Oct. 13, 1953 R. MARPLE 2,655,025

LATCH MECHANISM

Filed July 10, 1948 3 Sheets-Sheet 1

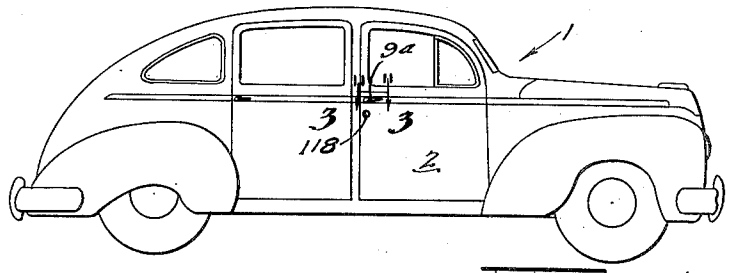


Fig. 1.

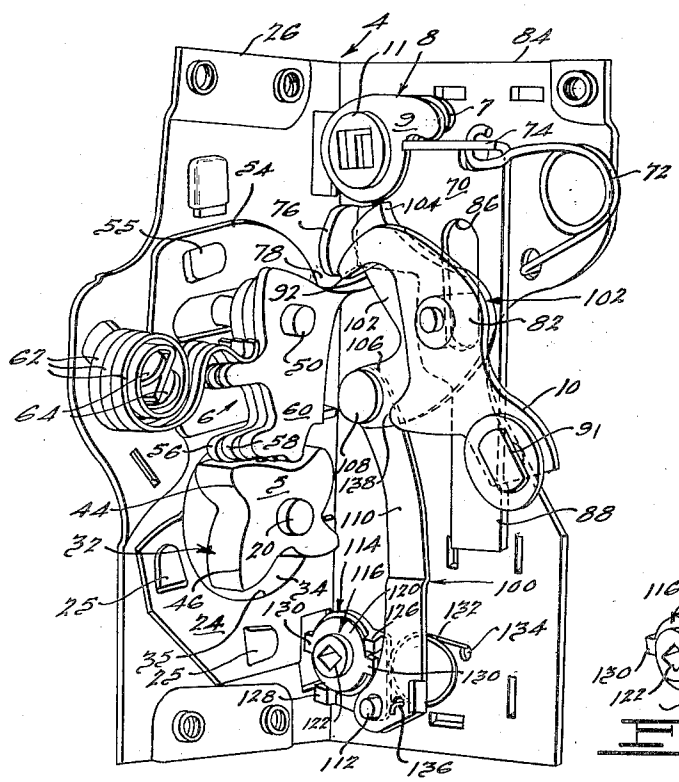


Fig. 2.

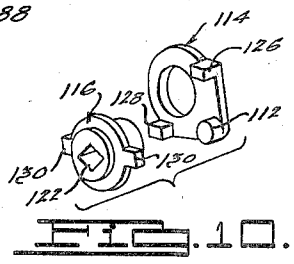


Fig. 10.

INVENTOR.
Rollo Marple.
BY
Harness, Dickey & Pierce
ATTORNEYS.

Oct. 13, 1953 R. MARPLE 2,655,025

LATCH MECHANISM

Filed July 10, 1948 3 Sheets-Sheet 2

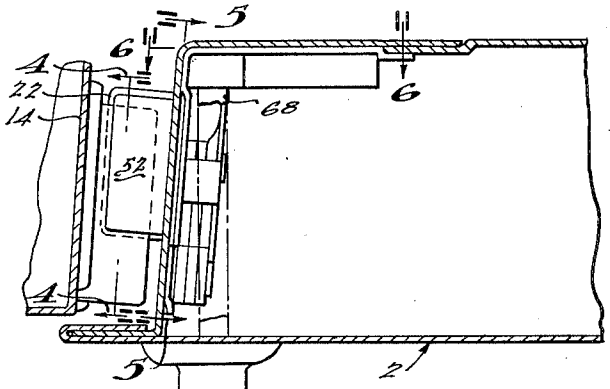


FIG. 3.

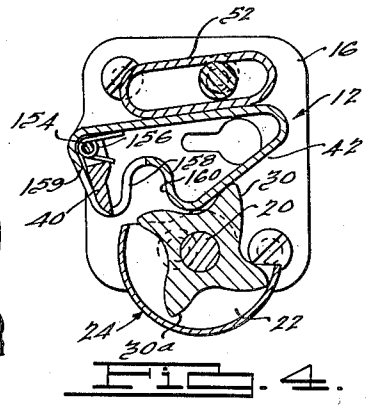


FIG. 4.

