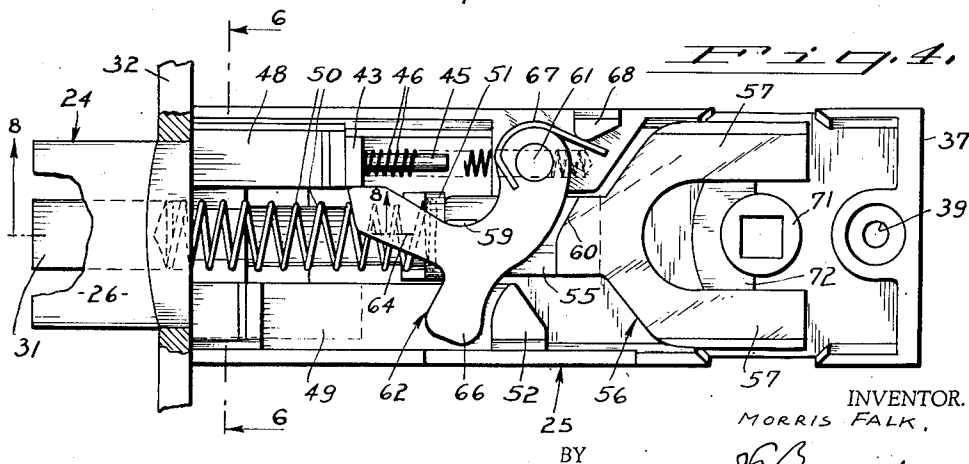


Fig. 4.



INVENTOR.
MORRIS FALK.

BY
J. F. Baruch
his ATTORNEY.

Aug. 18, 1942.

M. FALK

2,293,645

AUXILIARY LATCH

Filed May 17, 1940

3 Sheets-Sheet 2

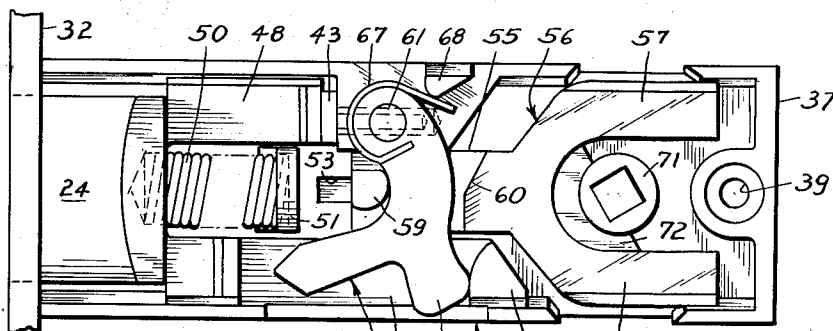


Fig. 5.

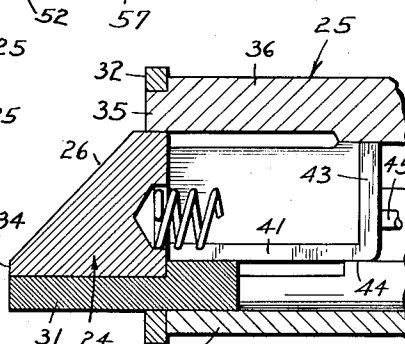
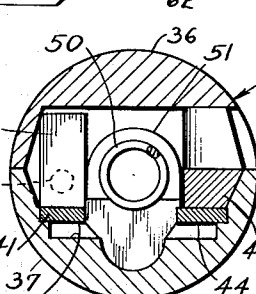
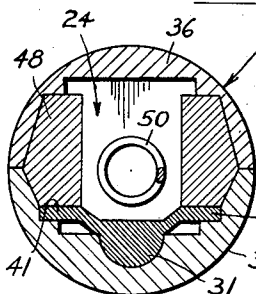


Fig. 6. Fig. 7.

Fig. 8.

