Feb. 13, 1940. H. A. PEARCE 2,189,992

AUTOMOBILE DOOR LOCK

Filed Oct. 20, 1937 6 Sheets-Sheet 1

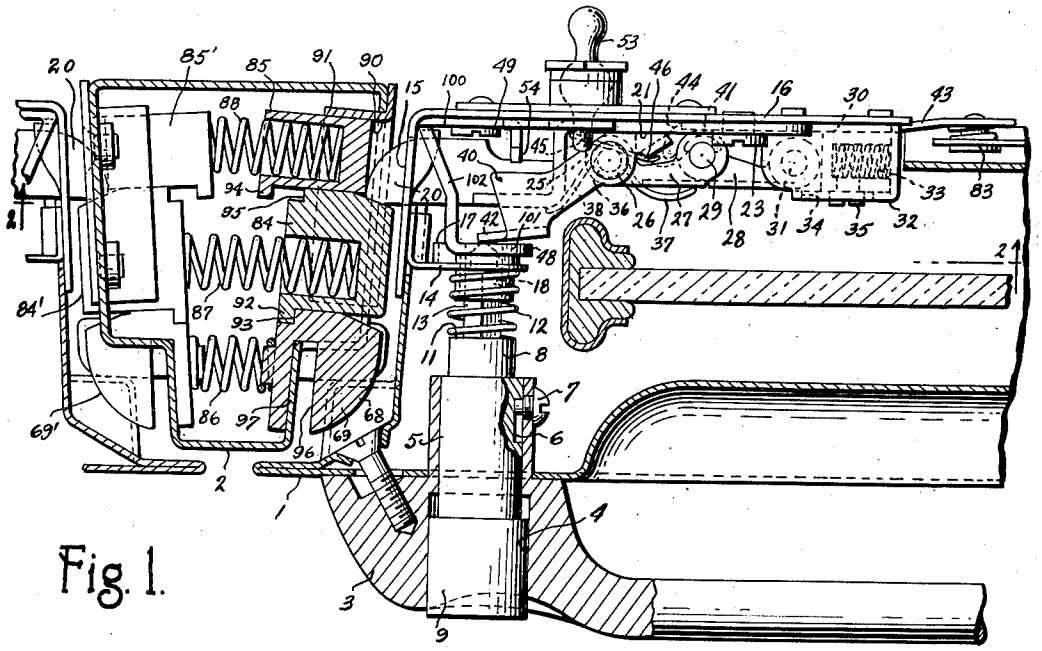

Fig. 1.

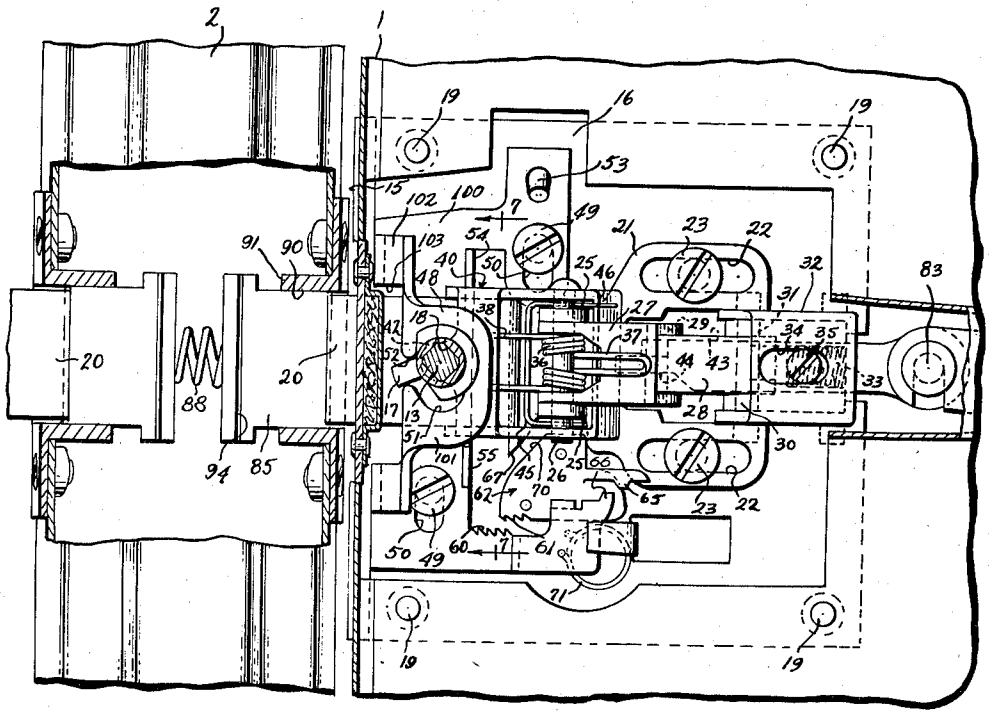

Fig. 2.

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Feb. 13, 1940. H. A. PEARCE 2,189,992

AUTOMOBILE DOOR LOCK

Filed Oct. 20, 1937 6 Sheets-Sheet 2

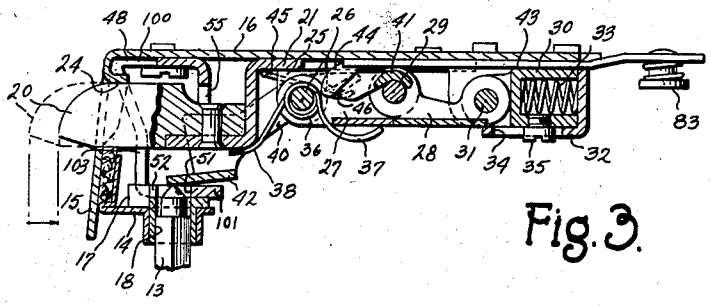

Fig. 3.

