Dec. 25, 1934. C. COURTNEY 1,985,363

LOCK CONSTRUCTION

Filed April 10, 1933

Fig. 1.

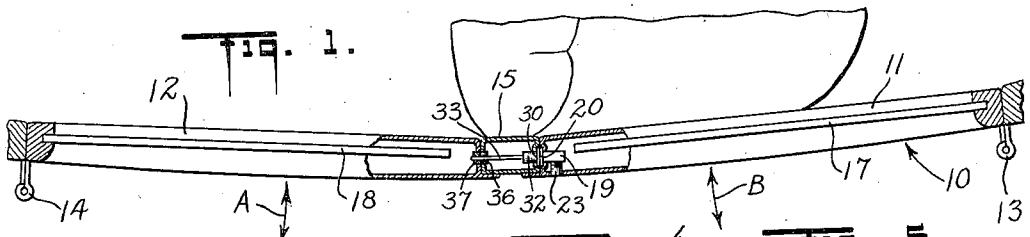

Fig. 2.

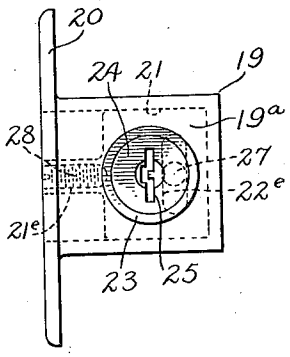

Fig. 3.

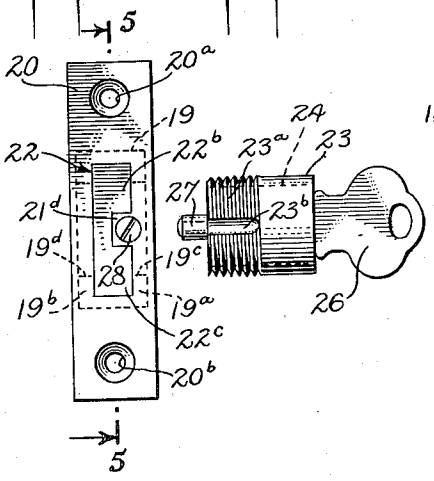

Fig. 4.

Fig. 5.

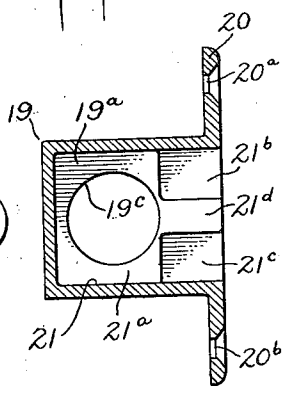

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Fig. 8.

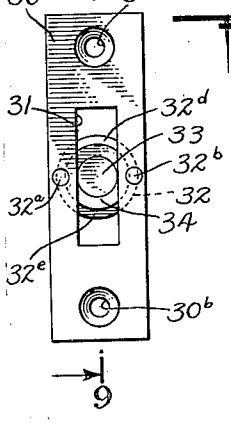


Fig. 9.

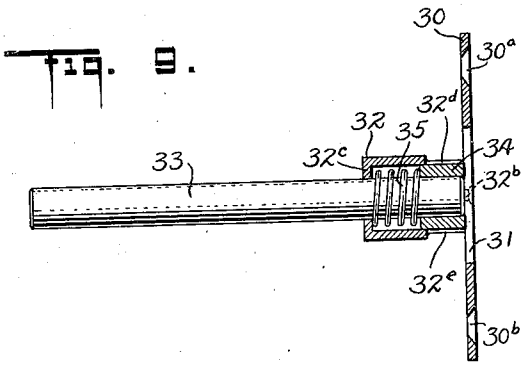


Fig. 10.

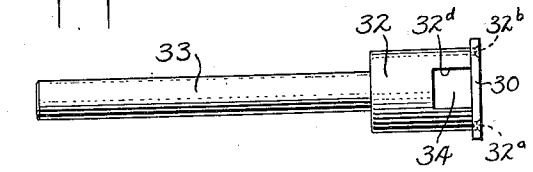


Fig. 6.

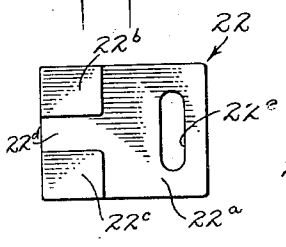
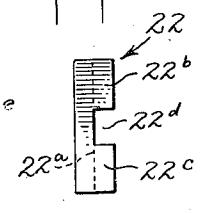


Fig. 7.



