

April 27, 1943.

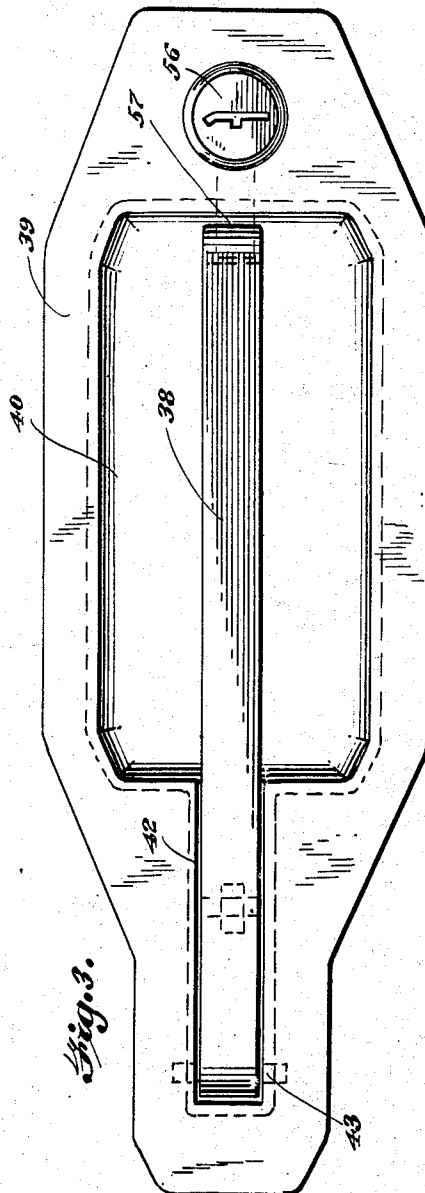
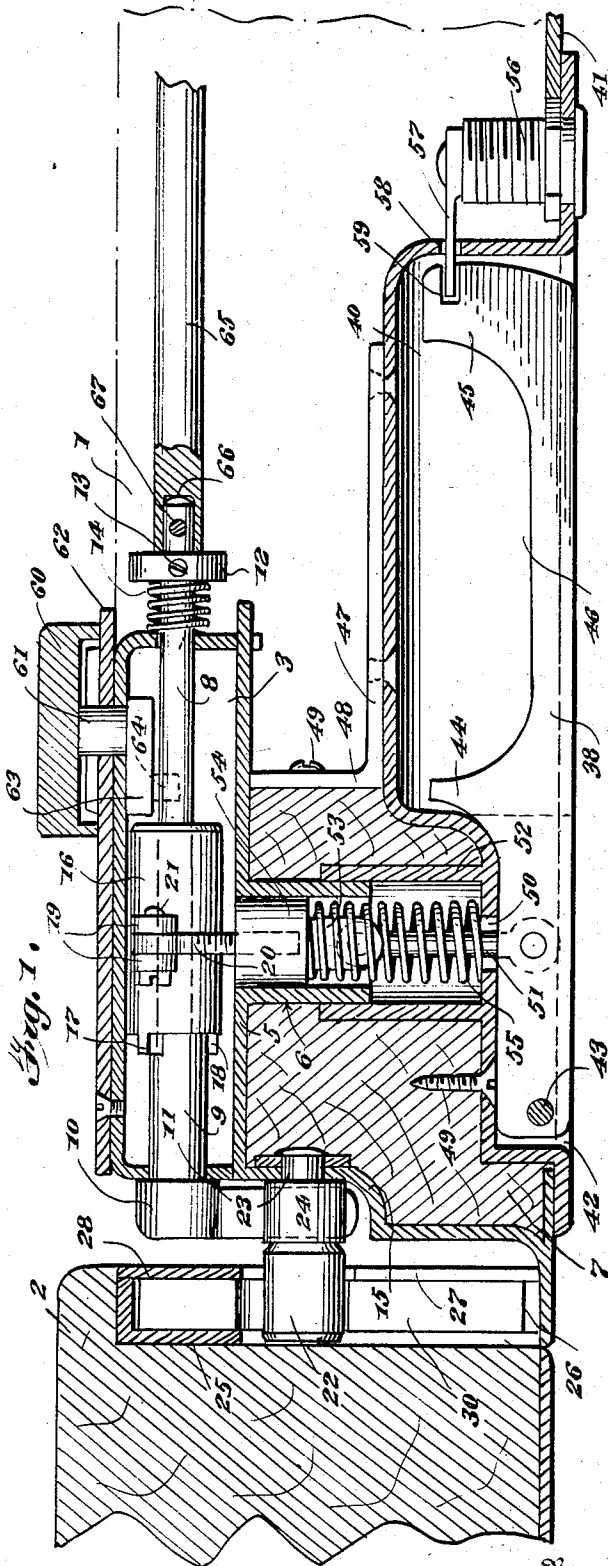
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2,317,700

