United States Patent

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[54] TURN LATCH LOCK FOR MOTOR VEHICLE DOORS

21 Claims, 13 Drawing Figs.

[52] **U.S. Cl.** **292/216,** 292/223
[51] **Int. Cl.** **E05c 3/10**
[50] **Field of Search** ..... 292/198, 216, 3(J), 2(Q), 280

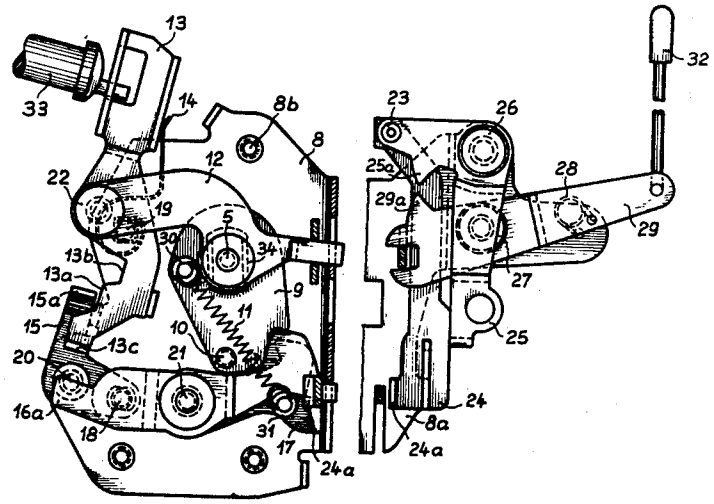
[56] **References Cited**

UNITED STATES PATENTS

3,206,237	9/1965	Roethel	292/48
2,234,810	3/1941	Simpson	292/221
2,625,420	1/1953	Endter	292/198
2,754,671	7/1956	Dingman et al.	70/135
3,034,818	5/1962	Cockburn et al.	292/216X
3,281,176	10/1966	McKey	292/216
3,206,240	9/1965	Roethel	292/216

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ABSTRACT: The present disclosure relates to a turn latch lock suitable for the doors of a motor vehicle wherein a base plate is arranged adjacent to the interface of the door for supporting the turn latch and a sidewall is arranged at an angle to the base plate and resting on the inside of the door. During closing of the door, the turn latch engages a stationary closing bolt mounted on the door frame so that the turn latch is rotated against the bias of the turn latch toward its closed position. The turn latch is held in its closed position by a ratchet wheel mounted on the axis of the turn latch and provided with a plurality of closing notches. A lock pawl is biased to engage the closing notches and is released by means of a rotatably mounted release lever, which has its pivot mounted on an intermediate lever so that it may be moved bodily between an engaged position in which it is operative to release the lock pawl and a disengaged position in which it is inoperative to release the lock pawl. A coupling lever that is in addition to the lock pawl lever is provided for camming the release lever into its disengaged position during normal closing of the door, but will not move the release lever into its disengaged position when the lock pawl moves from a preliminary lock notch to the final or main lock notch. Also, the door includes an abutment for engaging behind a collar on the outer end of the closing bolt opposite to the turning latch so that the door and frame cannot separate in the longitudinal direction during expansion in an automobile accident.



