Jan. 15, 1952 E. D. DALL 2,582,925

AUTOMOBILE DOOR LOCK

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Fig. 1

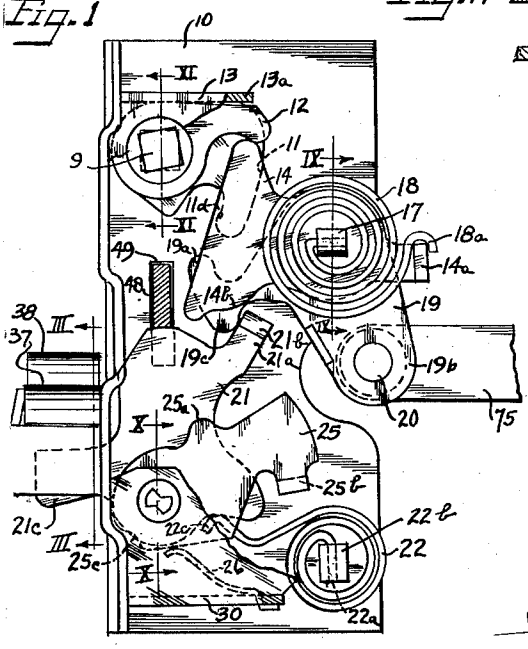
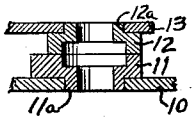
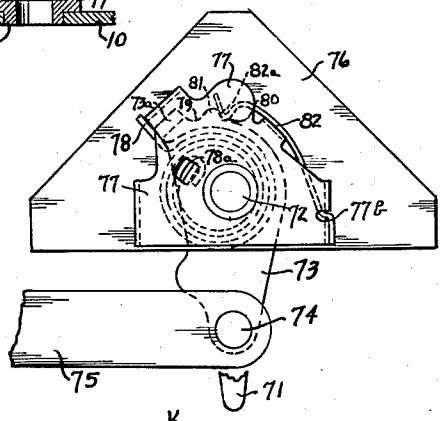



Fig. 11



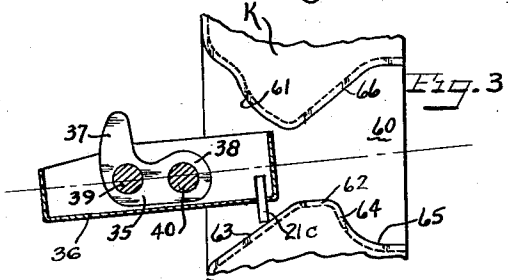




Fig. 3

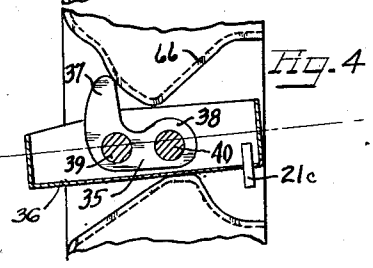
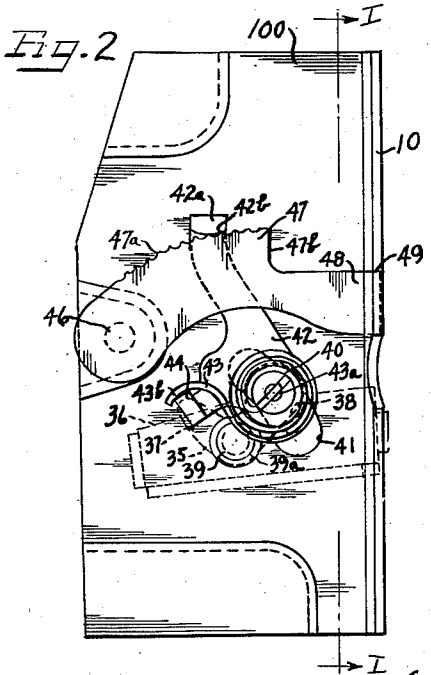



