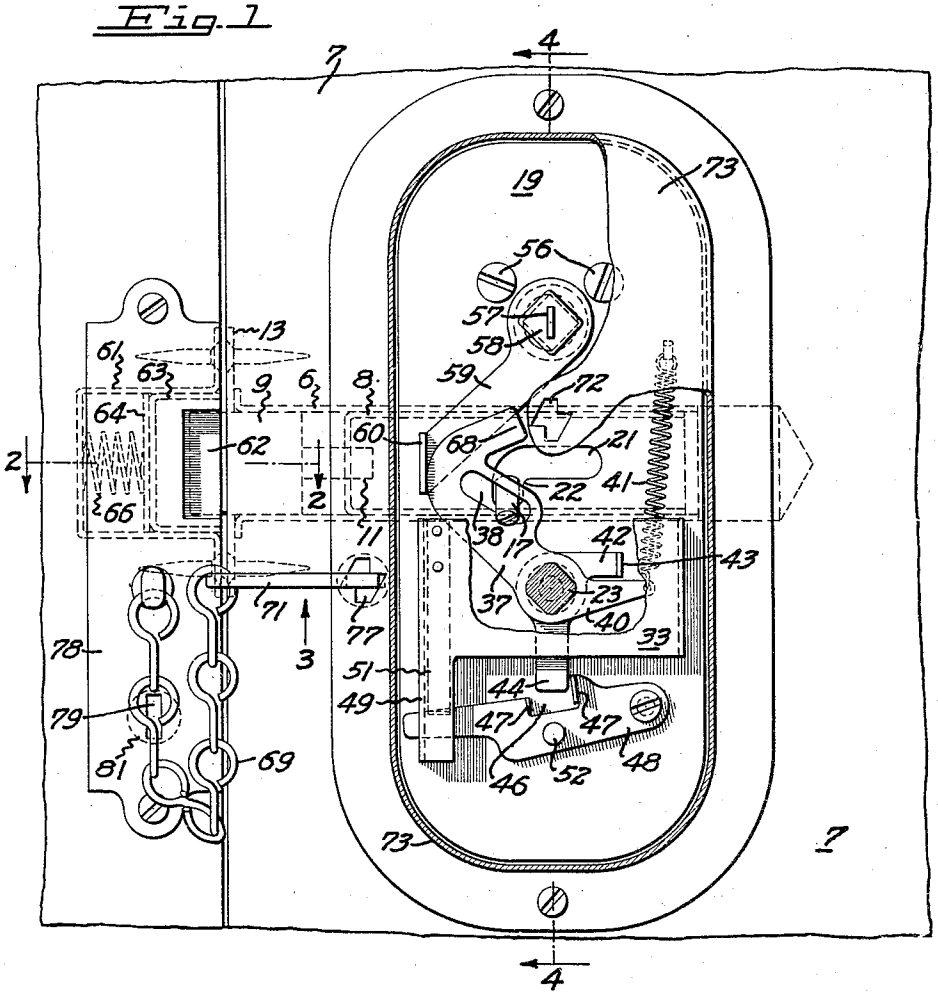
July 19, 1932. O. P. CRAMER 1,867,694

DOOR LOCK

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Fig. 1



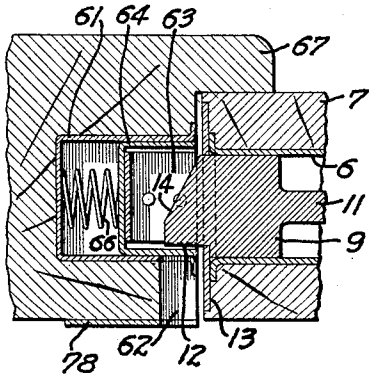
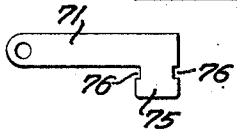


