Nov. 25, 1930. F. J. DOWLING 1,782,776

ROTARY BOLT LOCK

Original Filed June 17, 1925 2 Sheets-Sheet 1

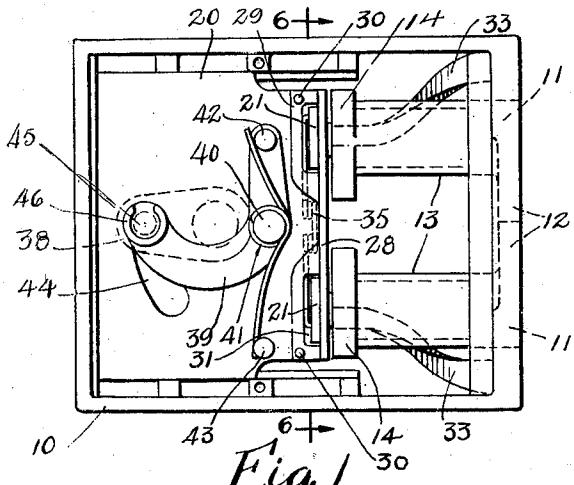


Fig. 1

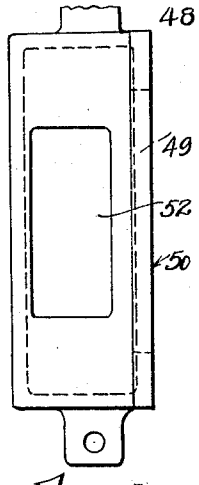


Fig. 15

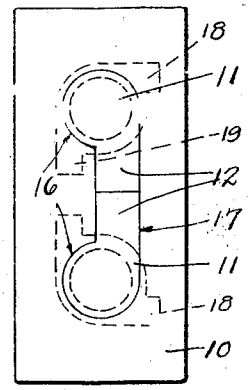


Fig. 2

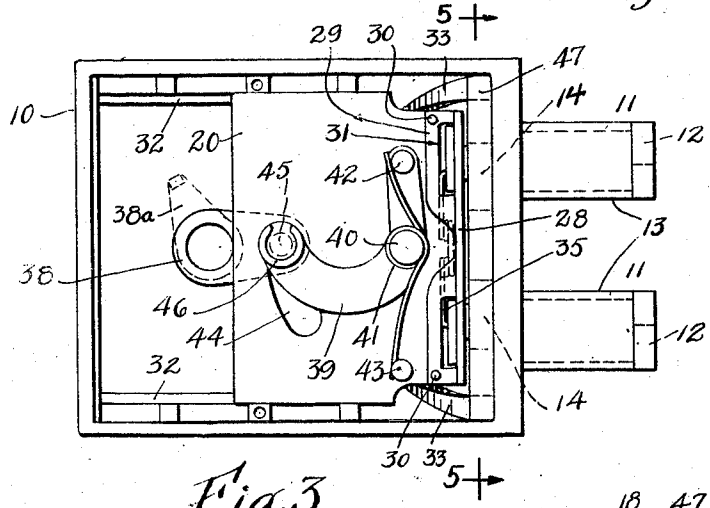


Fig. 3

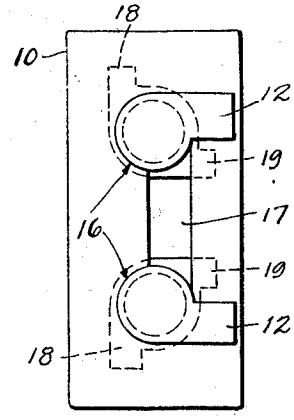


Fig. 4

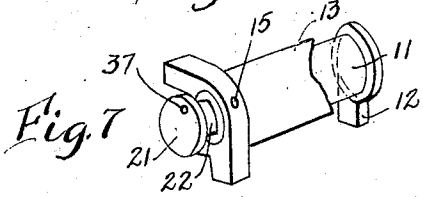


Fig. 7

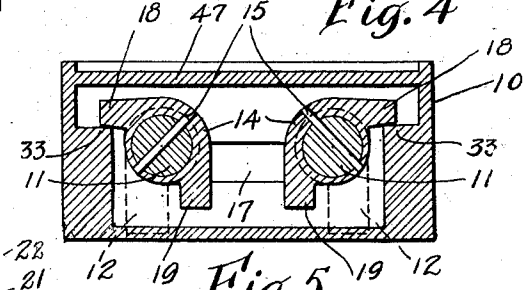


Fig. 5

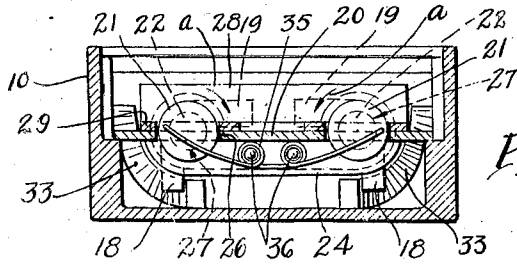


Fig. 6

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ROTARY BOLT LOCK

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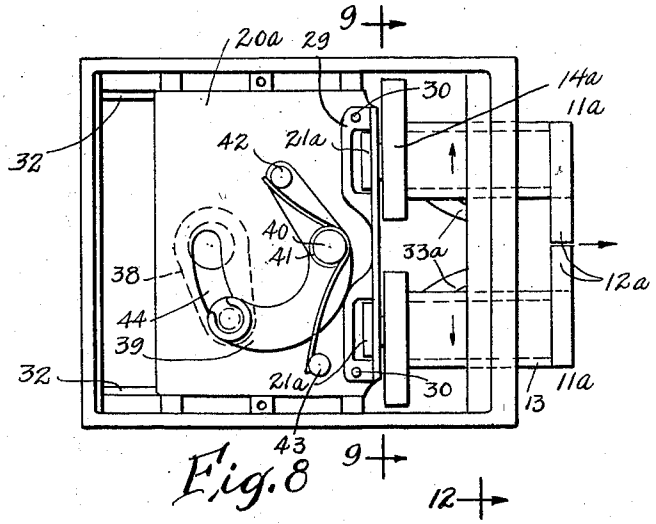


