Nov. 30, 1948. E. N. JACOBI 2,454,926

LOCK DEVICE FOR COMPARTMENT DOORS

Filed April 6, 1945

2 Sheets-Sheet 1

Fig. 1.

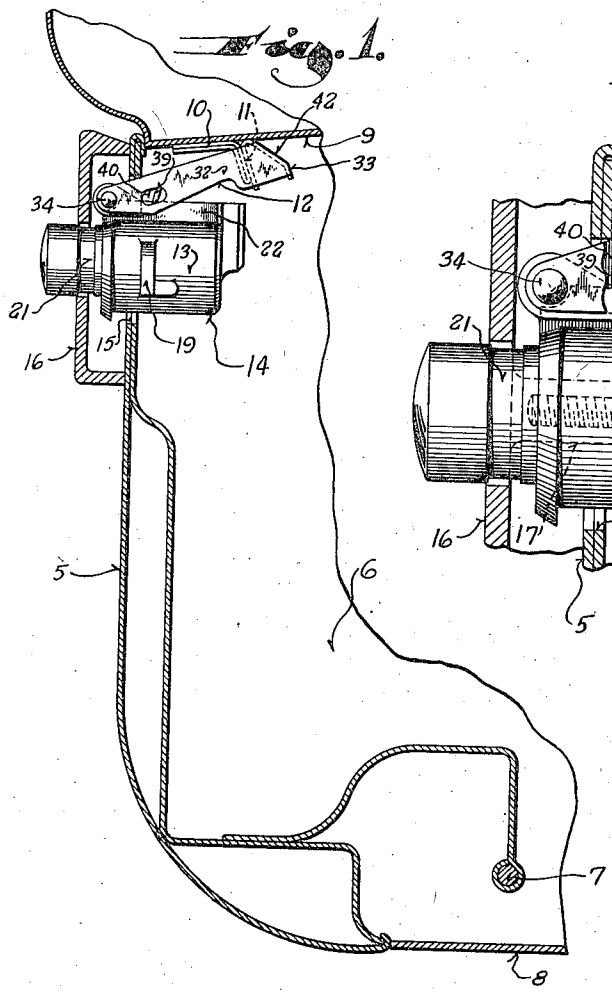


Fig. 2.

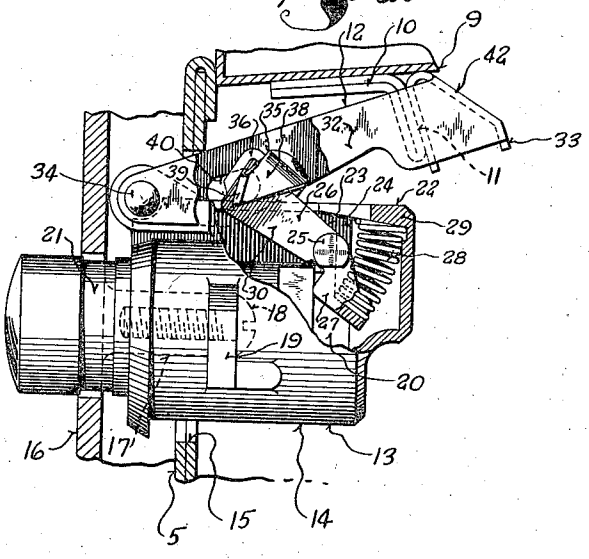
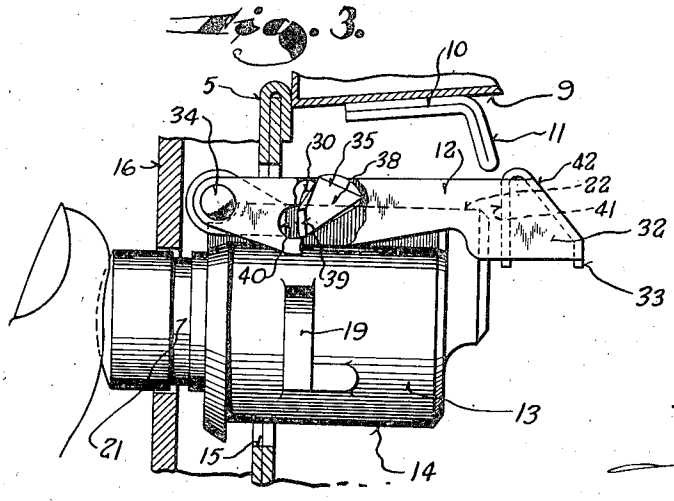


Fig. 3.