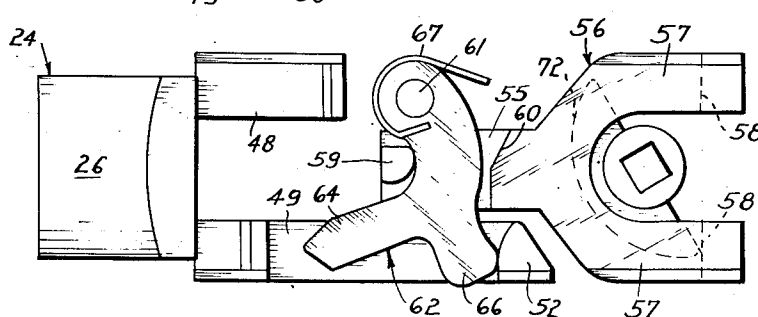
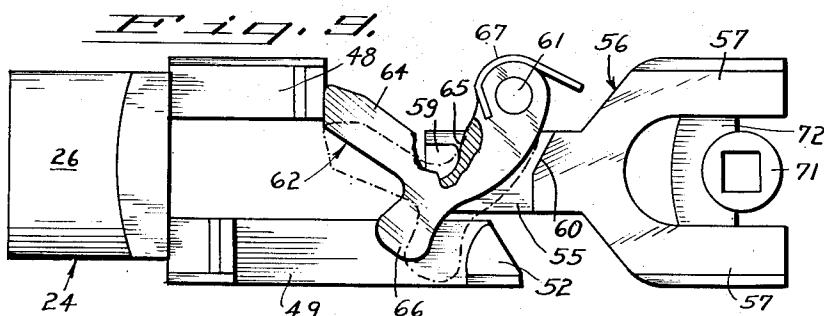


Fig. 9.

Fig. 10.

BY

INVENTOR.
MORRIS FALK.

J. P. Resnickes
his ATTORNEY.

Aug. 18, 1942.

M. FALK

2,293,645

AUXILIARY LATCH

Filed May 17, 1940

3 Sheets-Sheet 3

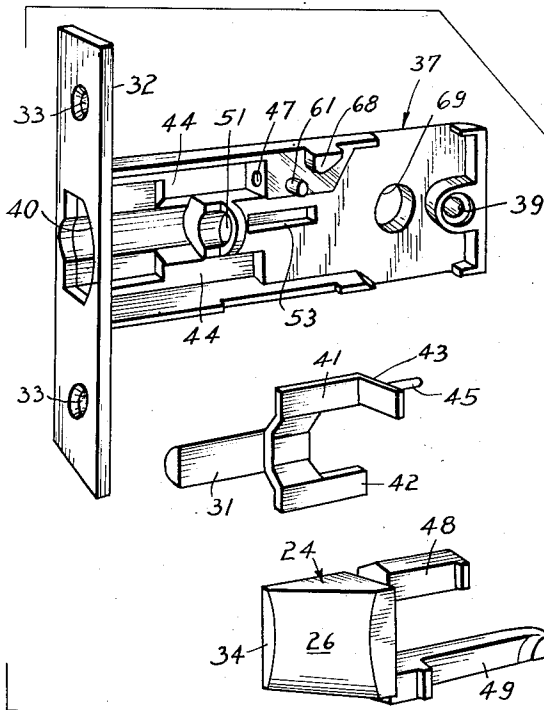


Fig. 11.

Fig. 12.

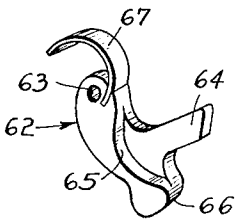
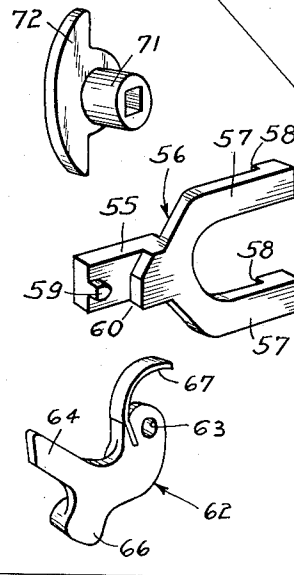
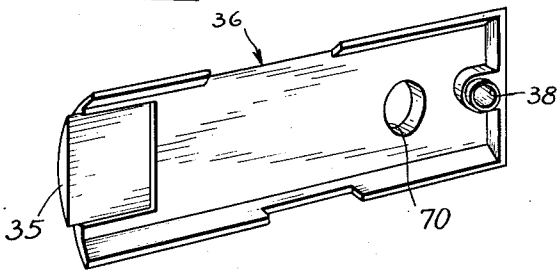


Fig. 14.