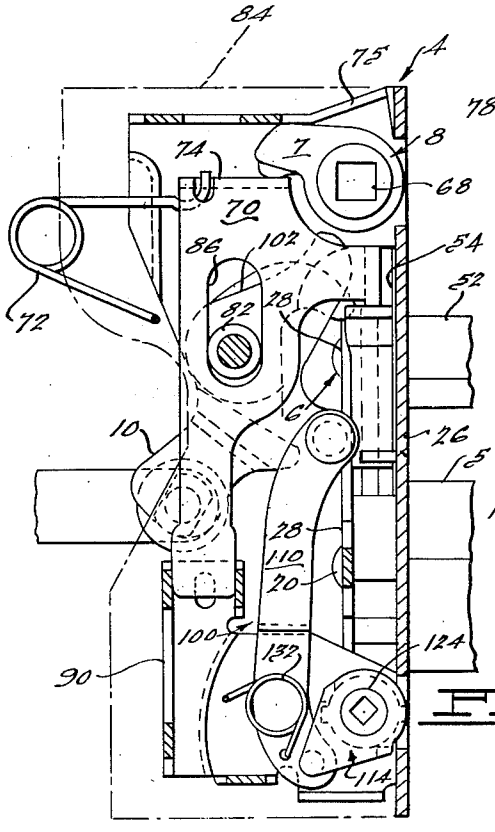


FIG. 6.

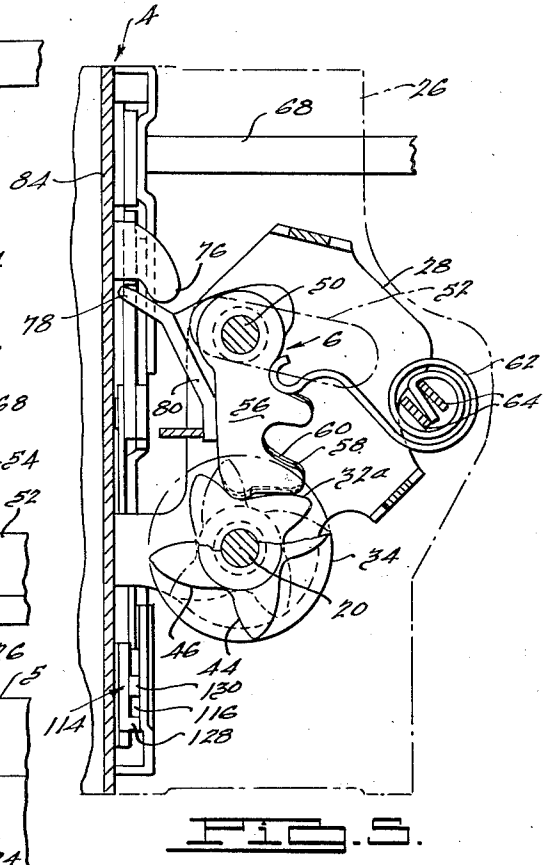


FIG. 5.

INVENTOR.
Rollo Marple.
BY
Harness, Dickey & Pierce
ATTORNEYS.