DOOR LOCK

Filed June 11, 1942

4 Sheets-Sheet 1



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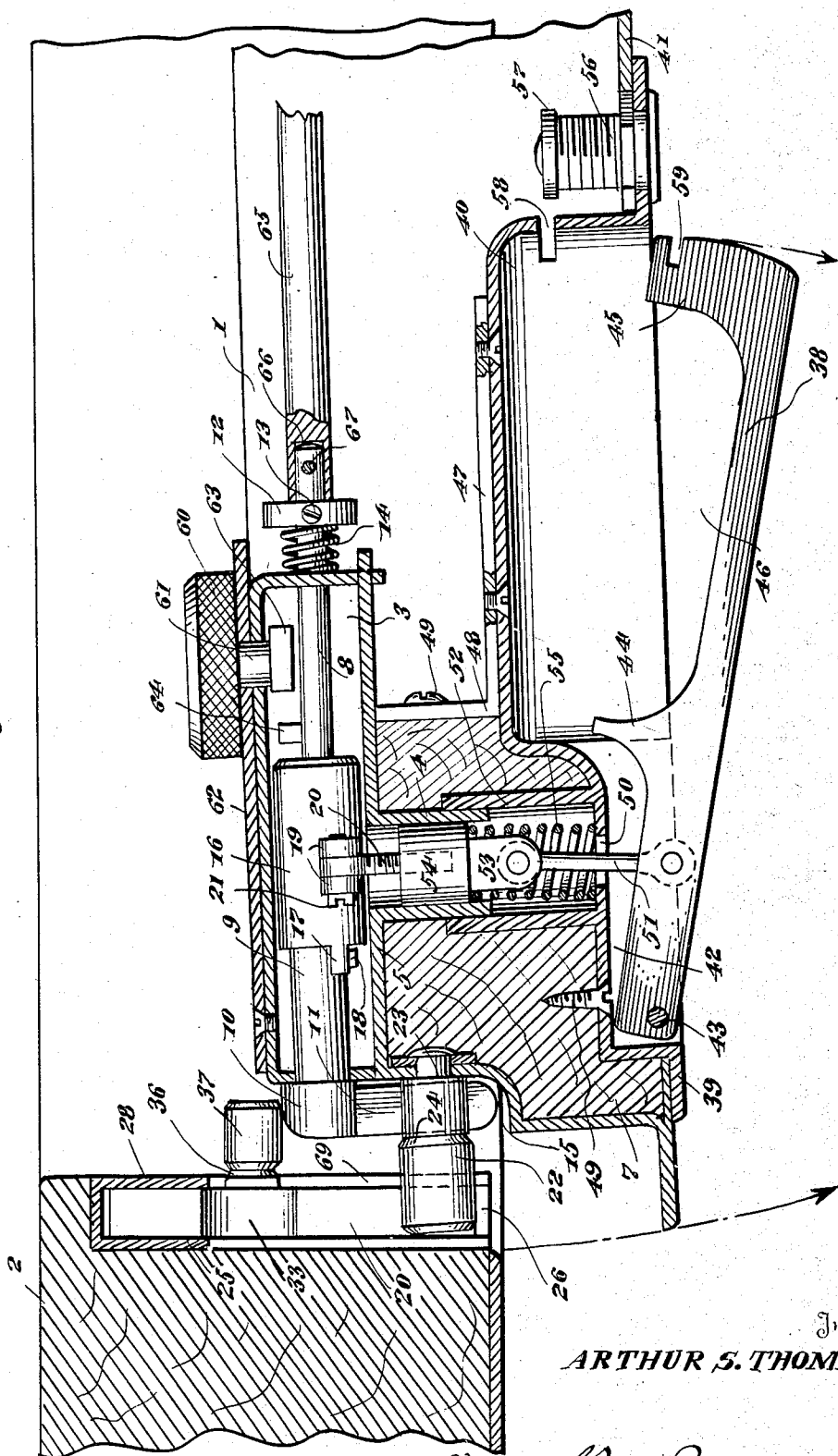
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Fig. 2.