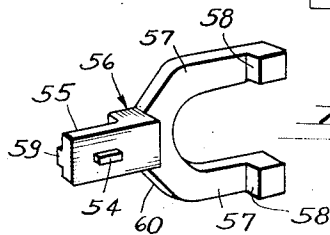


Fig. 15.

INVENTOR.
MORRIS FALK.

BY

J. F. Bassiches
his ATTORNEY.

UNITED STATES PATENT OFFICE

2,293,645

AUXILIARY LATCH

Morris Falk, Leominster, Mass., assignor to Independent Lock Company, Fitchburg, Mass., a corporation of Massachusetts

Application May 17, 1940, Serial No. 335,704

18 Claims. (Cl. 70—151)

My present invention relates generally to locks, and has particular reference to that type of device in which a latch bolt becomes automatically deadlocked upon the closing of the door or other closure with which the lock is associated.

For the purpose of explaining the general nature of the invention, it may be pointed out that the present device is primarily intended for use on a door of a hotel room or the like, the general object being to allow the latch bolt to function in the usual manner, but to effect an automatic deadlocking whenever the door is closed, thereby preventing manipulation of the latch bolt from the outside except with the aid of a special key or the like.

It is a general object of the invention to provide a lock of the foregoing character, in which the parts are constructed and arranged in a novel manner which results in unusual compactness and simplicity, and which reduces the cost of manufacture and installation.

A particular feature of the invention lies in an association of parts which allows the entire mechanism to be contained within a substantially tubular housing, the latch bolt being mounted for axial reciprocation into and out of one end of the housing. As a result, the installation of the present lock is greatly facilitated, since it may be inserted endwise into a substantially cylindrical hole drilled into the edge of the door.

Briefly, the present lock is of the type in which a yieldable means constantly urges a pivoted dog toward a deadlocking position with respect to a latch bolt, and in which a retracting means is provided for operating upon and retracting the dog. In accordance with my invention, I provide mutually-engageable portions on the dog and bolt whereby retraction of the dog effects retraction of the bolt.

The present retracting means includes a reciprocable link, and my invention provides another set of mutually-engageable portions on the link and dog whereby actuation of the link effects retraction of the dog.

To effect the desired automatic deadlocking whenever the door is closed, the device also includes an auxiliary latch bolt which moves with the main latch bolt at all times except when the door is closed. At that time, the main latch bolt is allowed to protrude, in the usual manner, into a suitable opening in the door jamb, but the auxiliary latch bolt is retained in a rearward position. When the auxiliary bolt is in this rearward position, the dog is enabled to swing into deadlocking position. At other times, i. e., when-

ever the door is open, yieldable means advances the auxiliary bolt into a position which blocks movement of the dog into deadlocking position.

Among the important features of the invention are the special configurations and relative arrangements of the various parts of the device, including those hereinbefore mentioned, whereby the desired simplicity and compactness are capable of achievement.

I attain these objects and advantages, and such other objects and advantages as may hereinafter appear or be pointed out, in the manner exemplified in the accompanying drawings in which:

Figure 1 is a fragmentary cross-sectional view through a door and door jamb, showing the general relationship of the present lock with the door;

Figure 2 is a front end view of the present device shown by itself;

Figure 3 is an enlarged cross-sectional view taken substantially along the line 3—3 of Figure 1 showing the main latch bolt in deadlocked position;

Figure 4 is a view similar to Figure 3 showing the relationship of the parts when the door is open;

Figure 5 is a view similar to Figures 3 and 4 showing the relationship of the parts when the main latch bolt is fully retracted;

