Feb. 5, 1935. E. N. JACOBI 1,989,928

LOCK

Filed July 13, 1933 2 Sheets-Sheet 1

Fig. 1.

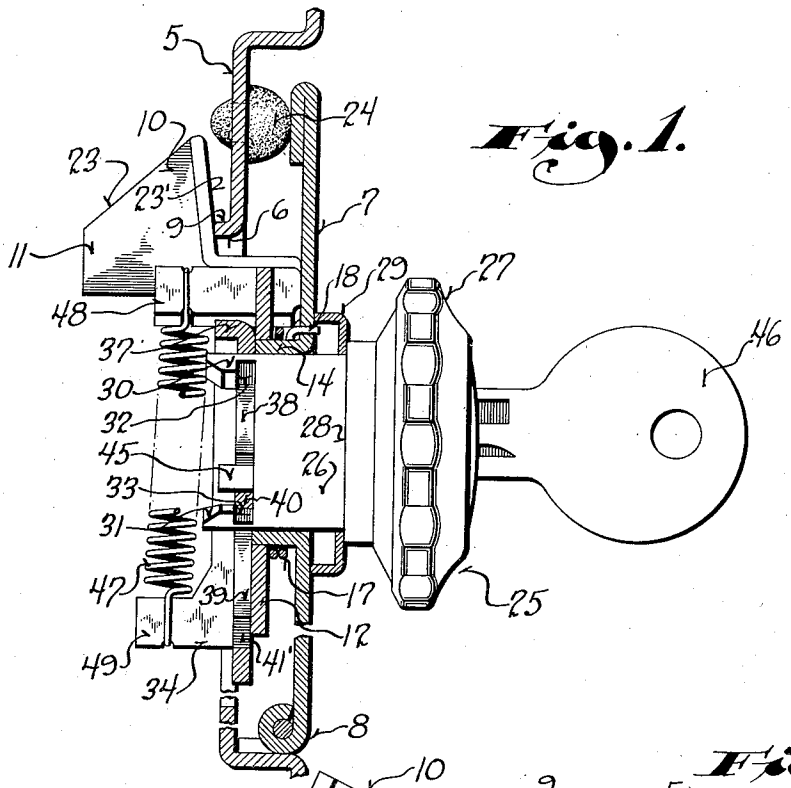


Fig. 2.

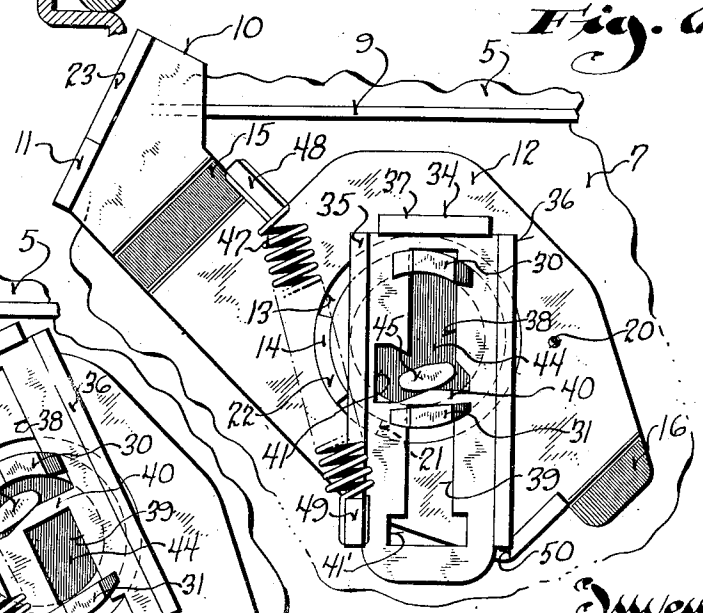
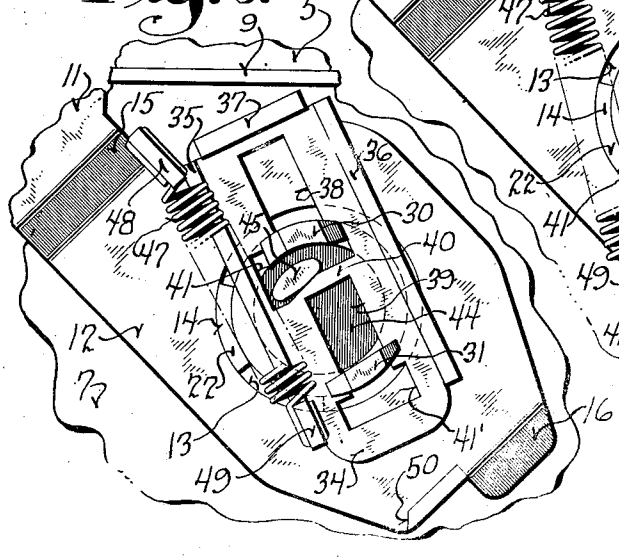


Fig. 3.