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Patented Dec. 25, 1934 1,985,363

UNITED STATES PATENT OFFICE

1,985,363

LOCK CONSTRUCTION

Charles Courtney, New York, N. Y.

Application April 10, 1933, Serial No. 665,301

8 Claims. (Cl. 70—46)

This invention relates to lock construction, particularly to the construction of locks for doors.

One of the objects of this invention is to provide a practical, inexpensive and reliable lock construction that will be compact and durable in construction. Another object is to provide a compact and strong lock construction and particularly one that may be embodied in relatively small form without sacrifice of effectiveness and strength. Another object is to provide a key-controlled bolt mechanism that will be capable of bolting or securing a plurality of doors in response to a single key-actuation. Another object is to provide a door-bolting construction of the above-mentioned character that will be strong and reliable, capable of inexpensive manufacture, and characterized by speed and ease of installation. Another object is to provide a lock construction for automobile doors that is capable of ready incorporation or installation in the construction employed in automobile bodies and doors. Another object is to provide a thoroughly dependable yet simple and inexpensive lock construction whereby two adjacent side doors of an automobile body may be effectively locked or unlocked under the control of a single key. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangements of parts as will be exemplified in the structure to be hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing in which is shown a preferred embodiment of my invention,

Figure 1 is a top plan view, partly in section, of part of an automobile body showing two adjacent side doors with my lock construction related thereto;

Figure 2 is a front elevation of a lock casing detached from the structure of Figure 1 and shown on an enlarged scale;

Figure 3 is an end elevation as seen from the left in Figure 2;

Figure 4 is a side elevation of the key cylinder shown in detached relation from the casing and related parts;

Figure 5 is a vertical sectional view as seen along the line 5—5 of Figure 3;

Figure 6 is a plan view of the bolt;

Figure 7 is an end view as seen from the left in Figure 6;

Figure 8 is a front elevation of the keeper and related parts with which the bolt coacts;

Figure 9 is a side elevation, partly in section, as seen from the left of Figure 8, and

Figure 10 is a top plan view as seen from above in Figure 9.

Similar reference characters refer to similar parts throughout the several views of the drawing.

As conductive to a clearer understanding of certain features of my invention, it might at this point be noted that many attempts have heretofore been made to effectively lock the doors of automobiles and that thefts of automobiles have been greatly facilitated because of the ease with which automobile door locks, as heretofore constructed, can be or have been sprung open or otherwise forced. It might also be noted that the problem of providing an effective automobile door lock has been further complicated by reason of the relatively small space within the door body itself that is available for the accommodation of the lock itself. One of the dominant aims of this invention is to provide a thoroughly dependable and strong lock construction, particularly for automobile doors, that will in a thoroughly practical manner overcome the many disadvantages and difficulties and defects of prior practice.

Turning now to the drawing, and referring first to Figure 1 I have there indicated at 10 a side portion of an automobile body provided with two doors 11 and 12 hinged to the frame or body 10 as at 13 and 14, respectively, thus to cause the doors to swing toward each other in closing direction or away from each other in opening direction, as is indicated by the arrows A and B. Door 11 swings into the plane of the side frame 10 of the car body so as to become alined with the vertical portion 15 of the frame or body, door 12 likewise swinging into the plane of the frame portion 10 of the body and into abutting relation to the same intermediate portion 15 of the body.

The frame or body and the doors may be of any usual or suitable construction and for purposes of illustration these parts may be assumed to be of the usual or standard type of built-up sheet metal construction, the doors being provided with suitable openings or windows closed by the window glass or plates indicated in Figure 1 at 17 and 18, the windows being capable in any known manner of being raised or lowered and being accommodated, when lowered, within the hollow portions of the doors. The intermediate portion 15 of the frame may, as above noted, be of usual construction and by way of illustration is indicated in Figure 1 as built up of sheet metal or

the like and being, therefore, substantially hollow.

In the door 11 (Figure 1) there is mounted a lock casing 19, being secured thereto in any suitable way as by the vertical plate 20 fitted to the end wall of the door 11, a key cylinder 23 extending through a suitable opening in the front or outer wall of the door 11 and into the casing 19. Turning now to Figures 2–5, the casing 19 and the securing plate 20 are better shown and are preferably integrally formed, being conveniently cast as one piece, the casing 19 being in general of rectangular cross-section and being cored out as at 21 to receive a bolt generally indicated at 22 in Figure 6.

