Feb. 10, 1931. T. A. FARMER 1,792,154

DOORLOCK

Filed Nov. 13, 1928

Fig. 1.

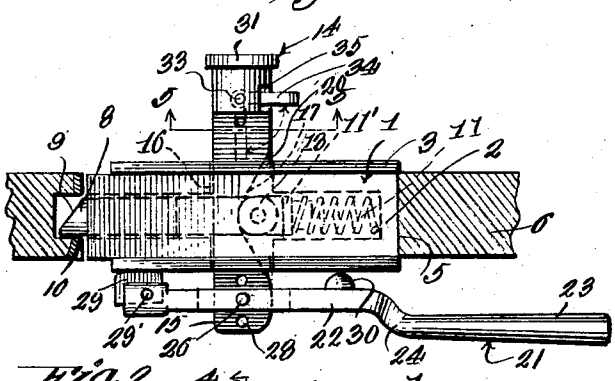


Fig. 2.

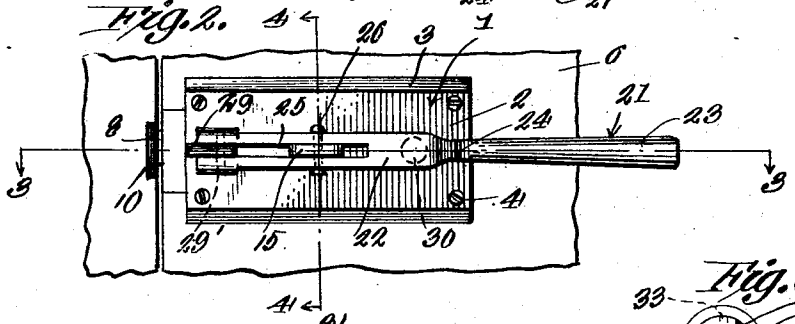


Fig. 5.

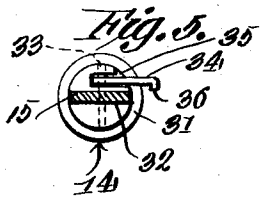


Fig. 3.

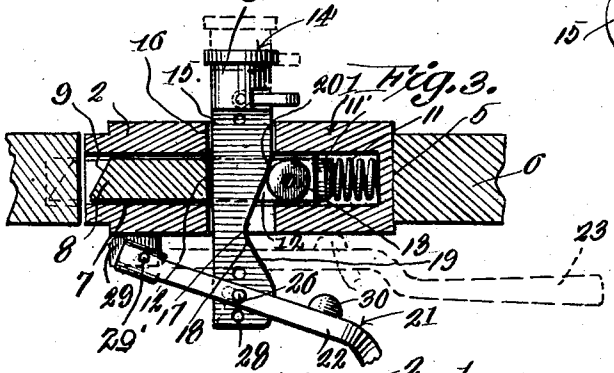
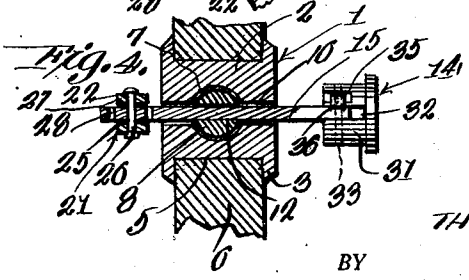


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE

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DOORLOCK

Application filed November 13, 1928. Serial No. 319,140.

This invention relates to improvements in locks, and while the lock is designed primarily for use on the doors of automobiles and more particularly automobiles of the closed type, the lock may be employed in numerous places where an efficient lock is required.

One of the objects of the present invention is to provide a lock so constructed that it may be actuated to release the door upon which it is mounted with less exertion and greater facility than locks as ordinarily constructed and particularly such as are employed on the doors of automobiles, the invention likewise contemplating, in this connection, a lock which may be manipulated without the necessity of resorting to repeated attempts at operating the same to retract the bolt as is frequently necessary in the use of some types of locks for this purpose ordinarily employed.

Another object of the invention is to so construct the lock that a single pull upon an actuating hand lever which constitutes a part of the lock, will serve not only to retract the bolt but also to permit of the pull being transmitted to the door in order to swing the door to open position, so that the door may be opened as readily as though the lock were not present.