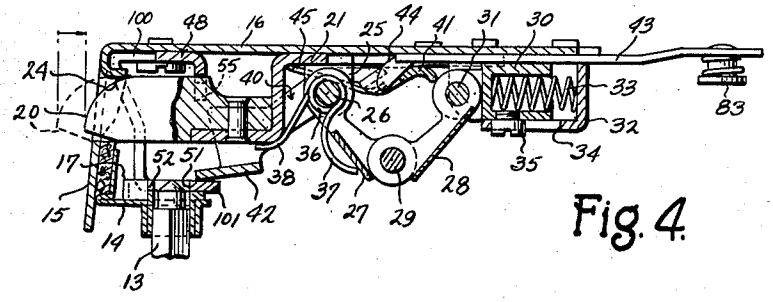

Fig. 4.

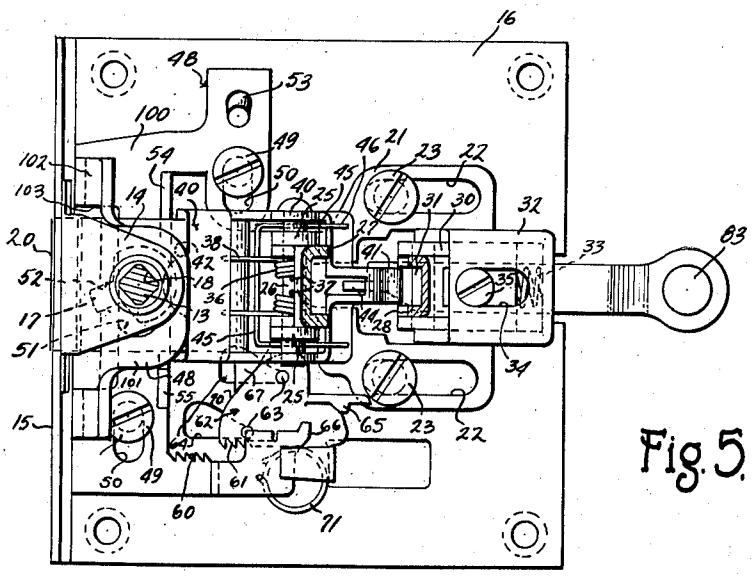

Fig. 5.

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AUTOMOBILE DOOR LOCK

Filed Oct. 20, 1937 6 Sheets-Sheet 3

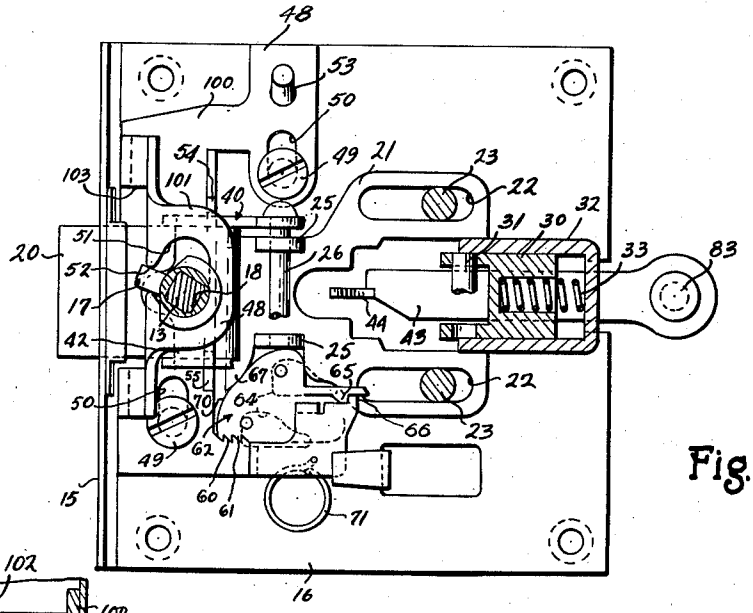

Fig. 6.

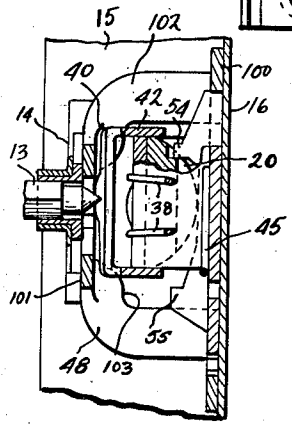

Fig. 7.

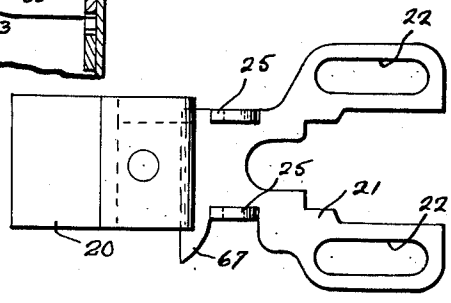

Fig. 9.

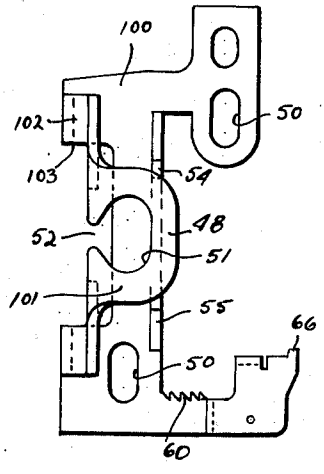

Fig. 8.

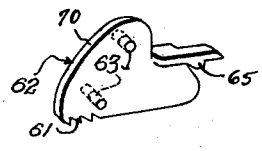

Fig. 10.

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AUTOMOBILE DOOR LOCK

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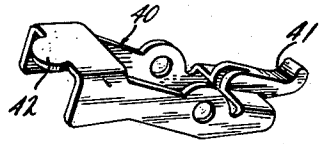


Fig. 11.