In order that the shape of the recess 21 in the casing 19 may be better understood, it might be noted that the core which is used, where the casing 19 is cast, is virtually identical in shape and configuration to those of the bolt itself. The bolt is shown in Figures 6 and 7, and it will be seen to comprise a rear portion 22^a and a forward portion that is channel-shaped in cross-section, having, therefore, spaced ribs 22^b and 22^c extending lengthwise of the bolt and spaced by a slot or recess 22^d likewise extending lengthwise throughout this forward portion of the bolt.

The recess or cored-out portion 21 of the casing is, as above noted, shaped like the bolt, and hence it has a forward portion providing recesses 21^b and 21^c for respectively accommodating the rib portions 22^b and 22^c of the bolt 22, a rib portion 21^d which is accommodated in the recess or slot 22^d (Figure 7) of the bolt, and a rear portion 21^a (Figure 5) for accommodating the rear portion 22^a of the bolt.

The resultant interfitting of the interior of the casing 19 with the bolt 22 thus insures a nice guiding of the latter as it is moved into or out of the casing but, moreover, the respective shapes of these parts, give them an unusual strength. For example, referring to Figures 6 and 7, the channel-shaped cross-section of the bolt gives it a very great resistance to bending per unit volume of metal employed, while the rib 21^d (Figures 3 and 5) increases the rigidity and strength of the casing itself.

The side walls 19^a and 19^b (Figures 2 and 3) of the casing 19 are provided with relatively large circular openings 19^c and 19^d (Figures 3 and 5), leading into that portion of the interior of the casing 19 at which the part 22^a (Figure 6) of the bolt 22 is accommodated when the latter is in withdrawn position. The opening 19^c (Figures 3 and 5) is threaded to receive the threaded portion 23^a of a key cylinder 23 (Figure 4), the latter having rotatably mounted therein a key barrel 24 (Figures 2 and 4) slotted as at 25 to receive a key 26, the key cylinder 23 and the barrel 24 being constructed or arranged, with wafers, tumbler pins, or the like (not shown) for control by the key 26 so that rotation of the key barrel 24 relative to the cylinder 23 can take place only when the proper key is inserted in the key slot 25.

The bolt 22 (Figure 6) is provided with a transverse slot 22^e adjacent its innermost end, while the barrel 24 is provided with an eccentric pin or crank arm 27 (Figure 4) adapted to enter the bolt slot 22^e so that rotation by the proper key of the barrel 24 can rotate the eccentric pin 27 throughout 180° and from one dead center position to the other and thus, through the slot 22^e to project the bolt or to withdraw the bolt, the dead center position of the crank pin 27 in either bolt position locking the latter against movement excepting under the control of the key.

The cylinder 23 (Figure 4) is provided on its outer surface and along its left-hand or inner end with a slot 23^b which, when the cylinder 23 is threaded into the opening 19^c, is brought to rest in line with the rib 21^d of the casing (see Figures 3 and 5); the rib 21^d is provided with a threaded countersunk hole 21^e that opens into the opening 19^c so that when a screw 28 (Figure 5) is threaded into the counterbored threaded opening 21^e, the innermost end of the screws 28 enters the slot 23^b of the cylinder 23 and thus locks the latter against rotation. The ribbed construction of the interior of the casing, as well as of the bolt 22, will thus be seen to be made to accommodate the set screw 28 and thus I am enabled to diminish the horizontal dimension (as viewed in Figure 5) of the casing construction and thus contribute materially toward diminutiveness and compactness of construction. These features are thus made materially to contribute toward the ready accommodation of the casing 19 and cylinder 23 within the narrow confines in the interior of the door 11, while still leaving the necessary space for the sliding window pane 17 and other parts.

The plate 20 (Figure 3) of the casing is provided with suitable openings 20^a—20^b for the reception of screws or other devices whereby the casing 19 may be secured to the end wall or other parts of the door 11.

In the right-hand wall of the intermediate frame portion 15 (Figure 1) is mounted the keeper construction and related parts with which the bolt 22 above described coacts when projected by the key; referring now to Figures 8, 9 and 10, this keeper construction includes a plate 30 preferably dimensioned to match the casing-plate 20 and provided with openings 30^a and 30^b whereby it may be secured to the end wall of the frame part 15; the keeper 30 is provided with a bolt-receiving opening 31 (Figure 8) which is generally rectangular in shape and is large enough to receive the forward portion of the bolt 22. But to the rear of the plate 30 (to the left as viewed in Figures 9 and 10) there is secured to the plate a cylindrical housing 32 whose axis extends substantially in line with the axis of the bolt 22. Conveniently the housing 32 is provided at its right-hand end (Figures 9 and 10) with extensions 32^a and 32^b which are received in suitable openings in the plate 30 and are then riveted or headed-over, thus securing these parts together. The end wall 32^c (Figure 9) is provided with a central opening in which is slidably received a bolt 33, conveniently of round cross-section, the right-hand end of the bolt 33 having a cylindrical head 34 which may be integrally formed therewith or take the form of a collar secured to the bolt 33. Intermediate of the end wall 32^c and the head 34 of bolt 33 is a spring 35 which normally holds the bolt 33 to the right, as viewed in Figure 9, and hence with its headed end up against the inside or left-hand face of the keeper plate 30, the bolt 33 being thus maintained in line with the movement of the bolt 22 when the latter is projected into and through the keeper opening 31.

