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T. A. SCANLAN
AUTOMOBILE DOOR LOCK

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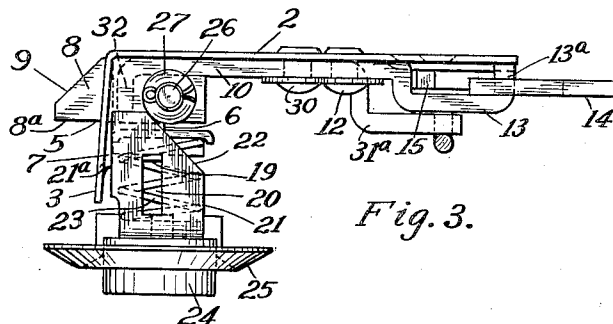


Fig. 3.

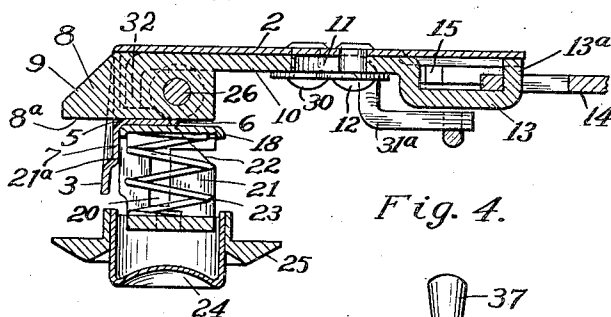


Fig. 4.

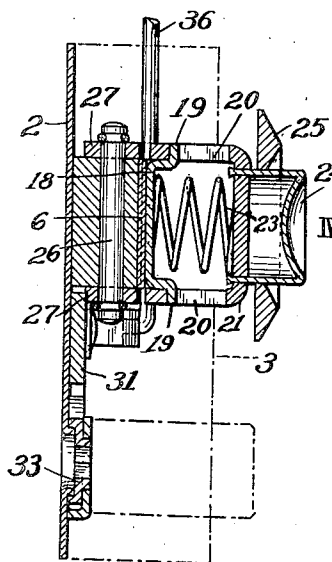


Fig. 2.

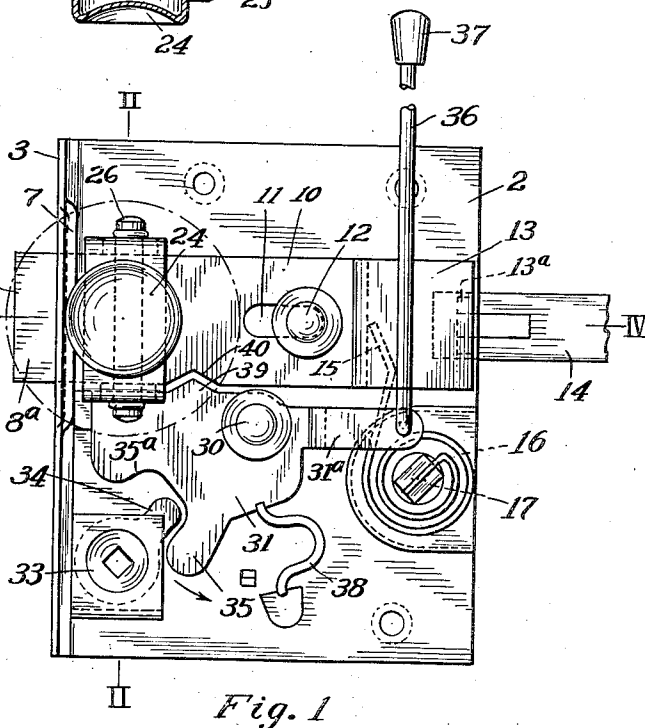


Fig. 1

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AUTOMOBILE DOOR LOCK

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This invention is for an improved door lock particularly, but not necessarily, designed for the doors of automobiles and other vehicles. It may however be used in any place where a lock of this type is of advantage.