Oct. 13, 1953 R. MARPLE 2,655,025

LATCH MECHANISM

Filed July 10, 1948 3 Sheets-Sheet 3

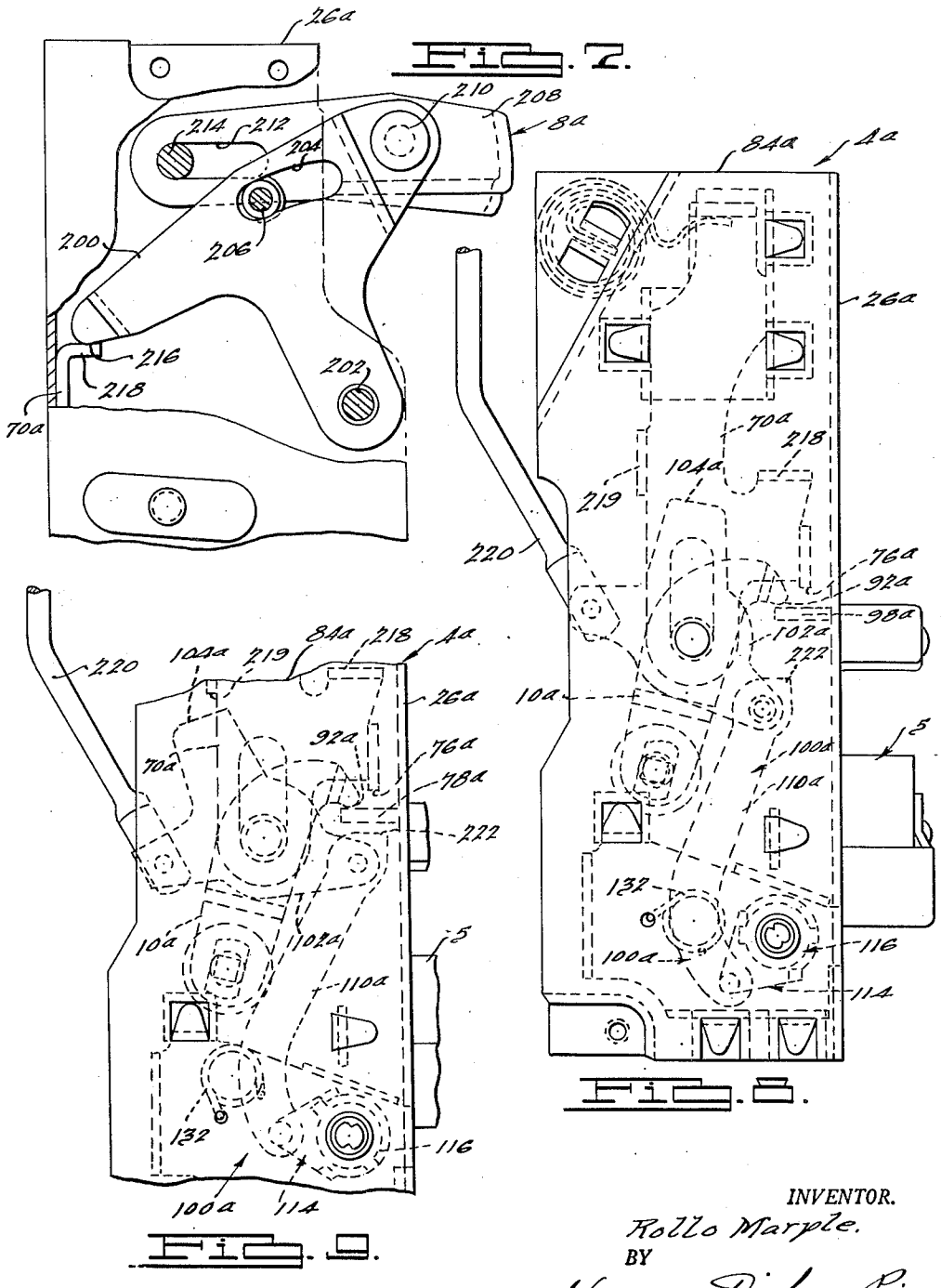


Fig. 2.

Fig. 3.

Fig. 4.

INVENTOR.
Rollo Marple.
BY
Harness, Dickey & Pierce
ATTORNEYS.

Patented Oct. 13, 1953

2,655,025

UNITED STATES PATENT OFFICE

2,655,025

LATCH MECHANISM

Rollo Marple, Jackson, Mich., assignor to Hancock Manufacturing Company, Jackson, Mich., a corporation of Michigan

Application July 10, 1948, Serial No. 38,110

6 Claims. (Cl. 70—135)

1

The present invention relates to latching devices for closures and in particular provides an improved latch construction for vehicle doors. In certain of its aspects the present invention provides improvements upon and modifications of the structures disclosed and claimed in applicant's United States Patent Nos. 2,195,179, 2,301,558 and 2,301,560.

The principal objects of the present invention are to provide an improved latch of the above generally indicated character particularly adapted for but not limited to use in connection with vehicle doors, characterized as being simple in construction, economical of manufacture and extremely durable and efficient in operation; to provide a latch of the rotary bolt type embodying improved means operable from within the vehicle for locking the inside and outside handles against actuation; to provide improved means actuated by the bolt for releasing the locking means; to provide a door latch embodying improved means operable by a key station for locking the latch against opening by the outside door handle and to generally improve the construction and operation of vehicle door latches.

With the above as well as other objects in view which appear in the following description and appended claims, a preferred but illustrative embodiment of the invention as shown in the accompanying drawings throughout the several views of which corresponding reference characters are used to designate corresponding parts and in which:

Figure 1 is a view in elevation illustrating the application of the invention to automobile doors;

Fig. 2 is a view in perspective of the improved latch mechanism;

Fig. 3 is a view taken substantially along the lines 3—3 of Fig. 1;

Fig. 4 is a view taken substantially along the lines 4—4 of Fig. 3;

Fig. 5 is a view taken substantially along the lines 5—5 of Fig. 3;

Fig. 6 is a view taken substantially along the lines 6—6 of Fig. 3;

Fig. 7 is a partial view showing a modified form of the invention;

Fig. 8 is a view similar to Fig. 6 but showing the modified form of latch shown in Fig. 7;

Fig. 9 is a view similar to Fig. 8 but showing the latch in locked position; and

Fig. 10 is an exploded perspective view of a portion of the locking mechanism.

The improved latch which is secured within a door 2 of the associated vehicle 1 comprises gen-

2

erally a casing 4, a plurality of cams or dogs designated generally as 6 for holding a bolt 5 against rotation in a door-opening direction; an outside operated roll back means designated as a whole as 8 for releasing the dogs 6 and the bolt 5 in response to movement of the conventional outside handle 9a; and a retracting member 10 which may be connected to the conventional inside door handle or the like (not shown), to release the dogs 6 from operative engagement with the bolt 5. The keeper 12 which is described in more detail below is suitably secured to the door pillar 14 as by means of the plate 16.

The bolt 5 is rotatably journaled in the latch casing upon a pin or trunnion 20, one end of which is supported in the flange 22 of a housing 24 which is suitably secured to the flange 26 of the casing 4, as by tabs 25 struck from the flange 26. The other end of the pin 20 is supported in a deck 28 which is suitably secured to the inner face of the flange 26.

The bolt 5 is formed to provide a keeper-engaging portion 30 which projects externally of the lock casing 4 for cooperation with the keeper 12; an inner or cam-engaging portion 32; and a separate fin or vane 34 which is somewhat larger in diameter than the portions 30 and 32 and serves to substantially close the opening 35 which is provided in the flange 26 of the casing 4 to accommodate the bolt. The lower half of the outwardly projecting portion 30 of the bolt 5 is substantially enclosed by the previously mentioned housing 24, which is given a substantially semi-cylindrical form for this purpose.