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Fig. 4.

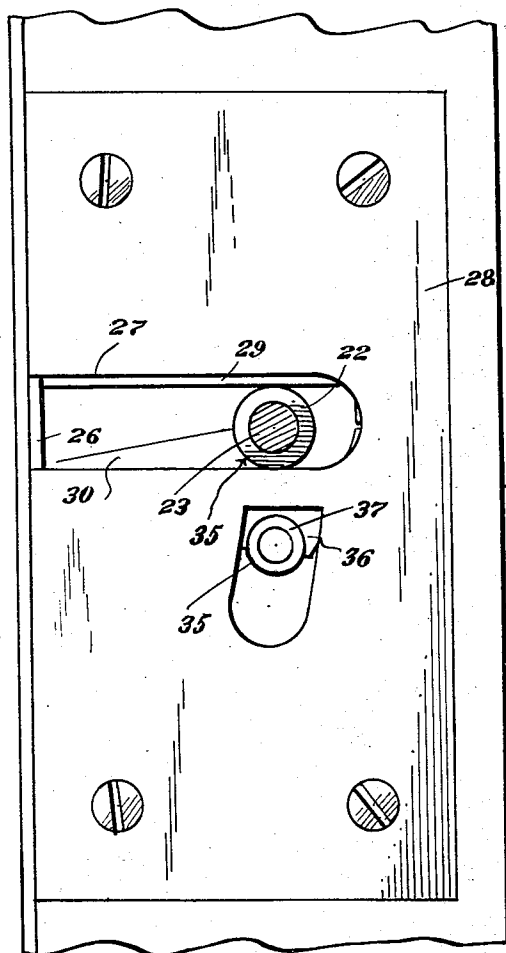


Fig. 5.

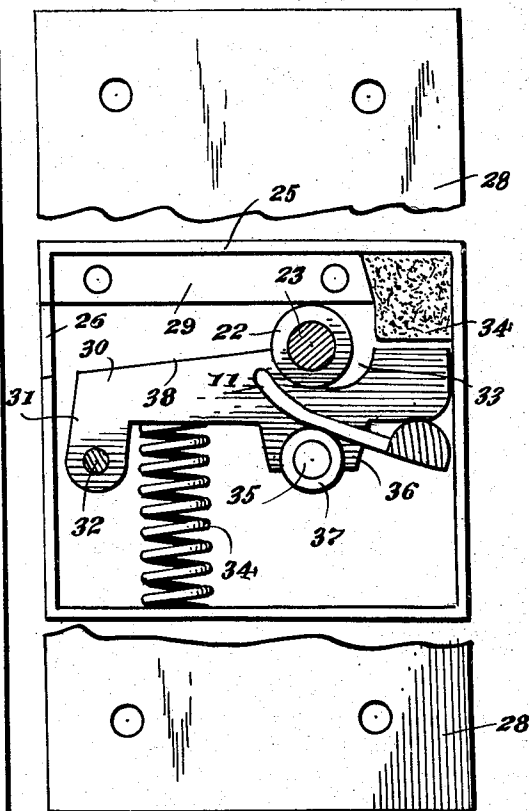


Fig. 6.

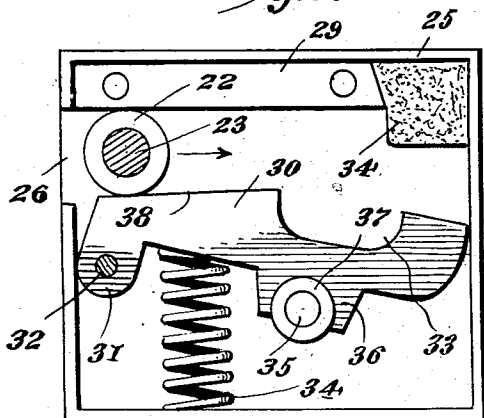
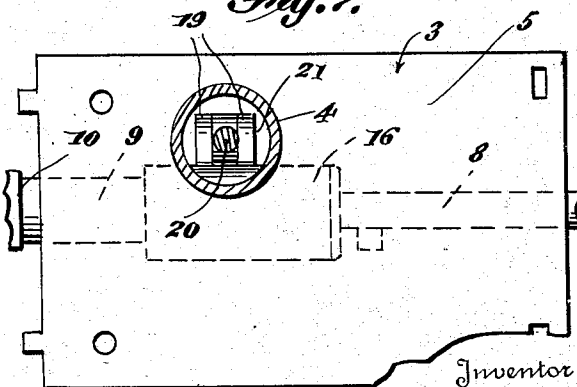


Fig. 7.