Another object of the invention is to provide a lock designed particularly for use upon the doors of closed automobiles, which lock may be actuated from the inner side of the door by mere pressure exerted against an actuating element, so that outward pressure is exerted upon the door to swing the same to open position at the same moment the lock bolt is retracted through the actuation of said element.

Another object of the invention is to provide a lock of the type referred to embodying a novel actuating means for the bolt which will be devoid of any rotating parts which are ordinarily subject to disarrangement and which, if they become rusted or are exposed in cold weather, are difficult to operate.

Another object of the invention is to so construct the lock that by the adjustment of a single element thereof, from the interior of the automobile upon which the lock is installed, or in fact anywhere that the lock may be employed, the actuating member for the lock bolt may be locked against shifting movement to retract the bolt thus enabling the one using the locks equipping all doors of the automobile with the locks, with the exception of one door where a lock of the ordinary type which can only be opened by a key from the exterior of the car is to be employed, thus effecting an economy in the equipment of the car with door locks.

Another object of the invention is to provide a lock which will present the advantage, from a commercial point of view, that it will embody a one-piece casing and that all of the parts of the lock may be assembled with the casing without the necessity of, afterwards, assembling casing sections or parts.

While the accompanying drawing and the description which is to follow, constitute a disclosure of the preferred embodiment of the invention, it will be understood that various changes may be made within the scope of what is claimed.

In the accompanying drawing:

Figure 1 is a top plan view of the lock embodying the invention, installed upon the door of an automobile, the door and frame being shown in section and the lock bolt and the actuating element being shown in the positions which they will assume when the lock bolt is engaged with the keeper;

Figure 2 is a view in side elevation of the lock, installed;

Figure 3 is a horizontal sectional view through the lock taken substantially on the line 3—3 of Figure 2, looking in the direction indicated by the arrows, and illustrating the positions assumed by the parts when the lock bolt is retracted, in full lines, and the normal positions of the parts in dotted lines;

Figure 4 is a vertical transverse sectional view taken substantially on the line 4—4 of Figure 2 looking in the direction indicated by the arrows;

Figure 5 is a horizontal sectional view taken substantially on the line 5—5 of Figure 1 looking in the direction indicated by the arrows.

The casing of the lock embodying the invention is indicated in general by the nu-

meral 1 and differs radically from the casings of locks of this type which have heretofore been placed upon the market in that it consists essentially of a one-piece body of substantially oblong rectangular form, which is indicated by the numeral 2, and which is a one-piece casting, the body, in the illustrated embodiment of the invention being formed upon its upper and lower faces and at the opposite sides thereof, with preferably beveled flanges 3 through which securing screws 4 may be fitted for the purpose of anchoring the body of the casing in a recess or mortise 5 which is cut directly in the edge of the door of the automobile indicated by the numeral 6, as illustrated in Figures 1, 3 and 4 of the drawing. The casing body 2 is formed midway between its upper and lower sides and between its opposite faces with a longitudinally extending bore 7 which is of cylindrical contour and which opens through one end of the casing, and this bore slidably accommodates the lock bolt which is indicated by the numeral 8 and which is likewise of cylindrical form and is provided with a beveled outer end 9 the bevel of which adapts the same to ride over the keeper for the lock which is indicated by the numeral 10 thus effecting automatic momentary retraction of the bolt at the time the door, upon which the lock is mounted, is swung to closed position, a compression spring 11 being arranged within the inner end of the bore 7 and bearing at one end against the closed end wall of the bore and at its other end against a disk 11′ which, in turn, is disposed against the inner end of the bolt 8. In order that the bolt and the actuating plunger therefor, which plunger is to be presently described, may be assembled and function properly, the bolt 8 is formed with a longitudinally extending diametric slot indicated by the numeral 12, and in order that there may be freedom of movement of the parts, an anti-friction roller 13 is journaled within the slot near the inner end of the bolt.