As will be seen in Fig. 4, the outer portion 30 of the bolt 5 is formed to provide a plurality of radially extending, equiangularly spaced, keeper-engaging teeth or projections 30a, any one of which is effective, as described hereinafter, to cooperate with the safety catch 40 associated with the keeper 12, or keeper portion 42, to hold the door in either the partially closed or safety position, or in the fully closed position, respectively. It will be appreciated that the angular spacing between the projections or teeth 30a relative to the spacing between the safety catch 40 and the keeper portion 42 is such that the bolt 5 can roll over or across the keeper in a manner similar to the cooperation between a gear and a rack.

As appears in Figs. 2 and 5, the inner portion 32 of the bolt 5 is formed to provide a number of dog-engaging teeth or projections 32a, the number and angular spacing between which corresponds to the number and angular spacing of the

keeper-engaging teeth 30*a*. The teeth 32*a*, however, are angularly displaced from the teeth 30*a*. This relation results in reducing the space requirements for the lock since the positioning of the cam can thus be determined independently of the rotative position of the teeth 30*a*. Each tooth 32*a* is formed to provide a generally radially extending, cam-engaging portion 44 and a locking portion 46, the purpose of which will be described hereinafter.

The dogs 6 are provided to cooperate with the latching portion 46 of the bolt 5 to hold the bolt 5 against rotation in a clockwise or door-opening direction as viewed in Fig. 2 or the counterclockwise direction as viewed in Fig. 5. It is preferred to use a plurality of such dogs of progressively increasing length to provide a take-up action for the latch as will be described below. In the present instance three such dogs are illustrated although a small or larger number may be utilized if desired.

The three dogs designated as a whole at 6, are rotatably supported in the latch casing upon a pin or trunnion 50 which extends parallel to but is spaced from the previously mentioned bolt-supporting pin 20. The outer end of the pin 50 is supported in a member 52, the inner flanges 54 whereof are secured to the inner face of the casing flange 26 as by means of tabs 55, one of which is shown in Fig. 2, which are struck from the flange 26 and project through apertures in the flange 54, after which they are bent downwardly to secure the flange 54 to the flange 26. The outwardly extending body portion of the member 52 serves as most clearly appears in Figs. 3 and 4 as a dovetail member. The inner end of the pin 50 is supported in the previously-mentioned supplemental casing member or deck 28. Each of the three dogs, which are individually designated as 56, 58, and 60, includes a downwardly extending body which terminates in a laterally offset foot. The cam 56 is slightly longer than the cam 58 and the cam 58 in turn is slightly longer than the cam 60. Each of the cams 56, 58, and 60 is provided with a biasing spring 62 individual thereto. One end of each spring is secured between a pair of lugs 64 which are inwardly struck from the casing flange 26 and the free end of each spring 62 bears against the edge of the associated cam and so continuously urges it in a counterclockwise or locking direction as viewed in Fig. 2.

The outside roll back, designated as a whole at 8, embodies an arrangement designed to prevent rattling. In the illustrated instance the outside roll back 8 comprises a pair of roll back members 7 and 9 arranged in face-to-face relation and each having an axially extending boss 11 which extends outwardly therefrom in directions opposite to the registering faces of the members 7 and 9. The roll back members 7 and 9 are provided with squared openings therein which are slightly angularly offset from each other and which are dimensioned to relatively freely receive the squared spindle 68 associated with the outside operating handle 9*a*. With this relation, the spindle 68 is inserted through the roll back members 7 and 9 when they are slightly angularly offset from each other. When later they are engaged by the slide 70 which is constantly urged in an upward direction by a spring 72 one of the members 7 or 9 will be in engagement with the upper flange 74 of the member 70 and urged in a counterclockwise direction (Fig. 2) while the other of the members 7 or 9 will be engaged by a downturned tab 75 of the deck 28 and held against such counterclockwise rotation whereby the members 7 and 9 tend to bind on the squared spindle 68 so that it is prevented from rattling upon being subjected to vibration.

Clockwise rotation of the roll back means 8 by means of the spindle 68 retracts the holding cams 56—58—60 through the action of a slide 70. The slide 70 is guided for its reciprocal sliding movement by means of a pin 82 carried by the base 84 of the casing 4 which pin extends through an elongated slot 86 of the slide 70. The lower end 88 of the slide 70 is guided between two downturned feet of a deck 90 suitably carried by the base 84 adjacent its lower end portion. A spring 72 continuously urges slide 70 upwardly, and normally holds it against the roll back 8.

Slide 70 has a laterally turned foot 74 for engagement by the roll back 8, and a laterally turned foot 76 which engages the nose 78 of the dog 60 and thereby rotates the dogs 56, 58, and 60 in a clockwise direction out of holding engagement with the rotatable bolt 5. The movement of the dogs 56 and 58 is caused by movement of the dog 60 by means of a flange 80 which lies behind the rear face of the dogs 56 and 58.

The retracting member 10 is pivotally supported on the pin 82 and may be rotated by means of an inside door handle (not shown, but of the type which is continuously urged to a center position but may be moved therefrom in either a locking direction or a door-opening direction) suitably connected to the pin 91 carried by the member 10. The member 10 has a nose 92 which is engageable with the nose 78 of the dog 60 whereby counterclockwise rotation of the member 10 will rotate the dogs 6 in a clockwise direction for releasing the rotary bolt 5.