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Fig. 8

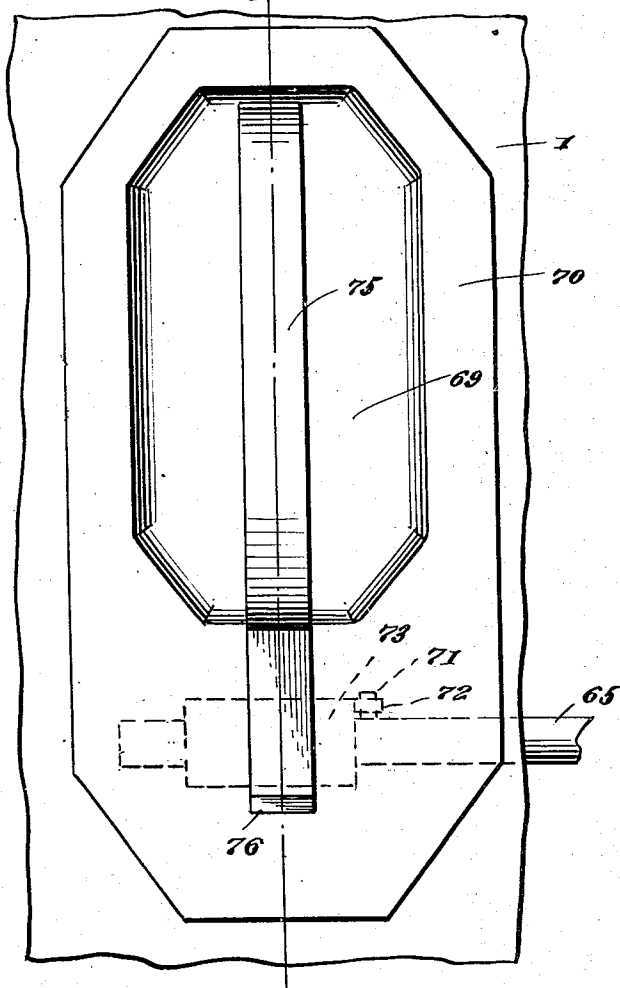


Fig. 9.

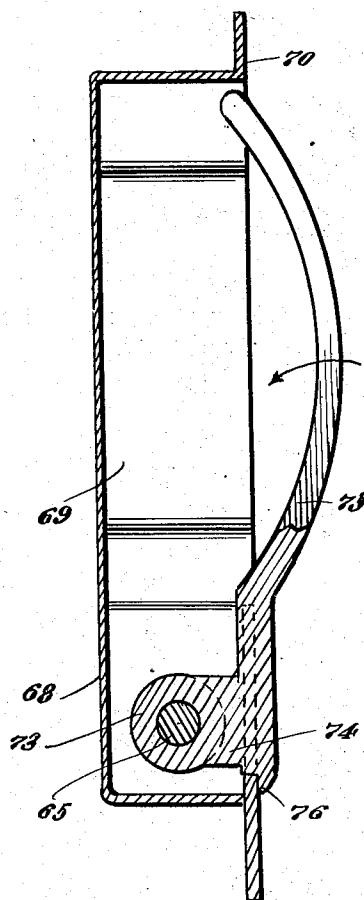
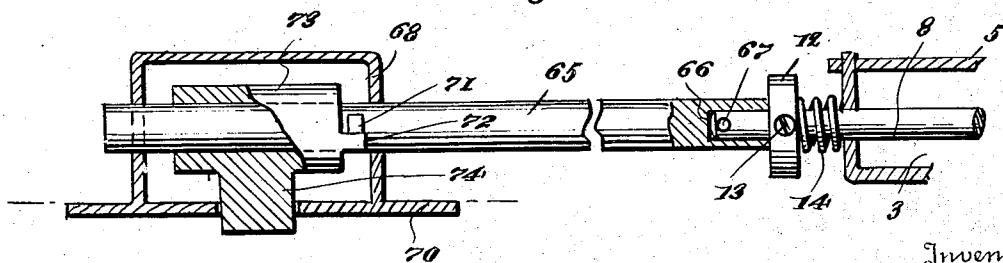


Fig. 10.