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SHEET 1 OF 7

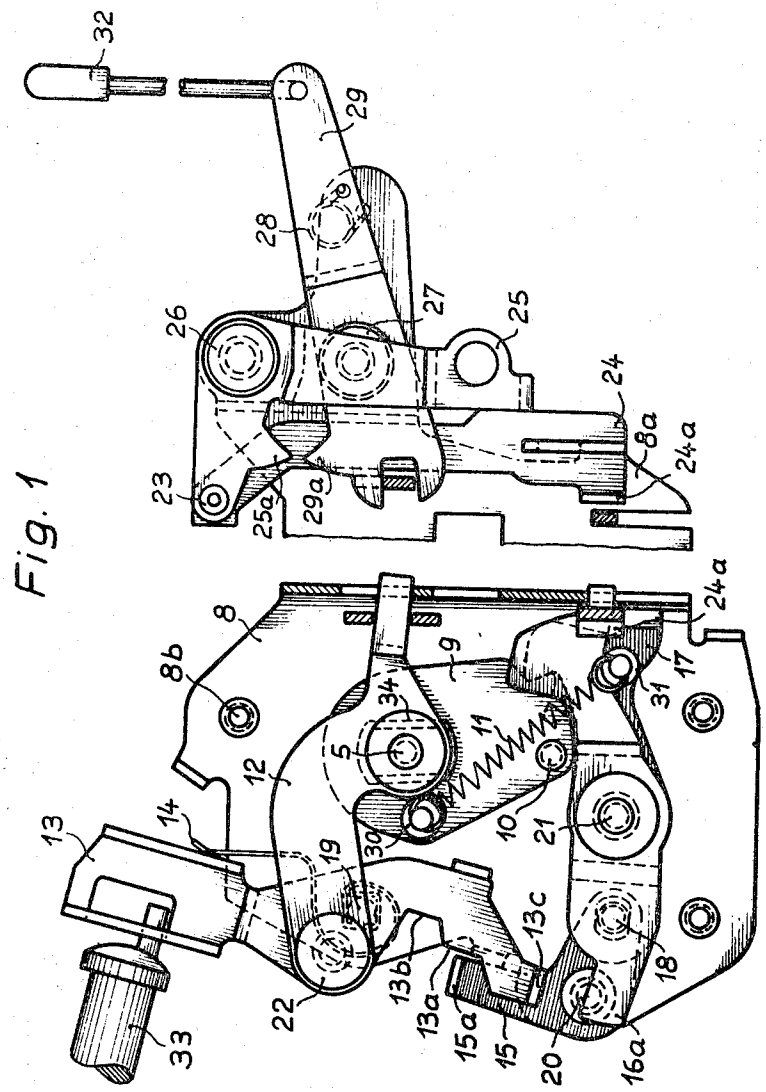


Fig. 1

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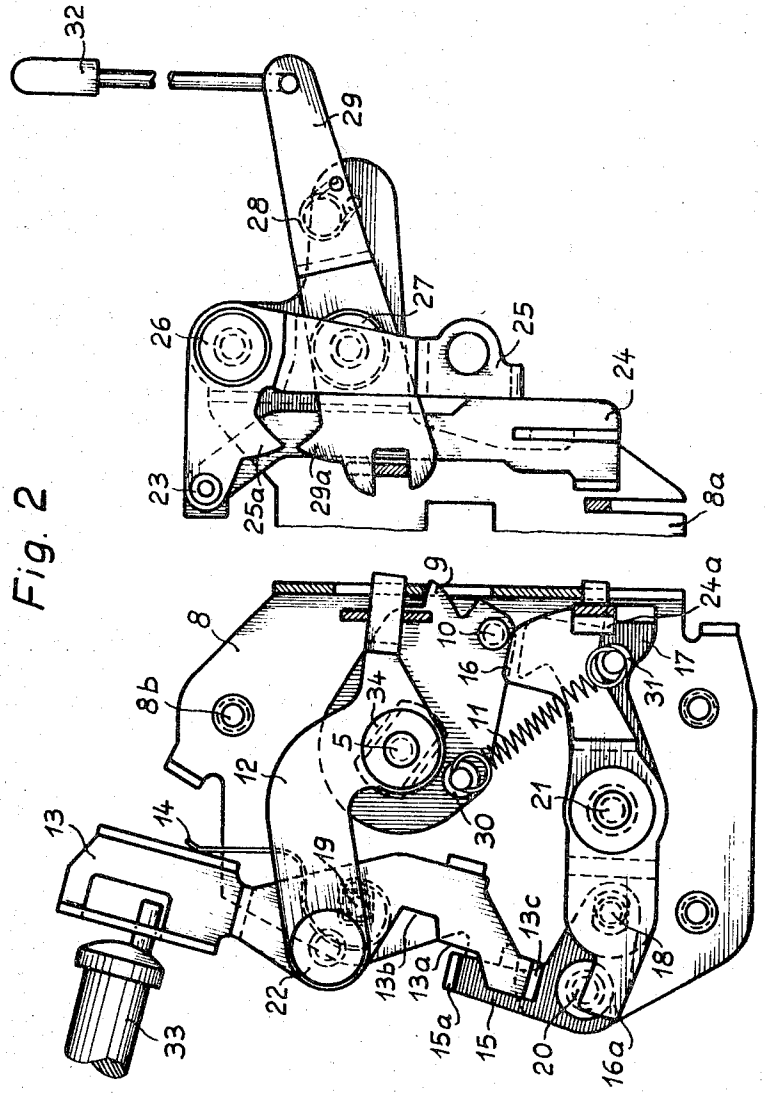