Locking means, generally designated 100, is carried by the base 84 and comprises a first pivotal lever 102, pivotally mounted on the pin 82, and having a foot 104 which is movable, upon clockwise rotation of the lever 102, from the position shown in Fig. 2 into a position in which it lies in the downward path of movement of the flange 74 of slide 70, thus preventing downward movement thereof under control of the outside roll back 8. The lever 102 has a second arm 106 which is pivotally connected by means of pin 108 to a link 110 which extends downwardly therefrom and is pivotally secured at its lower end to pin 112 carried by a key-operated member 114. The member 114 is carried by a member 116 which has a central axial opening extending therethrough for receiving the end portion of a lock shaft extending from the key station 118 carried by the exterior surface of the door 2. The member 116 has a radially enlarged central portion 120 and oppositely projecting axially extending cylindrical portions 122 and 124. The portion 124 extends completely through the member 114 and is journaled within an aperture in the base 84. The cylindrical portion 122 is received and journaled within an aperture in the deck 90. The member 114 is provided with a pair of spaced outwardly turned abutments 126 and 128 which extend into the plane of the central portion 120 of the member 116. This central portion 120 is provided with a pair of diametrically opposite portions extending outwardly from the peripheral surface thereof one of which portions will, upon rotation of the member 116 by the key station 118, move into engagement with one of the abutments 126 and 128 for rotation in a counterclockwise or clockwise direction of the member 114

for actuation of the link 110 and lever 102. This just recited connection between the members 114 and 116 is to provide a lost motion connection therewith so that upon rotation of the key in the lock 118 for either locking or unlocking movement of the member 114, the key may be rotated back to its initial position and removed from the lock without actuation of the member 114. The opposite abutment is provided so that the same part may be used in a latch of opposite hand.

In order that the locking mechanism 100 will be held in either its fully unlocked or its fully locked position and to prevent rattling, an overcenter spring 132 is provided. One end of the spring 132 is received within an aperture 134 of the base 84 while the other end of the spring is received within an aperture 136 in the lower end of the link 110. The location of the apertures 134 and 136 is so chosen relative to the normal movement of the link 110 that the resilient effort of the spring 132 will urge the link 110 in a downward direction as seen in Figs. 2 and 6 and will urge the link 110 in an upward position subsequent to upward movement of the link 110 to place the lever 102 in its blocking position with respect to the flange 74. The member 10 has a shoulder 138 which is engageable with the head of the pin 108 upon clockwise rotation of the member 10 to rotate the lever 102 clockwise from its position shown in Fig. 2, into its blocking position. Such operation of the locking mechanism 100 is accomplished by momentarily moving the inside door handle of the vehicle door 2 in a direction opposite to the direction required for releasing of the latch.

In order that the locking mechanism 100 may be automatically moved to its unlocked position, the arm 106 of the lever 102 is so shaped that upon clockwise rotation of the lever 102 to its locked position, the arm 106 will be located beneath the foot 78. As will be made clear hereafter, upon door-closing movement the bolt 5 will be rotated in a counterclockwise direction as shown in Figs. 2 and 4 whereby the dogs 6 are rotated clockwise about the pin 50 causing the foot 78 thereof to move downwardly engaging the arm 106 and rotating the lever 102 in a counterclockwise direction toward its unlocking position and sufficiently far so that the overcenter spring 132 will cause the locking mechanism 100 to be moved to and maintained in its unlocked position as shown in Fig. 2.

Referring particularly to Fig. 4, the keeper 12 comprises a body which may be and preferably is formed as a relatively heavy metal stamping which is formed to define the previously-mentioned bolt-engaging surface 42. The previously-mentioned safety catch 40 is and may be formed of a die casting or the like and is pivotally supported by a pin 154 which extends between and is supported in the opposite side walls of the keeper 12. A spring 156 is connected between the catch 40 and the keeper body and continuously urges the safety catch 40 to active position as shown in Fig. 4. It will be noted that the otherwise continuous body of the keeper 12 is cut away as indicated at 158 to afford a slot or opening through which the safety catch 40 may move from the active position shown in Fig. 4 to a retired position. It will also be noted that the back of the safety catch 40 abuts the portion 159 of the body of the keeper 12 so that such portion 159 forms a limit stop to the rotation thereof under the influence of the spring 156.

As also clearly appears in Fig. 4 when the door is in a closed position, the keeper 12 is in a position between the rotary bolt 5 and the previously-mentioned dovetail member 52, the upper surface of the keeper 12 as well as the under surface of the dovetail member 52 downwardly inclined in the direction of the door-closing movement. With this relation the dovetail member tends to serve as a stop to the movement of the keeper 12 in the leftward or door-closing direction as influenced by the bolt 5. These members 5, 12 and 52 accordingly function in accordance with the functioning of the usual separately formed dovetails usually associated with locks of the conventional slidable bolt type and permit such separate dovetail structures to be dispensed with.

