

June 26, 1934.

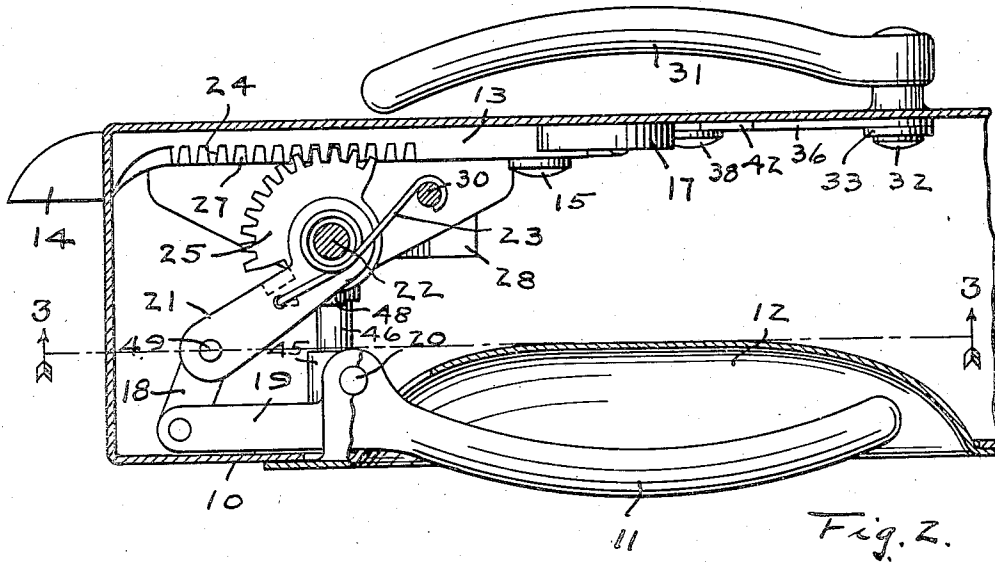
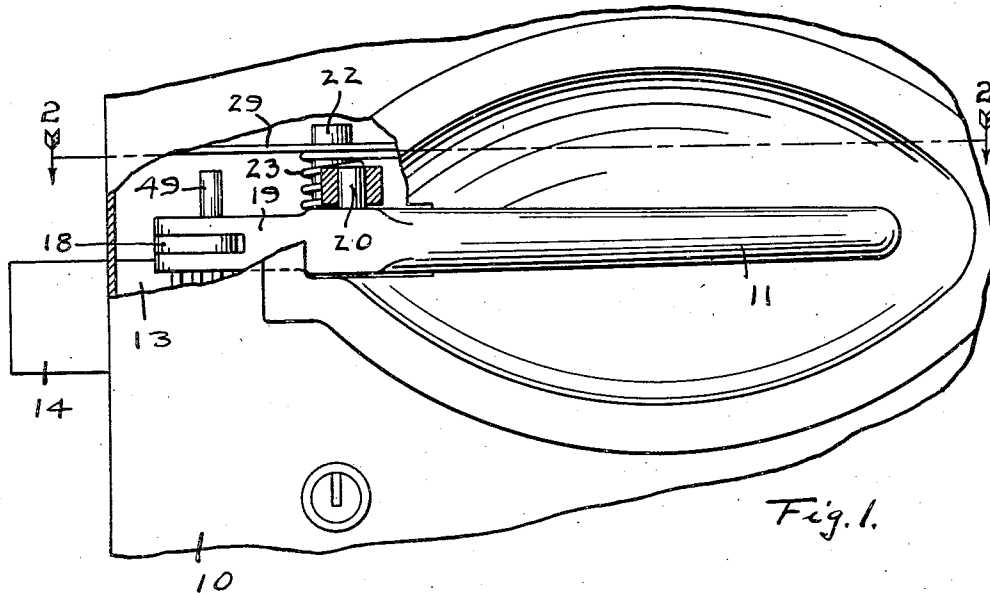
R. P. KUSZMAUL.

1,964,066

LATCH

Filed Nov. 11, 1933

2 Sheets-Sheet 1



Inventor,
Robert P. Kuszmaul,
By
Minturn & Minturn
Attorneys.

June 26, 1934.