The actuating member for the lock bolt 8 comprises a plunger which is indicated in general by the numeral 14 and which embodies a flat sided longitudinal shank 15 of a thickness adapting it to fit slidably through the slot 12 which is formed in the bolt 8, the casing body 2 being provided with transverse slots 16 at opposite sides of the bore 7 and the shank 15 of the plunger being fitted through the slots 16 in the casing body and through the slot 12 in the bolt 8. The spring 11 tends, as will be evident by reference to Figure 3 of the drawing, to project the bolt 8 so that its beveled end 9 will project beyond the open end of the bore 7 for engagement with the keeper 10 and it will likewise be observed by reference to this figure that the anti-friction roller 13 is yieldably held in peripheral engagement with that edge of the plunger shank 15 which is presented toward the closed end of the bore 7 so that when the plunger is in the position shown in full lines in Figure 1 of the drawing and dotted lines in Figure 3, the anti-friction roller will engage in a recess 17 formed in the said edge of the shank of the plunger and peripherally against the wall of said recess. By reference to Figure 3 of the drawings it will be observed that the recess 17 has its wall of such contour as to provide a concave intermediate portion 18 and oppositely inclined portions 19 diverging from the intermediate portion 18, one of said wall portions 19 merging, by way of a convexly rounded edge portion 20, with that edge of the shank 15 in which the recess is formed, these wall portions of the recess being formed in the manner stated so that when the plunger 14 is in the full line position shown in Figure 1, the anti-friction roller 13 may seat at its periphery against the concave intermediate wall portion 17 of the plunger shank and permit projection of the beveled end of the locking bolt 8 beyond the outer end of the lock casing, the rounded edge portion 20 and the inclined edge portion 19 of which it constitutes a continuation, being engaged by the periphery of the anti-friction roller 13 when the plunger 14 is shifted to the position shown in full lines in Figure 3 to retract the bolt, it being understood that, due to the curvature of the edge portion 20 and inclination of the associated wall portion 19, the pressure exerted by the door against the shank 15 of the plunger, under the influence of the spring 11, will effect retraction of the plunger to its normal position as shown in Figure 1, upon release of the means which will be presently described and which is associated with the plunger to provide for its adjustment to the full line position shown in Figure 3. It will also be evident at this point that when the plunger is shifted from the position shown in Figure 1 to the position shown in Figure 3, the inclined edge portion 19 which is adjacent the edge portion 20 will ride against the periphery of the anti-friction roller 13 to effect retraction of the bolt 8.

The invention contemplates the provision, in connection with the plunger 14, of means whereby the plunger may be shifted from either side of the door, and the means which is provided for actuating the plunger from the exterior of the door is in the nature of a hand lever which is indicated in general by the numeral 21 and which comprises a flat sided straight body portion 22 and a handle 23, the lever being provided with an offset portion 24 which connects one end of the member 19 and the handle 23 and by the provision of which the handle 23 is offset with respect to the said member 22. The member 22 is formed with a longitudinally extending slot 25 opening through its outer

end and one end of the shank 15 of the plunger 14 is fitted through this slot and a small pivot bolt 26 is fitted through openings 27 formed in vertical alinement through the portions of the member 22 above and below the slot 25, this bolt being also fitted through one or another of a series of openings 28 which are formed in the said end portion of the plunger shank 15, this construction providing a pivotal connection of the hand lever 21 with the plunger. The fulcrum for the hand lever 21 comprises a flat sided relatively thin block 29 which is disposed within the outer end of the slot 25 in the portion 22 of the hand lever and held in place by a pivot pin 29′ and it will be observed by reference to Figures 1 and 3 of the drawing that the pivot 29′ is so located that the fulcrum block 29 will project beyond that side of the member 22 which is presented toward the casing 1 so that this edge of the block may bear against the face of the casing and it will be quite evident that the lever 21 may be swung, in an outward direction, in order to shift the plunger from the full line position shown in Figure 1 of the drawing to the full line position shown in Figure 3 and at this point it will be understood that when the handle 23 of the hand lever is grasped and a pull exerted in a direction away from the door upon which the lock is mounted, a pull will be exerted upon the plunger effecting shifting thereof to retract the lock bolt 8, and at the same time a pull will be exerted upon the door to swing the same to open position, and therefore, in the opening of a door equipped with the lock embodying the invention, it is only necessary to grasp the hand lever and pull the same in an outward direction.

When the plunger 14 is in position to release the lock bolt 8 for projecting movement under the influence of the spring 11, as shown in Figure 1 of the drawing, the hand lever 21 will assume the position shown in full lines in this figure, and in order that the lever may be maintained in substantial parallelism with respect to the adjacent face of the lock casing and the handle 25 maintained in spaced relation to the door upon which the lock is mounted, so that it may be readily grasped, an abutment lug 30 is provided upon that side of the member 22 of the hand lever 21 at which the fulcrum 29 is located and near the inner end of the said member and preferably spaced from the pivot bolt 26 a distance the same as is the fulcrum 29, the said fulcrum and lug both resting against the outer face of the lock casing and the parts being maintained in this position due to the engagement of the anti-friction roller 13 in the recess 17 in the shank of the plunger.