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UNITED STATES PATENT OFFICE

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DOOR LOCK

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9 Claims. (Cl. 292—254)

This invention relates to door locks and more particularly to a lock for the door of an automobile, it being one object of the invention to provide a lock adapted to be mounted within the door of an automobile, it being one object of the invention to provide a lock adapted to be mounted within the door between inner and outer panels thereof and provided with an outer actuating handle and an inner actuating handle, the two handles being independently operable so that the lock may be released and the door opened from outside the automobile and by a person inside the automobile.

Another object of the invention is to so form and mount the handles and a locking shaft that the shaft may be turned through the medium of either handle but the other handle remain stationary during such operation.

Another object of the invention is to provide a lock wherein the outer handle is pivotally mounted in a lock of a door plate where it may be easily grasped and swung outwardly to release the lock and pull the door outwardly to open position.

Another object of the invention is to so mount the outer handle that it is prevented from getting out of line and sagging and also prevented from rattling.

Another object of the invention is to provide a key-operated lock for the handle carried by the outer door plate and provided with a bill movable into the pocket of the door plate for engagement with the handle to prevent the handle from being swung out of the pocket to a door-opening position.

Another object is to provide a door lock wherein a shaft, rotatably mounted in the lock casing, is adapted to be turned through the medium of a sleeve fitting about the shaft and connected with the outer handle, the shaft having an outer end portion projecting from the free side edge of the door and provided with a bill or arm for moving a jaw of a keeper to a releasing position in which a bolt carried by the door may move outwardly from between the jaws during opening of the door.

Another object is to provide a latch having an operating knob projecting from the inner surface of the door, the latch being rotatably mounted and having a bill for engaging a lug carried by the shaft so that the shaft may be held against turning in a releasing direction by a person within the automobile and thus prevent opening of the door by a person outside the car.

Another object of the invention is to provide

an inside handle mounted in a door plate and carried by a sleeve which is loosely mounted about a rod and provided with a lug or finger for engaging a companion lug upon the rod and turning the rod to move the shaft in a releasing direction when the door is to be opened by a person within the automobile.

Another object is to provide a door lock wherein the releasing shaft and the rod connected therewith are urged longitudinally in a direction to dispose lugs of the shaft and rod in position for engagement by lugs of the two sleeves and, in addition, eliminate shifting movement of the rod and shaft which would be liable to cause noises.

Another object of the invention is to provide a door lock which is simple in construction, efficient in operation, attractive in appearance, and not liable to get out of order and need repairs.

In the accompanying drawings:

Fig. 1 is a sectional view taken longitudinally through the improved lock and showing the door of an automobile closed.

Fig. 2 is a view similar to Fig. 1, showing the automobile door release and partially open.

Fig. 3 is a view looking at the outer face of the outer door plate with the handle pivotally mounted therein.

Fig. 4 is a view showing the keeper carried by the door frame in elevation and the keeper-engaging roller of the door engaged between jaws of the keeper.

Fig. 5 is a view of the keeper showing the face plate of its casing broken away and its jaws in normal position.

Fig. 6 is a view of the keeper with its face plate removed and the door-carried roller moving into place between jaws of the keeper.

Fig. 7 is a view showing the lock casing in elevation and a sleeve projecting outwardly therefrom in cross section.

Fig. 8 is a view showing the inner handle and the door plate carrying same in elevation.

Fig. 9 is a sectional view taken vertically through Fig. 8, on the line 9—9 thereof.

Fig. 10 is a fragmentary view showing the connection between the inner door handle and the shaft of the lock.