Figure 6 is a cross-sectional view taken substantially along the line 6—6 of Figure 4;

Figure 7 is a cross-sectional view taken substantially along the line 7—7 of Figure 3;

Figure 8 is a fragmentary enlarged cross-sectional view taken substantially along the line 8—8 of Figure 4;

Figure 9 is a view similar to Figure 3, showing only certain of the cooperative elements, illustrating the mode of operation;

Figure 10 is a view similar to Figure 9 showing the parts of Figure 9 in an adjusted relationship;

Figure 11 is an exploded view of the major elements entering into the present assembly;

Figure 12 is a perspective view, from the inside, of the housing wall section which cooperates with the housing wall section shown in Figure 11;

Figure 13 is a perspective view, as seen from underneath, of the dog; and

Figure 14 is a perspective view, as seen from underneath, of the link.

In Figure 1 I have shown an illustrative door in closed relationship to a door jamb 21. The door jamb 21 is provided with the usual metal plate 22 within which there is an opening which

registers with a recess 23 in the door jamb. This recess is adapted to receive the main latch bolt 24, in the usual manner, when the door is closed. This latch bolt is mounted for axial reciprocation into and out of the end of a substantially tubular housing 25, and is provided with the usual beveled face 26. Thus, as viewed in Figure 1, the door is intended to swing in the direction of the arrow 27.

On the assumption that the door swings into the room, as is customary, I have shown a typical handle or knob 28 on the inside of the door adapted to be manually controlled by the occupant of the room for retracting the latch bolt 24 when he wishes to open the door. This handle need not be manipulated when the door is to be closed, because the beveled face 26 of the latch bolt automatically causes a retraction of the latch bolt as the door closes. On the opposite or outside face of the door I have shown a typical key plate 29, and I have illustratively shown a key 30 in operative position. The retraction of the latch bolt from the outside of the door can be effected only by means of the proper key 30.

Both the handle 28 and the key 30 control the rotative movement of the same element, hereinafter to be described in greater detail.

On both sides of the door there may be the usual door knobs (not shown) by means of which the door is grasped.

Before proceeding to a description of the other figures of the drawings, it should be noted in Figure 1 that an auxiliary latch bolt 31, lying adjacent to the main latch bolt 24, is retained in a retracted position by the plate 22.

Secured to the forward end of the housing 25 is a plate 32, shown most clearly in Figure 2. When the device is installed, this plate is set into a suitable shallow recess in the edge of the door, so that the forward face of this plate is flush with the face of the door. The plate 32 is preferably provided with openings 33 adapted to receive screws or the like.

From Figure 2, it will also be observed that the auxiliary latch bolt 31 is considerably smaller than the main latch bolt 24, and is preferably of semi-circular cross-section. The reference numeral 34 is applied to the blunted attenuated end of the main latch bolt 24. The segmental piece 35 is an integral part of the housing section 36. This housing section is substantially semi-circular in cross-section and is shown by itself in Figure 12. It cooperates with the complementary housing section 37 which is also of substantially semi-circular cross-section. The section 37 is preferably formed in rigid association with the plate 32, while the section 36 serves as a removable cover. At their rear ends, these sections are adapted to be separably attached to each other by means of a stud (not shown) extending through openings 38 and 39 (see Figures 11 and 12). At their forward ends, the sections 36 and 37 are held in proper relationship by virtue of the segmental piece 35 which projects through the plate 32 and thereby serves as a positioning tongue.

Referring now to Figures 11-14, the individual elements entering into the present construction will be described in greater detail.

The plate 32, rigidly mounted on the forward end of the housing section 37, is provided with an opening 40 of suitable shape to allow passage through it of the auxiliary latch bolt 31, the main latch bolt 24, and the tongue 35.

The auxiliary latch bolt 31 is formed at its rear end with two spaced arms 41 and 42. One of these arms has an upstanding end 43. The

arms 41 and 42 are adapted to slide on the surfaces 44 provided for this purpose on the interior of the housing section 37. A post 45 mounted on the rear face of the upstanding piece 43 is adapted to support a compression spring 46 (see Figure 4). The rear end of this spring is mounted within a recess 47 formed in the housing. This spring thus serves as a yieldable means for constantly urging the auxiliary latch bolt 31 toward the protruding position of Figure 4.