Considering the operation as a whole of the above described construction, the parts are shown in Figs. 2, 3, 4, 5, and 6 in positions occupied thereby when the door is in a fully or tightly closed position and with the locking mechanism 100 in unlocked position. Under these circumstances the upper tooth 30a of the outer portion 30 of the rotary bolt 5 bears solidly against the cooperating surface 42 of the keeper 12 forcibly wedging the latter between the bolt 5 and the dovetail member 52. At the same time the foot of the longest dog 56 bears solidly against the upper substantially horizontally disposed locking surface 46 associated with the inner portion of the bolt 5. Cam 56 is thus effective to entirely prevent any clockwise rotation of the bolt 5 so that the door is positively held in the just-mentioned fully or tightly closed position.

To open the door, the outside roll back 8 associated with the door handle 9a may be rotated to rotate the outside roll back 8 in a clockwise direction shown in Fig. 2. Such rotation causes the link 78 to be moved downwardly whereby its nose 76 engages the nose 78 of the dogs 6 rotating these dogs 6 in a clockwise direction out of holding engagement with the bolt 5 whereby the bolt 5 is free to rotate. Upon an opening force being applied to the door 2 the bolt will rotate in a clockwise direction as seen in Fig. 4 permitting the door to be opened upon its hinges. If now instead of operating the outside door handle, the inside door handle is operated in a direction to rotate the link 10 in a clockwise direction, its nose 92 engages the nose 78 of the dogs 6 rotating the dogs 6 in a clockwise direction thereby releasing the bolt 5 for the previously-mentioned door-opening movement.

Assuming now that it is desired to place the locking mechanism 100 in its locked position, a key may be placed in the key station 118 and rotated in a direction to rotate the member 116 counterclockwise as seen in Fig. 2. The projection 130 then engages the projection 126 rotating the member 114 in a counterclockwise direction which acts through pin 112 carried thereby to move the link 110 upwardly. Upward movement of the link 110 rotates the lever 102 clockwise whereby the foot 104 thereof is moved into a position underlying the flange 74 whereby movement of the slide 70 downwardly will be prevented. The lock mechanism 100 may also be moved to its locked position by movement of the inner door handle in a direction opposite from that mentioned above for door-opening movement whereby the link 10 is rotated in a clockwise direction causing the projection 138 to engage the pin 108 and rotate the lever 102 in a clockwise direction causing the foot 104 to move to its blocking position in which it underlies the flange 74 of the slide 70.

With the locking mechanism 100 in this locked

position, downward movement of the slide 70 will be prevented and since the outside roll back 8 acts through this slide 70 and causes a downward movement thereof to release the dogs 6, the locking mechanism 100 prevents such release of the dogs 6 and the door cannot be opened by means of the outside door handle. Such locking position of the mechanism 100 will not affect operation of the latch from the inside door handle since the inside door handle acts on the link 10 which directly engages the foot 78 of the dogs 6 for rotation of the dogs 6 and does not act through the slide 70. Such operation of the dogs 6 by the inner door handle through the link 10 will effect an unlocking movement of the locking mechanism 100. This unlocking movement is caused by the engagement of the lower surface of the foot 78 with the arm 106 so that when the cams 6 are rotated clockwise by the link 10 the undersurface of the foot 78, due to its engagement with the arm 106, will rotate the link 102 in a clockwise direction past the overcenter condition of the spring 132 whereby the locking mechanism 100 will be moved to the unlocked position shown in Fig. 2. It may thus now be seen that door-opening movement by the inside door handle will cause the locking mechanism 100 to be moved to unlocked position.

If now the locking mechanism 100 has been moved to locked position (either by the key station 118 or lever 10) and it is now desired to open the door from the exterior of the car, it is first necessary to insert a key in the locking station 118 and then rotate the key in a direction whereby the member 116 is rotated clockwise so that its abutment 130 engages the abutment 128 of the member 114. Subsequent clockwise rotation of the member 116 rotates the member 114 clockwise to move the linkage 110 downwardly whereby the lever 102 pivotally connected with the arm 110 will rotate counterclockwise into the position shown in Fig. 2. This renders the outside roll back 8 effective to act through the slide 70 for releasing the dogs 6 as above described.

Suppose that the locking mechanism 100 is in its locked position and the door is open and it is desired to close the door. Upon door-closing movement, the bolt 5 moves to the right relative to the keeper 12 as viewed in Fig. 4. As the door approaches the partially closed position corresponding to the conventional safety position, the safety catch 40 engages the right-hand face of the upper tooth 30*a* associated with the bolt 5. Continued door-closing movement causes the catch 40 to apply a rotative force to the bolt 5. The springs 62, however, associated with the dogs are stronger than the spring 156 associated with the safety catch 40 so that no rotative movement of the bolt occurs. Instead the safety catch 40 rotates in a counterclockwise direction relative to the keeper 40 to a retired position in which the tooth may be moved past the keeper 12. As soon as the end of the safety catch 40 is passed by the upper bolt tooth, the springs 156 associated therewith is rendered effective to cause the safety catch to return to the active position shown in Fig. 4 in which it is effective to cooperate with the left-hand face of the upper bolt tooth 30*a* and positively prevent the door from again being fully open without again actuating the dogs 6 to release the bolt 5.

If the door-closing movement is continued beyond the safety position, just described, the sloping face 160 of the keeper 12 is brought into engagement with the right-hand face of the upper bolt tooth 30*a* and applies a positive rotative force of the bolt 5. Due to the fact that the bolt-holding effect of the dogs results from the cooperation between the teeth thereof and the bolt faces and not from the strength of the biasing spring 62, it is possible to utilize springs 62 which are relatively weak. Accordingly a minimum door-closing force is required to render the keeper face 160 effective to rotate the bolt 5 in a counterclockwise direction as viewed in Fig. 4.