This improved lock is for holding the door 1 of an automobile 2 closed, and has a casing 3 mounted within the door as shown in Figs. 1 and 2. A sleeve 4 projects outwardly from the face plate or wall 5 of the casing 3 and fits into an opening 6 formed in the wood side bar 7 at the free side of the door. A shaft 8 extends longitudinally through the casing 3 with its inner and

outer end portions projecting from edge walls of the casing, and, referring to Figs. 1 and 2, it will be seen that this shaft extends transversely of the door 1 to which the lock is applied. The portion 9 of the shaft is of an enlarged diameter and, at its outer end, the shaft is provided with a head 10 from which extends an arm 11 curved longitudinally, as shown in Fig. 5, and projecting from the head outwardly of the door. A collar 12 is secured on the rear end portion of the shaft by a set screw 13 and this collar or disc is engaged by the rear end of a helical spring 14 which urges the shaft inwardly and holds the head in contacting engagement with the outer edge face of the casing and retains the arm 11 in the recess 15 of the free edge face of the door 1. The spring also holds the rear end of the enlarged portion 9 of the shaft in abutting engagement with the front end of a sleeve 16 which fits loosely about the shaft and is provided at its front end with a finger or lug 17 for engaging a companion lug 18 projecting radially of the shaft from the rear end of the enlarged portion thereof. Ears 19 project from the sleeve midway the length thereof and, between these ears, an eye bolt 20 is pivotally mounted by a threaded pin 21.

The shaft and its arm 11 constitute means for permitting movement of a latching roller 22 out of engagement with a keeper during opening of the door. This roller is rotatably carried by a shaft or axle 23 projecting from the free side edge face of the door and the portion 24 of this axle extends over the arm so that when the door is closed, the roller may enter the casing 25 of the keeper through registering slots 26 and 27 formed in the casing and in the face plate 28 of the casing and engage between the stationary jaw 29 and the movable jaw 30 of the keeper. The movable jaw of the keeper is provided at its outer end with a depending heel 31 through which a pin 32 passes to pivotally mount the jaw and adjacent its inner free end this jaw is formed with a recess 33 to receive the roller 22 when the door is closed. A spring 34 normally holds the movable jaw in its raised or gripping position and, in order to cushion movement of the jaw to closed or gripping position, there has been provided a rubber cushion 34. A stub axle or stem 35 projects from the depending portion 36 of the movable jaw and carries a roller for engaging under the arm 11 of the shaft 8, and, from an inspection of Fig. 5, it will be seen that when the shaft is turned in a direction to swing the arm downwardly, pressure will be applied to the roller 37 to force the movable jaw downwardly to releasing position and permit the roller 22 to move outwardly of the keeper during opening of the door. When the door is closed, the roller 22 again enters the keeper casing and exerts a cam action on the sloping upper edge 38 of the movable jaw to depress this jaw and allow the roller to move into the recess 33. At this time, the spring 34 shifts the movable jaw upwardly and the roller will be gripped between the two jaws and the door firmly held closed.

To open the door, the movable jaw must be depressed to a position in which the roller 22 may leave the recess and move outwardly from the keeper. This is accomplished from outside the automobile by means of a handle 38 which extends longitudinally of a face plate 39 carried by the door. A portion of the face plate is struck upwardly to form a pocket 40 which extends into the door through an opening formed transversely of the outer shell 41 of the door. A portion of

the pocket is of reduced width to form a neck 42 in which one end of the handle is pivotally mounted by a pin 43 and the portion of the handle which is received in the main portion of the pocket is formed with arms 44 and 45 defining a recess 46 which permits the handle to be easily grasped when the fingers of a hand are thrust into the pocket. A bracket 47, which is riveted against the pocket has an arm 48 projecting from the pocket and secured against the side bar 7 of the door to firmly hold the face plate against the outer shell of the door. A screw 49, which passess through the inner wall of the neck 42, also serves as securing means for the face plate. The pivoted end portion of the handle extends across an opening 50 formed in the inner wall of the neck 42 and to this portion of the handle is pivoted the outer end of a link 51 which extends longitudinally through a sleeve 52 and has its inner end pivoted to an ear 53 extending outwardly from a block or coupling 54 slidably mounted in the sleeve 4 and formed with a threaded socket to receive the eye bolt 20. When the handle is grasped and pulled outwardly, pull is exerted on the link and the block and also upon the eye bolt and the sleeve 16 is turned to move the lug 17 into engagement with the lug 18 and thus turn the shaft 8 in the proper direction to swing the arm 11 downwardly and move the movable jaw to its releasing position. At the same time, the pull exerted on the handle will cause the door to be swung outwardly toward open position and the person opening the door may then enter the automobile. When the handle 38 is released, the spring 55, which is coiled about the link 51 and the ear 53 of the block with its ends abutting the block and the neck 42 of the socket, expands and forces the block inwardly so that the sleeve is turned about the shaft and the shaft may be turned by engagement of the arm 11 with the roller 37 and restored to its initial position during the closing of the door and movement of the roller 22 into the keeper, where it is gripped between the two jaws of the keeper to hold the door closed.