The main latch bolt 24 is provided with the spaced rearwardly-extending shanks 48 and 49. When the parts are assembled, the shank 48 lies on the arm 41 of the auxiliary latch bolt, and the shank 49 lies on the arm 42. The parts are so proportioned that when the rear end of the shank 48 is in contact with the upstanding end 43, the forward surfaces of the bolts 24 and 31 are in flush relationship as shown in Figure 4.

It will be observed that the shanks 48 and 49 are arranged in substantially diametric opposition to each other, within the tubular housing. In the space between them, there is room for a compression spring 50 (see Figures 3-5) whose rear end may be secured within a recess 51 provided in the housing for this purpose. The spring 50 serves as a yieldable means which constantly urges the main latch bolt into the protruding position shown in Figures 1, 3, and 4.

For a purpose presently to be described, the shank 49 is slightly longer than the shank 48 and is provided at its rear end with a rounded projection 52.

Behind the recess 51 in the housing, a longitudinal guide slot 53 is provided. This slot is intended to receive the guiding projection 54 (Figure 14), formed on the underface of the forward portion 55 of a reciprocable link 56. This link has spaced rearwardly-extending arms 57 each of which is provided with a shoulder portion 58.

The forward portion 55 of the link is offset with respect to the arms 57. On its upper surface, the portion 55 is provided at its forward end with a cam projection 59. Spaced rearwardly from this projection is the forwardly directed surface 60.

Behind the recess 47 in the housing, there is a pivot pin 61. Mounted on this pivot pin is the pivotable dog 62, which is substantially V-shaped. At one end of one arm of the V is the opening 63 which fits over the pin 61. The other arm 64 has a somewhat pointed end and is the arm which accomplishes the deadlocking function. Preferably, this arm is narrower than the body of the dog 62, as shown most clearly in Figure 13. This permits the provision of a concave cam surface 65 arranged, roughly speaking, in the region of the apex of the V. Also arranged at approximately the apex of the V is a projection 66 which has a camming function presently to be described.

A leaf spring 67 is secured at one end within a suitable notch in the dog 62. Its other end catches beneath a suitable projection 68 formed in the housing 37. This spring is illustrative of a yieldable means which constantly urges the dog in a clockwise direction, as viewed in Figures 3, 4, 5, and 11.

When the parts are assembled, the dog 62 lies on top of the link portion 55 so that the projection 59 is in rubbing contact with the cam surface 65. At the same time, the cam projection 66 positions itself in front of the cam projection 52, and is adapted for rubbing encounter therewith.

Near the rear end of the housing section 37 is a circular opening 59. In the corresponding portion of the housing section 36 there is a similar opening 70. These openings are in alignment and serve as bearings for a trunnion 71. Carried by this trunnion is a wing 72 the arms of which are adapted to encounter, respectively, the shoulders 58 of the link member 56.

By any suitable means (not shown) one end of the trunnion 71 is engaged by mechanism controlled by the key 30, while the other end of the trunnion is engaged by a suitable part associated with the handle or knob 28. By either of these means a rotative movement of the trunnion 71 is effected. This rotation brings one or the other end of the wing 72 into engagement with the corresponding shoulder 58, thus effecting retractive movement of the link 56.

The parts are all so designed and arranged that they fit snugly and compactly within the tubular housing formed of the two sections 36 and 37. They are assembled by mounting them successively into the housing section 37 and then finally applying the closure section 36.

When completely assembled and installed within the door, as shown in Figure 1, the operation is as follows, references being now directed particularly to Figures 3, 4, 5, 8, 9, and 10:

When the door is open, the parts are in the relationship shown in Figure 4. The spring 50 is retaining the main latch bolt 24 in projecting position, and the spring 46 is similarly maintaining the auxiliary bolt 31 in extended condition. The spring 67 is urging the dog 62 in a clockwise direction, but the rear end 43 of the auxiliary latch bolt is blocking movement of the dog into a deadlocking position. The link 56 is being retained in an advanced position (i. e., toward the left in Figure 4) by virtue of the fact that the cam surface 65 of the dog is pressing against the cam projection 59.