R. P. KUSZMAUL

1,964,066

-LATCH

Filed Nov. 11, 1933

2 Sheets-Sheet 2

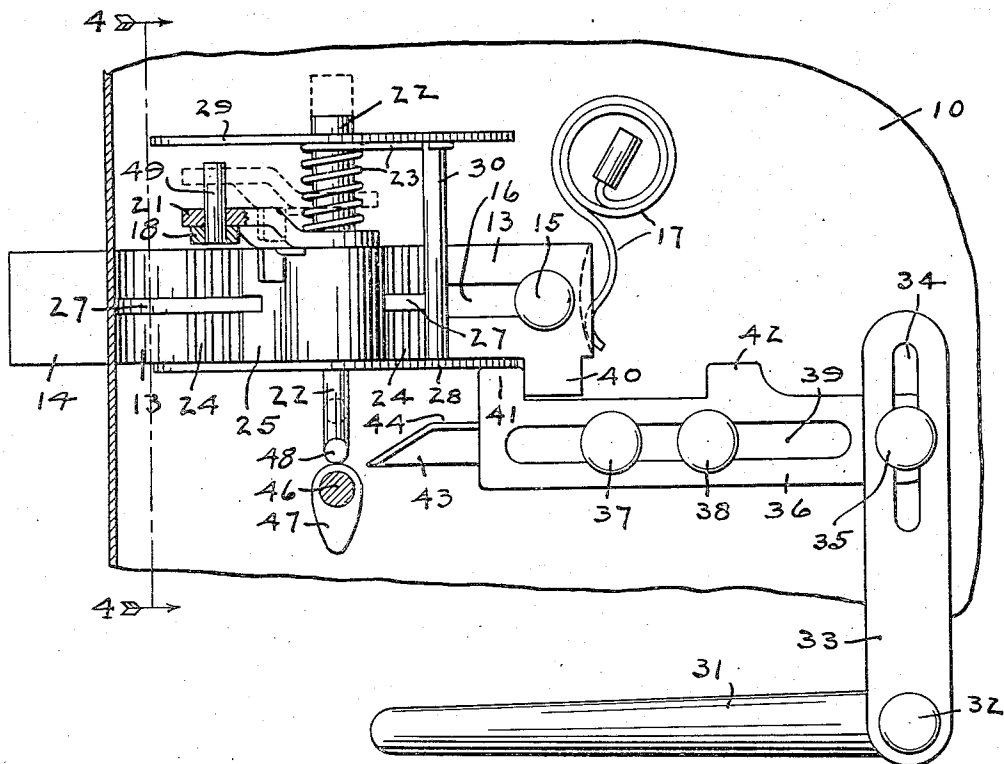


Fig. 3.

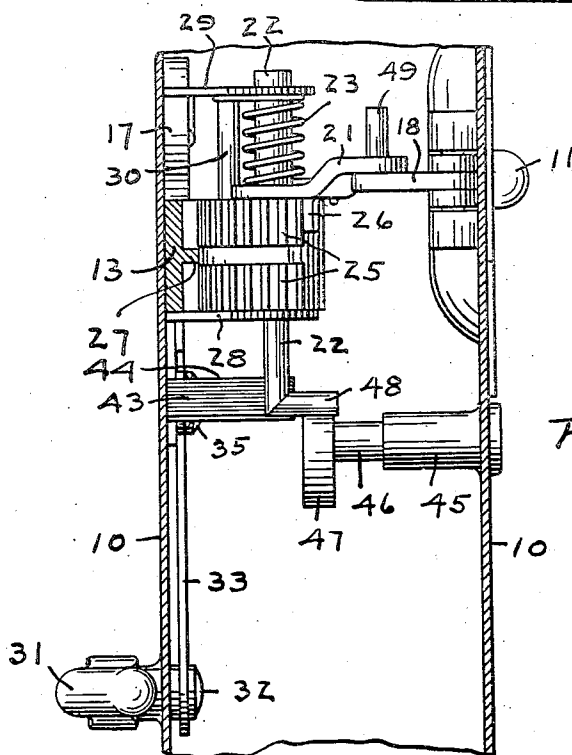


Fig. 4.

Inventor,
Robert P. Kuszmaul,
By
Minturn & Minturn,
Attorneys.

UNITED STATES PATENT OFFICE

1,964,066

LATCH

Robert P. Kuszmaul, Indianapolis, Ind.

Application November 11, 1933, Serial No. 697,569

16 Claims. (Cl. 70—29)

This invention relates to the art of latches such as may be employed for doors and the like. It is a primary object of the invention to provide a structure which may be formed from a minimum number of parts and in such a manner as to be extremely durable and positive over a long period of time. It is a further primary object of my invention to provide means for rendering the latch inoperative from one side of the door, that is, inoperative in the sense that the bolt of the latch will remain extended so that the door may not be opened from the opposite side. A still further important object of the invention is to provide a structure as above indicated to which may be added a locking device without having to interfere with other parts of the latch mechanism.