When the door is closed by a person standing outside the automobile, and it is desired to secure the door against opening by unauthorized persons, this is accomplished by a lock 56. This lock is of the key-operated style and includes a rotatable barrel or core carrying at its inner end a bill or arm 57 which projects radially of the lock and is of sufficient length to pass through the slot 58 formed in the adjacent end of the pocket 40 and enter the notch 59 of the free end of the handle. As long as the bill is engaged in the notch 59, it will be impossible to open the door.

It is also desired to permit the door to be secured closed by a person within the automobile. To accomplish this, there has been provided a latch consisting of a knob 60 having a shank 61 which is rotatably mounted through the wall of the casing 3 and through an inner face plate 62 which may be a portion of the inner shell of the door. The shank of the latch carries an arm or bill 63 at its inner end which projects radially from the shank and is of sufficient length to engage over the lug 64 of the shaft 8 and prevent the shaft from being turned in a releasing direction. It will thus be seen that the door may be secured either by a person within the automobile or by a person outside the automobile.

In order that the door may be released for opening by a person within the automobile, there has

been provided a rod 65 which extends transversely of the door in alinement with the shaft 8 and has one end formed with a socket 66 to receive the inner end of the shaft, the shaft being secured in the socket by a pin 67 passing through the socket and transversely through the shaft. The rod 65 extends to a point adjacent the hinged side of the door and is rotatably mounted transversely through a chamber 68 which may be an extension of the pocket 69 of an inner face plate 70 or be formed separate from the pocket 69. A lug 71 is carried by the portion of the rod within the housing 68 for engagement by a lug 72 projecting from an end of a sleeve 73 fitting loosely about the rod, and, from an inspection of Figs. 9 and 10, it will be seen, that the sleeve is formed integral with a shank or arm 74 projecting from the lower end of a handle 75. A lip or heel 76, at the lower end of the handle 75 prevents tilting of the handle outwardly beyond an upright position and, when the lever is pressed upon and forced into the pocket 69, the lug 72 will be brought into engagement with the lug 71 and turning motion imparted to rod 65 to rotate the shaft 8 in a releasing direction. It will thus be seen that the door may be released by a person within the automobile as well as by a person outside the automobile. It will also be seen that since the sleeves 16 and 73 are loosely mounted about the shaft and rod, the door may be released for opening by either of the handles without the other handle being swung out of its normal position.

Having thus described the invention, what is claimed is:

1. In combination with a door frame and a door hinged at one side to the door frame, a keeper carried by the door frame at the free side of the door and including a movable jaw normally in a gripping position, a member at the free side of said door for engagement by the movable jaw to hold the door closed, a rotatable shaft carried by the door and provided with means for moving the movable jaw of the keeper to a releasing position permitting opening of the door when the shaft is turned in a releasing direction, and a handle for turning said shaft exposed externally of the door.

2. In combination with a door frame and a door hinged at one side to the door frame, a keeper carried by the door frame at the free side of the door and including a movable jaw normally in a gripping position, a member at the free side of said door for engagement by the movable jaw to hold the door closed, a shaft rotatably mounted transversely of the door and provided with means for moving the movable jaw of the keeper to a releasing position when turned in one direction, and means for imparting turning motion to said shaft including an actuating member constituting a handle for the door.

3. In combination with a door frame and a door hinged at one side to the door frame, a keeper carried by the door frame at the free side of the door and including a movable jaw normally in a gripping position, a member at the free side of said door for engagement by the movable jaw to hold the door closed, and means carried by the door for moving the movable jaw of the keeper to a releasing position including a casing mounted in the door, a shaft rotatably carried by the casing and projecting outwardly from the free side edge of the door, a member at the outer end of said shaft having movement with the

shaft to shift the movable jaw out of gripping engagement with the door-carried member when the shaft is turned in a releasing direction, and means for turning the shaft in the releasing direction having an actuating member movable outwardly of the door during turning of the shaft and constituting a handle for swinging the door open.