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Fig. 4.

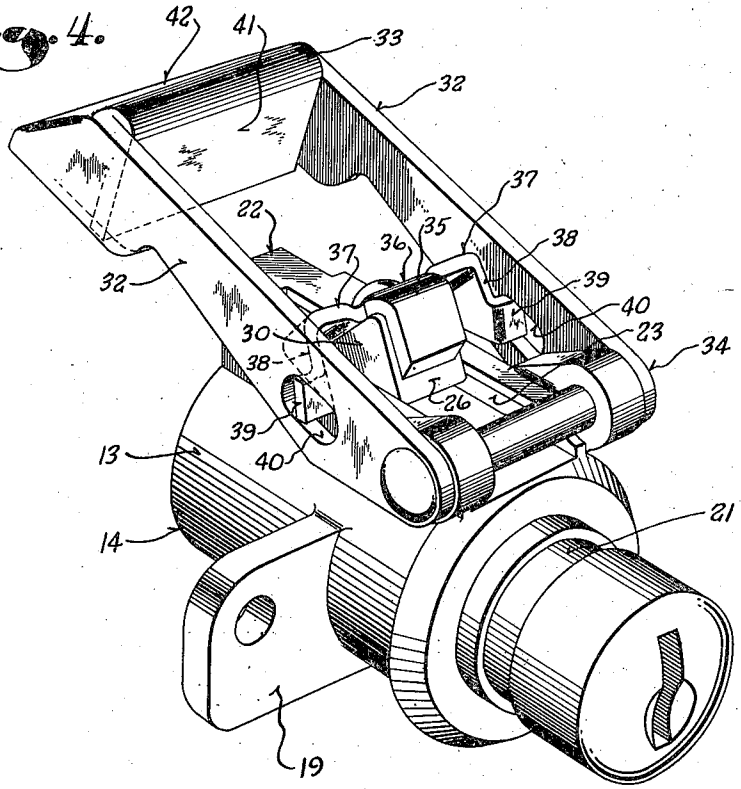
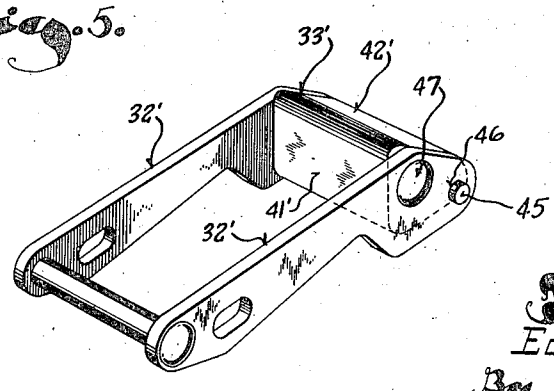


Fig. 5.



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2,454,926

LOCK DEVICE FOR COMPARTMENT DOORS

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Application April 6, 1945, Serial No. 586,879

13 Claims. (Cl. 70—81)

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This invention relates to locks and has particular reference to door latch locks designed for use on the glove compartment doors of automobiles such as the lock of Patent No. 2,208,003, issued to Edward N. Jacobi, July 16, 1940.

Lock devices like that shown and described in the aforementioned patent operate satisfactorily only when the door hinge along the edge of the door opposite the lock is kept as close as possible to the front of the door so that the surfaces of the latch bolt and the striker or keeper plate which engage to maintain the door latch in a closed position lie nearly radial with respect to the door hinge.