Fig. 4

Fig. 2



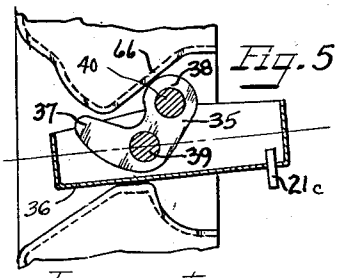




Fig. 5

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Fig. 6

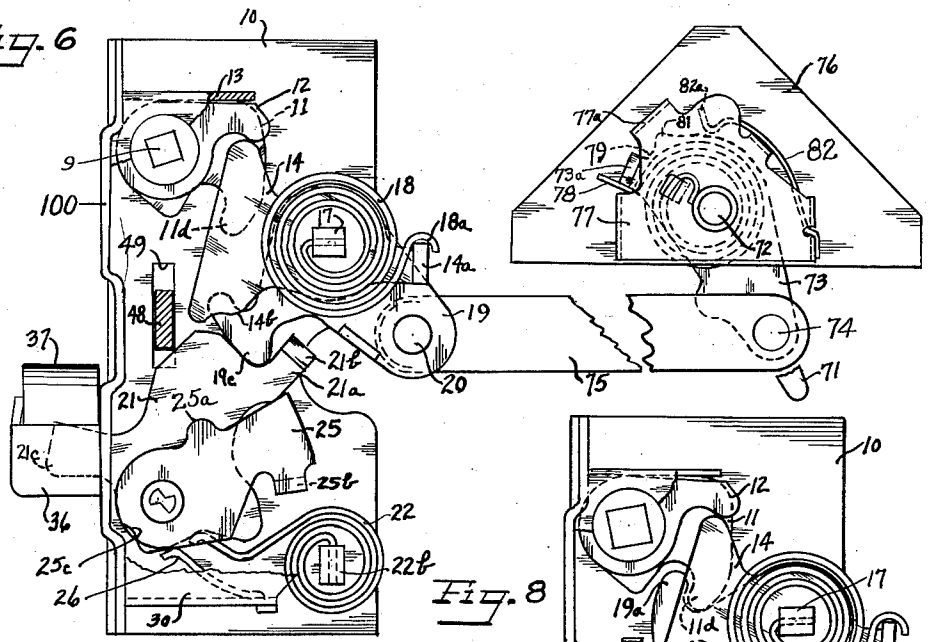



Fig. 8

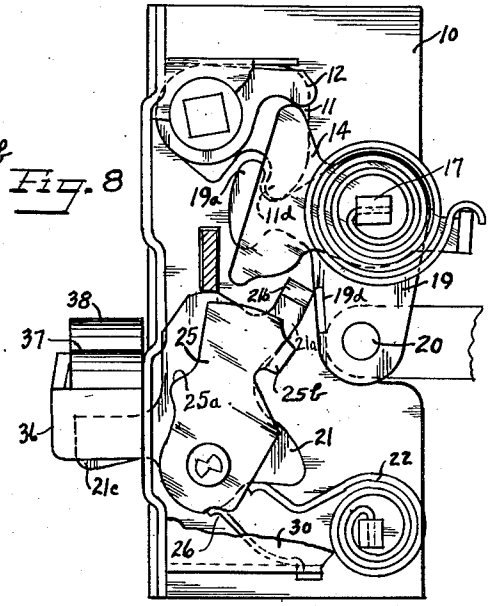
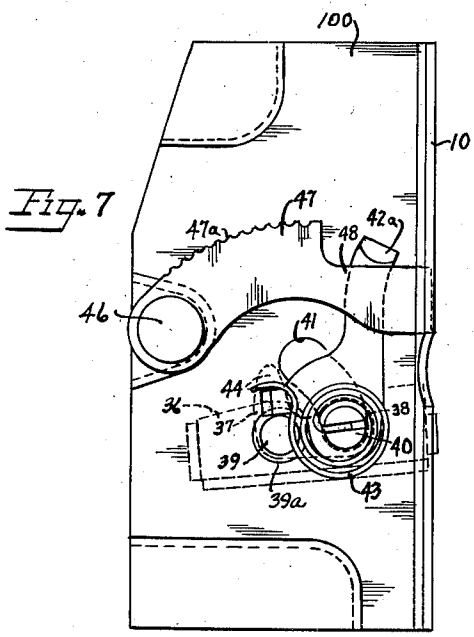



Fig. 7



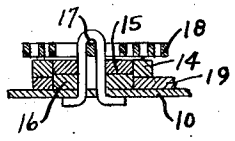
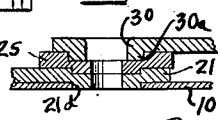




Fig. 9

Fig. 10




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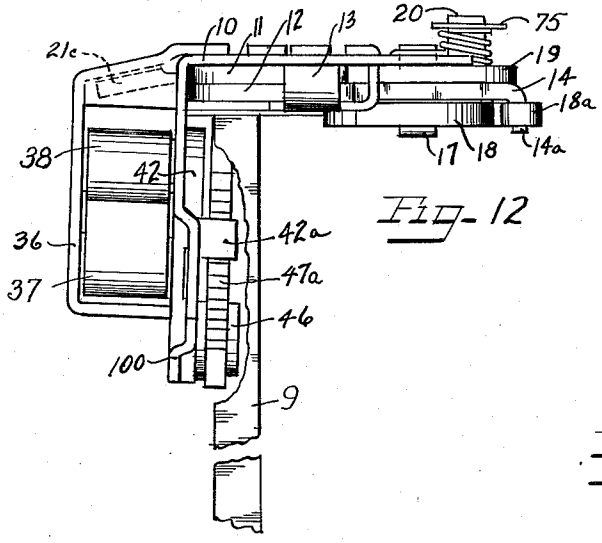