Fig. 2

Fig. 3



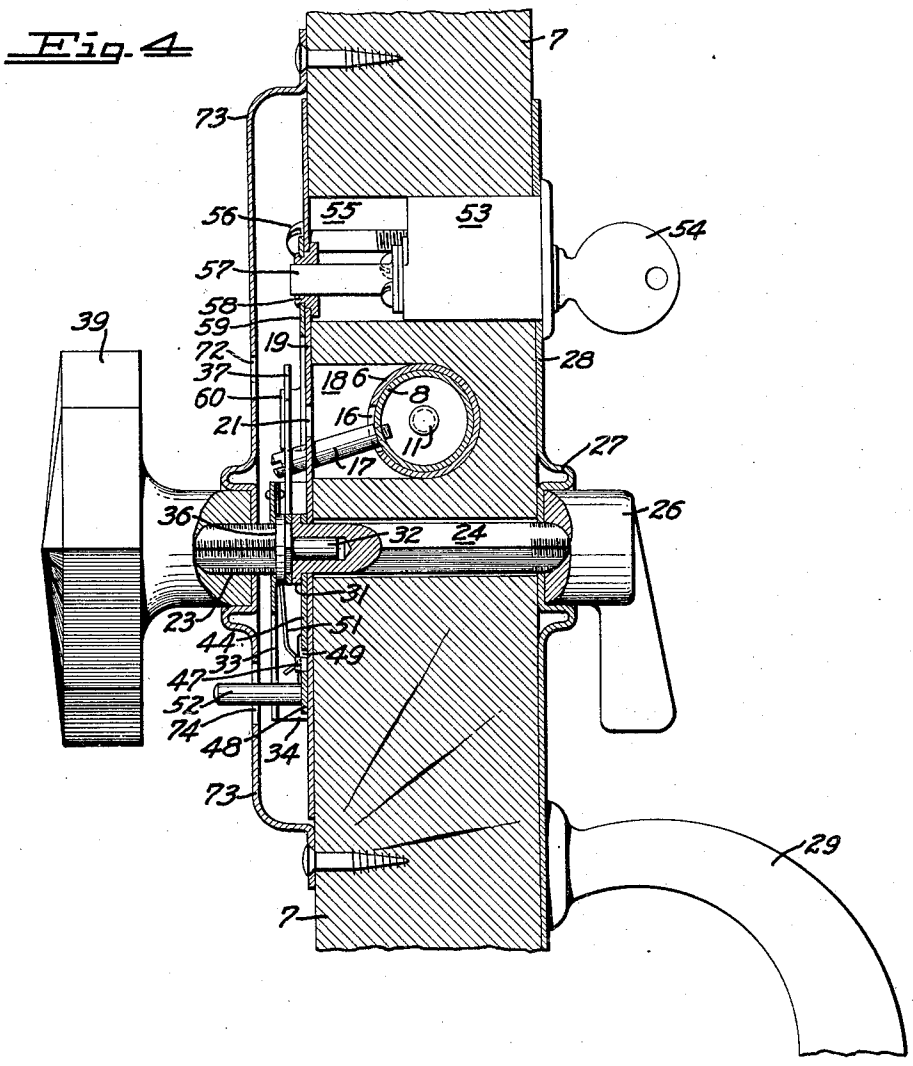
INVENTOR
OTTO P. CRAMER
BY Charles S. Evans
HIS ATTORNEY

July 19, 1932. O. P. CRAMER 1,867,694

DOOR LOCK

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Fig. 4



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Patented July 19, 1932 1,867,694

UNITED STATES PATENT OFFICE

OTTO P. CRAMER, OF SAN FRANCISCO, CALIFORNIA

DOOR LOCK

Application filed July 22, 1929. Serial No. 379,939.

My invention relates to fastening means, and particularly to a door lock.

An object of the invention is the provision of a door lock which is inexpensive, of sturdy construction, composed of few and simple parts, and which may be readily mounted in position.

Another object of the invention is the provision of a door lock of such construction that skilled mortising of the door is not required to mount the lock in position.

Another object of the invention is the provision of a burglar proof lock which cannot be tampered with.

Another object of the invention is the provision of the lock, of the character described, which may be operated from either the inside or outside of the door by turning the spindles therefor, but which may be dogged to prevent operation from the outside except by one having the proper means, such as a key.

It is also an object of the invention to provide means whereby the lock may be dogged to prevent operation from the outside of the door, even with the proper key.

A further object of the invention is the provision of a latch bolt, in a lock of the character described, which in extended position is dogged, so that it cannot be retracted by merely pushing the bolt inwardly.

My invention possesses other objects and valuable features, some of which will be set forth in the following description of my invention which is illustrated in the drawings forming part of the specification. It is to be understood that I do not limit myself to the showing made by the said description and drawings, as I may adopt varying forms of my invention within the scope of the claims.

Referring to the drawings:

Figure 1 is a side elevational view of the lock and a portion of the door and jamb, looking at the inside of the door; portions of the structure are omitted to disclose clearly the construction.

Figure 2 is a horizontal sectional view of a portion of the door and door jamb, illustrating in section the strike plate and a portion of the latch bolt, and taken in a plane indicated by the line 2—2 of Figure 1.