The particular illustration herein employed to illustrate one form of the invention is that particularly adapted to be used in conjunction with an automobile door although the invention is not to be construed to be limited to such an application. The above indicated objects as well as additional advantages of the invention will become apparent to those versed in the art by the following description which is made in reference to the accompanying drawings, in which

Fig. 1 is a fragmentary side elevation from the outer side of a door to which my invention is applied;

Fig. 2, a horizontal transverse section on the line 2—2 in Fig. 1;

Fig. 3, a vertical section on the line 3—3 in Fig. 2, and

Fig. 4, a vertical transverse section on the line 4—4 in Fig. 3.

Like characters of reference indicate like parts throughout the several views in the drawings.

Referring now to the drawings, a fragmentary portion of a door 10 is indicated wherein the wall is formed of sheet metal to define a chamber therewithin to receive the latch mechanism. I have here shown a flush type handle 11 as being provided on the outer side of the door to be normally carried substantially within a door recess 12. I believe this to be the better practice particularly on automobile doors so that the handle does not project beyond the face of the door. This construction not only gives a neater appearance to the side of the automobile but also would in many cases prevent serious injury to pedestrians who may be struck by the automobile. As is indicated by the drawings, Figs. 1, 2 and 4, this handle 11 is rockably mounted to swing horizontally rather than to turn vertically.

A bolt 13 is formed to be slidably carried with-

in the chamber between the walls of the door, here shown as being against the inner side of the inner wall to have a keeper engaging member 14 extending through the edge of the door, the hole through the edge being formed to serve as a guide for the bolt. This bolt 13 is carried horizontally inwardly within the chamber to have its inner end supported by a rivet 15 which extends through a slot 16 in the bolt. The rivet is so located in reference to the slot 16 that it serves to limit the travel of the bolt. A spring 17 is secured within the chamber to have an end compressively bearing against the inner end of the bolt 13 so that the bolt is normally moved by the spring to have the member 14 extended to its outermost position.

In order to retract the bolt 13 by means of the handle 11, I provide a suitable linkage therebetween which is here shown as comprising a link 18 rockably connected to the arm 19 which extends within the chamber of the door from the pivot pin 20 about which the handle 11 is rocked, and pivotally interconnect the other end of the link 18 to an arm 21 which is fixed to a vertically disposed post 22. The arm 21 is normally urged by a spring 23 to swing with the post 22 in that direction which will carry the handle 11 back into the recess 12. I provide an interconnecting mechanism between the arm 21 and the bolt 13 such that when the handle 11 is pulled outwardly from the recess 12, the arm 21 will be swung around toward the bolt 13 to overcome the spring 23 and to retract the bolt 13 against the push of the spring 17 so as to pull the member 14 of the bolt back into the chamber within the door.

One particular form of this interconnecting mechanism is here shown as comprising a rack 24 formed on the inner side of the bolt 13 with a gear segment 25 engaging therewith and rockably carried by the post 22 to have a leg 26 downturned from the arm 21 engaging over the back side of the gear segment 25 on that side of the post 22 toward the outer end of the bolt 13 when the arm 21 may be swung therearound. In order to support the gear segment 25 vertically along the post 22, I provide a rib 27 centrally disposed longitudinally along the rack 24, Figs. 3 and 4, and slot the gear segment 25 so as to permit this rib 27 to extend through the slot and thereby allow the upper face of the slot to rest on the upper side of the rib.

A plate 28 extends horizontally from the under side of the bolt 13 under the gear segment 25 to provide a bearing through which the lower end of the post 22 extends, this lower end being here shown as of a diameter reduced from that part of

the post which extends through the gear segment and to which the arm 21 is secured. An upper plate 29 is also provided to extend horizontally over but spaced above the bolt and gear segment to provide an upper bearing through which the post 22 may slidably be moved. These two plates 28 and 29 are preferably rigidly spaced apart by a post 30 about which one end of the spring 23 is engaged and from which the spring is carried to wrap around the post 22 by a number of turns normally spaced apart to have the other end of the spring extend from the post and be hooked into the arm 21, Fig. 2. It is to be noted that not only does the spring 23 act torsionally to retract the arm 21 but it also serves as a compression spring tending to urge the arm 21 downwardly against the upper side of the gear segment 25.