Inventor

Edward N. Jacobi

By Smith & Jones.

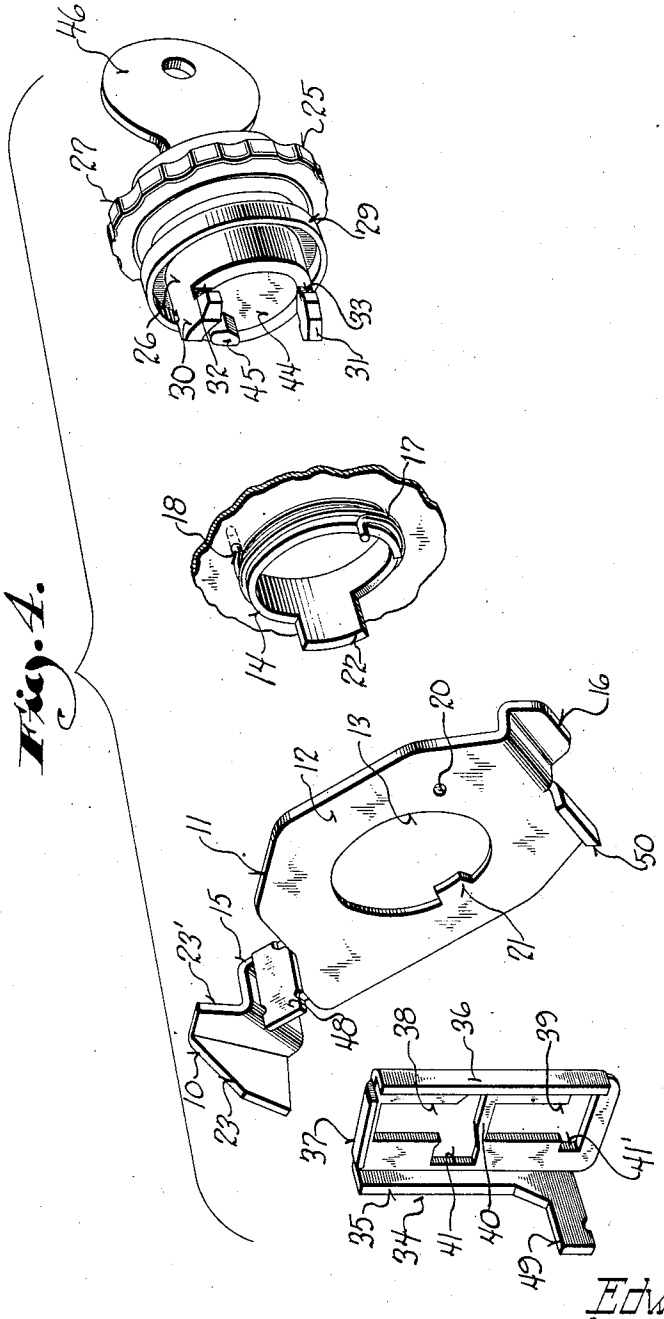
Attorneys

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Fig. 4.



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UNITED STATES PATENT OFFICE

1,989,928

LOCK

Edward N. Jacobi, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Milwaukee, Wis., a corporation of Delaware

Application July 13, 1933, Serial No. 680,221

20 Claims. (Cl. 70—91)

This invention relates to certain new and useful improvements in locks, and has as a general object to provide a simple locking device for compartment doors and especially the doors of instrument board compartments in automobiles.

Another object of this invention is to provide a simple latch lock for compartment doors of the character described, having a spring latch normally retractable by a handle knob wherein the driving connection between the operating knob or handle and the latch is controlled by a key operated lock cylinder by which it may be readily disconnected to render the knob ineffective for releasing the latch.

A further object of this invention is to provide a latch lock of the character described in which the component parts are so formed and related to each other that assembly of the entire mechanism is effected without the use of screws or bolts and nuts.

Another object of this invention resides in the provision of a lock device of the character described in which the parts are retained in their assembled positions by the lock cylinder.

And a further object of this invention is to provide a lock device of the character described which is so constructed as to permit its use as a non-locking latch to be converted into a locking latch merely by providing a lock cylinder and inserting the same in the handle.