Fig. 8

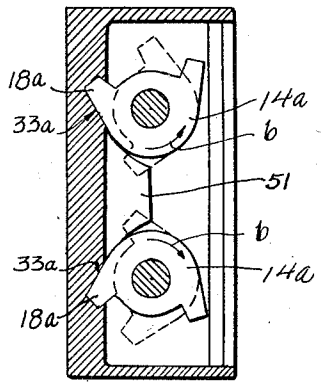


Fig. 9

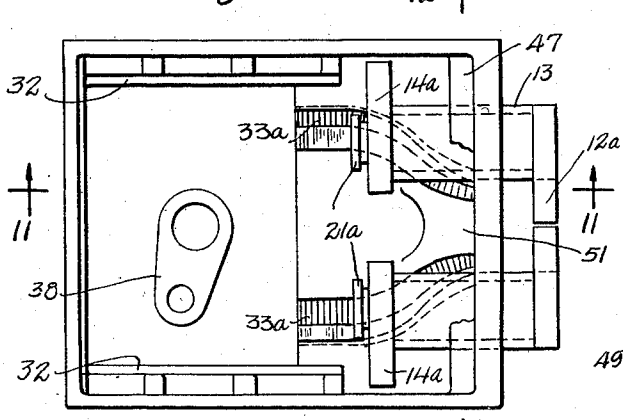


Fig. 10

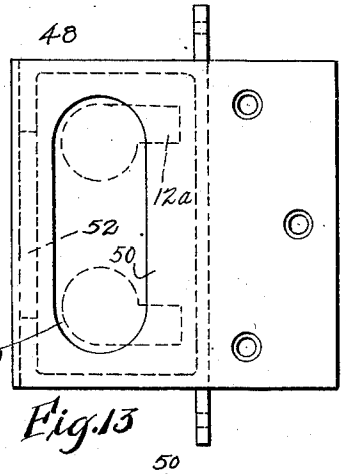


Fig. 13

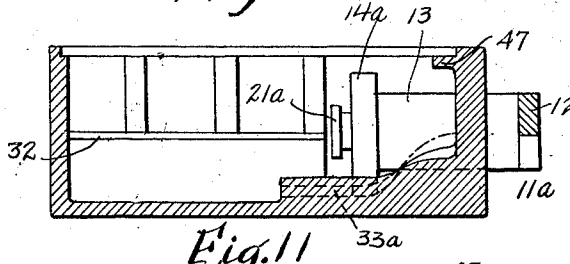


Fig. 11

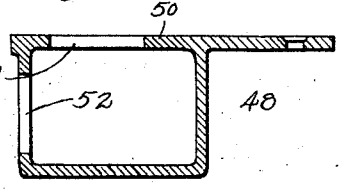


Fig. 14

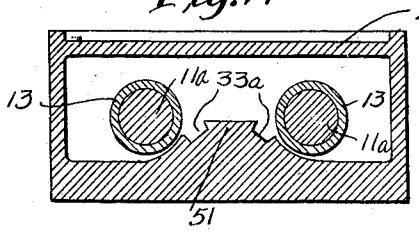


Fig. 12

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UNITED STATES PATENT OFFICE

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ROTARY BOLT LOCK

Application filed June 17, 1925, Serial No. 37,658. Renewed November 15, 1927.

This invention relates to lock construction and, with regard to its more specific features, to jimmy-proof locks such as those employing a rotatable bolt member.

One of the objects of the invention is to provide a lock which is thoroughly practical and highly efficient, affording great security. Another object is to provide a construction of the above nature having a bolt which, when it is in locking position, is dependably held in such position against any attempt to force the bolt to retracted position by means of a tool or otherwise. Another object is to provide a lock of the above nature which is simple in construction and inexpensive to build.

Another object of the invention is to provide a lock having a plurality of rotatable bolts which cooperate with each other and with an actuating means to provide a strong and reliable jimmy-proof lock. Another object is to provide a bolt having guarding and reinforcing means which dependably protect the bolt from being cut through by a saw or the like. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangements of parts as will be exemplified in the structure to be hereinafter described, the scope of the application of which will be indicated in the following claims.

In the accompanying drawings in which are shown one or more of the various possible embodiments of the several features of this invention,

Figure 1 is a view from the rear side of the lock casing showing the rear cover plate removed to expose the mechanism, and showing the bolts in retracted position;

Figure 2 is a view from the right-hand side of Figure 1;

Figure 3 is a view similar to Figure 1 but showing the bolts in projected and locking position;