An inner handle 31 is here shown as being mounted to be rocked vertically and to have a stud 32 extending inwardly through the inner wall of the door 10 to have an upwardly disposed rocker arm 33 secured thereto. The upper portion of this arm 33 is provided with a slot 34 through which extends a rivet 35 carried by a slide 36 constrained to horizontal travel by means of the pair of rivets 37 and 38 which extend through a longitudinally disposed slot 39 in the slide, Fig. 3. The bolt 13 is provided with a downwardly extending lug 40 and the slide 36 is provided with a pair of spaced apart upwardly extending lugs 41 and 42 between which the lug 40 is disposed. By rocking the handle 31 upwardly, Fig. 3, the rocker arm 33 is shifted to pull the slide 36 to carry the lug 41 against the bolt lug 40 so that the bolt 13 may thereby be retracted to pull the member 14 back within the chamber in the door. Releasing the handle 31 permits the spring 17 to return the bolt 13 to its normal position as indicated in Fig. 3. It is to be remembered that this handle 31 is the one on the inside of the door and I provide a mechanism whereby downward movement of the handle 31 will so affect the latch mechanism as to prevent retraction of the bolt by movement of the outside handle 11.

As was above indicated, the post 22 extends downwardly for a distance below the under plate 28. The slide 36 is provided with a tongue 43 which has an inclined surface directed toward the post 22 so that when the handle 31 is pushed downwardly the slide 36 is carried toward the post 22 and this tongue 43 is brought against the lower end of the post 22 by the inclined surface indicated so that continued movement of the handle 31 downwardly will cause the tongue 43 to be pushed under the post to lift it and retain it on the upper elevated surface 44 of the tongue. In this upward movement of the post 22, the arm 21, being fixed to the post 22, is also carried upwardly to further compress the spring 23 and also to lift the leg 26 up to assume the dotted line position as indicated in Fig. 3 whereby rocking of the handle 11 may still be permitted but such rocking will be ineffective to rock the gear segment 25 since the leg 26 has been lifted out of its path. The pin 49 which forms the pivot connection between the link 18 and the arm 21 is fixed to the link 18 and is of sufficient length to remain rockably connected with the arm 21 even when the arm is in the elevated position.

When the outer handle 11 is thus in effect disconnected from the bolt 13, should the door 10 then happen to be open and slammed shut, the lug 40 then being against the lug 42 of the slide 36 will push the slide 36 rearwardly to permit

the post 22 to drop and return the leg 26 to its position whereby the handle 11 may again be employed to retract the bolt 13. This operation is employed to prevent the door from being locked against admission from the outside when it is accidentally slammed shut but of course permits the door to remain in a locked position when it is shut and the handle 31 is lowered in the closed door position.

Now to provide some external locking means, I provide some form of a lock 45 here shown as being of the usual cylinder type operated by a key in the usual manner. This lock 45 has a barrel 46 extending inwardly to carry a cam 47 which may be revolved in a vertical plane by the barrel 46 in the path of a foot 48 turned thereover from the lower end of the post 22. The foot 48 is provided merely to give clearance between the tongue 43 and the cam 47, otherwise the barrel 46 could be made of sufficient length to bring the cam 47 directly under the lower end of the post. Supposing the handle 31 is to be lowered from the inside of the door so as to have forced the tongue 43 under the post 22 and to have disengaged the handle 11 from the bolt 13, slamming of the door to the closed position will of course immediately disengage the tongue and return it from the post. To lock the door then, the barrel 46 is turned in the usual manner by a key so as to revolve the cam 47 and lift the post 22 and thereby again disconnect the outside handle 11 from the bolt 13.

When the lock 45 is employed and the cam 47 has revolved to lift the post 22, it is still possible to rock the handle 11 but any rocking will be ineffective insofar as movement of the bolt 13 is concerned since the leg 26 can not drop down back of the gear segment 25, but will slide around on the upper surface thereof. The normal clearance between the gear segment and the leg 26 when that leg is in the lower position is such that there is not sufficient gap for the leg 26 to drop back of the gear segment 25 should the handle 11 be rocked sufficiently to carry the foot 48 off of the cam 47. Of course when the cam 47 is directly under the post 22 as above indicated, there is no possibility of the post 22 dropping at all until the cam is lowered.