When the door is closed, the main latch bolt 24 is retracted as it encounters the door jamb. As it retracts, the shank 48 presses rearwardly against the piece 43, whereby the auxiliary latch bolt is retracted at the same time. When the door reaches its completely closed position, however, the main latch bolt 24 snaps forwardly into the position of Figure 1, while the auxiliary latch bolt 31 is still retained in retracted position. As a result, the arm 64 of the dog is enabled to move into the position of Figure 3. In this position, it lies directly behind the shank 48, and the main latch bolt is thus deadlocked.

When the door is to be opened, either by turning the knob 28 on the inside of the door, or by using the proper key 30 from the outside of the door, the trunnion 71 is slightly rotated in one or the other direction. This causes the retraction of the link 56, whereby the projection 59 presses against the cam surface 65 of the dog and swings the dog in a counter-clockwise direction. The first portion of this swing is indicated by dot-and-dash lines in Figure 9. The dog is thus retracted from a deadlocking position. As the retraction of the dog proceeds, the projection 66 encounters the projection 52 and causes a retractive movement of the main latch bolt. At the end of this retractive movement, the parts are in the relationship shown in Figures 5 and 10.

Once this retraction has been effected the door may be swung open, and when the handle or key is released the parts resume the normal positions shown in Figure 4.

One of the structural innovations contributing toward the desirable compactness of the present assembly lies in the fact that the dog is pivoted at a point adjacent to one wall of the tubular housing, while the main latch bolt is engaged by the dog, for retraction purposes, adjacent to the diametrically opposite wall. Stated otherwise, the dog is pivoted so that it always lies in its entirety within the confines of the tubular housing.

Another feature which contributes to the simplicity of the device and to its compact and efficient nature, is the cooperative relationship between the reciprocable link 56, the pivoted dog 62 and the main latch bolt 24, whereby a retraction of the link brings about a retraction of the dog, while a retraction of the dog, in turn, brings about retraction of the main latch bolt.

In general it will be understood that the details herein described and illustrated may be modified by those skilled in the art without departing from the spirit and scope of the invention as expressed in the appended claims.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. In a lock of the character described having a substantially tubular housing, a latch bolt, a lever element pivoted on the housing transversely thereof, having a dog projecting therefrom, yieldable means constantly urging said dog toward a deadlocking position with respect to said bolt, retracting means arranged to operate upon said lever element and retract said dog, and mutually-engageable portions on the dog and bolt whereby retraction of the dog effects retraction of the bolt.

2. In a lock of the character described having a substantially tubular housing, a latch bolt, a lever element pivoted on the housing transversely thereof, having a dog projecting therefrom, yieldable means constantly urging said dog toward a deadlocking position with respect to said bolt, retracting means arranged to operate upon said lever element and retract said dog, and mutually-engageable portions on the lever element and bolt whereby retraction of the lever element effects retraction of the bolt, said mutually-engageable portions comprising projections arranged on the lever element and bolt for rubbing encounter with each other.

3. In a lock of the character described having a housing substantially as described, a latch bolt, a lever element pivoted transversely of the housing, having a dog projecting therefrom, yieldable means constantly urging said dog of said element toward a deadlocking position with respect to said bolt, retracting means including a reciprocable link, mutually-engageable portions on the link and element whereby actuation of the link effects retraction of the dog, and mutually-engageable portions on the element and bolt whereby retraction of the element effects retraction of the bolt.

4. In a lock of the character described having an elongated housing, a latch bolt slidable in said housing, a dog pivoted transversely of said housing, yieldable means constantly independently urging said dog toward a deadlocking position in the path of said bolt, retracting means including a reciprocable link spaced from said dog, mutually-engageable portions on the link and dog whereby actuation of the link effects retraction of the dog, and mutually-engageable portions on the dog and bolt whereby retraction

of the dog effects retraction of the bolt, each set of mutually-engageable portions being arranged for rubbing encounter with each other.