Fig. 2

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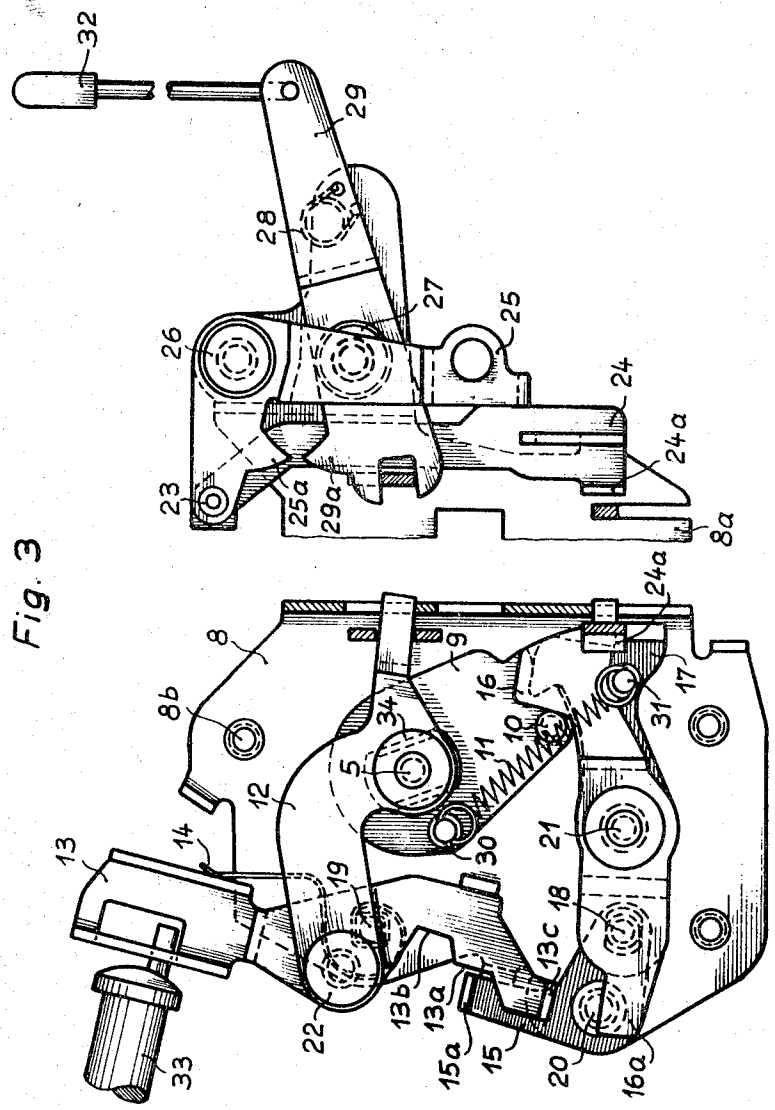


Fig. 3

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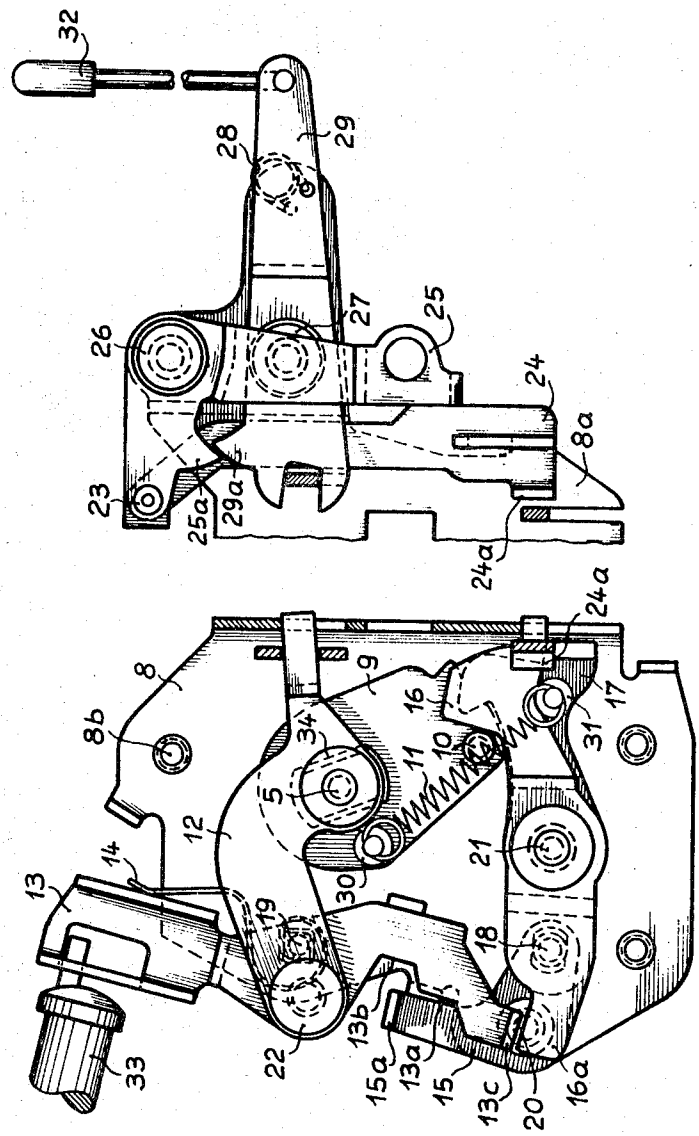