While I have herein shown and described my invention in the form as now best known to me, it is obvious that structural changes may be made without departing from the spirit of the invention and I, therefore, do not desire to be limited to that precise structure beyond the limitations as may be imposed by the following claims.

I claim:

1. A latch comprising in combination a rack bolt, a handle, a bolt actuating gear segment, interconnecting means between the handle and the bolt including a rockable arm releasably engaging the actuating segment, a slide member and a spring acting compressibly to move the arm into engagement with the gear segment and having a member through which it acts torsionally to rock the arm mounted to disengage said arm from said actuating segment upon movement thereof, and a member operable to shift said slide member.

2. A latch comprising in combination, a rack bolt, yielding means normally retaining the bolt in an extended position, a toothed bolt shifting segment mounted adjacent the bolt, an arm rockably mounted adjacent said shifting segment formed to engage and move the segment therewith upon travel of the arm, said arm being

shiftable toward and away from the shifting segment, spring means normally carrying the arm toward the side of the shifting segment, said spring also acting torsionally to swing the arm, an operating handle interconnected with said arm, and an arm shifting member for shifting the arm away from said shifting segment whereby said bolt remains stationary upon movement of the handle.

3. A latch comprising in combination, a bolt, a bolt shifting member revolubly mounted to engage the bolt, an arm, spring means urging the arm toward the side of the shifting member, said spring also acting torsionally to swing the arm, means comprising a lug depending from the arm normally permitting the lug to engage with the shifting member, and means for shifting the arm to overcome said spring means and disengage it from said bolt shifting member.

4. A latch comprising in combination, a bolt, a bolt shifting member revolubly mounted to reciprocate the bolt upon rotation thereof, spring means urging the bolt toward its extended position, an arm revolubly mounted adjacent said shifting member having means to carry the member around in a direction to move the bolt against the pressure of said spring means, said arm being spring urged toward the side of said shifting member, a pin upon which said shifting member and arm are both revolubly mounted, and a shiftable member formed to move said arm from the path of said shifting means by contact with an end of the pin to prevent rotation thereof by said arm.

5. A latch comprising in combination, a bolt, a bolt shifting member revolubly mounted to reciprocate the bolt upon rotation thereof, spring means urging the bolt toward its extended position, an arm revolubly mounted adjacent said shifting member having means to carry the member around in a direction to move the bolt against the pressure of said spring means, said arm being spring urged toward the side of said shifting member, and a shiftable member formed to move said arm from the path of said shifting means to prevent rotation thereof by said arm, said arm being mounted on a post having an axis common with the axis of rotation of the shifting member, said shiftable member being located to engage and lift said post to effect said movement of the arm.

6. A latch comprising in combination, a bolt, a bolt shifting member revolubly mounted to reciprocate the bolt upon rotation thereof, spring means urging the bolt toward its extended position, an arm revolubly mounted adjacent said shifting member having means to carry the member around in a direction to move the bolt against the pressure of said spring means, said arm being spring urged toward the side of said shifting member, and a shiftable member formed to move said arm from the path of said shifting means to prevent rotation thereof by said arm, said arm being mounted on a post having an axis common with the axis of rotation of the shifting member, said shiftable member being located to engage and lift said post to effect said movement of the arm, said interposed means comprising a leg extending from the arm into the path of said shifting means.

7. A latch comprising in combination, a bolt, a bolt shifting member revolubly mounted to reciprocate the bolt upon rotation thereof, spring means urging the bolt toward its extended position, an arm revolubly mounted adjacent said

shifting member having means to carry the member around in a direction to move the bolt against the pressure of said spring means, said arm being spring urged toward the side of said shifting member, and a shiftable member formed to move said arm from the path of said shifting means to prevent rotation thereof by said arm, said arm being mounted on a post having an axis common with the axis of rotation of the shifting member, said shiftable member being located to engage and lift said post to effect said movement of the arm, said spring means comprising a combined torsion and compression spring to return the arm and to carry the arm toward said shifting member.

8. A latch comprising in combination, a bolt, a bolt shifting member revolubly mounted to reciprocate the bolt upon rotation thereof, spring means urging the bolt toward its extended position, an arm revolubly mounted adjacent said shifting member having means to carry the member around in a direction to move the bolt against the pressure of said spring means, said interposed means being spring urged toward the side of said shifting member, and a shiftable member formed to move said interposed means from the path of said shifting means to prevent rotation thereof by said arm, said arm being mounted on a post having an axis common with the axis of rotation of the shifting member, said shiftable member being located to engage and lift said post to effect said movement of the interposed means, said shiftable member comprising a slide having an inclined surface to engage the post and effect said lifting thereof.