Fig. 12

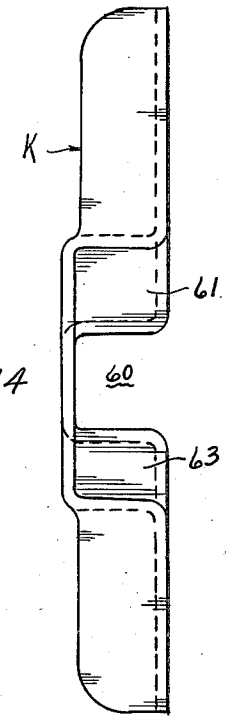
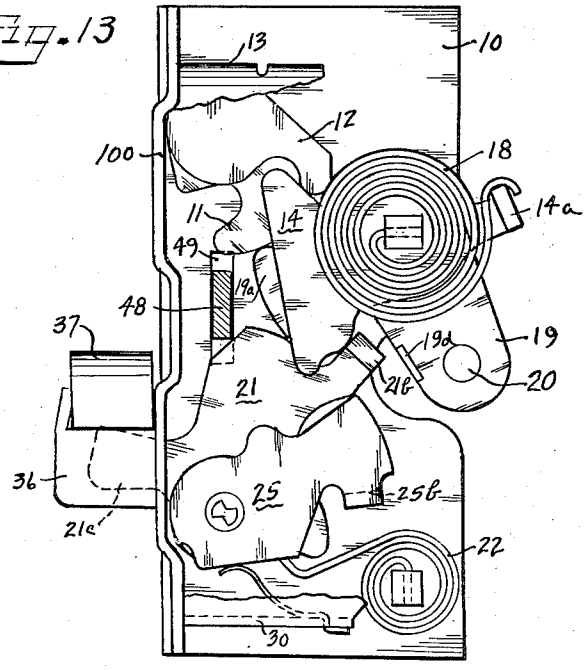



Fig. 14

Fig. 13




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# UNITED STATES PATENT OFFICE

2,582,925

## AUTOMOBILE DOOR LOCK

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Application March 12, 1947, Serial No. 734,266

9 Claims. (Cl. 70—141)

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This invention relates to a door lock, and more particularly to a door lock structure for use on automobile doors.

In accordance with the principles of my present invention, I provide an automobile door locking structure that is so constructed and arranged as to offer certain new and novel advantages over heretofore known door locks.

In this locking structure there are embodied several features that are especially advantageous for installation on automobile doors. One of these features is the provision of means for effectively unlatching, locking or unlocking the door from both the inside and the outside of the auto. Also, there is provided means for preventing the moving of the lock structure into locked position while the door is open or unlatched. This latter feature is instrumental in preventing the lock from becoming jammed or injured.

It is an important object of this invention to provide improved means for locking an automobile door against entry from the outside.

Another object of this invention is to provide improved means for preventing the door from rattling when it is in the latched position.

A further object of this invention is to provide improved means for unlatching a door lock structure from the inside of the automobile.

Another object of the invention is to provide improved means for positively blocking the movement of the outside rollback lever by a manipulation of the inside handle.

Another feature of this invention is the use of an intermediate spring loaded lever in the outside bolt retracting mechanism operative on one of a pair of outside rollback levers to grip an outside door handle shaft disposed in an opening in the levers in a scissors-like engagement thus preventing rattling of the outside door handle.

A further feature of this invention is the provision of means for locking an auto door through the use of an outside door key to move a locking lever in locking position for positively rendering the outside rollback lever inoperative.

A still further feature of this invention is the provision of an inside door handle retracting lever operative independently of the spring loaded lever which holds the outside door handle against rattling.

Other and further objects and features of this invention will be apparent to one skilled in the art from their disclosures in the specification

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taken in connection with the accompanying drawings.

On the drawings:

For a better understanding of the drawings, which will be presently described, it may be pointed out that the locking structure is assembled on a face plate formed to provide two plate portions nearly at right angles to each other. The plate portion which is to be mounted on the opening edge of the door and which carries the rotor assembly for contacting the striker plate on the door post will hereinafter be called the rotor plate. The other plate portion, which fits into position parallel to the inside wall of the door and on which is mounted the rollback means, will hereinafter be called the rollback plate.

Figure 1 is a sectional view from a plane on the line I—I of Figure 2 of a locking structure embodying the principles of my invention, showing the locking mechanism mounted on the rollback plate with the lock in its fully latched but unlocked position and also showing, with parts broken away, the door operating mechanism actuated by the inside door handle.

Figure 2 is a side elevational view of the locking mechanism mounted on the rotor plate, omitting all of the mechanism which is mounted on the rollback plate, and showing the take-up arm in take-up position on the rotor segment, as in the case when the door is latched and held latched by the rotary bolt.

Figure 3 is a fragmentary, sectional view taken substantially on line III—III of Fig. 1, in association with an elevational view of the striker plate of the keeper structure mounted upon the door post, illustrating the position of the rotor and the safety catch arm as the door approaches a closed position.

Figure 4 is a fragmentary, sectional view with the keeper structure in elevation, similar to Fig. 3 but showing the relative positions of the parts beyond the safety latch position and just prior to the door becoming latched by the rotary bolt.

Figure 5 is a fragmentary, sectional view with the keeper structure in elevation, similar to Figs. 3 and 4 but with the parts in their relative position after the door has been fully latched.

Figure 6 is a side elevational view, partly broken away, of the inside handle mechanism and the locking mechanism mounted on the rollback plate showing the safety latch retracted by the inside handle mechanism.

Figure 7 is a side elevational view of the locking mechanism mounted on the inside of the

rotor plate, showing the take-up arm out of engagement with the rotor segment, as in the case when the door is open.

Figure 8 is a side elevational view, partly broken away, of a locking mechanism mounted on the rollback plate showing the key operated locking plate in locked position.

Figure 9 is a fragmentary sectional view taken substantially on line IX—IX of Fig. 1.

Figure 10 is a fragmentary sectional view taken substantially on line X—X of Fig. 1.

Figure 11 is a fragmentary sectional view taken on line XI—XI of Fig. 1.

Figure 12 is a top plan view of the door lock.