Fig. 4

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Fig. 6

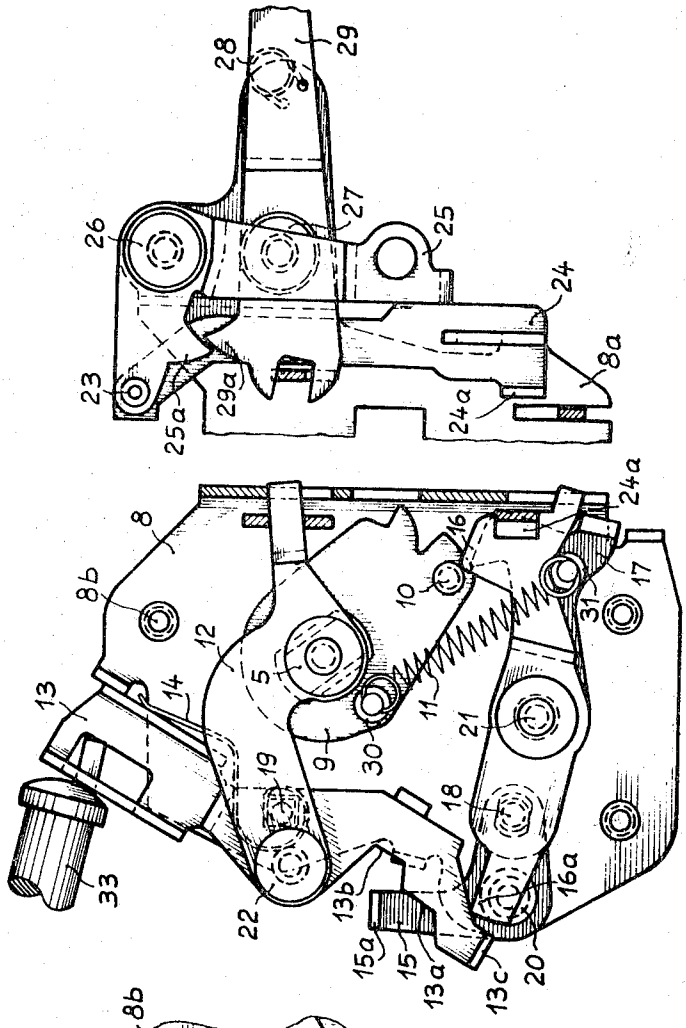
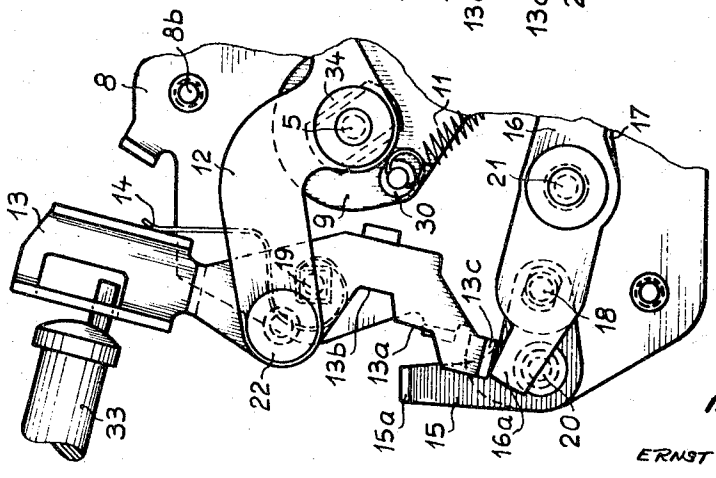