9. A latch comprising in combination, a bolt, a bolt shifting member revolubly mounted to reciprocate the bolt upon rotation thereof, spring means urging the bolt toward its extended position, an arm revolubly mounted adjacent said shifting member having means to carry the member around in a direction to move the bolt against the pressure of said spring means, said interposed means being spring urged toward the side of said shifting member, and a shiftable member formed to move said interposed means from the path of said shifting means to prevent rotation thereof by said arm, said arm being mounted on a post having an axis common with the axis of rotation of the shifting member, said shiftable member being located to engage and lift said post to effect said movement of the interposed means, said shiftable member comprising a slide having an inclined surface to engage the post and effect said lifting thereof, a lug extending from the bolt, and a pair of spaced apart ears on the slide between which the bolt lug extends whereby movement of the slide toward said post is ineffective to move said bolt but upon sufficient reverse travel, the slide will retract the bolt, and retraction of the bolt when the slide is engaged with said post will carry the slide away from the post.

10. A latch comprising in combination, a bolt, a bolt shifting member revolubly mounted to reciprocate the bolt upon rotation thereof, spring means urging the bolt toward its extended position, an arm revolubly mounted adjacent said shifting member having means to carry the member around in a direction to move the bolt against the pressure of said spring means, said interposed means being spring urged toward the side of said shifting member, and a shiftable member formed to move said interposed means from the path of said shifting means to prevent rotation

thereof by said arm, said arm being mounted on a post having an axis common with the axis of rotation of the shifting member, said shiftable member being located to engage and lift said post to effect said movement of the interposed means, and lock means preventing the lowering of the post.

11. A latch for a door comprising in combination, a bolt, a handle rockably mounted to swing toward and away from the door, a bolt actuating member, interconnecting means between the handle and the bolt including a rockable arm releasably engaging the actuating member, and means for disengaging the arm from said actuating means.

12. A latch comprising in combination, a bolt, a handle, a bolt actuating member, interconnecting means between the handle and the bolt including a rockable arm releasably engaging the actuating member, a pin on which the arm is pivoted and by which the arm is movable out of engagement with the bolt actuating member by a longitudinal movement of the pin and means for moving the pin longitudinally for disengaging the arm from the member.

13. A latch comprising in combination, a rack bolt, a handle, a toothed bolt actuating segment, interconnecting means between the handle and the bolt including a rockable arm releasably engaging the actuating segment, a pin on which the segment and arm are pivoted means for disengaging the arm from the segment by a longitudinal movement of the pin, said means comprising a shiftable lock controlled member, and an arm on the pin in the path of the controlled member.

14. A latch for a door comprising in combination, a bolt having a rack, a handle rockably mounted to swing toward and away from the door, and bolt actuating and interconnecting means between the handle and the bolt comprising a toothed segment engaging the rack, an arm adjustable in and out of engagement with

the segment, to rock the segment, a second handle on the other side of the door from the first handle, means connected with the second handle to retract the bolt and means actuated by the second handle for disengaging the arm from the segment.

15. A latch for a door comprising in combination, a bolt having a rack and a longitudinal rib centrally of the rack, a handle rockably mounted to swing in a horizontal plane toward and away from the door, and bolt actuating and interconnecting means between the handle and the bolt comprising a toothed segment, engaging the rack on both sides of the rib and having a channel receiving the rib, an arm movable in and out of engagement with the segment, to rock the segment, a second handle on the other side of the door from the first handle, means connected with the second handle to retract the bolt and means actuated by the second handle to raise the arm out of engagement with the segment.

16. The combination with a door having a surface recess, of a bolt having a rack and a longitudinal rib centrally of the rack, a handle located within the recess of the door, and rockably mounted to swing therein toward and away from the door, and bolt actuating and interconnecting means between the handle and the bolt comprising a pair of parallel fixed plates, a pin supported by the plates, a toothed segment on one of the plates rocking on the pin and engaging the rack on both sides of the rib and having a channel receiving the rib, an arm fixed on the pin and having a lug normally engaging the segment, a second handle on the other side of the door from the first handle, means connected with the second handle to retract the bolt and means actuated by the second handle to move the pin longitudinally and disengage the lug on the arm from the segment.

ROBERT P. KUSZMAUL.

45

120

50

125

55

130

60

135

65

140

70

145

75

150