The conventional automobile door lock includes a horizontally slidable bolt with a projecting beveled end that is pushed back when the door is closed by contact with a striker plate on the door frame and which springs out into a recess or keeper or engages some other suitable abutment when the door is fully closed. An operating shaft extends to the outside of the door with an exterior handle, while a remotely located handle on the inside of the door is usually provided for releasing the bolt from the inside of the car.

The present trend in car design, eliminating the now common running board and tending to make the sides of the doors more nearly in the plane of outermost sides of the body, render handles, protruding beyond the plane of the doors both undesirable and to some extent dangerous, and in some cases, the extent of projection of the handles is restricted by law.

It is a primary object of the present invention to eliminate the outside handle and provide a push button on the outside of the door for releasing and opening it.

This push button is retained in the lock as the bolt operating means while providing for the locking of the car, either by a push rod or locking button coming up through the inside window molding in the car door, and providing for the customary inside handle arrangement. The invention further provides certain protective arrangements to prevent the unintentional locking of the doors. In addition the invention provides a simple, cheap and practical lock which may be adapted to large scale production.

Generally, my invention provides a push button accessible from the outside of the door with cam elements thereon cooperating with rollers on the bolt element so that when the push button is pressed the bolt is cammed back to a released position. A spring returns the push button, after each operation, to its original position. An independently movable lever element is selectively rotatable between two positions, in one of which it obstructs the inward movement of the push button to prevent the door from being opened and in the other of which it is clear of the push button assembly to permit free operation. This lever may be operated in the conventional manner by a push rod pro-

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jecting through the window molding, or by a key lock accessible from the outside of the door.

My invention may be more fully understood by reference to the accompanying drawings in which:

Fig. 1 is a side elevation of the lock mechanism;

Fig. 2 is a transverse vertical section in the plane of line II—II of Fig. 1;

Fig. 3 is a top plan view of Fig. 1; and

Fig. 4 is a horizontal section in the plane of line IV—IV of Fig. 1.

In the drawings, 2 designates a supporting plate of relatively thin metal having a flange 3 along one vertical edge, the flange being bent almost but not quite perpendicular to the plane of the plate 2. It is provided with a bolt receiving opening 5 therethrough, the metal from the opening being bent inwardly to provide a supporting tongue 6 or bracket. Adjacent the opening the flange is recessed on its outer face, the metal being pressed in to provide a bearing surface 7 perpendicular to the plate 2.

The bolt has a heavy nose piece 8 slidably received in the opening 5 with a beveled end surface 9 to contact a striker plate on the door frame (not shown) in the usual manner while the flat front face 8a normally engages a keeper (not shown) to hold the door closed. The bolt may be said to be in the locking position when it is advanced to the left as shown in Figure 1, and to be in the retracted position when it is moved to the right so as to clear the striker plate. The bolt has a strip 10 thereon extending to the right as viewed in Figs. 1, 3 and 4, and this extension is slotted at 11 to receive a guide pin or rivet 12 that passes therethrough and retains the bolt in place while limiting its sliding movement. It will thus be seen that the bolt is slidably retained against the back plate.

The rear end of the extension 10 is provided with a vertical offset 13 providing a recess between the extension and the backplate, and the right hand end of the offset is turned down and shaped to provide a T-shaped projection 13a. An inside handle operating link 14 has its left hand end slotted and the T-shaped projection 13a passes through this slot with the cross head of the T crosswise of the slot, providing the usual lost motion connection, enabling the bolt to move toward the right (Figs. 1, 3 and 4) without moving the link but movement of the link in that direction pulls the bolt to retracted position. One end 15 of a torsion spring 16 secured at 17 to the supporting plate 2 extends into the re-

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cess 13 and bears against the forward shoulder of the offset to yieldably urge the bolt toward the left as viewed in Figs. 1, 3 and 4.