Figure 4 is a view from the right-hand side of Figure 3;

Figure 5 is a section taken along the line 5—5 of Figure 3;

Figure 6 is a section taken along the line 6—6 of Figure 1;

Figure 7 is a perspective view of a bolt and the parts carried thereby, partially broken away;

Figure 8 is a view similar to Figure 1 showing a modified construction and showing the bolts at an intermediate position;

Figure 9 is a section taken as indicated by the line 9—9 in Figure 8;

Figure 10 is a view similar to Figure 8 but showing part of the actuating mechanism removed;

Figure 11 is a section taken as indicated by the line 11—11 in Figure 10;

Figure 12 is a section taken as indicated by the line 12—12 in Figure 10;

Figure 13 is an elevation of the strike or keeper;

Figure 14 is a sectional view of the strike or keeper, and

Figure 15 shows the keeper viewed from the left-hand side of Figure 13.

Similar reference characters refer to similar parts throughout the several views of the drawings.

Referring now to the drawings in detail, and first to Figure 1, there is shown a lock casing 10 having in the right-hand end wall thereof (as viewed in Figure 1) an opening through which a pair of bolts 11 are arranged to slide and take into a keeper when slid outwardly or projected. As shown in Figure 2, each of these bolts 11 is provided at its outer end with a transversely projecting arm or tongue 12 which is adapted to turn into jimmy-proof position within a wall of the keeper when the bolts are projected and rotated, as will be described hereinafter. As shown in Figure 2, the end wall of the casing 10 is preferably provided with a single opening for the reception of the bolts, this opening consisting of two circularly shaped portions 16 in which the bolts slide and a connecting straight portion 17 for receiving the tongues 12. When the bolts are in retracted position, as shown in Figures 1 and 2, the tongues 12 project toward each other and substantially fill the opening portion 17. When the bolts are projected into final lock-

ing position, these tongues 12 are moved through substantially 90° and into positions at right angles to their positions when the bolts are retracted, all as will be described more fully hereinafter.