Figure 13 is a sectional view similar to that of Figure 1 but showing the outside handle shaft operated to retract the safety latch.

Figure 14 is an end elevation of the keeper, viewed looking toward its entering end.

With reference to Figures 1 to 11 inclusive, the locking mechanism of my invention here shown is one adapted to be used on either of the front or on either of the rear doors of a four door automobile, or in the case of a two door model on either one of the two doors. As previously stated, the main locking structure is assembled on a plate formed to provide two plate portions disposed at substantially right angles to each other. Although these plate portions are ordinarily formed from a single plate by bending the plate, they will be hereinafter referred to as though they were separate plates, one being identified as the rotor plate and the other as the rollback plate.

As illustrated in Fig. 1, reference numeral 10 indicates the rollback plate. A hook-shaped lever 11 is pivotally mounted in a circular aperture in the rollback plate 10 by means of an axially extending cylindrical boss 11*a*, as seen in Fig. 11, disposed in the aperture in the rollback plate 10. Positioned adjacent lever 11, and mounted for co-axial movement therewith is an outside rollback lever 12 which has an axially extending cylindrical boss 12*a* adapted for pivoting in a circular opening in a cover plate member 13. Besides acting as a pivotal support for roll-back lever 12, the cover plate 13 also holds both levers 11 and 12 on the plate 10, being secured to plate 10 in any suitable manner after the levers 11 and 12 have been assembled therein.

Each of the rollback levers 11 and 12 is equipped with a square aperture extending therethrough. A shank 9 of an outside door handle is adapted to be inserted into the square apertures in the bosses 11*a* and 12*a* when they are in line with each other. After the shank of the outside door handle is inserted in the square apertures the rollback levers may be revolved with the shank counterclockwise as seen in Fig. 1, until the upper edge of the lever 11 abuts the horizontally extending flange 13*a* of the cover member 13. However, the square aperture in the lever 12 is so located that the upper edge of lever 12 cannot quite rotate into contact with flange 13*a*. It will be seen therefore that, if the lever 12 is then yieldably urged to rotate further, as by a spring, there would be a scissor action by levers 11 and 12 taking effect upon the shank of the outside door handle which will tend to grip the shank firmly and prevent it from rattling in the door.

In this invention the lever 12 is constantly biased in a counterclockwise direction by means of a spring loaded outside retracting lever 14 which is mounted for pivoting about stationary



disk bearing members 15 and 16 secured by a U-shaped clip 17 to the rollback plate 10. A coil spring 18, anchored at one end in the clip 17, has a hooked outer end 18*a* which is engaged over an upwardly projecting end flange portion 14*a* of the outside retracting lever 14 so that the lever will always be urged in a clockwise direction against the upper rollback lever 12. Thus the lever 12 will be urged in a counterclockwise direction by the spring actuated lever 14 causing the shank of the outside door handle to be held securely against rattling.

Disposed between the lever 14 and roll-back plate 10 is an inside retracting lever 19 which also has a cylindrical opening adapted to be positioned over the stationary disk 16 for pivoting thereon as seen in Figure 9. It is to be noted that the clip 17 passes through the plate 10 and its ends are bent outwardly thereon thus holding the spring 18 and the levers 14 and 19 pivotally supported on the plate 10.

The inside retracting lever 19 has a forward hook portion 19*a* swingable into position as shown in Fig. 8 behind the hook portion 11*d* of the lever 11. When the hook portion 19*a* is so positioned, it will be releasably retained there by the inside handle assembly and will block the clockwise rotation by means of the outside door handle of the levers 11 and 12.

An arm 19*b* of the retracting lever 19 has an opening for receiving a pin 20 by which the retracting lever may be pivotally attached to an inside door handle mechanism, to be described hereinafter.

There is also provided an elbow portion 19*c* on the lever 19 which will, upon counterclockwise rotation of the lever, contact an upstanding arm 21*a* on the safety latch 21, which has an axially extending cylindrical boss 21*d* disposed in a cylindrical opening of the rollback plate 10 for pivoting therein, as seen in Fig. 10.

A laterally extending flange 21*b* on the arm 21*a* will be contacted by a lower edge 14*b* of the lever 14 when the latter is rotated in a counterclockwise direction by the rollback lever 12, to thereby retract the safety latch by clockwise rotation about its pivotal axis.

The latch 21 also has a latching nose 21*c* which extends through the rotor plate 100 to engage the keeper. A spring 22 is anchored at one end 22*a*, to a clip 22*b* (similar to clip 17) secured upon plate 10 and has a free end 22*c* biased against the under edge of the safety latch 21 as shown to yieldably oppose any clockwise rotation of said latch 21.

Means for locking the structure is provided by a locking lever 25 mounted coaxially with latch 21 and in sliding contact therewith. This lever 25 is provided with a projection 25*a* at one side thereof which is adapted upon being rotated counterclockwise to come to rest in a limiting position against a spring carried by the take-up lever in the rotary bolt assembly. In the unlatched position of the door lock, the contact of this spring by projection 25*a* will prevent the locking lever from being moved into its fully locked position by the key, for example, when the door is open. However, when the rotary bolt has been latched by closing of the door, the take-up lever spring will have moved into such a position as to allow the projection 25*a* to move closer toward the rotor plate and thus allow the lock lever to be put into locked position.