Obviously, some variation in the disposition of these engaging surfaces with respect to the hinge is permissible but if these engaging surfaces lie in a plane passing too far forwardly of the hinge axis the door is capable of being sprung open by force or accidentally as a result of vibration when the same is supposed to be in a closed locked position.

In recent glove compartment designs the tendency is to locate the door hinge at a considerable distance rearwardly of the front plane of the door, or interiorly of the compartment so that the lower portions of the door swing partially beneath the glove compartment upon being opened. The advantage of mounting the hinge rearwardly of the front of the door in this manner is that the door in fully open position extends less distance into the passenger space at the front seat of the vehicle.

A locking bolt such as that shown and described in the aforesaid patent to Edward N. Jacobi is obviously unsuitable for use with a compartment construction wherein the hinge is located well back of the front plane of the door for the reason that a line drawn from the hinge axis through the engaging surfaces of the lock bolt and the keeper forms an angle with said surfaces which, though less than 90°, is still greater than desired for positive latching of the door in closed position.

It is an object of the present invention, therefore, to provide a lock device for glove compartment doors which have their hinges located a distance rearwardly of the front plane of the door and in which the engaging surfaces of the latch bolt and the striker plate lie in a plane passing close to or radially of the hinge axis of the door so as to assure proper latching action.

More specifically, it is an object of this invention to provide a lock device for the doors of glove compartments wherein the door hinge lies well

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rearwardly of the front plane of the door characterized by a latch bolt pivotally carried by a forward portion of the lock mechanism with its striker plate engaging portion extending rearwardly therefrom toward the rear of the compartment and provided with a surface substantially radial to the door hinge axis when the bolt is in an operative projected position.

Another object of this invention resides in the provision of a novel latch bolt construction for compartment door locks of the character described.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate two complete examples of the physical embodiments of the invention constructed in accordance with the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a cross sectional view through the door of a glove compartment illustrating the locking latch of this invention applied thereto;

Figure 2 is an enlarged view of the lock of Figure 1 but having parts thereof broken away to better illustrate the operation of the latch bolt;

Figure 3 is a side elevational view similar to Figures 1 and 2 and illustrating the manner of retracting the latch bolt;

Figure 4 is a perspective view of the lock device of this invention; and

Figure 5 is a perspective view of a slightly modified form of latch bolt for the lock of this invention.

Referring more particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numeral 5 designates the door of a glove compartment 6 only the front portion of which has been shown in Figure 1.

The door 5 is supported on the hinge 7 located near the bottom wall 8 of the glove compartment but spaced a substantial distance inwardly from the front plane of the door so that the lower portion of the door swings beneath the bottom wall of the glove compartmet upon being opened. The glove compartment has a top wall 9 adjacent to the upper free edge of the door and secured to the top wall 9 of the compartment is a striker

plate 10 having a latch bolt engaging surface 11 located a distance inwardly of the door and projecting down into the compartment on an angle such that the surface 11 is substantially radial to the axis of the hinge 7.

A latch bolt 12 carried by the lock device 13 of this invention engages behind the striker plate portion 11 to secure the compartment door 5 closed.

The lock device 13 comprises a casing 14 the front end of which projects through an enlarged aperture 15 in the door to be positioned in the interior of a hollow molding strip 16 secured longitudinally along the upper free edge of the door at the front thereof. This molding strip thus forms part of the door, and bosses 17 extended rearwardly therefrom to lie at opposite sides of the casing provide for securing the lock device to the door. This is accomplished by screws 18 passing through diametrically opposite ears 19 on the sides of the casing and threading into the bosses 17 as indicated in Figure 2.

The internal details of the lock of this invention are the same as shown and described in the aforementioned patent to Edward N. Jacobi No. 2,208,003 and hence will be only briefly described herein.