As shown in Figure 7, each of the bolts 11 is preferably provided with a cylindrical outer sleeve 13 of hardened steel. The body portion of the bolts may be made of some relatively soft but suitably tough and strong material. The sleeves 13 have a loose fit upon the bolts 11 so that they are freely rotatable thereon. These sleeves thus serve as a reinforcement for the bolts, entering the keeper therwith, and they serve as a dependable guard against any attempt to saw the bolts in two, as by means of a saw inserted between the lock casing and the keeper. If it is attempted to saw the bolts in two, the saw merely causes the sleeve 13 to rotate without having any cutting action thereon, and the bolts are thus safeguarded.

At the outer ends of the bolts the sleeves 13 are held in place by the tongues 12 and the flanges which are preferably provided as shown in Figure 7. The outer surfaces of the sleeves preferably come substantially flush with the edges of these end flanges of the bolts, as may be seen in Figure 3. At the inner ends of the bolts (Figure 1) are provided members 14, in the shape of collars or rings, which are secured upon the bolts as by means of pins 15 (Figures 5 and 7). These members 14 hold the sleeves 13 in place at the rear ends of the bolts. The sleeves 13 are thus dependably held in position on the bolts, being loosely mounted thereon for rotation relative thereto and held against endwise movement relative to the bolts by means of the flanges at the forward ends thereof and the members 14 at the rear ends.

Referring again to Figure 7, rearwardly of the members 14 the bolts are provided with reduced portions 22 and, rearwardly of the portions 22 are enlarged portions or heads 21. The portions 21 are of a diameter equal to or less than that of the body of the bolts 11 so that the members 14 may be slipped thereover and into position upon the rear ends of the bolts.

Referring again to Figure 1, within the casing 10 is a slidable plate member 20 which is supported and guided in its sliding movements by suitable tracks or flanges 32 (Figure 3) formed on the inside of the casing. The edge of the plate 20 adjacent to the bolts 11 is provided with a projecting flange 24 (Figure 6) and, adjacent to this flange are a pair of openings 26 (Figure 1) for receiving the heads 21 of the inner ends of the bolts. Secured to the surface of the plate member 20, opposite to the flange 24, is an angle member provided with a flange 29 resting against the plate 20 and an upstanding flange 28. This angle member is fastened in place by suitable rivets or screws 30, as shown in Figure 1, and has a pair of openings 31 registering with the openings 26 in the plate 20. As shown in Figure 6, circular openings 27 are formed in the end wall built up of the combined flanges 24 and 28, and in these circular openings rest the reduced portions 22 of the bolts, the heads 21 resting in the registering openings 26 and 31. Thus, the bolts 11 are connected to the plate 20 to partake of the sliding movements of the plate and to rotate relatively thereto about their respective longitudinal axes.

Referring to Figure 5, each of the members 14 of the bolts 11 has a pair of projecting fingers or horns 18 and 19. As shown in Figures 1 and 6, fixed within the casing are a pair of spirally shaped cams 33 against which the projecting horns 18 bear. As shown in Figure 6, there is provided a spring 35 anchored upon pins 36 secured in the flange 24 and engaging with the bolts 11. Preferably the ends of the spring 35 enter openings 37 (Figure 7) in the heads 21 of the bolts. As viewed in Figure 6, the spring 35 tends to swing the left-hand bolt 11 in a counter-clockwise direction and tends to swing the right-hand bolt 11 in a clockwise direction, thereby holding the horns 18 against the cam surfaces 33. As shown in Figure 1, the cams 33 have portions which are substantially straight so that, as the projection of the bolts is started, they are held against rotation for a given length of movement and until they enter the keeper; thereafter, the spiral portions of the cams come into operation and rotate the bolts relative to the plate 20 through substantially 90°, turning the bolts into the position shown in Figures 3 and 4.

Thus, by moving the sliding plate 20, the bolts 11 are moved from the retracted position shown in Figure 1 to the extended or operative position shown in Figure 3. During this movement the sleeves 13 move longitudinally with the bolts, but preferably do not rotate therewith, the sleeves being preferably held against rotation by frictional contact with the casing and the bolt members 11 rotating within the sleeves. When the bolts reach final locking position, the members 14 thereon come into engagement with the inner surface of the striking wall of the casing and limit the outward movement of the bolts. As shown in Figure 5, projecting inwardly from the striking wall of the casing is a flange 47 spaced from the cam surfaces 33. When the bolts reach final locking position, the horns 18 are positioned between the flange 47 and the cam surfaces and the bolts are thereby dependably locked against reverse rotation until they have been moved inwardly. Thus, the bolts cannot be rotated to bring the tongues 12 into position for withdrawal through the

keeper opening without first starting the bolts in their retractive movement.