So much of the device as has now been described is, in general, and except for certain details, more or less generally known in the art. Welded or otherwise secured to the bracket 6 is tenon 18 having two ears 19 (see Fig. 2). These ears are received in slots 20 of a rigid U-shaped piece 21, the two legs of which are spaced to straddle the heavy nose of the bolt. As best shown in Fig. 3, each leg has a straight edge 21a that bears against bearing surface 7, and an angular cam surface 22 which may have a 45° slope. A light compression spring 23 confined between the tenon 18 and the inner face of the U-shaped piece 21, tending to resiliently urge this piece outwardly (or to the right as viewed in Fig. 2, or to the bottom of the sheet as viewed in Figs. 3 and 4). A push button 24 is secured to the outer end of the U-shaped piece and is of a length to terminate in substantially the plane of the outside of the door, 25 being an escutcheon ring that surrounds the button for giving a finished appearance.

A pin 26 passes vertically through the heavy nose part of the bolt inwardly of the flange 3 and it is provided at the top and bottom with free turning rollers 27. The rollers are in the plane of the legs of the U-shaped piece 21 and the angular surfaces 22 of the legs press against these rollers, the legs thus extending between bearing surface 7 on the flange 3 and the rollers.

When the push button is pressed in, the beveled leg surfaces 22 of the U-shaped member operating against the rollers cam the bolt back to retracted or released position. The light spring 23 restores the push button to its original position, and prevents the parts from rattling.

Pivoted by rivet 30 to the base plate 2, is a lever element 31 having a part or lug 32, which, in the position shown in the drawings, projects between the lower leg of the U-shaped member and the base plate 2. By rotating the lever in a counter-clockwise direction, as indicated by the arrow in Fig. 1, this lug may be moved down through a slight arc from such position to a position removed from the path of travel of the U-shaped member.

Rotatably supported on the plate 2 below the push button assembly is a cam 33 having a lug 34 (see Fig. 1) that cooperates with cam 35 on lever element 31. The cam 33 has a square hole through its hub to accommodate a standard door lock (indicated by dotted lines in Fig. 2) such as are in common use on motor cars, and the end of which door lock is flush or substantially flush with the plane of the outside of the door.

By inserting a key in the lock and turning it in a clockwise direction lug 34 on cam 33 will push down on cam 35 on the lever to rock the lever in the direction of the arrow of Fig. 1 and move lug 32 to a position where it does not obstruct the operation of the push button.

The lever 31 also has an offset extension 31a to which a vertical rod 36 is attached, this rod having a knob 37 to be located just above the molding strip on the bottom of the inside of the car door window. When this knob is pulled up from the position shown in Fig. 1, it rocks lever 31 in the direction of the arrow to the position in which it does not obstruct the push button, which I designate the release position. When lever 31 is in the release position, knob 37 is pushed down to lock the bolt.

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There is a small bent leaf or wire spring 38 engaged in the lower edge of the lever 31 and against a fixed abutment 32. It is just under the pivot 30, so that movement of the lever between its locked and unlocked positions throws this spring over center to one side or the other, to restrain the lever 31 against free movement and rattle.

Finally, the lever 31 has a double sloped projection 39 (see Fig. 1) on its upper edge which in the locking position of lever 31 engages in an inverted V-shaped notch 40 in the bolt. Any movement of the bolt toward the left from the position shown in Fig. 1 will cause the notch to cam the lever 31 down to the release position. Therefore, should the door be slammed shut, with lever 31 in locking position, the bolt, on engaging the striker plate on the door frame would move to the right to set lever 31 in the release position. Hence lever 31 can only be set in the locked position when the door is closed by operation of button 37 or turning the pillar lock with a key, abutment 35a on lever 31 co-operating with cam lug 34 in setting the lever to locked position.

The lock, as constructed, is extremely simple, cheap and practical. As long as locking lever 31 is in the released position the push button on the outside of the door may be operated to retract the bolt to open the door. When locking lever 31 is set in its locking position, the push button is restrained from operation, but operation of the inside handle (not shown) pulling on link 14 will enable the door to be opened, as now, from the inside, the cam notch 40 operating to release the locking lever 31. Also the door may be locked by push button 37 inside the car or by use of a key on the outside.