There is further provided on the locking lever

25 a lateral flange 25b bent toward plate 10 which will, upon counterclockwise rotation of the locking lever into locked position, assume a position immediately adjacent the arm 21a, as seen in Fig. 8. Thus, if thereafter the safety latch 21 is rotated clockwise by the inside handle mechanism it will contact the flange 25b of the locking lever 25 and move the locking lever clockwise out of locked position.

On the lower edge of the locking lever 25 there is provided a notch 25c which is adapted to receive in the locked position of the locking lever 25 the free end of a spring member 26 whose other end is anchored by extending it through a slot in a cover plate 30.

As best seen in Fig. 10, the cover plate 30 has a downwardly extending boss 30a which fits into a cylindrical recess of the locking lever 25 thus providing pivotal bearing support for the locking lever. At its lower edge the cover plate 30 has a portion bent laterally for projection through an aperture in the cover plate 10 on the back of which it is bent or peened over, to thus secure the locking lever 25 and the dogging lever 21 securely on the rollback plate 10.

Referring to Fig. 2 it will be seen that on the inner side of the rotor plate 100 there is mounted a take up mechanism while on the outer side of the plate and shown in dotted lines in Fig. 2 there is mounted a rotor bolt 35 in a rectangular box-shaped housing 36 closed at its ends, sides and bottom but having an open top. The rotor 35 is a substantially V-shaped member having a setting arm 37 and a locking arm 38 and being pivotally mounted on a stud 39 which is fixed at one end in the housing 36 and at its other end in the rotor plate 100. Near the outer end of the locking arm 38 a stud 40 is secured therein and extends through an arcuate opening 41 in the rotor plate 100, on which stud is pivotally mounted a take-up lever 42.

The lever 42 lies substantially adjacent the rotor plate 100 on the inner side. A coiled spring 43 surrounds the stud 40 and at one end is anchored by crimping it in the kerf 43a provided in the stud 40, while its free end 43b is hooked over an abutment arm 44 formed on the lever 42. The inner end 39a of the rotor stud 39 provides a stop for engagement by the lower edge of the lever arm 44 when the stud 40 is at the lower end of the slot 41, so that the spring 43 cannot then rotate the take-up lever 42. However, as the rotor 35 is rocked by contact with the keeper and the stud 40 carries the take up lever 42 bodily upward, the arm 44 will move away from the stop 39a so that the spring 43 will be free to urge the take-up lever 42 about the stud 40 in a counterclockwise direction as viewed in Fig. 2.

A stud 46 extends inwardly from the rotor plate 100 adjacent the outer edge thereof to form a fulcrum support for the one end of a rotor segment 47, the upper edge of which is serrated or provided with a toothed or wave-like contour, as at 47a. The take-up lever 42 is provided at its upper end with a laterally extending flange or tongue 42a having a curved edge 42b adapted to extend over the upper edge of the segment 47. Said segment 47 has an arm 48 which is downwardly offset from the upper edge 47a and which extends through a slot 49 in the rollback plate 10. When the safety latch 21 is fully projected, the end of the arm 48 rests upon the upper edge thereof, as illustrated in Fig. 1, to prevent downward movement of said arm 48, whereas if the latch 21 be retracted



when the door is fully closed, as illustrated in Fig. 6, it no longer supports the arm 48 which then is free to drop and thereby effect a disengagement between the tongue 42a and the upper edge 47a of the segment 47, whereupon the take-up lever 42 is free to move to unlatched position as the door is being opened.

The operation of the locking mechanism will now be described.

Latching of the door is accomplished in the following manner. Let us assume that the door is open. The relative position of the elements of the locking mechanism will then be as illustrated in Figs. 1 and 7. The safety latch 21 yieldably retains the position shown in Fig. 1 due to the counterclockwise torque imposed upon it by the spring 22. During closing of the door, the nose 21c of the latch 21 engages the keeper structure mounted on the door post.

As illustrated in Figs. 3, 4 and 5, the keeper structure K provides a channel 60, the middle portion of the upper wall of which is deflected downwardly to provide an upper strike surface 61 in the channel. The lower wall of the channel is deflected upwardly to provide a high point 62 preceded by a gradually inclined strike surface 63, and beyond the high point a safety shoulder 64 ahead of the recess 65.

It is to be noted that Figs. 3, 4 and 5 are drawn to illustrate the mechanism on a door which is so mounted on the auto as to cause the rotor housing 36 to approach the keeper in an upwardly slanted direction. When the door is swung from open position for closing thereof, the nose 21c on the safety latch 21 will encounter the inclined strike surface 63, thereby causing the latch 21 to be rocked in a clockwise direction against the resistance of the spring 22. As closing of the door continues, the nose 21c rides up along the guide surface 63 and along intermediate horizontal portion of the camming surface 62 until it reaches the shoulder 64, whereupon the nose of the safety latch is free to drop under the positive action of the spring 22 into the recess 65.

The door is now in its safety latched position with the relative positions of the elements of the locking mechanism again as shown in Fig. 1. From the instant that the safety latch drops down beyond the shoulder 64, the door will be safety latched and cannot be opened from this position until the safety latch arm is swung out of the recess 65 by means of the release action of either the inside door handle or of the outside door handle.