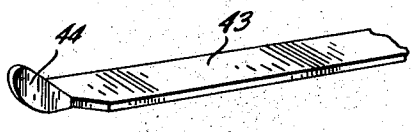
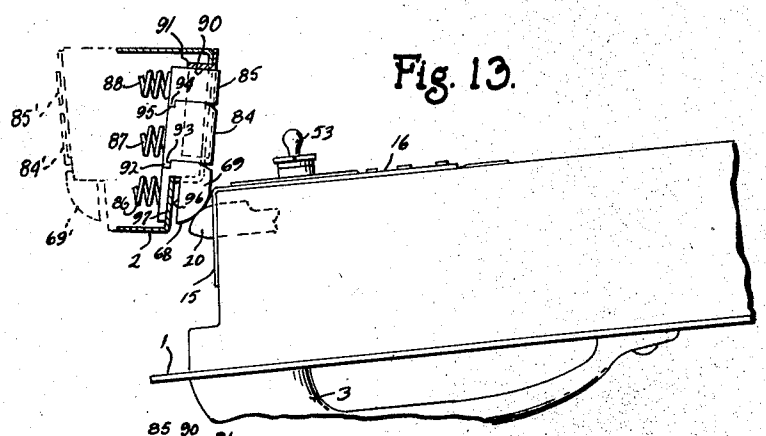


Fig. 12.

Fig. 13.



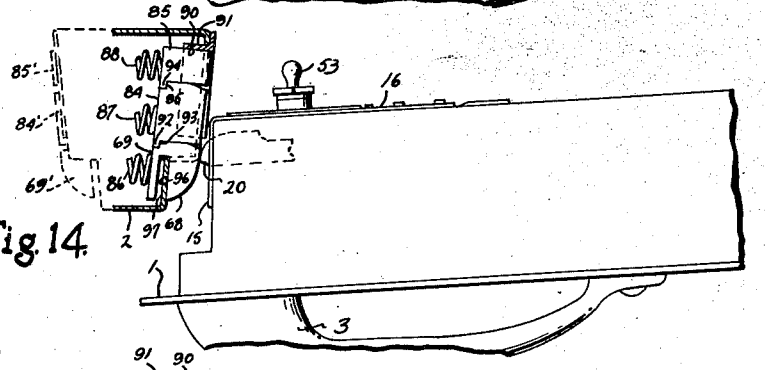


Fig. 14.

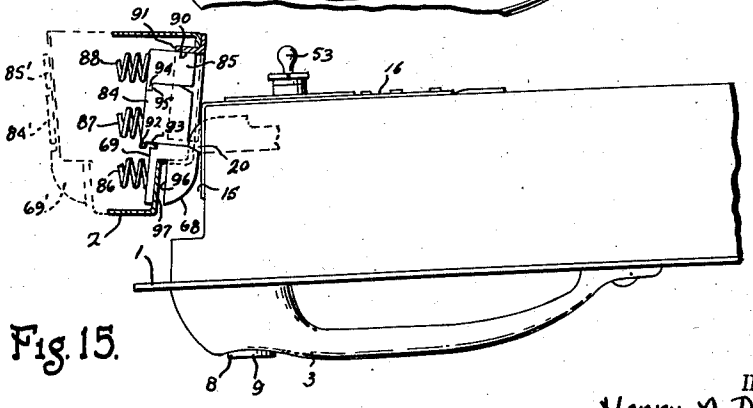


Fig. 15.

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AUTOMOBILE DOOR LOCK

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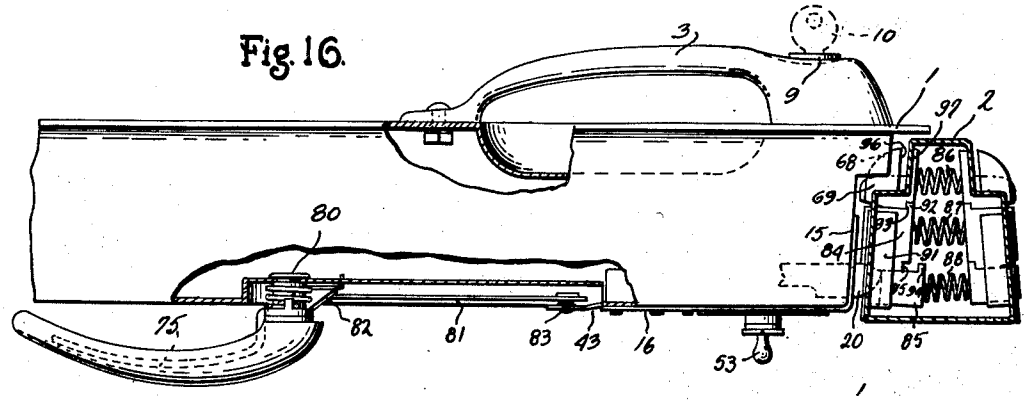
Fig. 16.



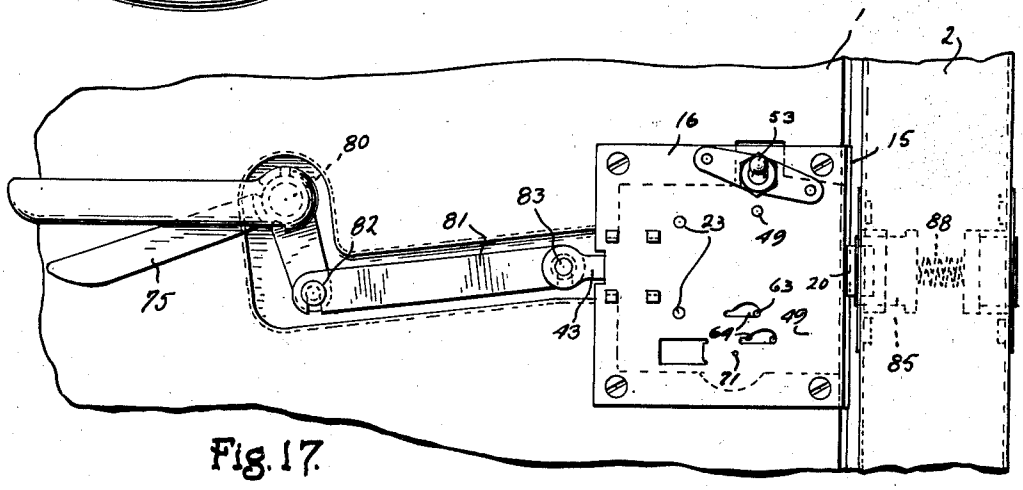


Fig. 17.