Considering now more particularly the actuating means for the bolts, swivelled in a wall of the casing is a crank arm 38 (Figure 3) which is preferably operated by means of a handle on the outer side of the casing wall. This crank arm 38 is provided at its outer end with a crank pin 45 which projects through a slot 44 in the plate member 20 and engages a swinging arm or lever 39. The lever 39 is made conveniently in the form of a bell crank and is pivoted upon a pin 40 projecting from the sliding plate 20. A spring 41 is coiled about the pin 40 and bears against a pin 43 projecting from the plate member 20 and against a pin 42 projecting from the end of the bell crank 39. The spring 41 tends to swing the lever 39 in a clockwise direction, as viewed in Figures 1 and 3.

When the bolts are moved from the retracted position shown in Figure 1 to the final locking position shown in Figure 3, or given their reverse movement of retraction, the crank arm 38 swings through substantially 180°, as is indicated in the drawings. Referring to Figure 1, it will be seen that, when the bolts are in retracted position, the pin 45, the center of rotation of the crank arm 38 and the pivot 40 are substantially in line with respect to the direction of movement of the bolts 11. Also, as shown in Figure 3, when the bolts are in final locking position, these three pivots are again substantially in line. The crank arm 38 and the lever 39 thus constitute a toggle mechanism for actuating the rotatable bolts, and coact with the latter in a highly advantageous way. For example, as the mechanism is caused to be moved from the position shown in Figure 1 to that of Figure 3, any resistance to rotation of the bolts is effectively overcome by the action of the spring 41 which, acting on the toggle, insures straightening out of the toggle and thus makes certain of the complete extension and rotation of the bolts. This action thus makes it unnecessary to rely wholly upon the operation of the cranks 38 and 38a. The relatively small effectiveness of the spring 41 is greatly multiplied by the toggle and complete movements of rotation of the bolts are dependably assured, into the positions shown in Figures 1 and 3. The upper end of the slot 44, as viewed in the drawing, limits the swinging movement of the parts. Referring to Figure 3, it will be seen that the pivot pin 45 has moved to a position in which it is on or beyond a line drawn between the axis of the crank arm 38 and the pivot 40. The bolts are thus dependably locked in their rotated and extended positions by this toggle against any attempt to force them. The toggle cannot be broken by any external force applied to the bolts but only by turning the crank arm 38 and the lever 39.

From the side of the lock opposite to that having the handle for operating the crank arm 38 the lock is preferably operated by means of a key in the usual manner. These parts are not shown in detail herein since they may take any well-known form. Preferably, the lock casing is provided with a rear cover plate in the usual manner, in which is pivoted a crank arm operated by a key and having a crank pin taking within the arcuate flange 46 (Figures 1 and 3), the flange 46 being formed upon the lever or toggle arm 39 and concentric with the crank pin 45 of the crank arm 38.

In the embodiment shown in Figures 1–7 and above described, when the bolts are projected into locking position they rotate in the directions indicated by the arrows *a* in Figure 6, and the horns or followers 18 are held against the cam surfaces 33 by means of the spring 35. In the embodiment shown in Figures 8–11 the operation of the bolts is substantially as hereinbefore described except that the bolts rotate in the opposite directions and a modified cam construction is provided for cooperating with the followers 18. Referring to Figures 9, 10, 11 and 12, the cam followers, which are in these figures numbered 18a, cooperate with spiral cams in the form of a pair of grooves 33a formed in the casing 10. These cam grooves 33a positively rotate the bolts in both their movement of projection and movement of retraction, and the spring means for holding the followers in engagement with the cams is done away with. The bolts, as they move from retracted toward operative position, rotate in the directions indicated by the arrows *b* in Figure 9, and move through the keeper opening 49 into the position shown in Figure 13. As is seen in Figures 10 and 11, the cams 33a have substantially straight portions which hold the bolt members against rotation during a first portion of their projecting movement and until the bolts have been advanced a sufficient distance to enter the keeper 48, thereby permitting the tongues 12a to rotate into position in back of the wall 50 of the keeper.

