July 30, 1940. C. E. ANDERSON 2,209,551

DOOR LATCH

Filed March 7, 1938

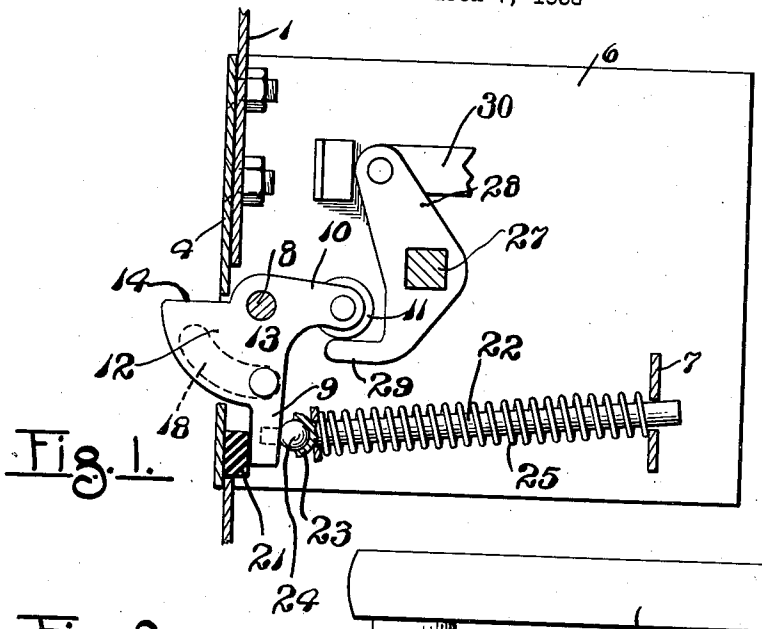


Fig. 1.

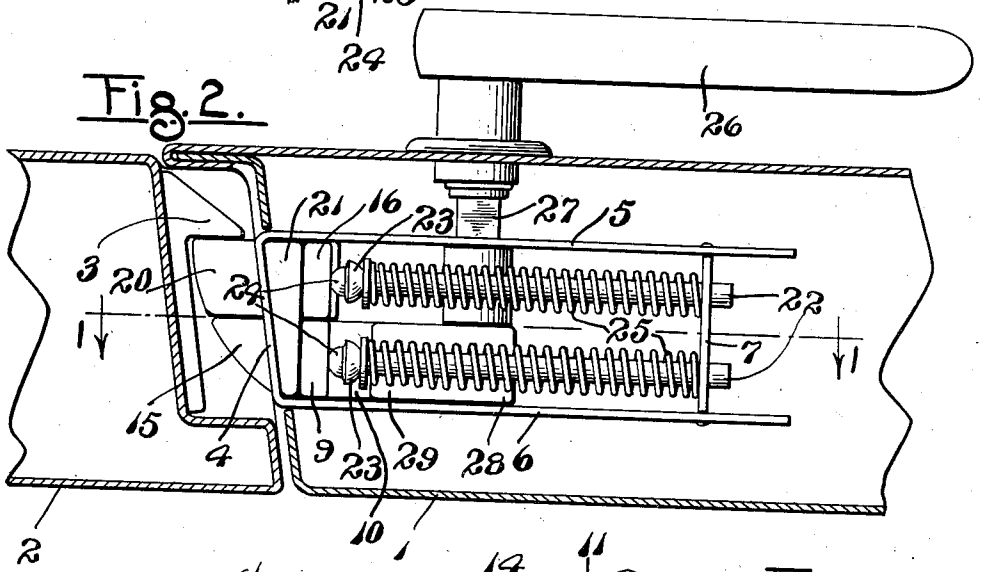


Fig. 2.

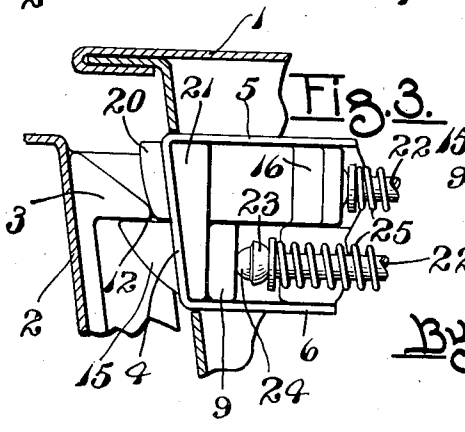


Fig. 3.