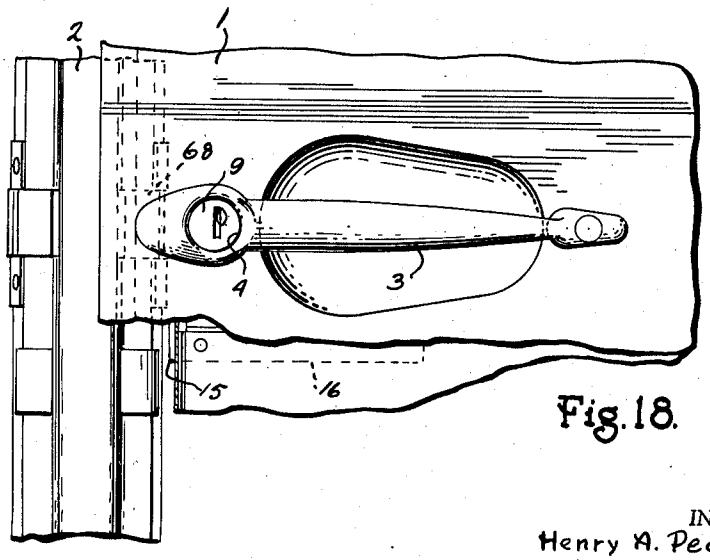


Fig. 18.

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AUTOMOBILE DOOR LOCK

Filed Oct. 20, 1937 6 Sheets-Sheet 6

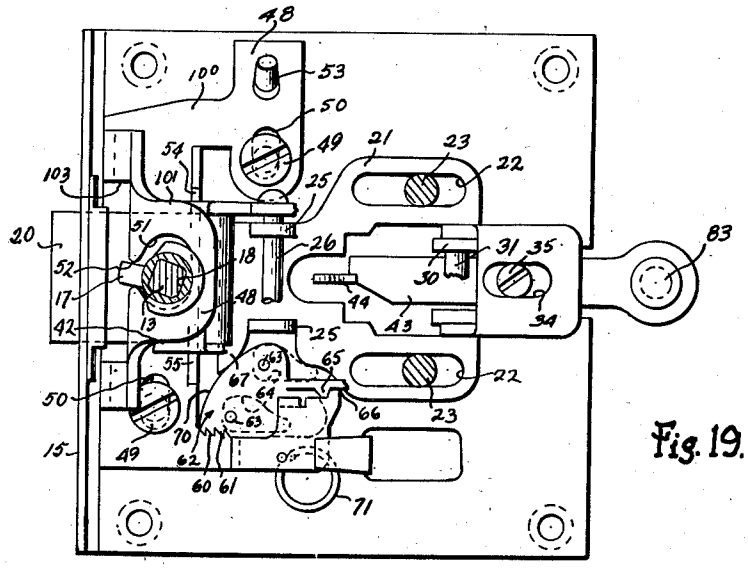

Fig. 19.

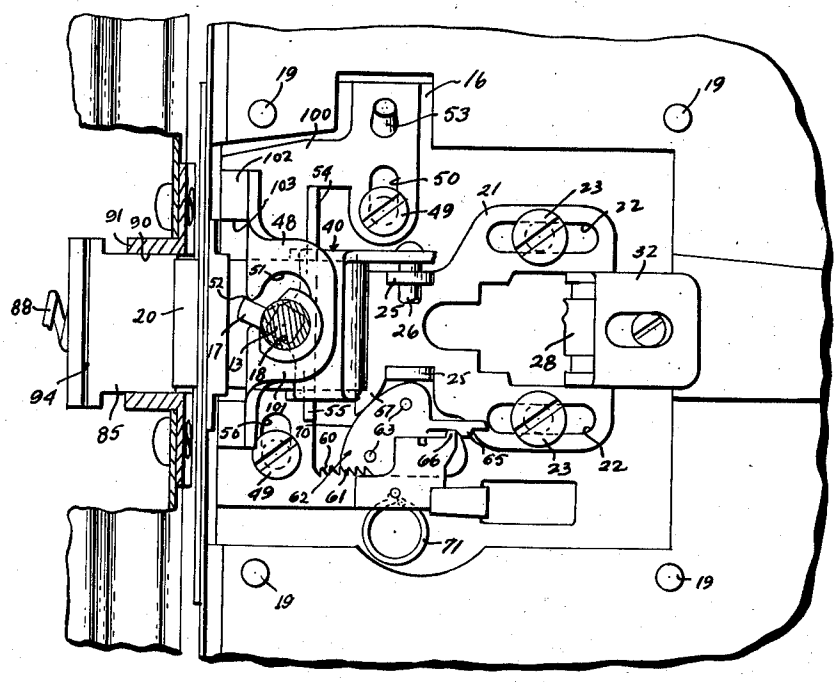

Fig. 20.

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Patented Feb. 13, 1940 2,189,992

UNITED STATES PATENT OFFICE

2,189,992

AUTOMOBILE DOOR LOCK

Henry A. Pearce, Detroit, Mich., assignor to Ternstedt Manufacturing Company, Detroit, Mich., a corporation of Michigan

Application October 20, 1937, Serial No. 170,069

9 Claims. (Cl. 70—150)

This invention relates to an automobile door lock and in particular to improvements in an automobile door lock of the toggle type.

The most customary automobile door lock used at present comprises a sliding bolt which is projected by a convolute spring. As the sliding bolt is retracted by rotation of the outside door handle and rollback, the bolt spring is loaded or compressed. Since retraction of the latch bolt is a necessary preliminary to opening the door, the more force required to retract the bolt, the more difficult it is to open the door.