During such movement a leading face 44 of an inner bolt tooth 32*a* bears against the rear edges of the cams and turns these dogs from the position shown in Fig. 2 to positions corresponding to positions in which the dogs 6 are rotated clockwise to permit a tooth projection to pass below the feet of the cams 56, 58, and 60. When the door reaches a substantial closed position, the just-mentioned inner bolt tooth face 44 passes beyond the heel of the shorter dog 60 permitting the latter to ride up over the rounded ends of the dog-engaging bolt face 46. As soon as this action takes place the spring 62 associated with the dog 60 becomes effective to rotate the latter in a counterclockwise direction as viewed in Fig. 2 and forcibly continues the rotation of the bolt 5 in a counterclockwise or door-closing direction. At slightly spaced stages in the continued door-closing movement, the bolt face 44 successively passes beyond the heels of the dogs 58 and 56 rendering the springs 62 associated with these dogs successively effective to continue the counterclockwise or door-closing rotation of the bolt 5. The dogs 56 and 58 may be expected in the fully closed position of the door to occupy the full blocking position described with reference to cam 60. Reviewing the door-closing operation of the latch mechanism upon door-closing movement, it will be noted that the dog 60 is rotated clockwise which will cause its foot 78 to be moved downwardly and engage the arm 106 of the lever 102 for rotating the lever 102 in a counterclockwise direction and the mechanism 100 to unlocked position similarly as described with respect to the downward movement of the foot 78 under operation of the link 10 controlled by the inner door handle.

From the foregoing it will be appreciated that the present invention provides an extremely effective structure which is simple and economical of manufacture and which is exceptionally efficient and satisfactory in operation. It will also be appreciated that the specifically described embodiment permits the latch mechanism to be locked from either inside of the vehicle by means of the inside door handle or externally of the vehicle by means of the key station 118 and for the same to be unlocked either by means of the inner door handle or of the key station irrespective of one of these two elements which was used to effect locking of the latch mechanism.

In the modified form of the invention shown in Figs. 7, 8, and 9, the latch is carried in a casing 4*a* having a flange 26*a* and a base portion 34*a*, a rotary bolt 5, a locking mechanism 100*a*, an outside roll back 8*a*, an inside retracting member 10*a* continually biased to its neutral or shown positions by an inside door handle (not shown), and dogs (not shown) releasably holding the bolt 5 against rotation. In this modification the outside roll back 8*a* comprises a lever 200 pivoted on a pin 202 carried by the flange 26*a*. The lever 200 has an arcuate aperture 204 through which projects a pin 206 carried by the flange 26*a*

whereby rotational movement of the lever 200 is limited. The lever 200 is operated by a slide member 208 which is pivotally secured to the lever 200 as by means of pin 210 which not only pivotally connects the members together but forms a partial guide for the movement of the slide 208. The other end of the slide 208 is provided with an elongated aperture 212 which receives a pin 214 carried by the flange 26a. In this manner the slide 208 is guided for reciprocal movement and the limits of the elongated aperture 212 provide the limits of reciprocal movement of the slide 208.

The link 200 has a nose 216 which is engageable with the upper surface of a flange 218 of a slide 70a. The slide 70a is suitably carried for sliding motion by the base 84a and is provided with a foot 76a which is engageable with a foot of the dog means 6 (not shown) which releasably holds the rotary bolt 5. The slide 70a acts upon downward movement the same as the slide 70 for releasing the dog means 6a permitting rotation of the bolt 5.

The lever 102a is of somewhat different shape than the previously described lever 102 and is provided with an abutment 104a which is movable upon counterclockwise rotation of the lever 102a into the path of movement of a foot 219 whereby the outside roll back is prevented from moving the slide 70a downwardly sufficient to rotate the dog means 6a associated with the bolt 5 for releasing the bolt 5 for rotary movement.

The locking mechanism 100a is provided with the overcenter spring 132, a link 110a and the members 114 and 116 for actuation from an outside located key station. The retracting member 10a is operable from the inside door handle by means of the usual connecting element whereby its nose 92a is engageable with the foot of the dogs associated with the bolt 5 for rotation of the dogs for releasing this bolt 5. In this modification the member 10a is not provided with an arm corresponding to the arm 138 of the member 10 and therefore the locking mechanism 100a is not actuatable by movement of the inside door handle. In this modification, the lever 102a is provided with a projection which is pivotally connected to a locking rod 220 which may extend upwardly between the inner and outer door panels and upwardly through the garnish mold (not shown) associated with the vehicle door. Downward movement of the rod 220 rotates the lever 102a in a counterclockwise direction causing its portion 104a to move into blocking position with respect to the foot 219. Actuation of the locking mechanism 100a by means of the key station will be similar to that described above in connection with the form of the invention shown in Fig. 2. The link 110a is provided with an upward projecting portion 222 which, when the locking mechanism 100a is moved to its locking position, will be located in the downward path of movement of the foot 78a of the dogs associated with the bolt 5 upon rotation of the dogs out of holding position with respect to the bolt 5 in the manner described above, whereby closing movement of the door with the latch in locked position will cause unlocking movement of the locking mechanism 100a. Similarly the locking mechanism 100a will be moved to unlocked position upon movement of the dogs for releasing the rotary bolt 5 by means of the retracting member 10a in the manner similar to that recited above.