It is sufficient to note that the casing has a bore 20 extending longitudinally thereof and opening to the front of the casing to slidably and rotatably receive a key operated lock cylinder 21. The casing is also provided with a longitudinal rib 22 extending along the top of the casing for the full length thereof and through which a radial slot 23 communicating with the casing bore opens to the top side of the casing.

The sides of the slot 23 are grooved to provide opposed channel shaped casing sections, the open sides of which face one another and which terminate as at 24 near the rear of the lock casing.

These channels receive trunnions 25 projecting from the opposite sides of a latch bolt operating lever 26 to pivotally mount the lever at the inner ends or bottom of the channels. The lever 26 has a downwardly extended leg 27 cooperable with the rear end of the lock cylinder by which the lever may be rocked upon its trunnions upon depression of the lock cylinder into its bore, and the lever is biased to a position with its leg 27 engaging the rear of the lock cylinder by a compression spring 28 confined between it and the rear portion 29 of the upper wall of the casing. The opposite leg 30 of the lever projects upwardly through the slot 23 toward the door.

The latch bolt 12 of this invention has a generally U-shaped stirrup-like configuration as best shown in Figures 4 and 5, and includes spaced apart opposite side arms 32 joined at their rearward ends by a bit 33 extending between the arms. The ends of the arms remote from the bit have a pivotal connection 34 with the lock casing at the forward end thereof with the pivot axis normal to the casing bore and positioned forwardly of the front plane of the door so as to lie between the door and the molding strip.

The side arms of the bolt are spaced apart a distance such as to embrace the rib 22 and extend rearwardly along the top of the casing so as to position the bit portion 33 of the bolt rearwardly of the back end of the casing when the bolt is retracted to an inoperative position such as shown in Figure 3.

Actuation of the bolt to its inoperative retracted position and biasing thereof to its keeper engaging projected position is accomplished in a novel manner by means of the lever 26.

For this purpose a yoke 35 is secured to the arm 30 of the lever adjacent to its free end which projects upwardly through the slot in the rib, and this yoke comprises a medial attaching portion 36 by which the yoke is secured to the lever arm, and opposite side arms 37 extending outwardly from the attaching portion towards the side arms 32 of the latch bolt.

The arms of the yoke have sufficient length as to span the width of the rib 22 and are bent downwardly as at 38 to lie along the outer sides of the rib between it and the bolt arms. The portions 38 of the yoke lie substantially parallel to the side arms 32 of the latch bolt and have trunnion-like drivers 39 bent outwardly therefrom for engagement in slots 40 cut into the side arms 32 of the latch bolt so that swinging motion of the lever about its trunnions 25 is translated into pivotal motion of the latch bolt to enable retraction from and projection of the bolt to its operative keeper engaging position.

The biasing force of the compression spring 28 acting on the leg 27 of the lever is, therefore, translated into a biasing force on the latch bolt yieldingly holding the same in projected position engaged behind the striker plate to thereby hold the door latched closed.

The front of the lock cylinder 21 projects through a suitable opening in the molding strip so as to be accessible at the front of the door, and inward depression of the lock cylinder into the casing bore, as illustrated in Figure 3, causes the lever to swing in a counterclockwise direction as shown in Figure 2, which motion is translated into pivotal retracting motion of the latch bolt to disengage its bit 33 from behind the striker plate surface 11.

Attention is directed to the fact that the surface 41 on the bit which flatwise engages with the striker plate surface 11 lies in a plane substantially radial to the hinge axis 7 when the bolt is in projected position and the angle of the engaging surfaces of the bit and striker plate thus precludes accidental displacement of the latch bolt from behind the striker plate by reason of vibration during operation of the vehicle, or displacement by forcing of the door when the same is locked closed.