As shown in Figures 13, 14 and 15, the strike or keeper 48 is preferably provided with an opening 52 therein in addition to the opening 49 through which the bolts pass. This opening 52 is placed in a wall of the keeper which is visible when the door is closed, and through this opening the operation of the bolts may be observed as they enter the keeper and rotate into final locking position.

The lock construction herein disclosed will be seen to afford a maximum of security. The sleeves 13 strengthen and reinforce the bolts and dependably guard against any attempt to saw them in two. When the bolts are in final locking position the flange 47 of

the casing dependably locks them against rotative movement. The toggle formed by the arms 38 and 39 securely holds the bolts against any attempt to force them longitudinally out of the keeper. The lock is simple in construction and compact and is capable of being manufactured at low cost.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a lock, the combination with a rotatable bolt having a follower, of means for causing the operation of the bolt comprising a carrier movable with the bolt endwise along the lock, said bolt being rotatable with respect to the carrier, and a cam which cooperates with said follower to cause rotation of the follower as a result of the endwise movement thereof and the carrier, the cam being dissociated from the bolt.

2. In a lock, the combination with a rotatable bolt, of means for causing said bolt to operate comprising a cam, bolt projecting means, said bolt having a follower to engage said cam, and resilient means to retain said follower in engagement with said cam to insure proper rotation of the bolt.

3. In a lock, the combination with a rotatable bolt, of means for actuating the bolt comprising means to project and retract the bolt, a cam to rotate the bolt, means to render the cam effective to rotate said bolt during projection or retraction thereof, said cam being arranged to have contact with the last-mentioned means along one surface, and resilient means operative to retain said means in engagement with said surface.

4. In a lock, in combination with a casing and a rotatable bolt, of means for actuating the bolt comprising a carrier to which the bolt is swiveled to project and retract the bolt, a cam fixed to the casing to rotate the bolt as a result of its projection and retraction, means including a follower fixed to the bolt to render said cam effective to rotate said bolt, said cam and said follower having contact with each other along the cam surface, and means to retain the cam and follower in engagement with each other.

5. In a lock, the combination with a rotatable bolt, of means for actuating the bolt comprising means to project and retract the bolt, a cam to rotate the bolt, a follower on said bolt, said cam having engagement solely with said follower to rotate the bolt, said follower having contact with said cam along a surface of the cam, and resilient means to retain said follower in engagement with the cam at said surface.

6. In a lock, the combination with a rotatable bolt, of means for actuating the bolt comprising means to project and retract the bolt, a cam to rotate the bolt, a follower on said bolt having a finger to engage said cam, said cam having a single surface along which said finger has contact, and resilient means operative to retain said follower in engagement with the cam along said surface.

7. In a lock, the combination with a bolt, actuating means for causing the same to enter and engage a strike, and means independent of the actuating means to cause rotation of the bolt while engaging the strike, of a sleeve journaled upon said bolt and extending therealong so as to reinforce the bolt and to guard the same from being cut by a saw, the saw being effective merely to cause said sleeve to rotate without damaging the same, said bolt being rotatable independently of the sleeve by means at the rear of the bolt and having means to engage the strike in a jimmy-proof manner when rotated.

8. In a lock, the combination with a bolt, means for projecting and rotating the bolt including a cam external of the bolt and dissociated therefrom, and a follower on the bolt having engagement with said cam to cause the bolt to rotate when the same is being projected, said cam having a surface along which said follower is arranged to move, resilient means to retain said follower in contact with said surface, and stop means within the lock arranged to contact the follower at an opposite side thereof relatively to the cam when the bolt is projected to prevent unintended rotation of the bolt.

9. In a lock, the combination with a lock casing, a rotatable bolt and means to move the same endwise along the lock, said means comprising a non-rotatable carrier movable endwise with the bolt, of cam means external of the bolt and secured rigidly at a side of the lock casing, said bolt having follower means at an end thereof engaging said cam means to cause rotation of the bolt while being moved endwise.

10. In a lock, the combination with a casing, a rotatable bolt, and means to move the same endwise along the lock, said means comprising a carrier movable endwise with the bolt and at the same speed, of a cam, and means secured to said bolt at an end thereof comprising a member having a follower to contact said cam to cause said bolt to rotate when projected by the means aforesaid, and a flange on the bolt arranged to abut against the striking wall of the lock casing to limit the projection of said bolt.