With the above and other objects in view which will appear as the description proceeds, my 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 herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawings, I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a section view through a compartment door equipped with the lock of this invention;

Figure 2 is a rear view taken on the inside of the door and illustrating the latch in its operative position;

Figure 3 is a view similar to Figure 2, but with the handle knob disconnected from the latch and illustrating the connecting means turned by the handle without effecting the position of the latch; and

Figure 4 is a perspective view of the various elements of the lock disassembled and in their proper order of assembly.

Referring now more particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numeral 5 designates a stationary panel, as for instance, the instrument board of an automobile, having a door opening 6 adapted to be closed by a door 7 hingedly mounted as at 8. The opening 6 is provided with an inturned flange 9 along its edge opposite the hinged connection 8 with which the active end 10 of a latch bar 11 engages to hold the door 7 closed.

The latch bar 11 is formed from a blank of sheet metal and comprises a flat central portion 12 having a round opening 13, whereby the latch bar is rotatably mounted on the outer end portion of a drawn hub 14 formed in the door 7. At the opposite ends of the latch bar are offset feet 15 and 16 which serve to space the medial flat portion 12 from the adjacent inner face of the door 7 and position the medial portion of the latch bar with its outer face substantially flush with the end of the drawn hub 14.

In the space between the latch bar and the door 7, a torsion spring 17 is coiled about the hub. One end 18 of the spring is hooked into an opening in the door 7 and its other end 19 is hooked in a hole 20 in the latch bar. In assembling the latch bar with the spring and the hub, the spring is placed in tension so that it tends to turn the latch bar about the axis of the hub to engage its operative end portion 10 with the flange 9. Such rotation of the latch bar is limited by the engagement of an inwardly directed lug 21 on the latch bar with a lug 22 projecting from the end of the hub.

It is observed that the active end 10 of the latch bar is formed by a continuation of the metal forming the foot 15 and that this end 10 has a cam edge 23 arranged to strike the edge of the opening 6 as the door is closed so as to cam the latch bar past the edge of the opening. It is also noted that the connecting web 23' of the active latch bar end 10, which engages the flange 9 when the door is closed, is slightly inclined so that as the latch bar returns to its operative position after the door has been closed, it will draw the door firmly against rubber bumpers 24.

Mounted within the hub 14 is a handle knob 25. The handle knob 25 comprises a tubular cylindrical portion 26 which is journalled in the hub, and a handle 27 which, in the present instance, is an enlarged knob. The juncture between the tubular cylinder 26 and the knob 27 affords a shoulder 28 which is spaced outwardly of the front face of the door 7 when the inner end of the cylindrical portion 26 is flush with the end of the hub 14, and this space is maintained by a flanged escutcheon plate 29 abutting the shoulder 28. The escutcheon plate 29 is sufficiently large to cover the projecting spring end 18.

Extending from the inner end of the cylindrical

handle knob portion 26 are two substantially diametrically opposite projections 30 and 31. These projections are undercut as at 32 and 33 respectively to provide T heads with which a bolt 34 is slidably engaged. The bolt 34 is formed of bendable metal and as best shown in Figure 4, is substantially rectangular in shape and has flanges 35 and 36 extended from its opposite sides, and a flange 37 directed laterally from its upper end to afford rigidity.

Upper and lower aligned longitudinal slots 38 and 39, respectively, are cut into the web of the bolt. These slots are, in effect, one opening divided at its medial portion by a transverse bar 40. At their lower ends the slots 38 and 39 have transverse enlargements 41 and 41' respectively.

The width of the slots 38 and 39 is slightly greater than the width of the undercut portions of the projections 30 and 31 on the handle knob and the enlarged lower ends 41 and 41' of the slots are sufficiently large to permit the outer T heads on the projections 30 and 31 to be passed therethrough so as to permit the engagement of the projections in the slots. The bolt 34 is thus interengageable with the projections when the bolt is in a predetermined longitudinal position with respect to the projections, and after being engaged, it is apparent that the bolt has a degree of sliding movement transversely of the handle knob.

It is further to be noted that when the latch bar 11 has been mounted on the hub 14 in its proper position and the cylindrical portion 26 of the handle knob is inserted into the drawn hub, these elements will be retained assembled with the hub by the attachment of the bolt 34 with the projections 30 and 31 on the cylindrical portion of the knob.