The latch bolt itself is of novel construction and the bolt illustrated in Figures 1 to 4, inclusive, is shown as a stamping cut and formed from a single blank of sheet metal. With this construction, it will be noted that the bit is integrally joined to the rear ends of the side arms 32 of the bolt by means of an inclined cam surface 42 on the side of the bit opposite the arms and which has the keeper engaging surface 41 of the bit bent downwardly therefrom at an acute angle so as to lie between and face the side arms 32. The surface 42 thus acts to cam the bolt past the striker plate against the action of the spring 28 biasing the bolt to projected position upon closing the door. Camming of the latch bolt past the striker plate takes place although the lock cylinder may be in a locked position by reason of the novel manner of mounting the actuating lever 26 in the casing 14.

It is also possible to construct the latch bolt as shown in Figure 5, wherein the arms 32' are made as identical stampings and the bit 33' is comprised of a die casting having a substantially triangular cross section to provide the inclined cam surface 42' and the keeper engaging surface 41'.

With this construction the bit has opposite

dowels 45 projecting from its ends and received in holes 46 provided in the arms. These dowels cooperate with the rivet 47 passing through aligned holes in the arm and the bit in assembling the bolt to assure proper disposition of the arms relative to the striker plate engaging surface 41' of the bit.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art that this invention provides a push button type of locking door latch which is admirably suited for glove compartments, the doors of which are hinged a considerable distance inwardly of the front plane of the door.

What I claim as my invention is:

1. A lock device for compartment doors, comprising: a lock body; a U-shaped latch bolt pivoted at its open end from the forward end of the lock body and having opposite side arms embracing the lock body and extending rearwardly from said pivot; a lever carried by the lock body for pivotal motion on an axis parallel to the latch bolt pivot axis and near the rear of the lock body; a motion transmitting connection between the lever and the lock bolt such that pivotal motion of the lever in opposite directions is translated into pivotal motion of the latch bolt to carry the same to and from an operative position at which the closed end of the bolt engages behind a striker plate on the compartment; a spring reacting between the lock body and the bolt for yieldingly holding the latch bolt in an operative projected position; and means on the lock body operable through said lever for moving the latch bolt to a retracted inoperative position.

2. A lock device of the character described, comprising: a lock body; a U-shaped latch bolt having a keeper engaging bit at its closed end disposed adjacent to the rear of the lock body and opposite side arms projecting forwardly therefrom and embracing a portion of the lock body; a pivotal connection between the ends of the arms remote from the bit and the forward end of the lock body by which the bit end of the bolt may be swung toward the rear of the lock body to an inoperative retracted position to unlatch the door; a lever pivotally carried by the lock body; a connection between the lever and said lock bolt through which the bolt is moved to an inoperative retracted position upon pivotal motion of the lever in one direction; and a lock cylinder slidable in the lock body and operable through said lever upon inward endwise motion of the lock cylinder to move the lock bolt to its inoperative retracted position.

3. A lock device of the character described, comprising: a casing having a bore opening to its forward end and opening to one side wall through a radial slot; a latch bolt; means pivotally mounting the latch bolt from the forward end of the casing with the bolt extending rearwardly along the casing adjacent to said slot and with the operative striker plate engaging portion of the bolt disposed near the rear end of the casing; a lever pivotally mounted on the casing with an end portion thereof projecting through said slot toward the latch bolt and with an opposite end portion projecting into the bore of the casing; a connection between said end of the lever and the latch bolt by which pivotal motion of the lever in one direction is translated into pivotal motion of the latch bolt from its operative projected position to an inoperative retracted position; spring means reacting between the casing and the lever for maintaining the latch bolt in its operative projected position; and a depressible actuator slidable in the bore of the casing with its inner end engageable with said opposite end portion of the lever to effect pivotal motion thereof in said direction upon depression of the actuator into the casing to thereby effect motion of the latch bolt to its inoperative retracted position.