It is the object of this invention to produce an automobile door lock having a bolt which can be retracted more easily than the sliding bolt in the above-mentioned conventional latch and in particular, to produce a latch having a bolt which can be retracted without compressing the bolt spring. This object has been achieved by combining the sliding latch bolt with a toggle which can be easily swung over center to permit full retraction of the latch bolt and without compressing the bolt spring.

In the drawings:

Fig. 1 is a horizontal sectional view through a portion of the door and the body pillar showing the door closed and latched.

Fig. 2 is a section along the line 2—2 of Fig. 1.

Fig. 3 is a horizontal sectional view through the latch showing the latch bolt and straightened toggle, the latch bolt being retracted half way which is the limit of the bolt retraction when the toggle is straightened.

Fig. 4 is a view showing the bolt fully retracted with the toggle broken.

Fig. 5 is an elevation of the lock with the toggle broken and the bolt fully retracted.

Fig. 6 is an elevation of the lock with the toggle parts omitted showing the lock, when the door is open, locked vs. operation from the outside except by means of a key.

Fig. 7 is a section along the line 7—7 of Fig. 2.

Fig. 8 is a detail of the locking slide.

Fig. 9 is a detail of the bolt.

Fig. 10 is a detail of one of the cams for automatically unlocking the outside push button.

Fig. 11 is a detail of the toggle tripping lever.

Fig. 12 is a detail of the remote handle operated retractor and cam for breaking the toggle.

Figs. 13, 14 and 15 are fragmentary sectional views illustrating the successive positions of the striker parts during the closing of the door.

Fig. 16 is a horizontal sectional view through the door and body pillar showing the door in latched position.

Fig. 17 is an inside elevation of the latch and remote handle.

Fig. 18 is an outside fragmentary elevation of the body pillar and door showing the outside door handle and push button.

Fig. 19 is a view showing how the retraction of the bolt in the closing of the door automatically unlocks the lock.

Fig. 20 is a view showing the locking slide plate in raised or locking position with the door closed.

Referring more particularly to the drawings there is shown an automotive vehicle door 1 and a body pillar 2. The door has affixed thereto the outside door handle 3. The fixed outside door handle 3 is provided with a cylindrical opening 4 in which is mounted a cylindrical sleeve 5. The sleeve 5 is provided with a slot 6 which receives the end of the screw pin 7. The pin 7 and slot 6 permit the cylinder sleeve 5 to slide longitudinally in the opening 4 but prevent turning of this cylinder sleeve in the opening.

A lock cylinder or plug 8 having a push button head 9 is slidably and rotatably mounted within the cylinder sleeve 5. The lock cylinder 8 is of the pin tumbler type and can be rotated from without the vehicle by a key 10. The cylinder 8 and rollback 17 are always rotated from within the body when the lever 53 is operated to raise or lower the plate 48. The lock cylinder 8 is provided with a shoulder 11.

A compression coil spring 12 is mounted over the reduced end 13 of the lock cylinder 8 between the shoulder 11 and bracket 14 which is fixed to the selvage plate 15 of the lock frame 16. The bracket 14 serves as a support bearing for the rotary rollback 17. The rollback 17 is provided with a square opening 18 into which fits the reduced end 13 of the cylinder 8 which is also of square cross section.

The lock frame 16 is fixed to the door by the bolts 19. The bolt is shown in Fig. 9 and comprises a bolt head 20 and a bolt plate 21 which is provided with the elongated openings 22. The bolt head and plate are mounted for rectilinear sliding movement on the frame 16 by means of the headed bolts 23 which pass through and slidably engage the plate 21 in the openings 22 and are screwed into the latch frame 16. The bolt head is also guided in the opening 24 in the selvage plate 15.

The bolt plate 21 is provided with a pair of perforated outwardly turned lugs 25 which carry the pin 26. The toggle lever 27 is pivotally mounted at one end on the pin 26 between the ears 25 and the other end of the toggle lever 27 is

pivotally connected to one end of the toggle lever 28 by the pin 29. The other end of the toggle lever 28 is pivotally connected to the slide 30 by the pin 31. The slide 30 is slidably mounted within the housing 32 which is fixed to the latch frame 16. The compression coil spring 33 is mounted between the slide 30 and the housing 32 and normally tends to maintain the slide 30 in projected position, as shown in Fig. 4.

For retaining the slide 30 within the housing 32, the housing 32 is provided with an elongated slot 34 which slidably receives the screw pin 35 which is screwed into the slide 30. A torsion spring 36 is also carried by the pin 26. One end 37 of the torsion spring acts against the toggle 27 and urges the toggle over center toward "made" position, as shown in Fig. 3. The other end 38 of the spring abuts against the bolt head 20. Thus, in "made" position the pin 29 of the toggle, as viewed in Fig. 3, is over center, or slightly above a line passing through the axes of pins 26 and 31.

As shown in Fig. 1, the pin 26 pivotally supports the tripping lever 40 (Fig. 11) for the toggle. One end of the tripping lever 40 is provided with a finger 41 which engages behind the pin 29. The finger 41 is thus positioned between the pin 29 and the remote handle retracting slide 43. The remote handle slide 43 is provided with a cam lug 44 which is arranged to slidably engage the finger 41 upon the retraction of the plate 43 to swing the tripping lever 40 clockwise about the pin 26 as viewed in Fig. 3. A spring 45 is positioned between the pin 26 and the bolt plate 21 and overlaps the tripping lever 40 as at 46 to normally urge the tripping lever counterclockwise, as viewed in Figs. 3 and 4, into engagement with the remote retractor plate 43.

The other end 42 of the tripping lever 40 has a sliding contact with the locking plate 48. The locking plate is shown in detail in Fig. 8. The locking plate is a stamping generally U shaped in section comprising side walls 100 and 101 and a front wall 102. The locking plate 48 is slidably mounted upon the latch frame 16 by means of the headed screws 49 which pass through and slidably engage the wall 100 in the elongated slots 50. The front wall of the plate 48 is provided with an opening 103 through which the bolt projects, Fig. 3. The wall 101 is provided with an opening 51 which receives the rollback 17. The rollback 17 engages the wall 101 in the mouth 52 of the opening 51 to raise and lower the lock plate 48. The plate 48 can also be raised and lowered from the inside of the car by the usual lever 53.