Figure 3 is a bottom elevational view of a pin used in connection with the latch chain of Figure 1, and looking in the direction of arrow 3 of Figure 1.

Figure 4 is a vertical sectional view taken in a plane indicated by the line 4—4 of Figure 1. Portions of the structure are shown in elevation to disclose clearly the construction.

In broadly descriptive terms, the door lock of my invention comprises an elongated and tubular latch bolt adapted to be inserted in an aperture bored horizontally in the edge of the door. The door is provided with a pair of turnable spindles, each accessible from a side of the door and having means for retracting the latch bolt. Means are provided for dogging the outside spindle, so that the latch bolt may be retracted only by turning of the inside spindle; and means operable by any conventional key operated lock, accessible from the outside of the door, are provided for retracting the latch bolt when the outside spindle is dogged.

When the latch bolt is in extended position, means are provided for dogging it to prevent retraction thereof except by the proper mechanism; and in order for the rigid latch bolt to engage a strike plate, the strike plate is movably mounted within the door jamb to recede when the latch bolt engages therewith. By this construction, it is apparent that, when the door is closed, it is impossible to disengage the latch bolt from the strike plate by a wire or other similar means.

In order to permit only partial opening of the door, a latch chain is preferably provided on the door jamb, and has a pin adapted to engage with the door. As an added safety precaution and to prevent the door being opened from the outside even by means of the

proper key, means are provided whereby both spindles may be dogged to prevent retraction of the latch bolt. For this purpose, I preferably employ the pin on the latch chain.

The mechanism of my invention may be made of any suitable material, generally employed for such purposes.

The preferred embodiment of my invention, as illustrated in the drawings, comprises a tubular casing 6 mounted within a hole preferably bored horizontally in the edge of the door 7. In the casing is a latch bolt comprising the tubular body portion 8 slidable and turnable therein, and into which is threaded the head 9 by means of the threaded stem 11 on the head. Head 9 is flattened at one side 12, and is held against rotation or turning by means of the plate 13 fixed to the inner edge of the door, and having an aperture with a straight edge engaging the flat portion of the head. The outer edge of the head 12 is provided with an inclined face 14, according to conventional construction.

A wide elongated slot 16, extending longitudinally of casing 6, is formed in the lateral wall thereof. Body portion 8 of the latch bolt is provided with a pin 17, threaded into the wall thereof and which projects thru the casing slot 16, thru an aperture 18 in the inner side of the door and thru an L-shaped slot formed in the plate 19 secured on the inside of the door, and comprising an elongated portion 21 extending longitudinally of the latch bolt and a transversely extending portion 22. In the normally extended position of the latch bolt, the pin lies in the transverse portion 22 of the slot to dog the latch bolt, so as to prevent retraction or inward movement thereof, except by turning of the body portion 8 in the casing to move pin 17 out of slot portion 22, and then by movement of the pin 17 along the longitudinally extending portion 21 of the slot. It is obvious that instead of forming the L-shaped slot in the plate 19 it may be formed in the casing 6 to perform the same function.

Means are provided for retracting the latch bolt, including a pair of independently turnable spindles 23 and 24, each being accessible from a side of the door. Spindle 24 is the outside spindle and lies in a hole bored thru the door, transversely of and below the latch bolt. Fixed on the outer end of spindle 24 is a handle 26 whereby the spindle may be turned; and the handle is journaled in the hub 27 formed in the plate 28 mounted on the outside of the door; a handle 29 being secured to the outside of the door whereby it may be grasped to pull the door open. The inner end of spindle 24 projects beyond the inside of the door and is provided with a shoulder 31, between which and the door lies the plate 19.

Inside spindle 23 abuts against the outside spindle, and has a stud 32 journaled in the outside spindle, thus permitting independent rotation of either of the spindles. A plate 33, having side flanges 34 secured to plate 19, abuts against a shoulder 36 formed on the inside spindle to hold the spindles in position. Shoulder 36 is spaced from shoulder 31 of the outside spindle.