After the safety latch arm has dropped into the recess 65, and the movement of the door is continued toward full latched position, the setting arm 37 of the rotor 35 comes into engagement with the inclined upper strike surface 61 in the keeper channel, as shown in Fig. 4. Further closing movement of the door causes the rotor 35 to be rocked upon its fulcrum stud 39, thereby rotating the locking arm 38 of the rotor in a counterclockwise direction. Meanwhile the spring 43 tends to urge the lever 42 in a counterclockwise direction and thereby to keep the lower edge of its arm 44 against the stud 39, but the take-up lever 42 being supported on the post 40 will move bodily therewith in a counterclockwise direction about the stud 39 when the rotor arm 37 is so revolved. However, when the tongue 42a of the take-up lever 42 hits the vertical shoulder on the segment 47 at 47b, it will be forced upwardly in substantially a vertical di-

rection upon the continued rotation of the rotor arm 38. Thus, the lower edge of the arm 44 on the lever 42 is moved away from the stud 39 against the action of the spring 43. When, in its upward movement, the curved flange 42b, on the take-up arm reaches the serrated surface 47a, the action of the spring 43 will move the tongue 42a to the left along the surface 47a to the extent caused by the further latching rotation of the rotor 35. This surface 47a lies generally along an arc such that the further the tongue 42a moves to the left along the segment 47 the closer the spring 43 will cause the lower edge of arm 44 of the take-up lever 42 to approach the stop 39. However, in the total travel across said serrated surface, the arm 44 will never come to rest on the stud 39 and therefore there is, for any position of the tongue 42a on the cam surface, a strong force due to the spring 43 tending to press said tongue 42a firmly against said serrated surface 47a.

At the same time, as the tongue 42a is moving to the left across the surface 47a, the arm 38 of the rotary bolt is rotated upwardly for engagement with the rear inclined surface 66 on the keeper K until it reaches the position illustrated in Fig. 5.

Fig. 5 assumes that the door has been pushed hard enough to compress the rubber bumpers with which a door is usually equipped, and after release of the closing force the door has sprung out far enough to cause the latching head 38 of the rotary bolt to rest snugly against surface 66 on the keeper. In this position the door is latched and cannot be opened until the rotor 35 is free to revolve about its fulcrum pin 39 in a clockwise direction. In the latched position, the rotor 35 cannot revolve in a clockwise direction because the tongue 42a, which is an integral part of the rotor take-up lever 42, is now up on the serrated surface 47a of the rotor segment 47, which in turn, cannot move in a clockwise direction, or downwardly, because its projecting arm 48 is prevented from moving in a vertical direction by the safety latch 21, the under surface of the arm 48 then resting upon the upper edge of said safety latch, as shown in Fig. 1.

With the locking mechanism in the position illustrated in Fig. 1 and the rotor 35 in the position illustrated in Fig. 2, the combined effect of the door bumpers and the inclined surface 66 of the keeper against the locking arm 38 is to press the tongue 42a more firmly down upon the surface 47a of the segment 47 augmented whenever a force is exerted against the door tending to open it, provided there is no concurrent use of the door handle release means. Such a force, for instance, would be exerted against the door if a person or object were accidentally to lean or be thrown against the inside of the door. Thus, while the tongue 42a may move counterclockwise across the surface 47a only as far as is determined by the extent of the closing of the door toward the door post, said tongue 42a will nevertheless be held in tight engagement with the surface 47a for any position therealong that the tongue 42a may assume. The provision of a serrated, notched or wavy cam surface 47a on the segment 47 nullifies the effect of vibration on the holding qualities of tongue 42a, so that no amount of vibration by itself can loosen the engagement of the tongue 42a with the surface 47a, although such vibration may produce a tightening effect due to the continued biasing action of the spring 43 tending to move the tongue 42a into tight engagement with the surface 47a.

The pressure which the tongue 42a of the take-up lever 42 exerts on the surface 47a acts through a moment arm about the center of the stud 46 and thus causes the segment 47 to exert a pressure on the safety latch 21. The tighter the door is closed, the shorter will be this moment arm since the tongue 42a will move further up along the camming surface 47a closer to the pivot 46. Thus, the moment arm is being shortened, and though the pressure of the tongue 42a on the surface 47a is being increased due to the greater reaction of the bumpers upon tighter closing of the door, the pressure of arm 48 of segment 47 on the safety latch 21 will remain substantially constant. Hence, the force required for releasing the latch 21 from under the arm 48 will remain nearly constant for all closed positions of the door, a valuable feature not often found in door locks.

The unlatching and opening of the door will now be described. From the preceding discussion it is evident that the only way in which the door may be unlatched from fully latched position is to move the safety latch 21 from under the arm 48 of the segment 47. This will allow the segment 47 to swing downwardly about the stud 46, permitting the tongue 42a to slide back along the surface 47a whenever the surface 66 of the keeper exerts a force on the rotor locking arm 38 tending to rotate said locking arm in a clockwise or unlatching direction. The latch may be withdrawn from under the arm 48 by either one of two methods.

In accordance with one of these methods, the latch 21 may be rotated from under the arm 48 by use of the outside door handle shank 9. As previously described this shank is held in a scissors-like grip between the levers 11 and 12. If these levers are rotated by the shank clockwise as viewed in Fig. 1, the lever 12 will contact the release lever 14 causing it to be rotated in a counterclockwise direction (see Fig. 13) about its pivot and thus cause the lower edge 14b of said lever to contact the flange 21b of the latch 21 and rotate the latter in a clockwise direction thus moving the latch from under the arm 48 of the segment 47. When the safety latch 21 is moved from underneath the arm 48, the rotary bolt is released, the door is unlatched and may be opened by an outward pull on the door handle.