The upper and lower forward portions of the housing 32 are cut away as at 32^d and 32^e (Figures 9 and 10) so as to form virtually rearward slot-like extensions of the keeper opening 31 for the reception of the bolt 22.

Recurring now to Figure 1, the keeper plate 30 with its housing 32 and bolt 33 will be seen to be

mounted in the right-hand wall of the frame part 15 which is intermediate of the two doors 11—12, being secured thereto as above noted as by screws or the like; the left-hand wall of the frame portion 15 is preferably provided with a bushing 36 for slidably guiding and holding the left-hand portion of the bolt 33 while the right-hand end wall of the door 12 is provided with an opening, preferably by way of a suitable keeper plate or bushing 37 which is brought in line with the bolt 33 when the door 12 is closed.

If, now, the doors 11 and 12 are thrown closed and the key 26 turned so as to carry the crank pin 27 from one dead center position to the other, the bolt 22 is moved out of the casing 19 and is moved toward the left, as viewed in Figure 1, the throw of the bolt being so proportioned that the above-mentioned channel-shaped front portion of the bolt 22 bridges across the open end of the casing and the keeper plate 30, thus interposing the above-described features of great strength of the bolt for securing the door 11 in closed position to the frame part 15. But the projection of the bolt 22 and its entry into the keeper opening 31 (Figures 8, 9 and 10) and into the slots 32^d—32^e, has been effective to move the bolt 33 to the left, against the action of spring 35, causing the bolt 33 to be projected out of the bushing 36 (Figure 1) and into the keeper 37 on the door 12, thus securely locking the door 12 in position, all as the result of a single key-actuation.

A secure locking against unauthorized opening of the doors is thus achieved, the dead center position of the crank arm 27 preventing the forcing in retrograde direction not only of the bolt 22 but also of the bolt 33. Moreover, it is virtually impossible to jimmy either of the bolts, both of them being dead bolts.

When it is desired to unlock the doors, the key is utilized to give the key barrel and hence the crank pin 27 (Figure 4) a 180° rotation, thus withdrawing the bolt 22, spring 35 (Figure 9) making certain that the bolt 33 partakes of the same withdrawing movement as does the bolt 22. Thus, both bolts are withdrawn from their respective keepers, the new dead center position of the eccentric pin 27, furthermore, dependably locking the bolt 22 against unintended or undesired projecting movement.

Thus, it will be seen that there has been provided in this invention a lock construction in which the various objects hereinbefore noted, together with many thoroughly practical advantages, are successfully achieved. It will be seen that the construction is of a thoroughly practical character and is well adapted to meet dependably the hard conditions of practical use. Moreover, the construction is capable of inexpensive manufacture and may, furthermore, be quickly and inexpensively installed in practice.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth, or shown in the accompanying drawing, is to be interpreted as illustrative and not in a limiting sense.

I claim:—

1. In lock construction, in combination, a casing having a bolt projectable therefrom, said bolt being slotted in the direction of its projecting movement and said casing having a rib-like portion extending inwardly into the casing and fitted into said slot in said bolt, a key cylinder related to said casing and having key-controlled means for actuating said bolt, said key cylinder being positioned in line with said rib-like portion, and a screw threaded lengthwise through said rib-like portion of said casing for locking said cylinder in position.

2. In lock construction, in combination, a casing having a bolt-receiving recess whose cross-section in the direction of the length of the bolt provides two portions extending at an angle to each other, a bolt slidable in said recess and having a cross-section transversely of its length to provide two portions extending at an angle to each other and to be received respectively in said two portions of said recess, a key cylinder related to said casing and having key-controlled means for actuating said bolt, and means accommodated in that portion of said casing in the angle between said two recessed portions for locking said cylinder in place.