Mounted for movement with the inner spindle 23 and lying between the spindle shoulders 31 and 36, is an upwardly extending arm 37 having a slot 38 in which engages the pin 17 of the latch bolt. Slot 38 is disposed at an acute angle with respect to the axis of pin 17, so that when inside spindle 23 is turned by means of knob 39 in a clockwise direction, with respect to Figure 1 of the drawings, pin 17 is first lifted out of engagement with the transversely extending portion 22 of the slot in plate 19; and then upon further turning of the spindle, the pin is moved along the longitudinally extending portion 21 of the slot, thus retracting the latch bolt. The lower portion of arm 37 is formed with an outwardly extending finger 40, to which is connected a spring 41 fixed to the plate 19. Spring 41 urges the arm 37 and spindle 23 in a counterclockwise direction, with respect to Figure 1 of the drawings, and thereby thrusts the latch bolt outwardly to extended position, and the pin 17 into the transverse portion 22 of the slot, when the spindle is released. Arm 37 is keyed to spindle 23, since the spindle is square shaped and the arm is provided with a similarly shaped aperture.

Retraction of the latch bolt by turning of the outside spindle 24 is effected by means including an arm 42 mounted above the finger 40 of arm 37. Arm 42 lies between plate 19 and shoulder 31 of the outside spindle, and is mounted for movement with said spindle in a manner similar to arm 37. A flange 43, adapted to bear against the finger 40 when the outside spindle is turned in a clockwise direction, is provided on arm 42. By the described construction, it is apparent that by turning the outside spindle in the proper direction, the latch bolt may be retracted, since arm 42 bears against finger 40 to effect movement of the inside spindle. However, when the latch bolt is retracted by turning of the inside spindle, the outside spindle is not moved.

Means are provided for dogging the outside spindle 24 to prevent retraction of the latch bolt thereby. Arm 42 is formed with a downwardly extending portion 44 adapted to engage in the recess 46 having the side flanges 47, and formed in the upper edge of an arm 48 which is pivotally mounted on plate 19. The end of arm 48 opposite the pivot projects thru a guide slot 49 formed in the side flange 34 of plate 33; and a spring 51 mounted on plate 33 holds the arm 48 in desired position. An outwardly extending pin

52 is provided on arm 48, so that it may be moved.

When portion 44 of arm 42 engages in recess 46, the outside spindle 24 cannot be turned, and hence the door cannot be opened by turning of this spindle; but may be opened from the inside by turning the inside spindle. In the lower position of arm 48, the right hand flange of recess 46 is high enough to prevent turning of spindle 24 in a direction which will not effect movement of finger 40 to cause retraction of the latch bolt. However, in this position, left hand flange of recess 46 is free of arm portion 44 to permit turning of the outside spindle in the proper direction for causing retraction of the latch bolt.

The mechanism thus described, for effecting retraction of the latch bolt, is mounted without the door. This makes it unnecessary to provide a large aperture in the door for housing the retracting means, and also provides for a ready assembly of the structure.

In order that the door may be opened from the outside by an authorized person even when the outside spindle 24 is dogged, I preferably employ a lock of any conventional construction in combination with the mechanism described. Lock 53 which may be operated by the proper key 54 is mounted in an aperture 55 bored transversely thru the door and above the latch bolt. The lock is mounted for accessibility from outside the door, and is fixedly held in position by means of bolts 56 passing thru plate 19 and threaded into the lock. Bolts 56 thereby provide securing means for the plate 19, in addition to the flange 31 and arm 42 of the outside spindle.

Fixedly mounted with an element of lock 53, which is turnable by the key 54 and which for instance may be the lock barrel, is a pin 57 projecting on the inside of the door. The pin 57 carries a collar 58 journaled in an aperture in plate 19. Mounted for movement with the pin 57 and fixedly mounted to the collar 58 is a downwardly extending arm 59 having a flange 60 adapted to bear against arm 37 of the inside spindle upon movement of arm 59 in the proper direction. By such movement, the latch bolt may be retracted in the manner previously described even when the outside spindle is dogged.

As previously set forth, when the latch bolt is in extended position, it is dogged by means of the latch bolt pin 17 engaging in the transverse portion 22 of the slot in plate 19, to prevent retraction of the latch bolt except by the mechanism described. I therefore provide a spring pressed receding strike plate in order to permit engagement of the latch bolt therewith when the door is closed.

The strike plate is movably mounted in a casing 61 set in the edge of the door jamb, the inner side of the door jamb being provided with a groove 62 to permit the rigid latch bolt to pass therethru. Preferably the strike plate comprises two parts, one of which is a U shaped plate 63 rigidly secured to the walls of the casing. The other part, which engages the latch bolt, also consists of a U shaped but movable plate 64, positioned behind the plate 63 and having its side flanges between the side flanges of the fixed plate 63. A spring 66 is mounted in casing 61; and it is interposed between the plate 64 and the casing to yieldably thrust the movable plate 64 towards the fixed plate 63.