While I have shown and described in detail one preferred embodiment of my invention, it will be understood that I do not limit myself to the exact arrangement disclosed, and that various changes and modifications may be made within the contemplation of my invention and under the scope of the following claims.

I claim:

1. An automobile door type of lock comprising a slidable bolt, a push button assembly supported for movement in a direction normal to the plane of movement of the bolt, the push button assembly including two cam-forming elements which straddle the bolt, and a pin passing through the bolt having a cam engaging roller at each end thereof for cooperation with the two cam-forming elements, whereby movement of the push button assembly effects movement of the bolt in a plane at right angles to the direction of movement of the push button assembly.

2. An automobile door type of lock comprising a slidable bolt, a push button assembly supported for movement in a direction normal to the plane of movement of the bolt, co-operating cam and cam engaging elements on the bolt and push button assembly for retracting the bolt when the push button assembly is pressed in a direction toward the bolt, means independent of the push button assembly movable into and out of position to prevent movement of the push button assembly toward the bolt and cooperating surfaces between said means and the bolt for moving the means out of movement-preventing position.

3. An automobile door type of lock comprising a slidable bolt, means for slidably supporting the bolt including a plate, means on the bolt constituting a cam engaging surface, a push button as-

sembly having a pair of legs which straddle the bolt and each of which has a beveled cam surface thereon for engagement with the cam engaging surface of the bolt, the push button being supported for movement in a direction normal to the plane of movement of the bolt whereby the application of pressure to the push button causes said cam and cam engaging surface to slide the bolt in a direction transverse to the direction in which the push button assembly is moved, the supporting plate on which the bolt is mounted having a flange thereon with an opening therein through which the bolt passes; a tongue on said flange extending between the legs of the push button assembly, and a spring bearing against the push button assembly supported on said tongue.

4. An automobile door type of lock comprising a supporting structure, a bolt slidably mounted on the supporting structure, a connecting link secured to one end of the bolt for moving the same, a push button assembly supported for movement in a direction normal to the plane of movement of the bolt, spring means for normally urging the push button assembly, in a direction away from the bolt, the push button assembly including an inclined cam element, roller means on the bolt for co-operation with the inclined cam element of the push button assembly, the push button assembly serving, when moved toward the bolt by engagement of the cam element roller, to retract the bolt, and selectively operable means for preventing movement of the push button assembly toward the bolt, said last named means including a lever having an abutment movable into and out of the path of movement of the push button assembly, there being cooperating surfaces on the bolt and the lever whereby the abutment is moved out of the path of movement of the push button assembly when the bolt is retracted, and means for operating said lever to move said abutment into and out of the path of movement of said push button assembly.

5. An automobile door type of lock comprising a supporting structure, a bolt slidably mounted on the supporting structure, a connecting link secured to one end of the bolt for moving the same, a push button assembly supported for movement in a direction normal to the plane of movement of the bolt, spring means for normally urging the push button assembly in a direction away from the bolt, the push button assembly including an inclined cam element, roller means on the bolt for co-operation with the inclined cam element of the push button assembly, the push button assembly serving, when moved toward the bolt by engagement of the cam element and roller, to retract the bolt, selectively operable means for preventing movement of the push button assembly toward the bolt, said last named means including a lever having an abutment movable into and out of the path of movement of the push button assembly, and a lock controlled rotatable cam for operating the lever, there being cooperating surfaces on the bolt and the lever whereby the abutment is moved out of the path of movement of the push button assembly when the bolt is retracted.