To prevent movement of the bolt 34 to its position realigning its enlarged openings 41 and 41', with the heads of the projections 30 and 31 and thereby retain the bolt attached to the handle knob, a lock cylinder 44 is inserted into the tubular handle knob with its eccentric cam 45 projecting into the enlarged portion 40 of the slot 38. The cam 45 is so located with respect to the range of sliding movement of the bolt 34 that regardless of its position as determined by the position of rotation of the lock cylinder, it prevents shifting of the bolt 34 to a position at which its enlarged openings 41 and 41' align with the projections 30 and 31.

Hence, the engagement of the cam 45 with the bolt 34 precludes detachment of the bolt from the handle knob and it is only by withdrawing the cylinder from the handle knob that disassembly of the parts may be effected.

The lock cylinder 44 is of conventional construction and may be of the removable type or may be permanently secured in the bore of the handle knob. In any event, as hereinbefore brought out, if the cylinder has been engaged in the handle knob, the parts are secured against disassembly. Locking tumblers (not shown) are carried by the lock cylinder to secure the same against rotation in the handle knob and these tumblers, as is customary, are retractable by a proper key 46 to free the cylinder for rotation.

In its locked position, the cylinder 44 is turned so that the cam 45 is at the uppermost position in its arcuate path of motion, and when the cylinder is in its unlocked position, the cam 45 is turned to an opposite position at which it holds the bolt 34 by engagement with the transverse bar 40 down in an operative position as now about to be described.

The bolt 34 is yieldably held in its uppermost or inoperative position by a spring 47 having one end hooked to a finger 48 carried by the latch bar 11 and its other end engaged over a finger 49 extended from the flange 35 of the bolt 34. Consequently, the spring 47 at all times holds the bolt in a position engaging its transverse bar 40 with the eccentric cam 45 causing the bolt to follow the cam as the lock cylinder is turned from an unlocked position holding the bolt down, to a locked position permitting it to move upwardly.

When the bolt 34 is moved down to its operative position against the action of the spring 47 by the turning of the cylinder, its lower end engages an abutment 50 on the latch bar 11. A driving connection is thus established between the handle knob and the latch bar 11 so that upon rotation of the handle knob, the turning force thereof is imparted to the latch bar. This is the unlocked position of the parts.

In the locked position, the bolt 34 is raised by the action of the spring 47 so that its lower end no longer can engage the abutment 50. Consequently, the driving connection between the handle knob and the bolt 34 is disrupted and it is impossible to actuate the latch bar from the knob.

It is noted that as the upper end of the spring 47, which is attached to the finger 48 on the latch, is to one side of the bolt, its action, besides sliding the bolt upwardly along the projections 30 and 31, also imparts a turning moment to the connected bolt and handle knob to yieldably retain the knob and bolt in an inoperative position. This position is defined by the engagement of the side of the bolt 34 with one edge of the projection 22 on the drawn hub 14, and as clearly shown in Figure 2, the bolt in this position is so disposed as to be movable into and out of engagement with the abutment 50.

Engagement of the same side of the bolt 34 with the opposite edge of the projection 22 on the drawn hub defines the limit of movement of the entire assembled structure in its inoperative position.

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 simple locking mechanism particularly adapted for use with the doors of instrument board compartments in automobiles and that the assembly of the parts requires no screws or bolts.

It is also seen that if desired, the lock may be supplied with a dummy plug inserted into the handle knob in place of the lock cylinder whereupon a non-locking spring latch is provided which may be readily converted into a key controlled lock merely by removing the dummy plug and inserting a lock cylinder. This permits the owner of an automobile equipped with this device to provide a lock cylinder which will fit the key of the other locks on the automobile.

What I claim as my invention is:

1. In a lock device of the character described, a latch bar engageable over the edge of an opening, spring means to yieldably urge the latch bar in one direction and over the edge of the opening, a rotatable handle to move the latch bar in another direction, and a key controlled bolt to form a driving connection between the handle and the latch bar and adapted to be located in a

position ineffective to actuate the latch bar and arranged to hold the latch bar in the plane of its movement to and from operative position engaged over the edge of the opening.

2. In a lock device of the character described, a handle having a rotatable portion, a latch bar mounted to turn about the axis of rotation of said handle portion to be engageable over the edge of an opening, spring means to turn the latch bar in a direction to engage the same over the edge of the opening, a movable member to drivingly connect the handle with the latch bar when in a predetermined position of rotation so as to enable turning of the latch bar in the opposite direction by the handle, said movable member holding the latch bar against movement parallel to the axis of rotation of the handle portion, and against the edge of the opening, and key operated means to control the position of said movable member.