It is thus seen that upon closing the door after being opened, the rigid latch bolt upon striking movable plate 64 will cause it to move into the casing, and thus permit the latch bolt to engage in the strike plate. When the door is closed, spring 66 holds the movable plate 64 outwardly; and it is impossible to cause inward movement thereof by a wire or other similar means to effect disengagement with latch bolt, due to the presence of stationary plate 63 in front of the movable plate. To insure doubly against tampering with the latch bolt from the outside, the outside portion of the door jamb is provided with a shoulder 67 overlying the door.

In order to prevent retraction of the latch bolt from the outside even by means of the proper key for lock 53 when the outside spindle is dogged, I preferably employ means whereby the inside spindle and consequently both spindles may be dogged.

Arm 37 of the inside spindle 23 is provided with an upwardly extending finger 68 lying above slot 38 therein. By blocking this finger, in any manner, the entire mechanism is dogged to prevent retraction of the latch bolt from either the inside of the door or the outside thereof. For doing this, I preferably employ a latch chain 69 having one end thereof mounted on the door jamb, and a pin 71 at the opposite end thereof. The pin may be inserted into aperture 72 formed in housing 73, fixedly mounted on the inside of the door and enclosing the lock mechanism. The aperture 72 is positioned adjacent finger 68, so that when the pin 71 lies therein, the mechanism is blocked as previously described. Housing 73 is also provided with an elongated aperture 74, thru which projects pin 52 of blocking arm 48; and it is thus seen that the outside spindle may be dogged when the door is closed.

Preferably aperture 72 is of such shape as to have its upper edge defined by a line comprising two horizontal portions and a vertical portion, and its lower edge defined by a similar line, but offset from the upper edge to provide spaces between the vertical and horizontal portions of each edge. By this construction the pin 71, which comprises a relatively flat body having a flat shank portion 75 provided with a recess 76 on each side thereof, may be inserted into the aperture

72 in a vertical position; and when turned 90 degrees therein, the pin is securely held in the recess due to the engagement of the side edges thereof in recesses 76.

It is desirable to have the latch chain 69 serve as a day latch, so that the door may be only partially opened from the inside, but cannot be thrust open from the outside by one attempting to make an entrance. For this purpose, I provide, in the housing and adjacent the inner edge thereof, an aperture 77 similar to aperture 72. The door in back of aperture 77 is formed with a cavity to accommodate the shank of pin 71.

In order that the door may not be marred by the latch chain 69 when the pin 71 is in aperture 77, the latch pin 71 is of such length that its inner end projects beyond the edge of the door. Therefore, when the door is opened, the latch chain 69 will not engage therewith.

For supporting pin 71 when it does not engage the door, I provide an ornamental plate 78 mounted on the inside of the door jamb, and having an aperture 79 therein. A recess 81 is formed in the door jamb and in back of aperture 79, to accommodate the pin when placed in said aperture.

I claim:

1. A door lock comprising a casing adapted to be mounted within the door and having an aperture therein, a latch bolt slidable in said casing, a pin on said latch bolt and projecting thru said aperture, a pair of turnable spindles each adapted for accessibility from a side of the door, and means actuated by turning of either of said spindles for moving said pin to retract the latch bolt.

2. A door lock comprising a casing adapted to be mounted within the door and having an aperture therein, a latch bolt slidable in said casing, a pin on said latch bolt and projecting thru said aperture, a pair of turnable spindles each adapted for accessibility from a side of the door, means actuated by turning of either of said spindles for moving said pin to retract the latch bolt, and yieldable means for moving the latch bolt from retracted position.

3. A door lock comprising a casing adapted to be mounted within the door and having an aperture therein, a latch bolt slidable in said casing, a pin on said latch bolt and projecting thru said aperture, a pair of turnable spindles each adapted for accessibility from a side of the door, means actuated by turning of either of said spindles for moving said pin to retract the latch bolt, and means for dogging the outside spindle while the inside spindle remains turnable.

4. A door lock comprising a latch bolt adapted to be movably mounted within the door, a pin on said latch bolt, a pair of turnable spindles each adapted for accessibility from a side of the door, an arm carried by each spindle and movable therewith, the arm on one of said spindles being adapted for engaging the pin to retract the latch bolt upon turning of said spindle, and the arm on the other spindle being adapted to move the first arm upon turning of its spindle.