Wall 100 of the plate 48 is provided with projecting lugs 54 and 55. When the plate 48 is in raised position, as shown in Fig. 6, the lugs 54 and 55 engage under the end 42 of the tripping plate 40. This prevents the tripping plate 40 from swinging clockwise about the pin 26, as viewed in Figs. 1 and 3, and the push button 9 cannot be pushed inwardly to swing the tripping lever 40 clockwise about the pin 26. Thus, the lock is "locked" against operation from the outside except by means of the key 10. By turning the key 10 the cylinder 8 and rollback 17 can be swung counterclockwise to lower the plate 48 from the position shown in Fig. 6 to that shown in Fig. 2. This removes the lugs 54 and 55 from beneath the tripping lever 40 and when the push button 9 is pushed inwardly against the tension of coil spring 12 the reduced end 13, which passes through opening 51 in wall 101 of the plate 48, engages lever 40 and swings the same clockwise as viewed in Figs. 1 and 3 to break the toggle. As herein used "toggle" refers to the toggle levers 27 and 28 which are pivoted to each other as at 29 and to the bolt and slide by the pins 26 and 31 respectively.

When the locking slide plate 48 is in raised position, Fig. 6, to lock the lock against outside operation except by means of a key, the toothed edge 60 of the plate 48 meshes with the teeth 61 of the lock releasing member 62. The member 62 is provided with a pair of pins 63 which have a floating engagement with the lock frame 16 in the openings 64, Figs. 6 and 17. This permits the plate 62 to slide upon the frame 16. The plate 62 is also provided with a pawl 65 which interengages with a lug 66 on the slide plate 48. The latch bolt plate 21 has a cam lug 67.

In Fig. 6 the lock is shown in locked position, that is, the lugs 54 and 55 prevent operation of the tripping plate 40 by the push button 9. Thus the lock at this time is "locked" within the meaning of the term "locked" as herein used. If the lock is locked while the door is in open position (Fig. 6 so illustrates the lock), then upon closing the door the bolt head 20 engages the cam face 68 of the first section 69 of the striker. The cam surface 68 retracts the bolt, that is, slides it to the right as viewed in Fig. 6. At this time the cam lug 67 engages the cam face 70 of the tripping member 62 and since lug 65 interengages lug 66 on plate 48, member 62 cannot move to the right and therefore cam lug 67 cams the member 62 downwardly. Fig. 19 shows the lock in the process of being automatically unlocked with the lock parts in positions intermediate those shown in Figs. 6 and 2. As the plate 62 moves downwardly, it moves the plate 48 vertically downwardly until the snap over center spring 71 throws the plate 48 to its completely lowered and released position, shown in Fig. 2. The snap over center spring 71, which has one end connected to the frame 16 and the other to the plate 48, upon snapping over center releases the teeth 61 from teeth 60 and pawl 65 from lug 66 which permits the plate 62, upon further retraction of the bolt 21, to travel with the bolt. Thus, if the lock is locked while the door is open, in closing the door the striker section 69 retracts the bolt and the cam lug 67, acting through plate 62, lowers the locking plate 48 and removes the lugs 54 and 55 from beneath the tripping lever 40. This unlocks the lock and again permits one to retract the lock bolt by pushing in on the button 9.

The latch is provided with a remote handle in the form of a bell crank lever 75 pivotally mounted on the door as at 80. A link 81 is pivotally connected as at 82 to the bell crank lever 75 and as at 83 to the remote retractor plate 43.

The latch bolt striker consists of three parts 69, 84 and 85 which are backed up by the compression springs 86, 87 and 88 respectively. The keeper parts 69, 84 and 85 are slidably retained in the opening 90 in the body pillar 2. The opening 90 is provided with the guide flange 91. The flange 91 permits the keeper parts 69, 84 and 85 to slide transversely of the pillar 2, as shown in Figs. 1 and 2, but positively prevents any vertical sliding movement by these keeper parts. The keeper part 84 is provided with a shoulder 92 which engages the recessed corner 93 of the keeper part 69. The keeper part 85 is provided with a shoulder 94 which engages with the recessed corner 95 of the keeper part 84. The keeper part 69 is provided with a recess 96 which receives the part 97 of the pillar 2. The recess

96 is wider than the thickness of the pillar part 97 and thus permits limited in and out movement by the keeper part 69. Opposite each of the keeper parts 69, 84 and 85 are similarly mounted respectively the keeper parts 69', 84' and 85' which are identical respectively with keeper parts 69, 84 and 85. The compression springs 86, 87 and 88 also serve to urge the keeper portions 69', 84' and 85' outwardly to the position shown in Fig. 13.

When the door is open, springs 86 holds the keeper part 69 outwardly in the position shown in Figs. 1 and 13 with one face of the slot 96 against the part 97 of the pillar 2. The compression springs 87 and 88 also urge the parts 84 and 85 outwardly or to the right, Figs. 1 and 13, but the keeper parts are retained in the opening 90 by flanges 92 and 94 which abut against the inside edge of the flange 91.

When the door is open, the bolt 20 is in full projected position, as shown in dotted lines, Figs. 3, 6 and 13. At this time the toggle is in "made" or straightened position, as shown in Fig. 3, with the pin 29 slightly over center. When the door is open and the bolt disengaged from the striker, the spring 33 holds the bolt projected and the slide 30 is also projected similarly as shown in Fig. 4.