5. In a lock of the character described having an elongated housing, a main latch bolt, a dog pivoted substantially transversely of said housing, yieldable means constantly urging said dog toward a deadlocking position in the path of said bolt, an auxiliary latch bolt, yieldable means constantly urging said auxiliary bolt into a position blocking movement of the dog into deadlocking position, and retracting means including a reciprocable link, said link having a portion which engages and retracts the dog when the link is actuated, said dog having a portion which in turn engages and retracts said main bolt.

6. In a lock of the character described having an elongated housing, a latch bolt slidable in said housing, a dog pivoted within said housing on an interior wall thereof, yieldable means constantly urging said dog toward a deadlocking position with respect to said bolt, retracting means including a reciprocable link, said link having a portion which engages and retracts the dog when the link is actuated, said dog having a portion which in turn engages and retracts said bolt.

7. In a lock of the character described, a substantially tubular housing, a latch bolt mounted in the housing for axial reciprocation into and out of one end thereof, a dog pivoted in the housing adjacent to one wall thereof, yieldable means constantly urging said dog toward a deadlocking position with respect to said bolt, retracting means arranged within the housing to operate upon and retract said dog, and mutually-engageable portions on the dog and bolt whereby retraction of the dog effects retraction of the bolt, said mutually-engageable portions being arranged adjacent to the housing wall opposite said dog pivot.

8. In a lock of the character described, a substantially tubular housing, a latch bolt mounted in the housing for axial reciprocation into and out of one end thereof, said bolt having rearwardly-extending shanks arranged in substantially diametric opposition to each other within said housing, a dog pivoted in the housing, yieldable means constantly urging said dog toward a deadlocking position behind one of said shanks, retracting means arranged within the housing to operate upon and retract said dog, and a projection on said dog adapted to engage the other shank when the dog is retracted, whereby retraction of the dog effects retraction of the bolt.

9. In a lock of the character described, a substantially tubular housing, a latch bolt mounted in the housing for axial reciprocation into and out of one end thereof, said bolt having rearwardly-extending shanks arranged in substantially diametric opposition to each other within said housing, a dog pivoted in the housing behind one of said shanks, yieldable means constantly urging said dog toward a deadlocking position behind said shank, retracting means arranged within the housing and comprising a reciprocable link, said link having a portion which engages and retracts the dog when the link is actuated, said dog having a portion which in turn engages the other shank and thereby retracts said bolt.

10. In a lock of the character described, a substantially tubular housing, a latch bolt mounted in the housing for axial reciprocation into and out of one end thereof, said bolt having rearwardly-extending shanks arranged in substantially diametric opposition to each other within said housing, a substantially V-shaped dog pivoted in the

housing at one end of one of its arms, yieldable means constantly urging said dog toward a deadlocking position in which the other arm of the dog lies behind one of said shanks, retracting means arranged within the housing to operate upon and retract said dog, and a projection on said dog at the apex of the V adapted to engage the other shank when the dog is retracted, whereby retraction of the dog effects retraction of the bolt.

11. In a lock of the character described, a substantially tubular housing, a latch bolt mounted in the housing for axial reciprocation into and out of one end thereof, said bolt having rearwardly-extending shanks arranged in substantially diametric opposition to each other within said housing, a substantially V-shaped dog pivoted in the housing at one end of one of its arms, yieldable means constantly urging said dog toward a deadlocking position in which the other arm of the dog lies behind one of said shanks, retracting means arranged within the housing to operate upon and retract said dog, and a projection on said dog at the apex of the V adapted to engage the other shank when the dog is retracted, whereby retraction of the dog effects retraction of the bolt, said retraction means comprising a reciprocable link provided with a cam portion engaging the dog within the V apex.