3. In a lock device of the character described, a rotatably mounted handle, a latch bar mounted to turn about the axis of rotation of the handle independently of the handle, spring means to yieldably urge the latch bar to an operative position engaged over the edge of an opening, and key controlled means overlying the latch bar to hold the same against movement in a direction parallel to the axis of rotation of the handle and away from the edge of the opening, said key controlled means affording a driving connection between the handle and latch bar to enable retraction of the latch bar from its operative position by the handle.

4. In a lock device of the character described, the combination with a cylindrical bearing, of a handle rotatably mounted in the bearing, a latch bar rotatably mounted from said bearing independently of the rotatable handle, yieldable means to urge the latch bar in one direction, and common means having connections with the handle and the latch bar to afford a driving connection between the handle and latch bar and to retain the handle and latch bar assembled with the cylindrical bearing.

5. In a lock device for compartment doors, a handle mounted on said door, a latch bar mounted on said door for movement independently of the handle, yieldable means to urge the latch bar to its operative position, and means to retain the handle and latch bar assembled with the door, said means also affording a releasable drive connection between the handle and the latch bar.

6. In a lock device for compartment doors, a handle mounted on said door, a latch bar mounted on said door for movement independently of the handle, yieldable means to urge the latch bar to its operative position, a member to retain the handle and latch assembled with the door in all their positions, said member being shiftable to and from a position drivingly connecting the handle and the latch bar, and a key operated means for controlling the position of said shiftable member.

7. In a lock device of the character described, the combination with a cylindrical bearing, of a handle rotatably mounted in the bearing, a latch bar rotatably mounted on said bearing independently of the handle, spring means to yieldably urge the latch bar to its operative position of rotation, a member movably connected with the handle to at all times retain the handle and latch bar assembled with the cylindrical bearing and movable to a position drivingly interlocking the handle and the latch bar so that the latch bar may be released by actuation of the handle, and a key controlled lock cylinder mounted in the handle to control the position of said movable member.

8. In a lock device of the character described, a spring pressed latch bar movable in a fixed plane to be engageable over the edge of an opening, a handle to retract the latch bar, a member connected with the handle and engaging the latch bar to hold the latch bar against movement out of said fixed plane and against the edge of the opening and adapted, when in a predetermined position, to drivingly connect the handle and latch bar, spring means to hold said member in a position disengaged from the latch bar, and a lock cylinder to hold the member in its position drivingly connecting the handle and the latch bar.

9. In a lock device for compartment doors, the combination with a cylindrical bearing carried by the door, of a rotatable handle loosely received in said bearing, a latch bar freely rotatably mounted on the exterior of the cylindrical bearing, a spring coiled about the bearing and having one end connected to the latch bar to yieldably urge the same in one direction of rotation about the axis of the bearing to its operative position, a bolt slidably connected with the handle and overlying the latch bar to retain the handle and the latch bar assembled with the cylindrical bearing, an abutment on the latch bar with which the bolt is engageable to impart turning force from the handle to the latch bar, whereby the latch bar may be moved against the action of said spring upon turning of the handle, spring means to hold the bolt out of engagement with said abutment, and a lock cylinder rotatable in the handle and operable to move the bolt to its position engaging the abutment on the latch bar.

10. In a lock device, the combination with a mounting bearing, of a rotatable handle having a part inserted into the bearing from one end thereof, a latch bar rotatably mounted on the bearing adjacent the other end thereof, and a member transversely slidably connected with the rotatable handle to overlie the latch bar and retain the latch bar and the handle assembled with the bearing.

11. In a lock device of the character described, a tubular support, a handle having a part rotatably mounted in said tubular support, a latch bar rotatably mounted on said tubular support, undercut projections on said handle part extending beyond the latch bar, a member slidably engaged with said undercut projections to retain the latch bar and the handle assembled with the tubular support, said member being engageable with and disengageable from said undercut projections when in a predetermined position, and a lock cylinder mounted in the handle and engaging the sliding member to prevent movement thereof to said predetermined position.

12. In a lock device of the character described, a tubular support, a latch bar fitted on one end of the tubular support to be rotatable about the axis of the support, spring means to yieldably urge the latch bar in one direction of rotation, a handle having a part rotatably received in the tubular support with portions thereof projecting beyond the end of the support and beyond the latch bar, a member having a sliding interengagement with said projecting portions of the handle to overlie the latch bar and retain the latch bar and handle assembled with the tubular support, said member being movable to a position driv-

ingly connecting the handle with the latch bar so that rotation may be imparted to the latch bar by the handle, and said member being engageable with and disengageable from said projecting portions of the handle in a predetermined position of movement, and a lock cylinder carried by the handle and having a part engaged with the sliding member to hold the same against movement to said predetermined position and to effect movement thereof to said position drivingly connecting the handle and the latch bar.