4. A lock device of the character described, comprising: a casing having a bore opening to one end and having a rib extending longitudinally along the exterior of its side wall, said bore opening to the side of the casing through a radial slot in said rib; a U-shaped latch bolt having spaced apart side arms embracing said rib and of a length at least as great as that of the casing so that the closed keeper engaging portion of the bolt is disposed behind the casing in the retracted position of the bolt; a pivotal connection between the opposite extremities of the side arms and the casing at the forward end of the casing with the pivot axis lying transversely of the rib; a lever pivotally mounted in the casing with one leg projecting through the radial opening to lie between the side arms of the bolt and having another leg projecting into the bore of the casing; a motion transmitting connection between the lever and the latch bolt including a yoke on said leg of the lever having opposite arms spanning the spaces between the lever and the side arms of the latch bolt at opposite sides of the lever, the arms of the yoke being bent to embrace the rib and so as to lie between the bolt arms and the rib, and drivers on the extremities of said yoke arms engageable in slots cut into the arms of the bolt so that pivotal motion of the lever imparts pivotal motion to the latch bolt; a spring reacting between the casing and said other leg of the lever for yieldingly holding the latch bolt in an operative position with its closed end projected away from the casing; and a key controlled lock cylinder slidably mounted in the bore of the casing and engageable with said other leg of the lever upon depression of the cylinder into the casing for effecting retraction of the latch bolt to an inoperative position through said lever.

5. A substantially U-shaped latch bolt for compartment locks having a casing fixed to the door of the compartment, comprising: spaced apart stamped arms providing the sides of the U-shaped bolt; a die cast bit secured between said arms at one extremity thereof and providing the closed end of the bolt; a keeper engaging surface on the side of the bit facing said arms and lying in a plane substantially perpendicular to the length of the arms; a cam surface on the opposite side of said bit connecting with the keeper engaging surface at an acute angle; and means at the free extremities of the arms providing for pivotally attaching the bolt to the casing.

6. A substantially U-shaped latch bolt for compartment door locks of the type having a casing fixed to the compartment door, said latch bolt comprising: a stamping cut from a single blank of sheet metal and bent to provide straight substantially parallel opposite side arms forming the sides of the U-shaped bolt, and a bit at the closed end of the U-shaped bolt, said bit including an inclined cam portion integrally joined to the extremities of the side arms, and a keeper engaging portion bent inwardly at an acute angle from said cam portion so as to lie between the arms at the side of the bit adjacent to the free

extremities of the arms; and means at the opposite ends of the side arms providing for pivotally attaching the bolt to the lock casing.

7. In a lock device for compartments having a door closing the open front of the compartment and mounted from a bottom portion of the compartment for swinging motion on a horizontal axis spaced rearwardly a distance from the front plane of the door, said door having a hollow molding strip on its outside face along the free edge of the door: a lock casing having a bore opening to its forward end; means providing for securing the lock casing to the back of the molding strip with the casing projecting into the interior of the compartment through a hole in the door; a latch bolt mounted on the casing for pivotal motion about an axis normal to the axis of the casing bore and directly adjacent to the front of the casing so that the pivot axis lies between the molding strip and the front face of the door and so that the latch bolt projects rearwardly of the casing through said hole in the door and into the interior of the compartment; means biasing the rear portion of the latch bolt away from the casing to an operative keeper engaging position including a lever connected with the latch bolt and pivotally carried by the casing at the rear portion thereof, pivotal motion of the lever in one direction effecting retraction of the latch bolt from its operative keeper engaging position; a keeper engaging surface on the rear of said latch bolt substantially radial to the door hinge axis with the bolt in operative projected position; and a key operable lock cylinder rotatable and slidable in the casing bore and having its front end projecting through the front face of the molding strip for imparting pivotal motion to the lever in said direction upon depression of the lock cylinder into the casing bore so as to effect retraction of the lock bolt from its operative keeper engaging position.

8. A lock device of the character described, comprising: a casing having a bore opening to its forward end and opening to one side wall through a substantially radial slot; a latch bolt; means pivotally mounting the latch bolt from the forward end of the casing with the bolt extending rearwardly along the casing adjacent to said slot and with the striker plate engaging portion of the bolt disposed near the rear end of the casing; means biasing the latch bolt to an operative projected position with its operative striker plate engaging portion spaced from the side of the casing; a depressible actuator slidable in the bore of the casing; and means for translating depression of the actuator into the casing bore into pivotal retracting motion of the latch bolt to carry the striker plate engaging portion of the bolt to an inoperative position adjacent to the rear end of the casing.