12. In a lock having a substantially tubular housing, a latch bolt extended adjacent one end thereof, retractor means adjacent the opposite end thereof and including a reciprocable link slidably mounted within said housing, intermediate said latch bolt and retractor, a lever element pivoted within said housing transversely thereof and engaged by said reciprocable link connected with said retractor means at an intermediate portion thereof and means on said lever element engaging said latch bolt whereby retraction of said link will cause retraction of said bolt by the pivotal movement transmitted to said element by said slidable link.

13. In a lock having a substantially tubular housing, a latch bolt extended adjacent one end thereof, retractor means adjacent the opposite end thereof and including a reciprocable link slidably mounted within said housing intermediate said latch bolt and retractor, a lever element pivoted within said housing on an interior wall portion thereof transversely thereof, and engaged by said reciprocable link connected with said retractor means at a point intermediate the pivotal point and the end of said element, and means adjacent the end of said element engaging said latch bolt whereby retraction of said link will cause a retraction of the bolt by the pivotal movement transmitted to said element by said slidable link for a multiple distance through which said link moves.

14. In a lock having a substantially tubular housing, the combination comprising a latch bolt extended adjacent one end thereof, retractor means comprising a rotatable cam adjacent the opposite end thereof and including a reciprocable link slidably mounted within said housing, intermediate said latch bolt and the rotatable cam of said retractor means, a lever element pivoted within said housing transversely thereof and engaged by said reciprocable link connected with said retractor means at an intermediate portion thereof, and means on said lever element engaging said latch bolt whereby retraction of said link will cause retraction of said bolt by the piv-

otal movement transmitted to said element by said slidable link.

15. In a lock having a substantially tubular housing, the combination comprising a latch bolt extended adjacent one end thereof, retractor means comprising a rotatable cam adjacent the opposite end thereof and including a reciprocable link slidably mounted within said housing intermediate said latch bolt and the rotatable cam of said retractor means, a lever element pivoted within said housing on an interior wall portion thereof transversely thereof, and engaged by said reciprocable link connected with said retractor means at a point intermediate the pivotal point and the end of said element, and means adjacent the end of said element engaging said latch bolt whereby retraction of said link will cause a retraction of the bolt by the pivotal movement transmitted to said element by said slidable link for a multiple distance through which said link moves.

16. In a lock having a substantially tubular housing, the combination comprising a latch bolt extended adjacent one end thereof, retractor means comprising a rotatable cam adjacent the opposite end thereof and including a reciprocable link slidably mounted within said housing in substantial alignment with said latch bolt intermediate said latch bolt and cam of said retractor means, a lever element pivoted transversely of said housing and engaged by said link connected with said retractor means at an intermediate portion of said lever, and means on said lever element engaging said latch bolt whereby retraction of said link will cause retraction of said bolt by the pivotal movement transmitted to said element by said slidable link.

17. In a lock having a substantially tubular housing, the combination comprising a latch bolt

extended adjacent one end thereof, retractor means comprising a rotatable cam adjacent the opposite end thereof, and including a reciprocable link slidable in substantial alignment with said latch bolt intermediate said latch bolt and the cam of said retractor means, an offset adjacent the forward end of said link, a lever element nested within said offset portion and pivoted within said housing transversely of said link and engaged by said link connected with said retractor means at an intermediate portion thereof, and means on said lever element engaging said latch bolt whereby retraction of said link will cause retraction of said bolt by the pivotal movement transmitted to said element by said slidable link.

18. In a lock having a substantially tubular housing, the combination comprising a latch bolt extended adjacent one end thereof having spaced fingers forming slide guides for said latch bolt, spring projecting means for said latch bolt engaging a stud on said housing and disposed between said fingers, a lever engaging end on one of said fingers, retractor means comprising a rotatable camming element adjacent the opposite end of said housing including a reciprocable link slidable in substantial alignment with said latch bolt intermediate said latch bolt and the cam of said retractor means, a lever element pivoted within said housing transversely thereof and engaged by said reciprocable link connected with said retractor means at an intermediate portion thereof, and means on said lever element engaging the lever engaging end of said finger of said latch bolt whereby retraction of said link will cause retraction of said bolt by the pivotal movement transmitted to said element by said link.

MORRIS FALK.