11. In a lock, the combination with a casing, actuating means therein, and a strike, of a bolt comprising a plurality of members which are movable longitudinally as a unit, one of said members being rotatable within

the other and having projecting means for inter-engagement with the strike, the outer member being projected by the inner member.

12. In a lock, the combination with a casing, actuating means therein, and a strike, of a plurality of bolts each of which is rotatable into engagement within the strike when projected by said actuating means, said bolts having tongues extending toward each other in retracted position of the bolts, said tongues being effective for engagement with the strike as aforesaid.

13. In a lock, the combination with a casing, and a strike, of a bolt comprising projecting means at the rear portion thereof, a cam fixed within the lock in engagement with which said projecting means is movable for rotation of the bolt, and an actuating member for moving the bolt longitudinally to cause rotation thereof by said cam, the bolt having projecting means at its outer end for engagement with the strike as a result of said rotation.

14. In a lock, the combination with a casing, actuating means therein, and a strike, of a plurality of bolts, each of which is rotatable into engagement with the strike when projected by said actuating means, said bolts having tongues to engage the strike extending toward each other in retracted position of the bolts, said tongues being positioned to one side of a plane passing through the axes of the bolts, said bolts being rotatable in the direction of the side of the plane aforesaid when the same are being projected.

15. In a lock, the combination with a casing and a strike, of a bolt, and actuating means therefor, said bolt comprising a core, a sleeve thereon, said core having a flange at the forward end of the bolt to retain the sleeve on the bolt, said core having a flange at the rear end thereof to engage said actuating means, said flange being positioned substantially within the elements bounding the surface of the core to permit said sleeve to pass thereover to seat on the core, and a ring arranged to pass over said flange and seat on said core at the rear end of the sleeve to retain the sleeve on the core.

16. In a lock, the combination with a casing and a strike, of a bolt, and actuating means therefor, said bolt comprising a core, a sleeve thereon, said core having a flange at the forward end of the bolt to retain the sleeve on the bolt, said core having a flange at the rear end thereof to engage said actuating means, said flange being positioned substantially within the elements bounding the surface of the core to permit said sleeve to pass thereover to seat on the core, and a ring arranged to pass over said flange and seat on said core at the rear end of the sleeve to retain the sleeve on the core, said ring being arranged to abut against the front wall of said casing to limit the outward movement of said bolt.

17. In a lock, the combination with a casing and a strike, of a bolt, and actuating means therefor, said bolt having means at the inner end thereof to engage said actuating means, and a ring arranged to seat on the bolt in spaced relation to the engaging means on the bolt, said actuating means having a bearing member to be received in the space aforesaid, said ring acting also as an abutment to contact the front wall of the casing to limit the outward movement of the bolt thus preventing said actuating means from being subjected to any force in that direction.

18. In a lock, the combination with a casing, and a strike of a bolt comprising follower means at the rear portion thereof, a cam fixed relatively to the casing and in engagement with which said follower is movable for rotating the bolt, and an actuating carrier to move the bolt endwise to cause rotation thereof as aforesaid, said carrier and bolt being in the same position with relation to each other at all times.

19. In a lock, the combination of a casing, a strike, a rotatable bolt projectable from the casing into interlocking engagement with the strike, and actuating means for the bolt for rotating it including a stationary spiral cam fixed in the casing externally of the bolt, and a follower secured to the bolt and having wiping contact with the cam, said cam having different degrees of spirality at different points between its ends.

20. In a lock, the combination of a casing, a strike, a rotatable bolt projectable from the casing into engagement with the strike, and actuating means for the bolt including a stationary cam fixed relatively to the bolt, a follower secured to the bolt and cooperating with the cam, and a resilient member to make effective the cooperation between the cam and the follower.

21. In a lock, the combination of a casing, a strike, a rotatable bolt projectable from the casing into engagement with the strike, and actuating means for the bolt comprising a cam fixed relatively to the bolt and with a portion thereof disposed in the form substantially of a helix about the axis of the bolt, for causing rotation of the bolt and having a straight portion to hold the bolt from rotation during a different portion of its projection, and a follower secured to the bolt and cooperating with said cam along a single surface thereof.