9. A lock device of the character described, comprising: a lock body having a bore opening to the front thereof; a U-shaped latch bolt having a keeper engaging bit at its closed end and opposite side arms embracing a portion of the lock body; a pivotal connection between the ends of the arms remote from the bit and the front end of the lock body; a push button slidable in the bore of the lock body; and a motion transmitting connection between the push button and the latch bolt for translating endwise motion of the push button inwardly of the lock body into arcuate motion of the latch bolt to carry the same away from an operative keeper engaging position.

10. A lock device for compartment doors, comprising: a lock body extending rearwardly from the front of the door; a latch bolt pivoted at one end on an axis fixed with respect to the lock body and adjacent to the front of the door for arcuate motion of its rear end behind the door toward and from the rear of the lock body, said bolt having a keeper engaging portion at the rear thereof cooperable with a striker plate to latch the door closed when the bolt is in a position projected away from the lock body; a sliding button in the lock body accessible from the front of the door; and a motion transmitting connection between the button and the latch bolt including a part actuated by the button and connecting with the bolt intermediate its ends and substantially on a line leading from the keeper engaging portion of the bolt through the pivot axis of the bolt for translating sliding motion of the button into latch bolt disengaging motion.

11. A lock device for compartment doors, comprising: a lock casing extending rearwardly from the front of the door; a latch bolt pivoted at one end on an axis fixed with respect to the lock casing and adjacent to the front of the door for arcuate motion of its rear end behind the door toward and from the rear of the lock casing, said bolt having a keeper engaging part at the rear thereof cooperable with a striker plate to latch the door closed when the bolt is in a position projected away from the lock casing; a sliding button guided in the lock casing and accessible from the front of the door; a motion transmitting member actuated by the button for connecting the latch bolt with the sliding button, said motion transmitting member working through an opening in the casing wall; and a connection between said motion transmitting member and the latch bolt at a point on the bolt intermediate its ends and substantially on a line leading from said keeper engaging part through the pivot axis of the bolt by which the motion transmitting element is operable to translate sliding motion of the button into latch bolt disengaging motion.

12. A lock device of the character described comprising: a lock body having a bore opening to the front thereof; an elongated latch bolt pivotally connected to the body at its forward end and having its rear free end adjacent to the rear end of the body and adapted to engage a fixed keeper, said bolt having an aperture opening to the side of the bolt facing the body; a push button slidable in the bore of the lock body; and a motion transmitting connection between the push button and the latch bolt for translating endwise motion of the push button toward the rear of the lock body into swinging motion of the latch bolt away from an operative keeper engaging position and toward the lock body, said motion transmitting connection including a part movably carried by the lock body and extending into said aperture in the latch bolt for connection with the bolt.

13. In a lock device for a compartment door: a lock body having a bore opening to the front thereof; a mounting lug on the side of said lock body, spaced intermediate the ends thereof, and adapted to cooperate with the body portion of a compartment door to secure the lock body in place thereon with the front end portion of the lock body projecting forwardly through a hole in the door and the rear portion of the body extending rearwardly of said portion of the door into the compartment closed by the door; a latch bolt pivoted at one end from a por-

tion of the lock body ahead of said mounting lug for arcuate motion of its free end toward and from the rear of the lock body, said latch bolt extending rearwardly from its pivot alongside the lock body and being adapted to project through said hole in the door to have its rear portion cooperable with a fixed striker plate mounted on a wall of the compartment; a push button slidable in the bore of said body; and a lever connecting said push button with the latch bolt, whereby depression of the push button effects swinging of the bolt toward the lock body to retract the latch bolt from an operative keeper engaging position.

EDWARD N. JACOBI.

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