4. In combination with a door frame and a door hinged at one side to the door frame, a keeper carried by the door frame at the free side of the door and including a movable jaw normally in a gripping position, a member at the free side of said door for engagement by the movable jaw to hold the door closed, and means carried by the door for moving the movable jaw of the keeper to a releasing position including a shaft rotatably mounted transversely of the door and projecting outwardly from the free side edge of the door, an arm extending from the outer end of said shaft and having swinging movement to shift the movable jaw out of gripping engagement with the door-carried member when the shaft is turned in a releasing direction, a sleeve loose about said shaft and having a lug for turning the shaft with the sleeve in a releasing direction, a plunger slidably mounted laterally of the shaft and having an inner end connected with the sleeve, a pocket in the outer face of the door, a handle pivoted in the pocket, a link connecting said handle with the outer end of said plunger, and a spring urging the plunger inwardly and normally holding the handle within the pocket and the sleeve and shaft in normal position.

5. In combination with a door frame and a door hinged at one side to the door frame, a keeper carried by the door frame at the free side of the door and including a movable jaw normally in a gripping position, a member at the free side of said door for engagement by the movable jaw to hold the door closed, and means carried by the door for moving the movable jaw of the keeper to a releasing position including a casing mounted in the door, a shaft rotatably carried by the casing and projecting outwardly from the free side edge of the door, an arm extending from the outer end of said shaft and having swinging movement to shift the movable jaw out of gripping engagement with the door-carried member when the shaft is turned in a releasing direction, a sleeve loose about said shaft and having a lug for turning the shaft with the sleeve in a releasing direction, a plunger slidably mounted laterally of the shaft and having an inner end connected with the sleeve, an external handle for the door pivotally mounted and connected with the plunger to draw the plunger outwardly and effect turning of the shaft and sleeve in a releasing direction when the handle is grasped and swung outwardly to open the door, and a spring yieldably holding the handle and the plunger and sleeve in a normal position with the shaft in its normal position and the movable jaw in gripping position.

6. In combination with a door frame and a door hinged at one side to the door frame, a keeper carried by the door frame at the free side of the door and including a casing formed with a slot through its side and outer edge, a jaw pivoted at one end for tilting movement in said casing movable into and out of gripping position, the pivoted end of said jaw being at the slotted edge of the casing, a spring yieldably holding the jaw in gripping position, a member extending from the free side edge of the door to

enter the casing through said slot and along the jaw to depress the jaw and move into position to be gripped by the movable jaw when the door is closed, a shaft rotatably carried by the door, a member carried by the shaft to engage and move the movable jaw to releasing position when the shaft is turned in a releasing direction, and means for turning said shaft in a releasing direction constituting a handle for the door.

7. In combination with a door frame and a door hinged at one side to the door frame, a keeper carried by the door frame at the free side of the door and including a casing formed with an opening, a movable jaw in said casing movable into and out of gripping position and normally in gripping position, an abutment extending from the movable jaw and out of the casing, a member extending from the free side edge of the door to enter the casing and be gripped by the movable jaw when the door is closed, a shaft rotatably mounted transversely of the door with an end projecting from the free side of the door and provided with a member for engaging across the abutment when the door is closed, and means for turning the shaft in a direction to swing said member towards the abutment and move the jaw to a position releasing the door-carried member and permitting opening of the door.

8. In combination with a door frame and a door hinged at one side to the door frame, a keeper carried by the door frame at the free

side of the door and including a casing formed with an opening, a movable jaw in said casing movable into and out of gripping position and normally in gripping position, an abutment extending from the movable jaw and out of the casing, a member extending from the free side edge of the door to enter the casing and be gripped by the movable jaw when the door is closed, a shaft rotatably mounted transversely of the door with an end projecting from the free side of the door and provided with an arm for engaging across the abutment when the door is closed, and means for turning the shaft in a direction to swing its arm toward the abutment and move the jaw to a position releasing the door-carried member and permitting opening of the door, said means having an actuating member disposed externally of the door and constituting a handle for opening the door.

9. In combination with a door frame and a door hinged at one side to the frame, a keeper carried by the frame, said keeper including a movable jaw normally in a gripping position, a member extending from said door for engagement with said jaw to hold the door closed, and means for moving the jaw to releasing position including a rotatable shaft mounted transversely of the door, a member carried by the shaft for moving the jaw to releasing position, and a handle for turning said shaft disposed externally of the door.

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