5. A door lock comprising a latch bolt adapted to be movably mounted within the door, a pin on said latch bolt and adapted to project beyond a side of the door, a pair of turnable spindles each adapted for accessibility from a side of the door, an arm carried by each spindle and adapted for mounting without the door, the arm on one of said spindles being adapted for engaging the pin to retract the latch bolt upon turning of said spindle, and the arm on the other spindle being adapted to move the first arm upon turning of its spindle.

6. A door lock comprising a latch bolt adapted to be movably mounted within the door, a pin on said latch bolt, a pair of turnable spindles each adapted for accessibility from a side of the door, an arm carried by each spindle and movable therewith, the arm on the inside spindle being adapted for engaging the pin to retract the latch bolt upon turning of said spindle, and the arm on the outside spindle being adapted to move the first arm upon turning of its spindle, and means for dogging the outside spindle while the inside spindle remains turnable.

7. A door lock comprising a latch bolt adapted to be movably mounted within the door, a plate adapted to be mounted adjacent said latch bolt and having a slot therein, said slot comprising a portion extending substantially longitudinally of said latch bolt and a portion extending substantially transversely thereof, a pin on said latch bolt and adapted to project thru the transverse portion of said slot when the latch bolt is extended to dog the bolt, a turnable spindle adapted for accessibility from a side of the door, and means actuated by turning of the spindle for imparting movement of the pin along said slot to retract the latch bolt.

8. The combination with a door lock comprising a latch bolt adapted to be movably mounted within the door, means for retracting said bolt from extended position, and means for preventing retraction thereof except by said retracting means, of a spring pressed strike plate adapted to recede in the door jamb for engaging said latch bolt.

9. The combination with a latch bolt adapted to be movably mounted within a door, a pin on said latch bolt, a pair of turnable spindles each adapted for accessiblity from a side of the door, an arm carried by each spindle and movable therewith, the arm on the inside spindle being adapted for engaging the pin to retract the latch bolt upon turning of said spindle, and the arm on the outside spindle being adapted to turn the first

arm upon turning of its spindle, and means for dogging the outside spindle while the inside spindle remains turnable, of a lock adapted to be mounted on the outside of said door and having an element movable by the proper key therefor, and an arm movable with said element and adapted to engage the arm on the inside spindle for turning said spindle while the outside spindle is dogged.

10. The combination with a latch bolt adapted to be movably mounted within a door, a turnable spindle adapted for accessibility from a side of the door, means including an arm turnable with said spindle for retracting the latch bolt upon turning of the spindle, and a housing adapted to be mounted on the side of said door, said housing having an aperture adjacent said arm, of a latch chain adapted to be mounted on the door jamb and carrying a pin adapted to be inserted in the housing aperture to prevent turning of said spindle and arm.

11. The combination with a latch bolt adapted to be movably mounted within a door, a turnable spindle adapted for accessibility from a side of the door, means including an arm turnable with said spindle for retracting the latch bolt upon turning of the spindle, and a housing adapted to be mounted on the side of said door, said housing having an aperture adjacent said arm, of a latch chain adapted to be mounted on the door jamb and carrying a pin adapted to be inserted in the housing aperture to prevent turning of said spindle and arm, said housing having a second aperture in which the pin may be inserted to permit only partial opening of the door.

12. The combination with a latch bolt adapted to be movably mounted within a door, a turnable spindle adapted for accessibility from a side of the door, means including an arm turnable with said spindle for retracting the latch bolt upon turning of the spindle, and a housing adapted to be mounted on the side of said door, said housing having an aperture adjacent said arm, of a latch chain adapted to be mounted on the door jamb and carrying a pin adapted to be inserted in the housing aperture to prevent turning of said spindle and arm, said housing having a second aperture in which the pin may be inserted to permit only partial opening of the door, the length of the pin being such as to prevent marring of the door by the chain when the door is opened.

13. A door lock comprising a latch bolt adapted to be movably mounted on the door, a pair of turnable spindles each adapted for accessibility from a side of the door, and means for retracting the latch bolt including an arm carried by each spindle and movable therewith, the arm on one of said spindles being adapted to move the other arm upon turning of its spindle.

14. A door lock comprising a latch bolt adapted to be movably mounted on the door, a pair of turnable spindles each adapted for accessibility from a side of the door, and means for retracting the latch bolt including an arm carried by each spindle and movable therewith, the arm on one of said spindles being adapted to move the other arm upon turning of its spindle, and both of said arms being mounted without the door.

In testimony whereof, I have hereunto set my hand.

OTTO P. CRAMER.