In closing the door the bolt head 20 first strikes cam surface 68, as shown in Fig. 13. Preferably spring 33 is somewhat stronger than spring 86. The cam surface 68 cams the bolt head to the right, compressing spring 33, and retracting the bolt and the straightened toggle to the positions shown in Figs. 3 and 14. The slide 30 has now almost abutted the end of the housing 32. Consequently the striker portion 69 is pressed inwardly or to the left, as viewed in Fig. 1, until it seats against the pillar portion 97, as shown in Fig. 14. The bolt head 20 and toggle are now in the position shown in the full lines, Fig. 3. Continued closing movement of the door to the right causes the bolt to ride off striker part 69 and on to part 84. As illustrated in Fig. 15, the bolt depresses or moves inwardly the striker part 84 because the toggle slide 30 now abuts the end of housing 32. The bolt head 20 is now held behind the first striker part 69. As soon as the bolt head 20 moves beyond this portion 69 of the striker, the spring 86 projects the part 69 outwardly to the position illustrated in Figs. 1 and 15.

Still further closing movement of the door causes the bolt to ride off striker part 84 and on to the third striker part 85. When the bolt rides on to striker part 85, it depresses or moves the same inwardly of the pillar 2 because the toggle slide 30 is now against the end of housing 32. The striker springs 87 and 88 actually are stronger than the bolt spring 33. As the bolt moves off portion 84, the spring 87 projects this part outwardly to the position shown in Fig. 1 where it forms a step or shoulder behind which the bolt head engages to hold the door securedly latched. It will be noted that in the closing of the door bolt spring 33 and the three striker springs 86, 87 and 88 are compressed. Since in closing the door the operator has the benefit of the force of a heavy swinging door, the force of these springs are relatively easily overcome and the closing of the door presents no difficult problem. Unlike the conventional lock, in opening the door no further compression of the bolt spring to retract the latch bolt is necessary. This makes retraction of the latch bolt and opening of the door easily accomplished.

To open the door the operator, if he be on the outside of the car and assuming that the push button is not locked, need merely press inwardly on the push button 9. As the push button travels inwardly of the opening 4 from the position shown in Fig. 1, the reduced end 13 of the push button engages tripping lever 40, swinging the same clockwise which causes the finger 41 to push the pin 29 outwardly and to the other side of center position from that shown in Fig. 3. As soon as the pin 29 crosses center position, that is, a straight line through axes of pin 26 and pin 31, the toggle levers 27, 28 offer no further resistance to the force of springs 33 and 88. The force of spring 33 acting through slide 30 and coacting with the force of spring 88, which acts through bolt head 20, causes the toggle to break to the position shown in Fig. 4. As the spring 88 moves the keeper portion 85 outwardly in the opening 90, it retracts the bolt head to the position shown in Fig. 4. The bolt head is now disengaged from behind striker part 84 and permits the door to be easily opened. After the toggle is broken and the bolt is retracted to the position shown in Fig. 4, the spring 37 tends to straighten the toggle and project the bolt. However, the spring 37 is a much weaker spring than any of the springs 86, 87 and 88. Therefore, the toggle cannot be made or straightened and the bolt cannot be projected until the bolt head rides down cam surface 68 and the door is in open position. As soon as the bolt clears part 69 of the striker, the spring 37 again straightens the toggle and bolt head 20 is fully projected to the position shown in Fig. 13.

To unlatch the door from the inside of the car, the inside remote handle 75 is swung clockwise, as viewed in Fig. 17. This acts through link 81 to retract plate 43. As plate 43 travels to the right, as viewed in Fig. 3, cam lug 44 cams finger 41 outwardly thus throwing the pin 29 below center as viewed in Fig. 3. At this time springs 33 and 88 again coact in the fashion above described to break the toggle and retract the bolt to the position shown in Fig. 4.

In Fig. 20 the lock is shown in locked position with the door closed. At this time teeth 61 of member 62 interengage teeth 60 of the locking plate 48. Since the plate 48 can only slide up and down on the pins 49 in the slots 50 and since the cam finger 67 can only travel horizontally with the bolt 20 when the same is reciprocated, it necessarily follows that interengagement of the teeth 60 and 61, for practical purposes, dead lock the bolt 20. This will be seen as follows: If the inside remote handle 75 is swung to retract slide 43, cam lug 44 will engage finger 41 and throw it outwardly to slightly over center position. From this point on the bolt 20 is retracted only by spring 88 which expands and acts through the striker member 85 to retract the bolt head 20. However, in order to retract the bolt head 20 the force exerted against the end of the bolt 20 must be sufficient to act through cam 67 and plate 62, teeth 60 and 61 to lower the slide 48. Considerable energy is expended in lowering the slide 48 through cam 67 in overcoming the friction involved in such operation of this mechanism. Considerably more force is required to thus lower by downward camming the slide 48 than is provided by the spring 88. This feature of the lock provides additional safety for the occupants of the car, particularly small children, because it neces-

sarily follows that when the door is closed and locked, the bolt cannot be retracted by operation of the remote handle 75 unless the lever 53 is first raised to lower or release the undogging plate 48. Thus the latch bolt is actually dead locked.

I claim:

1. A door latch comprising in combination a latch frame, a retractable and projectable latch bolt mounted on said frame, a toggle operatively connected to said bolt and latch frame whereby the said toggle when made holds said latch bolt projected, a keeper adapted for interengagement with said bolt when the bolt is projected, resilient means associated with said keeper adapted to be compressed by the said projected bolt when interengaged with the keeper, and tripping mechanism for throwing the toggle over center when the bolt and keeper are interengaged whereby the force of the said resilient means breaks the toggle and retracts the bolt to disengage the bolt and the keeper to permit door opening.

2. A door latch comprising in combination a latch frame, a retractable and projectable latch bolt mounted on said frame, a toggle having one end pivotally connected to said bolt and the other end pivotally mounted on the said latch frame, a resilient keeper adapted for interengagement with said bolt when the bolt is projected, resilient means associated with said keeper adapted to be compressed by the said projected bolt when interengaged with the keeper, and tripping mechanism for throwing the toggle over center when the bolt and keeper are interengaged whereby the force of the said resilient means breaks the toggle and retracts the bolt to disengage the bolt and the keeper to permit door opening.