What is claimed and is desired to be secured by United States Letters Patent is as follows:

1. In a latch mechanism, a bolt, means for releasably holding said bolt, a roll back mechanism operatively connected to said holding means and actuatable to actuate said holding means for releasing said bolt, a blocking lever having a first position in which it acts to render said roll back mechanism ineffective and having a second position in which it is ineffective to render said roll back mechanism ineffective, a rotatable key actuated member normally maintained in a first position but rotatable into a second and a third position, a second lever having lost motion connection with said key member, a link pivotally connected at one portion to said blocking lever and a second portion to said second lever, said key member being operable upon movement from its said first to its said second position to pass through said lost motion and actuate said second lever to actuate said link to move said blocking lever to its said first position and operable upon movement from its said first position to its said third position to pass through said lost motion and actuate said second lever to move said blocking lever to its said second position, said lost motion being of sufficient magnitude to permit movemen of said key member from said third or said second position to said first position without actuating said second lever.

2. The combination of claim 1 in which an overcenter spring pivotally connected to said link is provided to hold said blocking lever in either of its said positions.

3. In a latch mechanism, a keeper-engageable bolt movable to a freeing position away from the keeper, a dog engageable with the bolt to hold it against such freeing movement, movable means for releasing said dog from its holding position, a locking member movable between a blocking position in the path of movement of said movable means to prevent said releasing movement, and an unblocking position out of said path of movement, over-center means for urging said locking member into either of its positions, second movable means for releasing said dog from its holding position, said dog and locking member having surfaces in adjacent relation when said locking member is in its blocking position and said dog is in its holding position, dog-releasing movement of said second movable means causing engagement of said surfaces to move said locking member toward its unblocking position, whereby said over-center means is permitted to complete the movement of said locking member into its unblocking position.

4. In a latch mechanism, a keeper-engageable bolt movable to a freeing position away from the keeper, a dog engageable with the bolt to hold it against such freeing movement, movable means for releasing said dog from its holding position, a locking member movable between a blocking position in the path of movement of said movable means to prevent said releasing movement, and an unblocking position out of said path of movement, over-center means for urging said locking means into either of its positions, actuating means including a lost-motion connection for moving said locking member between its said positions, a second movable means for releasing said dog from its holding position, said dog and locking member having surfaces in adjacent relation when said locking member is in its blocking position and said dog is in its holding position, dog-releasing movement of said second movable means causing engagement of said surfaces to move said

locking member toward its unblocking position, whereby said over-center means is permitted to complete the movement of said locking member into its unblocking position, said lost-motion connection being of sufficient magnitude to permit said unblocking movement without disturbing said actuating means.

5. In a latch mechanism, a keeper-engageable bolt movable to a freeing position away from the keeper, a dog engageable with the bolt to hold it against such freeing movement, movable means for releasing said dog from its holding position, a locking member movable between a blocking position in the path of movement of said movable means to prevent said releasing movement, and an unblocking position out of said path of movement, over-center means for urging said locking means into either of its positions, actuating means including a lost-motion connection, a link pivotally connected at one end to said locking member and at the other end to said actuating means for transmitting the movement of said actuating means to said locking member, a second movable means for releasing said dog from its holding position, said dog and locking member having surfaces in adjacent relation when said locking member is in its blocking position and said dog is in its holding position, dog-releasing movement of said second movable means causing engagement of said surfaces to move said locking member toward its unblocking position, whereby said over-center means is permitted to complete the movement of said locking member into its unblocking position, said lost-motion connection being of sufficient magnitude to permit said unblocking movement without disturbing said actuating means.

6. In a latch mechanism, a keeper-engageable bolt movable to a freeing position away from the keeper, a dog engageable with the bolt to hold it against such freeing movement, movable means for releasing said dog from its holding position, a locking member movable between a blocking position in the path of movement of said movable means to prevent said releasing movement, and an unblocking position out of said path of movement, a second movable means for releasing said dog from its holding position, said dog and locking member having surfaces in adjacent relation when said locking member is in its blocking position and said dog is in its holding position, dog-releasing movement of said second movable means causing engagement of said surfaces to move said locking member toward its unblocking position, a rotatable key-actuated member normally maintained in a first position but rotatable into a second and a third position, a lever having lost-motion connection with said key member, a link pivotally connected between said locking member and said lever, said key member being operable upon movement from its said first to its said second position to pass through said lost motion and actuate said lever to move said locking member to its said blocking position, and operable upon movement from its said first position to its said third position to pass through said lost motion and actuate said lever to move said locking member to its said unblocking position.

ROLLO MARPLE.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,159,635	Wolfe et al.	Nov. 9, 1915
1,549,603	Murmann	Aug. 11, 1925
2,246,782	Dall	June 24, 1941
2,301,221	Marple	Nov. 10, 1942
2,393,147	Cousino	Jan. 15, 1946
2,435,987	Tierney et al.	Feb. 17, 1948