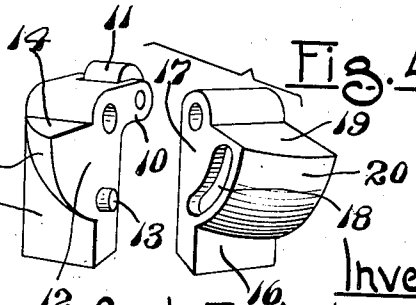


Fig. 4.

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DOOR LATCH

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Application March 7, 1938, Serial No. 194,342

8 Claims. (Cl. 292—49)

This invention relates to door latches, which have their greatest field of usefulness on automobile doors though not restricted thereto. It is an object and purpose of the present invention to provide a door latch in which there is a double bolt, that is, two latch bolts with one or the other of which the keeper on the body or door frame will engage when the door is closed, providing a safety means so that the door will not accidentally open if it should not be fully closed. One of the bolts holds the door in a completely closed position and the other in the safety position. As is now substantially the universal practice in automobile doors, there is usually a double means of engagement on a single latch bolt with the keeper which, however, is subject to various disadvantages, and the present invention is designed to produce a more practical and fool-proof, and at the same time, a very simple construction of latch which will insure closing the door either in its completely closed or in its safety position.

Other objects and purposes are to provide a practical latch of the type described which may be manually operated to release the door in a simple and practical manner. Many other objects and purposes than those stated will appear upon understanding the invention from the following description, taken in connection with the accompanying drawing, in which:

Fig. 1 is a section taken substantially on the plane of line 1—1 of Fig. 1, looking in the direction indicated by the arrows.

Fig. 2 is a fragmentary horizontal section and under plan view, the section being taken through the door and the adjacent portion of the body and the latch mechanism being viewed from below, with the door in its fully closed position.

Fig. 3 is a fragmentary section similar to Fig. 2 but with the door partly closed or in the safety position, and

Fig. 4 is a perspective view of the two latch bolts separated from and turned at an angle to each other to better disclose their structure.

Like reference characters refer to like parts in the different figures of the drawing.

The door on which the latch is to be installed is indicated at 1, and the adjacent portion of the body or door frame indicated at 2, upon which the keeper is installed, which keeper has a retaining hook 3 with which either one or the other of the latch bolts engage when the door is moved from open to closed position. The structure of the door and the body may be any conventional structure such as is used in automobile bodies.

The latch structure includes a support made from a length of sheet metal and bent into substantially U-form, having a connecting portion 4 and two parallel spaced apart sides 5 and 6 which extend through openings in the edge of the door into the interior thereof, as shown in Fig. 2. Adjacent their inner ends and near their lower portion is a cross bar 7 between the sides permanently connected at its ends thereto.

The latch bolts, two in number, are pivotally mounted upon a pivot pin 8 extending between the sides 5 and 6 of the support. One of the latch bolts, that toward the inner side of the door, is of a substantially L-shaped form having a depending leg 9 below the pivot 8, and an inwardly extending leg 10 substantially in the same horizontal plane with the pivot 8 which, at its free end, carries a roller 11. The latch bolt at one side has a plain vertical face 12 (Fig. 4) and has a short pin or stud 13 projecting at said face. At the outer side of the leg 9 is a dog, shaped substantially as a quadrant of a sphere, one side thereof being a continuation of the side 12, the upper side 14 being an arc of a circle and the outer curved surface 15 being of substantially spherical form, as best shown in Fig. 4. The bolt is pivotally mounted upon the pivot pin 8 at the angle where the two legs 9 and 10 integrally join each other at an inner position with respect to the door.