3. In lock construction, in combination, a one-piece cast metal casing cored out to provide a bolt-receiving recess extending between the side walls and toward the rear wall thereof, said recess having a rear portion displaced laterally from the central plane of the casing to thereby cause the one side wall portion that bounds said rear portion to be of greater thickness than the other side wall, and having two spaced forward portions whose median plane is substantially coincident with the central plane of said casing, said spaced forward portions being separated by a rib portion forming substantially a forward extension of said thicker side wall portion, a bolt receivable in said recess and shaped to have a rear portion slidably received within the rear portion of said recess, said rear portion of the bolt being forwardly extended to provide two spaced portions of greater thickness received respectively in said two spaced portions of said recess, said thicker side wall having a threaded opening therein to receive a key cylinder having means for operating said bolt, and means extending lengthwise of and through said rib portion for locking said cylinder in position.

4. In lock construction, in combination, a one-piece cast metal casing cored out to provide a bolt-receiving recess extending between the side walls and toward the rear wall thereof, said recess having a rear portion displaced laterally from the central plane of the casing to thereby cause the one side wall portion that bounds said rear portion to be of greater thickness than the other side wall, and having two spaced forward portions whose median plane is substantially coincident with the central plane of said casing, said spaced forward portions being separated by a rib portion forming substantially a forward extension of said thicker side wall portion, a bolt receivable in said recess and shaped to have a rear portion slidably received within the rear portion of said recess, said rear portion of the bolt being forwardly extended to provide two spaced portions of greater thickness received respectively in said two spaced portions of said recess, said rear portion of said bolt having a transverse slot therein and said thicker side wall having an opening therein, a key cylinder received in said opening and having a key-controlled crank pin engaging in said transverse slot and movable from one dead center position to the other, and a threaded member threaded into and through said rib portion of said casing for locking said key cylinder in place.

5. In lock construction, in combination, a one-piece cast metal casing cored out to provide a

bolt-receiving recess extending between the side walls and toward the rear wall thereof, said recess having a rear portion displaced laterally from the central plane of the casing, whereby one side wall portion that bounds said rear portion is of greater thickness than the other side wall, and having two spaced forward portions whose median plane is substantially coincident with the central plane of said casing, said spaced forward portions being separated by a rib portion forming substantially a forward extension of said thicker side wall portion, a bolt receivable in said recess and shaped to have a rear portion slidably received within the rear portion of said recess, said rear portion of the bolt being forwardly extended to provide two spaced portions of greater thickness received respectively in said two spaced portions of said recess, and key-controlled means operative through one of the side walls of said casing for controlling said bolt.

6. In lock construction, in combination, a casing having a bolt-receiving recess, said recess having a rearwardly extending portion substantially rectangular in vertical cross-section and having a forwardly extended portion whose cross-section is substantially channel-shaped and the wing portions of which channel-shaped cross-section project from a base which is in cross-section substantially equivalent to the rectangular cross-section of said rear portion, and a bolt slidable in said recess having a rear portion that is rectangular in cross-section and receivable in said rear portions of said recess and having a forward portion that is in cross-section channel-shaped to correspond to the cross-section of said forwardly extended portion of said recess, and means for controlling the projection of said bolt out of said recess and acting to limit the projection of the bolt so that only a part of said channel-shaped portion of said bolt is projected out of said casing.

7. In lock construction, in combination, a casing having a bolt-receiving recess formed by two relatively closely spaced side walls, one of which is thicker than the other, a bolt slidably received within said recess, sail bolt having a forward part carrying a plurality of vertically spaced but laterally projecting rib-like portions, the forward portion of said thicker side wall having vertically spaced recesses forming lateral extensions of said first-mentioned recess for receiving respectively said rib-like portions of said bolt, and means for projecting said bolt, said projecting means having a range of projecting movement of said bolt such that only a portion of said forward part of said bolt is projectable out of said casing.

8. In lock construction, in combination, a casing having a bolt-receiving recess, said recess having a rearwardly extending portion substantially rectangular in vertical cross-section and having a forwardly extended portion whose cross-section is substantially channel-shaped and the wing portions of which channel-shaped cross-section project from a base which is in cross-section substantially equivalent to the rectangular cross-section of said rear portion, there being thereby formed a rib upon the inside face of a wall of said casing and between the said wing portions, and a bolt slidable in said recess having a rear portion that is rectangular in cross-section and receivable in said rear portion of said recess and having a forward portion that is in cross-section channel-shaped to correspond to the cross-section of said forwardly extended portion of said recess, said wall having an opening therein to the rear of said rib, a key cylinder received in said opening in said wall and having a key-controlled key plug therein, means forming an operating connection between said key plug and said bolt, and means extending through said rib for holding said key cylinder in place in said opening.

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