22. In lock construction, in combination, a slidable and rotatable bolt, and means for projecting said bolt in the direction of its axis of rotation and for rotating said bolt into final locking position, said means including cam means to effect rotation of said bolt and a toggle mechanism adapted to pro-

ject said bolt and to move into a position to oppose initial unlocking movement of said bolt when said bolt is moved into final locking position.

23. In lock construction, a casing, in combination, a rotatable bolt movable relative to said casing and into and out of locking position; a sliding member slidably guided by said casing and connected to said bolt to move therewith; means for moving said bolt including a lever pivoted upon said sliding member, a swinging arm pivotally connected to said lever, and means for swinging said arm; and means for rotating said bolt.

24. In lock construction, in combination, a casing; a rotatable bolt movable in a direction substantially lengthwise of its axis of rotation into and out of said casing; and means for moving and rotating said bolt including a crank arm swiveled in a wall of the casing and a lever connected to said crank arm and cooperating therewith to form a toggle adapted to oppose initial movement of the bolt out of locking position.

25. In lock construction, in combination, a rotatable bolt; means for moving said bolt in a direction substantially lengthwise of its axis of rotation into and out of locking position comprising a pair of swinging lever arms one of which has a pivot movable in position as the bolt moves, said two levers cooperating to form a toggle and said movable pivot having such a range of movement that said toggle may straighten out; and means responsive to the actuation of said means for rotation said bolt, the effect of said toggle increasing as rotation of said bolt proceeds.

26. In lock construction, in combination, a rotatable bolt; means for moving said bolt into and out of locking position and in a direction substantially lengthwise of its axis of rotation comprising a pair of swinging lever arms one of which has a pivot movable in position as the bolt moves, said two levers cooperating to form a toggle and said movable pivot having such a range of movement that said toggle may straighten out; means responsive to the actuation of said means for rotating said bolt, the effect of said toggle increasing as rotation of said bolt proceeds, and spring means acting against said lever arms in a direction to oppose breaking of said toggle.

27. In lock construction, in combination, a rotatable bolt; cam means for rotating said bolt as the latter moves in a direction substantially lengthwise of its axis of rotation; and means for moving said bolt into and out of locking position and for making said cam means effective comprising a pair of swinging lever arms one of which has a pivot movable in position as the bolt moves, said two levers cooperating to form a toggle adapted to increase in its effect upon said means as movement of said bolt proceeds and said movable pivot having such a range of movement that the effective arms of said levers may move into alinement.

28. In lock construction, in combination, a casing; a rotatable bolt movable into and out of locking position through a wall of said casing; a sliding plate slidably guided by and within said casing and to which said bolt is connected; means for moving said sliding plate and said bolt therewith including a lever arm pivoted in a wall of said casing, a lever arm pivoted upon said plate, and a pin connecting the ends of said lever arms and projecting through a slot in said plate, an end of said slot limiting the swinging of said arm; and means responsive to the actuation of one of said lever arms for effecting rotation of the bolt.

29. In lock construction, in combination, a casing; a rotatable bolt movable into and out of locking position through a wall of said casing; a sliding plate within said casing and to which said bolt is connected; means for moving said sliding plate and said bolt therewith including a lever arm pivoted in a wall of said casing, a lever arm pivoted upon said plate and connected with said first-mentioned lever arm to form therewith a toggle; means responsive to actuation of said toggle for effecting rotation of said bolt; and a spring acting upon said toggle and mounted to be movable with said sliding plate.

30. In lock construction, in combination, a casing, a bolt having at its outer end means projecting therefrom adapted to enter and interengage with a strike, means for moving said bolt out of said casing and for rotating said bolt, said bolt having adjacent its inner end means responsive to said actuating means for coaction in effecting rotation of said bolt, and a rotatable sleeve journaled upon said bolt intermediate of said projecting means and said responsive means.

31. In a lock, the combination with a casing, actuating means therein, and a strike, of a bolt comprising a plurality of members which are movable longitudinally as a unit, one of said members being rotatable, in response to said actuating means, and having projecting means for interengagement with the strike, and the other of said members being rotatably journaled upon said rotatable member and being projected with the latter in response to said actuating means.

In testimony whereof I affix my signature.

FRANCIS J. DOWLING.