A second method of unlatching the door is by means of the inside door handle mechanism. As illustrated in Fig. 1, the inside door handle mechanism includes an inside door handle 71 secured to a shaft 72. A downwardly extending lever arm 73 is mounted upon said shaft 72 and at its lower end is pivotally connected, as at 74 to the free end of remote control link 75 which is pivotally connected to the retracting lever 19. The lever 73 is held on the base plate 76 of the inside door handle mechanism by means of a cover plate 77 which completely covers the upper end of lever 73 and has downwardly extending arms which project through the base plate 76 and are bent over on the rear side thereof to secure the cover member onto the base plate 76. A spring member 78 is disposed about the shaft 72, having one end anchored on a laterally extending tab 78a of the cover member 77 and the other end abutting the flange 77a of the cover plate 77, which flange is secured to the plate.

There are two detent portions 79 and 80 formed on the upper edge of the lever 73 on opposite sides of a knob 81. A spring 82, having a down-

wardly hooked free end 82a and being anchored at the other end in opening 77b in the cover plate 77, is adapted to engage its outer end 82a in the detents 79 or 80 upon the selective operation of the door handle 71. When the spring 82 is in either of these detent positions the lever 73 is thereby held in its corresponding position.

If the inside door handle 71 is moved in a counterclockwise direction as viewed in Fig. 1 it will, through the action of the strap 75 rotate the retracting lever 19 in a counterclockwise direction about its pivot point causing its elbow 19c to contact the arm 21a of the safety latch, rotating the latter in a clockwise direction from underneath the arm 48 of the segment 47, thus releasing the take-up lever 42.

It is to be noted that, in the unlatching movement of the inside door handle, the outer end 82a of the spring 82 is riding along the substantially smooth upper edge of the lever 73 and has no holding power or function. However the projection 73a on lever 73 will have picked up the free end of spring 78 and rotated it away from flange 77a on cover 77—hence the spring will tend to return the lever to normal.

Thus it is seen that the door locking structure of this invention is arranged for unlatching from either the outside or the inside of the automobile.

It should be noted that if the door has been only partially closed with the safety catch nose 21c lying in the recess 65 of the keeper K, either of the above mentioned releasing methods would result in the withdrawal of the nose 21c from the recess 65, since the nose 21c is an integral part of the latch 21 and rotates when said dogging lever rotates. The unlatched position of the safety latch is shown in Fig. 6.

The locking of the door will now be described. Referring to Figs. 1 and 8, the door may be locked by either of two methods. From the outside, locking may be accomplished by revolving the usual square spindle of the key lock, details of which need not be shown. When the spindle is revolved in a counterclockwise direction, the locking lever 25 will be also rotated in a counterclockwise direction and will be positioned, as in Fig. 8, directly under the lower edge of the outside release lever 14, so that any attempt to rotate the outside door handle to unlatch the door will be blocked due to the fact that the locking lever will prevent rotation of the intermediate member 14 which in turn will block the rotation of the rollback lever 12. Thus the door may be locked against entry from the outside. It should be noted, however, that the locking lever 25 is pivotally mounted for rotation independently of the latch 21. Thus, even though the outside key lock has been turned to render the outside door handle mechanism ineffective, the inside release mechanism, by operating the handle 71, is still effective to operate the retracting lever 19 to retract the latch 21 and unlatch the door from the inside. Furthermore, the laterally extending arm 25b of the locking lever 25 will come to rest (in the locked position of the locking lever) at a point adjacent the side of the safety latch 21 and when the latch 21 is rotated clockwise by means of the inside door handle mechanism, the rear edge of the safety latch will contact the arm 25b and rotate the locking lever 25 out of locking position.

The second method of locking the door is by use of the inside door handle mechanism. When the inside door handle 71 is rotated clockwise as viewed in Fig. 1, the strap 75 and consequently the retracting lever 19 will be moved to the left, the lever 19 pivoting about its pivot point. In its movement to the left the upper hooked end 19a of the lever 19 will take the position shown in Fig. 8 engaging the lower end 11d of the lever 11, thus preventing downward movement of the lever 11 by means of the outside door handle and hence any rotation of that handle.

It is to be noted in Fig. 1 that when the door handle 71 is moved clockwise the spring 82a will be forced upwardly by the knob 81 and will come to rest in the detent 79. The force exerted by the spring and the configuration of the detent 79 will cooperate to hold the inside handle mechanism in the locked position and will prevent the retracting lever 19 from being rotated counterclockwise by the lever 11.

The safety catch arm 21b can also unlock this mechanism if it has been placed in locking position by the inside door handle mechanism when the door is open. When the latch 21 is moved clockwise as by operation of the safety latch nose 21c striking the lower strike surface 63 in the keeper, if the door be slammed, the upper end of the arm 21a will contact the forward edge of the retracting lever 19 as at 19d (see Fig. 8) and cause the lever to be rotated counterclockwise to withdraw hook 19a out of the locked position. Thus if the door is inadvertently locked by means of the inside door handle mechanism when the door is open, it will be moved out of locked position upon the slamming of the door.