Fig. 5



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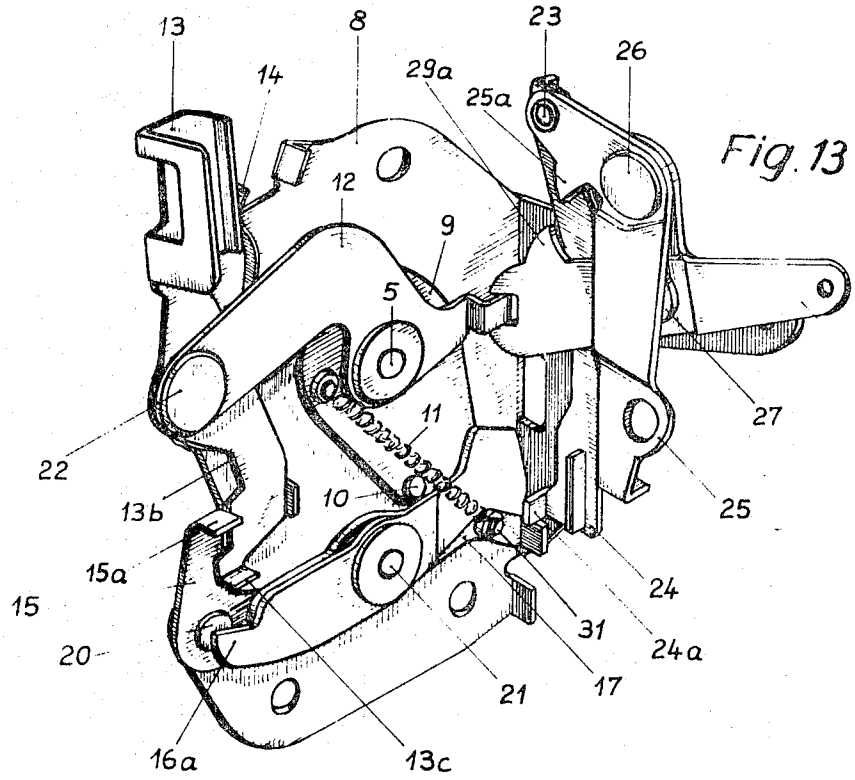


Fig. 13

Fig. 7

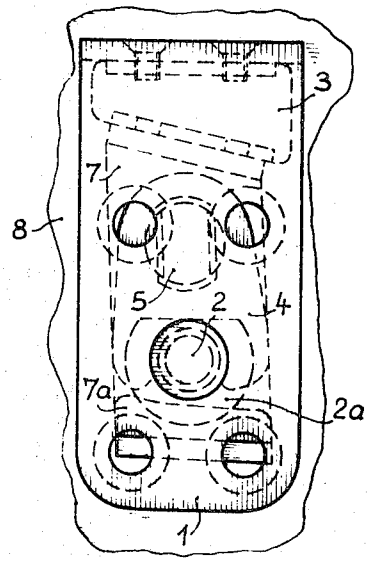
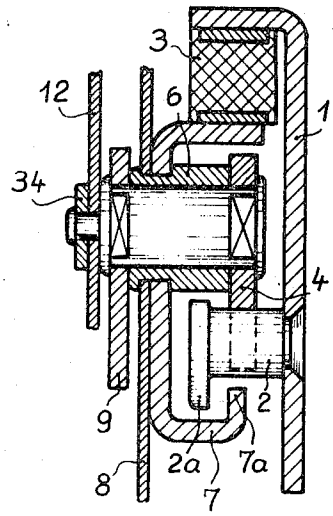