3. A door latch comprising in combination a latch frame, a retractable and projectable latch bolt mounted on said frame, a toggle having one end pivotally connected to the said bolt and the other end pivotally and reciprocably mounted on the said latch frame, the said toggle when made being retractable with the said bolt when the bolt is retracted by the keeper in the closing of the door, a keeper adapted for interengagement with said bolt when the bolt is projected, resilient means associated with said keeper adapted to be compressed by the said projected bolt when interengaged with the keeper, and tripping mechanism for throwing the toggle over center when the bolt and keeper are interengaged whereby the force of the said resilient means breaks the toggle and retracts the bolt to disengage the bolt and the keeper to permit door opening.

4. A door latch comprising in combination a latch frame, a retractable and projectable latch bolt mounted on said frame, a toggle having one end pivotally connected to the said bolt and the other end pivotally and reciprocably mounted on the said latch frame, resilient means operatively connected to said other end of the toggle and adapted to act through said toggle to project said bolt, the said toggle when made being retractable with the said bolt when the bolt is retracted by the keeper in the closing of the door whereby the said above mentioned resilient means for projecting the bolt is compressed, a keeper adapted for interengagement with said bolt when the bolt is projected, resilient means associated with said keeper adapted to be compressed by the said projected bolt when interengaged with the keeper, and tripping mechanism for throwing the toggle over center when the bolt and keeper are interengaged whereby the force of the said resilient means breaks the toggle and retracts the bolt to disengage the bolt and the keeper to permit door opening.

5. A door latch comprising in combination a latch frame, a reciprocable latch bolt slidably mounted on the said frame, a toggle having one end pivotally connected to the said bolt and the other end pivotally and reciprocably mounted on the said latch frame, a spring operatively connected to the said other end of the toggle and adapted to act through said toggle to project said bolt, the said toggle when made being retractable with the said bolt when the bolt is retracted by the keeper in the closing of the door whereby the said spring is compressed, a keeper over which the said bolt rides in the closing of the door adapted for interengagement with the said bolt when the bolt is projected and the door closed, a plunger associated with the said keeper and adapted to be depressed by the said bolt when interengaged with the keeper, a second spring for backing up the said plunger and adapted to be compressed by the said projected bolt when interengaged with the keeper, a tripping lever pivotally mounted on the said bolt adapted when swung to engage the toggle lever and throw the same over center whereby the force of said springs breaks the toggle and retracts the bolt to disengage the bolt and keeper to permit door opening.

6. A door latch comprising in combination a latch frame, a reciprocable latch bolt slidably mounted on the said frame, a toggle having one end pivotally and reciprocably mounted on the said latch frame, a spring operatively connected to the said other end of the toggle and adapted to act through said toggle to project said bolt, the said toggle when made being retractable with the said bolt when the bolt is retracted by the keeper in the closing of the door whereby the said spring is compressed, a keeper over which the said bolt rides in the closing of the door adapted for interengagement with the said bolt when the bolt is projected and the door closed, a plunger associated with the said keeper and adapted to be depressed by the said bolt when interengaged with the keeper, a second spring for backing up the said plunger and adapted to be compressed by the said projected bolt when interengaged with the keeper, a tripping lever pivotally mounted on the said bolt adapted when swung to engage the toggle lever and throw the same over center whereby the force of said springs breaks the toggle and retracts the bolt to disengage the bolt and keeper to permit door opening, and a push button mounted on the outside of the door operatively connected with said tripping lever and actuatable to swing the said lever to cause retraction of the said latch bolt.

7. A door latch comprising in combination a latch frame, a retractable and projectable latch bolt mounted on said frame, a toggle having one end pivotally connected to the said bolt and the other end pivotally and reciprocably mounted on the said latch frame, a spring operatively connected to said other end of said toggle and adapted to act through said toggle to project said bolt, the said toggle when made being retractable with the said bolt when the bolt is retracted by the keeper in the closing of the door whereby the said first mentioned spring for projecting the bolt is compressed, a stop for limiting the retraction of said straightened toggle and bolt, a keeper adapted for interengagement with said bolt when the bolt is projected, a spring associated with said keeper adapted to be compressed by the said

projected bolt when interengaged with the keeper and retraction of said toggle and bolt is arrested by said stop, and tripping mechanism for throwing the toggle over center when the bolt and keeper are interengaged whereby the force of the said spring breaks the toggle and retracts the bolt to disengage the bolt and the keeper to permit door opening.

8. A door latch comprising in combination a latch frame, a retractable and projectable latch bolt mounted on said frame, a toggle operatively connected to said bolt and latch frame whereby the said toggle when made holds said latch bolt projected, a keeper adapted for interengagement with said bolt when the bolt is projected, resilient means associated with said keeper adapted to be compressed by the said projected bolt when interengaged with the keeper when the toggle is made, tripping mechanism for throwing the toggle slightly over center whereby when the bolt and keeper are interengaged and the bolt is freely retractable the force of the resilient means breaks the toggle and retracts the bolt to disengage the bolt and keeper to permit door opening, and blocking means adapted to be set and released, said blocking means when set serving to block retraction of the bolt by said resilient means when the bolt and keeper are interengaged.

9. A door latch comprising in combination a latch frame, a retractable and projectable latch bolt mounted on said frame, a toggle operatively connected to said bolt and latch frame whereby the said toggle when made holds said latch bolt projected, a keeper arranged to retract the bolt in the closing of the door and adapted for interengagement with said bolt when the bolt is projected and the door closed, resilient means associated with the keeper adapted to be compressed by the said projected bolt when the toggle is made and when the bolt is interengaged with the keeper, tripping mechanism for throwing the toggle over center whereby when the bolt and keeper are interengaged and the toggle is made the force of said resilient means breaks the toggle and retracts the bolt, blocking means adapted to be set and released, said blocking means when set serving to block retraction of the bolt by said resilient means when the bolt and keeper are interengaged and said blocking means when set and the bolt and keeper are disengaged as when the door is open being releasable by the bolt as it is retracted by the striker in closing the door.

HENRY A. PEARCE.