Should the driver unlatch the door from the inside as indicated in Fig. 6 and then change his mind before actually opening the door the safety latch may be forced back again under the rotor segment arm 47—48 to re-latch the door, merely by swinging the inside handle mechanism to the inside dogging position illustrated in Fig. 8, during which movement a laterally offset flange 19d on lever 19 will engage flange 21b and rotate the safety latch to projected position.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted thereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. In a door latch mechanism, in combination, a pivoted latch bolt, outside retracting means including an oscillatable rollback and an oscillatable release member pivoted at a point removed from the axis of said rollback and actuatable thereby for retracting the latch bolt, inside retracting means including an oscillatable lever movable independently of said release member having means for engaging and retracting the latch bolt upon movement in one direction and having other means for directly dogging said rollback upon movement in another direction, a key operable locking plate rotatable into position to block the bolt retracting movement of said release member, and cooperating means on said latch bolt and locking plate whereby retracting movement of the latch bolt operates to return said locking plate to unlocked position.

2. A door lock structure comprising a support member, a pivoted latch mounted on said support member, rollback means associated with said latch for moving it from latched position including two coaxial levers and a stop positioned to be

engaged by one of said levers, an outside door handle shank of rectangular cross-section in operative relation with said levers and a spring urged lever operable to engage and retract said latch and disposed to pivot one of said levers and yieldably hold the other of said levers into engagement with said stop and effect a scissors-like grip on the rectangular cross-sectional portion of said outside door handle shank, and inside means independent of said rollback means for retracting said latch without disturbing said spring loaded lever.

3. A door lock structure comprising a main latching bolt, bolt-holding means movable into cooperative engagement as said main latching bolt moves into latching position, a lever having an arm movable into safety latching position by closing of the door, said lever being simultaneously movable into position to hold said means against disengagement, outside retracting means operable on said lever to retract said lever, and inside retracting means for said lever including means for positively blocking the retracting movement of said outside retracting means.

4. In a door latch mechanism, a pivoted latch, outside retracting means including a pivoted rollback and an oscillatable latch release member pivoted separately from said rollback and actuated thereby for rocking said latch, and inside retracting means including a second oscillatable member movable independently of said first latch release member in one direction to engage and release said latch and movable into another direction to dog said rollback, and an engaging connection between said latch and said second oscillatable member for rocking said second oscillatable member from said latch and withdrawing said second member from its dogging position upon movement of said latch to an unlatched position.

5. In a door latch mechanism, a pivoted latch, outside retracting means including a rockable handle shaft, a rollback operable thereby, a release member cooperable with said rollback and latch for retracting the latter and pivotally mounted at a point removed from the axis of said handle shaft, resilient means constantly acting on said release member for restoring said handle shaft to and holding it at a normal position, and inside retracting means including an oscillatable member mounted coaxially with said release member for selective engagement with said rollback and latch at spaced apart points, said oscillatable member being swingable independently of said release member in one direction to engage said latch to retract said latch and in another direction to dog said rollback.

6. In a door latch mechanism, a pivoted latch, outside retracting means including a rockable handle shaft, a rollback operable thereby, a release member cooperable with said rollback and latch for retracting the latter and pivotally mounted at a point removed from the axis of said handle shaft, resilient means constantly acting on said release member for restoring said handle shaft to and holding it at a normal position, and inside retracting means including an oscillatable member mounted coaxially with said release member and having spaced engaging surfaces selectively engageable with said rollback and latch and being swingable independently of said release member in one direction to engage one of said engaging surfaces with said latch and retract said latch and in another direction to engage the other of said engaging surfaces with said rollback and render said outside means ineffective to retract said latch.

7. In a door latch mechanism, a pivoted latch, outside retracting means including a rockable handle shaft, a pair of oscillatable plates pierced by said shaft, a spring loaded release member constantly in yielding contact with one plate and oscillatable thereby to contact and unlatch said latch, stop means contactible by the second plate only for restraining rotation of the shaft and first plate responsive to the spring action of said release member, inside handle control means operable independently of the outside retracting means operable to engage the latch for retracting said latch upon movement in one direction and operable to dog said second plate upon movement in another direction to thereby block the operation of said outside retracting means.

8. In a door latch mechanism, in combination, a pivoted latch, outside retracting means including an oscillatable rollback and an oscillatable release member pivoted at a point remote from the axis of said rollback and actuatable thereby for retracting the latch, inside retracting means movable independently of said release member including an oscillatable retractor having means for engaging and retracting said latch upon movement in one direction and means spaced from said first means and engageable with said rollback for directly dogging said rollback upon movement in another direction, and a key operable locking plate rotatable into position to block the latch retracting movement of said release member.

9. In a door latch mechanism, a pivoted latch, outside retracting means including a pivoted rollback and an oscillatable latch release member pivoted separately from said rollback, an arm on said latch engageable by said release member for retracting said latch, and inside retracting means including a second oscillatable member having two spaced engaging surfaces, said second oscillatable member being movable independently of said first member in one direction to engage one of said surfaces with said arm to release said latch, and in another direction to engage the other of said surfaces with said rollback and rock and dog said rollback, said second oscillatable member also having a third engaging surface, engaged by said arm on said latch during door closing movement and rocked thereby to withdraw said other of said engaging surfaces from its dogging position.

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