The second or outer bolt 16 comprises a substantially vertical leg which has a vertical face 17 and which also has a projecting dog, one side of which is a continuation of the face 17. And in such side of the dog an arcuate slot or recess 18 is provided. When the two latch bolts are located side by side with the faces 12 or 17 thereof together, the pin 13 enters the arc-shaped recess 18. The dog projecting from the outer side of the bolt 16 has an upper horizontal side 19 in the same plane with the side 14 of the dog on the other bolt, and the curved outer side 20 is a continuation of the spherical curvature of the outer side 15 of the first described dog on the first bolt. The face opposite the face 17 of the second dog 16 is in a vertical plane spaced from and paralleling said face 17.

When the two bolts are mounted side by side on the pivot pin 18 the two projecting dogs pass through openings in the edge of the door and through the part 4 of the support and their lower depending portions below said dogs are adapted to come against a cushion bumper 21, as shown in Fig. 1. Normally they are held against said bumper by a yielding spring pressure. Each of the latch bolts has associated therewith a rod 22,

at its forward end shaped with a concave socket 23 which engages over the spherical shaped head 24 of a stud permanently secured at the inner side and adjacent the lower end of each of the bolts 9 and 16. The rear ends of the rods 22 pass through openings in the cross bars 7. Coiled springs 25 under compression between said bars 7 and the sockets 23 normally hold the bolts against the bumper 21 through yielding pressure exerted by the springs.

The operation of the latch bolts from the outer side of the door is through a handle 26 secured at the outer end of a shaft 27 which passes through the door and through the side 5 of the support and at its inner end carries a lever 28, the lower end of which is provided with a horizontal finger 29 coming underneath the roller 11 on the arm 10 of the first and inner latch bolt. By turning the handle so as to move the lever 28 in a clockwise direction the finger 29 is lifted and turns the first described latch bolt in a counterclockwise direction, retracting the dog thereon inwardly, and by reason of the pin 13 being seated in the arc-shaped groove 18, the second and outer latch bolt 16 is simultaneously moved with the bolt 9 compressing both of the springs 25 in such operation. It is evident that irrespective of which of the dogs of the two latch bolts may be engaged with the hook 3 of the keeper there will be a disengagement from the keeper on manual operation of the handle 26 as described.

In closing the door the inclined outer side of the hook 3 of the keeper is first engaged by the curved surface 15 of the projecting dog of the inside bolt 9, whereupon the bolt is swung inwardly, and by reason of the pin and slot connection at 13 and 18 of the two bolts, both bolts are swung inwardly. However, as soon as the projecting dog of the innermost bolt 9 has passed by the nose of the keeper, it will move outwardly to its initial position and thereafter in completing the movement of the door to closed position the outside dog 16 only will be moved farther inwardly. If the door is closed with sufficient force the keeper will pass by both of the projecting dogs and will then engage the side opposite the side 17 of the bolt 16, as in Fig. 2. However, if the force used in closing the door is not sufficient to carry by both bolts, but only by the first one and then partly over onto the second, the projecting dog on the first bolt 9 engaged by the keeper will have moved to its outer position and will engage the keeper 3, as in Fig. 3, on the tendency of the door to swing open when the projecting dog on the bolt 16 does not move far enough to come inside the keeper hook. The keeper hook 3 will thereupon engage against the face 12 of the bolt 9 and hold the door against opening even though the door may not be completely and tightly closed. In this position the bolt 16 will be partly swung inward and by applying force to the door, it may be completely closed by moving it to the position shown in Fig. 2; or by operation of the handle 26 the door may be opened and then completely closed by the exertion of a greater force.

The upper portion of the lever 28 is adapted to have a link or other connection, such as indicated at 30 in Fig. 1, connected therewith and extend substantially to the central or other portion of the door selected to be associated with a manually operable handle or other means located at the inner side of the door for manually releasing the latch from within the automobile body.

The invention described, while of a simple character, is very practical and efficient, readily manufactured at low cost and easily installed upon an automobile or other door.