6. An automobile door type of lock comprising a supporting structure, a bolt slidably mounted on the supporting structure, a connecting link secured to one end of the bolt for moving the same, a push button assembly supported for movement in a direction normal to the plane of movement of the bolt, spring means for normally

urging the push button assembly in a direction away from the bolt, the push button assembly including an inclined cam element, roller means on the bolt for co-operation with the inclined cam element of the push button assembly, the push button assembly serving, when moved toward the bolt by engagement of the cam element and roller, to retract the bolt, selectively operable means for preventing movement of the push button assembly toward the bolt, said last named means including a lever having an abutment movable into and out of the path of movement of the push button assembly, and a pull rod attached to the lever for operating the same, there being cooperating surfaces on the bolt and the lever whereby the abutment is moved out of the path of movement of the push button assembly when the bolt is retracted.

7. An automobile door type of lock comprising a supporting structure, a bolt slidably mounted on the supporting structure, a connecting link secured to one end of the bolt for moving the same, a push button assembly supported for movement in a direction normal to the plane of movement of the bolt, spring means for normally urging the push button assembly in a direction away from the bolt, the push button assembly including an inclined cam element, roller means on the bolt for co-operation with the inclined cam element of the push button assembly, the push button assembly serving, when moved toward the bolt by engagement of the cam element and roller, to retract the bolt, selectively operable means for preventing movement of the push button assembly toward the bolt, said last named means including a lever having an abutment movable into and out of the path of movement of the push button assembly, there being cooperating surfaces on the bolt and lever whereby the abutment is moved out of the path of movement of the push button assembly when the bolt is retracted, and a pull rod accessible at the interior of the door and attached to the lever for operating the same.

8. An automobile door type of lock comprising a slidable bolt, a push button assembly supported for movement in a direction normal to the plane of movement of the bolt, co-operating cam and cam engaging elements on the bolt and push button assembly for retracting the bolt when the push button assembly is pressed in a direction toward the bolt, means selectively movable into and out of position to prevent movement of the push button assembly toward the bolt, said selectively movable means comprising a lever, a pull rod accessible from the interior of the door for operating said lever into and out of position to prevent movement of the push button assembly, co-operating means on the bolt and lever and operable by movement of the bolt to retracted position for moving the lever to a position where it does not prevent movement of the push button assembly when the bolt is retracted, and a link connected to the bolt for retracting the same.

9. An automobile door type of lock comprising a base plate having a flange thereon, a bolt supported on the base plate for sliding movement and having an end portion which projects through said flange, a cam engaging means on the bolt, a push button assembly mounted for movement in a direction normal to the plane of the base plate, said push button assembly including a push button and a cam member attached thereto having a cam surface for engagement with the cam engaging means on the bolt, the

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said cam means on the push button being slidably engaged with the inner face of said flange, operation of the push button toward the base plate serving to retract the bolt, means for urging the push button assembly outwardly from the base plate, and means for selectively locking or releasing the push button assembly.

10. An automobile door type of lock comprising a base plate having a flange thereon, a bolt supported on the base plate for sliding movement and having an end portion which projects through said flange, a cam engaging means on the bolt, a push button assembly mounted for movement in a direction normal to the plane of the base plate, said push button assembly including a push button and two cam forming elements which straddle the bolt and are movable into engagement with the cam engaging means on the bolt, the said cam means on the push button being slidably engaged with the inner face of said flange, operation of the push button toward the base plate serving to retract the bolt, means for urging the push button assembly outwardly from the base plate, means for selectively locking or releasing the push button assembly, said locking means comprising a lever movable into and out of the path of movement of the push button assembly, and means for operating said lever.

11. An automobile door type of lock compris-

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ing a supporting plate, a slidable bolt mounted on the supporting plate, a push button assembly supported on the plate, co-operating cam and cam-engaging elements on the bolt and push button assembly for retracting the bolt when the push button assembly is pressed and selectively operable means for preventing movement of the push button assembly, said last-mentioned means including a lever mounted on the supporting plate and having an abutment movable into and out of the path of movement of the push button assembly and cooperating cam surfaces on the bolt and lever for moving the lever to released position when the bolt is retracted.

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