13. In a lock device of the character described, a latch bar movable to and from operative position, a spring biasing the latch bar to its operative position, a handle to move the latch bar out of its operative position against the action of said spring, common means to mount the latch bar and the handle, said latch bar and handle being readily assembled with said common means, and a member having an interlocking connection with the handle and engaging the latch bar to retain the latch bar and handle assembled with their common mounting means, said member being movable to and from a position affording a driving connection between the handle and latch bar.

14. In a lock device of the character described, a latch bar movable to and from operative position, a spring biasing the latch bar to its operative position, a handle to move the latch bar out of its operative position against the action of said spring, common means to mount the latch bar and the handle, said latch bar and handle being readily assembled with said common means, a member having an interlocking connection with the handle and engaging the latch bar to retain the latch bar and handle assembled with their common mounting means, said member being movable to and from a position affording a driving connection between the handle and the latch bar, and a key operated lock cylinder to retain said driving member assembled with the handle and to hold said member out of its position at which it forms the driving connection between the handle and the latch bar.

15. In combination with a compartment door having an opening therethrough provided with a hub, a handle rotatably mounted in said hub, a latch bar rotatably mounted on the hub, the end of the hub and the end of the handle being substantially flush with a portion of the latch bar, and said handle and latch bar being readily assembled with the hub, and a member connected with the handle and extending transversely across said end of the handle and hub and overlying said portion of the latch bar to retain the handle and latch bar assembled with said hub.

16. In combination with a door having a bore extending therethrough, a handle having a cylindrical portion inserted into said bore from the outside of the door with the end of said cylindrical portion substantially flush with the opposite end of the bore on the inside of the door, a latch bar mounted on the inside of the door to turn about the axis of said bore and having a portion flush with the said end of the bore, and a driving member having an interlocking connection with the end of the cylindrical handle portion and extending transversely across the end of the handle to project beyond the periphery of the bore and overlie the said portion of the latch bar to thereby retain the parts assembled, said driving member being movable to and from a position affording a driving connection between the handle and latch bar, and a lock cylinder mounted in the handle and operable to move said driving member to control its position.

17. In a lock device of the character described, a latch bar, a handle to actuate the latch bar, common means to rotatably mount the latch bar and handle, a driving member to afford a driving connection between the handle and latch bar, said driving member having an interlocking connection with the handle and positioned so as to retain the latch bar and handle assembled with their common mounting means, said interlocking connection being readily releasable upon movement of the driving member to a predetermined position, and key controlled means to prevent movement of the driving member to said position.

18. In a lock device of the character described, a latch bar movable to and from an operative position, a rotatable handle to move the latch bar, common means to movably mount the latch bar and handle, an abutment on the latch bar, an abutment on the handle, a driving member having a transversely sliding connection with the abutment on the handle and movable transversely of the axis of rotation of the handle to and from a position engaging the abutment on the latch bar, said driving member being movable by the handle whereby actuation of the handle when the driving member is in its position engaging the abutment on the latch bar transmits motion to the latch bar, and key controlled means to determine the position of said driving member.

19. In a lock device of the character described, a movable latch bar, a spring biasing the latch bar to its operative position, a movable handle to move the latch bar to an inoperative position, an abutment on the latch bar, a driving member having a longitudinal slot, projections on the handle having an interlocking engagement in said slot whereby the driving member is movable by the handle and is longitudinally shiftable to and from a position engaging the abutment on the latch bar to effect a driving connection between the handle and the latch bar, and key controlled means to shift the driving member to its position engaging the latch bar abutment.

20. In a lock device of the character described, a movable latch bar, a spring biasing the latch bar to its operative position, a movable handle to move the latch bar to an inoperative position, an abutment on the latch bar, a driving member having a longitudinal slot, projections on the handle having an interlocking engagement in said slot whereby the driving member is movable by the handle and is longitudinally shiftable to and from a position engaging the abutment on the latch bar to effect a driving connection between the handle and the latch bar, a spring connected with said driving member to yieldably retain the same in a position disengaged from the latch bar abutment and to yieldably retain the handle in its inoperative position of rotation, and key controlled means to shift the driving member against the action of said spring to its position engaging the latch bar abutment.

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