A desirable feature of the latch is an action obtained by the peculiar manner in which the bolts are mounted. The pivotal mounting of the bolts may be described as having the axis parallel with a cord of the arc through which the door swings. The inclined or cam surfaces of the bolts which engage the keeper in closing the door is of greater length than is customary upon bolts mounted to move in other ways and therefore the inclination of this cam surface may be less abrupt which requires less power to retract the bolt when closing the door. Another feature due to this mounting of the bolt is that when latched there is less tendency for the bolt to inadvertently become unlatched. In order to become unlatched they must go through a rotating movement and if in contact with the keeper such movement is less likely to inadvertently occur than in other types of bolts.

While the structure embodying this invention is herein disclosed as a pivotal mounting of the bolts it is conceived that the same fundamental invention may be applied to other specific structures such as bolts mounted for sliding movement or bolts mounted for pivotal movement on axes different than that herein shown.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a latch, a support having spaced apart sides, two latch bolts pivotally mounted side by side to turn about the same pivotal axis, each of said bolts having a projecting keeper engaging dog, individual spring means for each of said bolts normally moving said bolts to an outer position, manually operable means for turning one of said bolts against the resistance of its spring means to thereby retract the keeper engaging dog thereof, and a pin projecting from the face of said bolt which is adjacent a face of the other bolt, said adjacent face of the other bolt having an arc-shaped recess into which the pin of the first bolt extends.

2. A latch comprising, a support having spaced apart sides connected at their outer ends by a cross member, two latch bolts located side by side and pivotally mounted on said support to turn about a horizontal axis, each of said latch bolts having a keeper engaging dog projecting from the outer side thereof through the connecting member of the support, the adjacent faces of said latch bolts being close together, a pin on one of said latch bolts, the other of said latch bolts having an arc-shaped slot therein into which said pin extends, said pin and slot being at the adjacent faces of the bolts, manually operable means for turning the pin carrying bolt about its pivot to inwardly retract the keeper engaging dog thereof and thereby also retract the other bolt, and spring means acting on each of said bolts to normally move the same to outer position, as specified.

3. A latch structure comprising, a U-shaped support of sheet metal having parallel spaced apart sides and an integral connecting portion at and between the outer ends of said sides, a pivot pin extending between the sides of the support near the front ends thereof, two latch

bolts pivotally mounted on said pin and extending downwardly therefrom, each of said latch bolts having a keeper engaging dog extending outwardly from the outer side thereof, the front connecting portion of said support having an opening for the passage of said dogs, a pin on one of said bolts, an arc-shaped slot on the other of said bolts receiving the pin, said pin and slot being at adjacent faces of said bolts, studs having rounded heads connected one to each of the bolts at their rear sides and below said pivots, a rod having a concaved socket portion at its forward end associated with each of said studs, the sockets engaging against said rounded heads, a bar having openings therethrough extending between and permanently secured at its ends to the sides of the support, and coiled springs between said bar and said socket portions of the rods, said springs being under compression and normally moving the bolts to project their keeper engaging dogs outwardly, as specified.

4. A construction containing the elements in combination defined in claim 3, said bolt which carries the pin having a horizontally and inwardly extending arm at the upper end thereof, a rock shaft mounted on said support, and a member secured to said rock shaft having a forwardly extending horizontal finger at its lower end extending under said arm of said bolt whereby on rocking the rock shaft in one direction the associated bolt is retracted and, through the pin and slot connection with the other bolt, said other bolt is retracted.

5. A latch structure comprising a support, two latch bolts located side by side and mounted for pivotal movement about the same axis, keeper engaging dogs on said bolts, means on each of said bolts to maintain them in extended position, and manual means for retracting said bolts.

6. The combination of elements defined in claim 5, combined with a slot in one of said bolts and a pin on the other of said bolts, for the purposes specified.

7. A latch structure comprising two movably mounted bolts located side by side, keeper engaging dogs on the outer end of each of said bolts, a pin and slot connection between the bolts whereby the retraction of one bolt will cause a simultaneous retraction of the other bolt, but said other bolt can remain retracted when the one bolt is moved to outer position, and individual spring means for each bolt normally moving them to outer position.

8. The combination of elements defined in claim 7, combined with manually operable means directly and operatively associated with said one bolt for retracting the same, whereby the other bolt will also be retracted through the pin and slot connection.

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