In order that the actuating member or plunger 14 may be conveniently actuated from within the automobile or in other words from the other side of the door upon which the lock is mounted, a finger knob 31 is provided and is formed with a diametric slot 32 in which the other end of the shank 15 of the plunger 14 is fitted, a rivet or other securing element 33 being secured through registering openings in the body of the knob 31 and in the said end portion of the plunger shank 15 and it will be evident at this point that by exerting pressure against the finger knob in the direction of the lock casing, shifting motion will be imparted to the plunger shank to effect adjustment thereof to the position shown in full lines in Figure 3 of the drawing and a consequent retraction of the lock bolt 8, and at this point it will be evident that the pressure exerted against the finger knob to effect withdrawal of the lock bolt from locking engagement with the lock member is imposed indirectly upon the door so that the door is swung to open position.

From the foregoing it will be evident that the lock embodying the invention is so constructed as to greatly facilitate the opening of doors upon which it is mounted and that the actuation of the hand lever or the push button serves, in each instance, not only to effect retraction of the lock bolt, but also a movement of the door about its hinges to open position. It will also be evident from an inspection of the drawing and from the foregoing description that in assembling the lock at the factory or elsewhere, the plunger comprising the shank 15 and finger knob 31 may be inserted through the slots 16 in the body 2 of the lock casing, the spring 11 and bolt 8 having been previously disposed within the bore 7 of said casing and the bolt having been shoved inwardly, manually, to substantially the position shown in full lines in Figure 3, whereupon the insertion of the shank of the plunger may be continued until the plunger extends not only through the slots 16 but also through the slot 12 in the bolt 8, after which the hand lever 18 may be readily assembled with the plunger shank 15 and the bolt 26 fitted into place so as to hold these parts in their properly connected relation.

The invention, as previously stated, also contemplates the provision of means for locking the plunger 14 against shifting movement so that it cannot be actuated by manipulation of the hand lever 21, thus enabling the purchaser of the lock to equip his car with the same at a very low cost inasmuch as the lock of the invention is of such construction that, due to the presence of the feature referred to, it cannot be opened from the exterior of the car, and therefore it will only be necessary for the owner of the car to install one lock which may be unlocked by a key from the exterior of the car, the other doors being equipped with locks of the present invention. The means referred to comprises a detent

finger 34 which is pivotally mounted at one end upon the rivet 33, in a recess 35 formed in the inner end of the finger knob 31 and by reference to Figure 1 of the drawing it will be evident that the finger is adapted to be swung to assume the full line position shown in the said figure in which position it will be located bodily inwardly of the said end of the finger knob and consequently will offer no obstruction to inward sliding movement of the plunger when pressure is exerted against the knob. On the other hand, when the finger is swung to the position shown in dotted lines in the said figure its outer end, which is preferably turned downwardly as indicated by the numeral 36, will abut against the adjacent face of the body of the lock casing if any attempt is made to shift the shank of the plunger in a direction to retract the lock bolt. Therefore, before leaving the car, the driver may swing the fingers 34 of all of the locks, of the invention, to the dotted line position shown in Figure 1 and may then, with the proper key, lock the lock which is installed upon the door of the car equipped with a lock of the ordinary construction.

Having thus described the invention, what I claim is:

In a lock, a casing, a longitudinally extending bolt mounted therein for movement into and out of locking position, means tending to move the bolt to locking position, a transversely extending actuating member slidably mounted in the casing and extending entirely therethrough, coacting means upon the bolt and actuating member for effecting movement of the bolt upon operation of the actuating member in either direction, a thumb piece upon one end of the actuating member for shifting the same in one direction, a hand lever pivotally mounted at one end on the casing, means pivotally connecting the actuating member at the opposite end thereof from the thumb piece to the lever intermediate its ends, a hand grip on the free end of said lever, and a pivoted detent carried by the transversely extending actuating member for movement into and out of engagement with the casing for holding the actuating member against shifting movement in one direction.

In testimony whereof I affix my signature.

THOMAS A. FARMER.