Fig. 8



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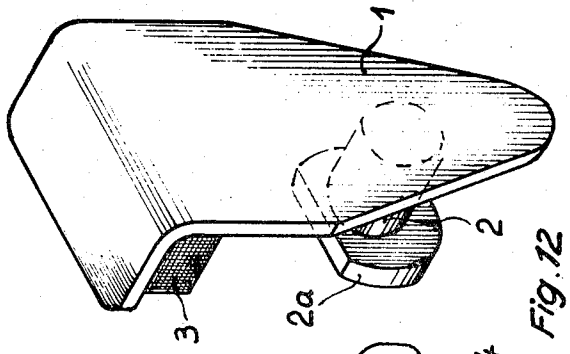
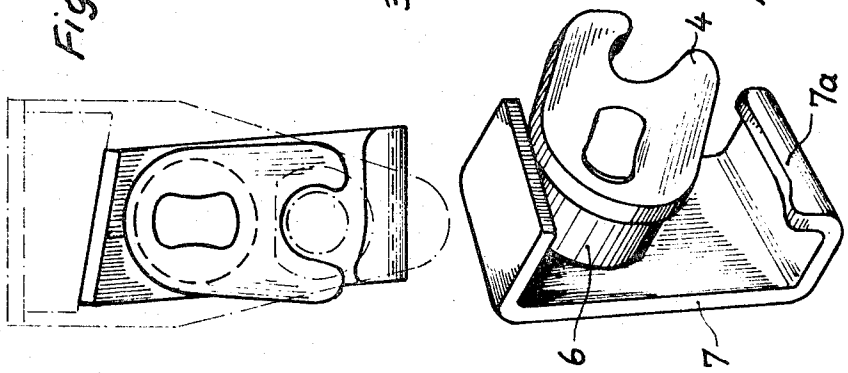


Fig. 11

Fig. 12



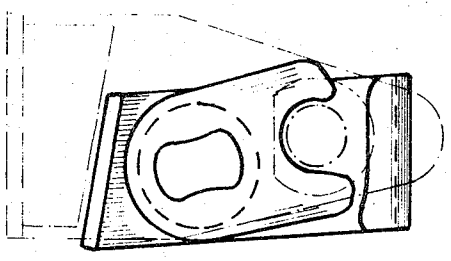


Fig. 10

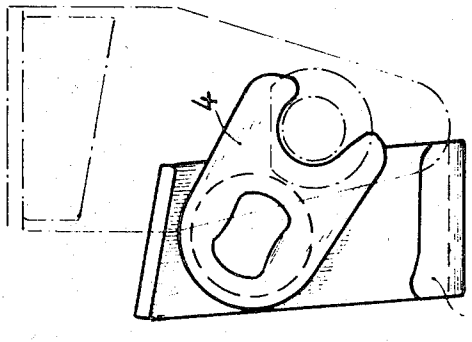


Fig. 9

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TURN LATCH LOCK FOR MOTOR VEHICLE DOORS

BACKGROUND OF THE INVENTION

It is known to provide the release lever of a turn latch lock for motor vehicle doors; this release lever is slidably mounted so that it may be slid into a disengaged position or slid into an engaged position. However, this slidable mounting has the serious disadvantage that it is extremely susceptible to the accumulation of dirt or water that may freeze so that its movement may be retarded, difficult, or impossible.

Also, known turn latch door locks for automotive vehicles may be locked and closed only partially, that is, the lock pawl would be engaged only in a preliminary stop with the door slightly ajar but not in the final stop with the door fully closed. In this position, the door cannot be directly opened and the control button or the like would indicate that the door is locked even though it is only partially closed. If the door is then pushed inwardly to move the lock pawl, or the like, from its preliminary stop to its main stop so that the door is completely closed, the door lock will be rendered ineffective so that the normal operation of the release lever from the outside will open the door. It is seen that this is a serious disadvantage, because the operator of the vehicle may lock and partially close the door so that the outside handle cannot be used to open the door; thereafter, someone else may push the door into its fully closed position so that the lock will be released and the handle may be normally operated to open the door.

It is an object of the present invention to specifically overcome the above mentioned disadvantages and generally provide a safer turn latch lock for automotive vehicle doors. jettisonable

SUMMARY OF THE DISCLOSURE velocity-sensing interrupted,

The release lever is pivotally mounted on an intermediate lever, which is pivotally mounted to the door, so that the intermediate lever may be pivoted to selectively move the release lever between its engaged position wherein it is operative to release the lock pawl and its disengaged position wherein it is inoperative to release the lock pawl. Pivoting of the intermediate lever may be accomplished by means of a safety lever operable from the inside of the door. The pivotally mounted levers are not as susceptible to the accumulation of dirt and water as are the aforementioned known slidably mounted release lever so that there is less likelihood of malfunction or impaired function due to freezing or dirt accumulation.

The turn latch lock is also constructed so that it offers increased safety against the opening of the door during accidents, particularly the longitudinal expansion of the door relative to the door frame during an automobile accident. Opposite the gear tooth opening of the turn latch, there is provided an abutment, which will engage behind a flange or collar on the outer free end of the stationary closing bolt on the side opposite from the turn latch, when the door is in its closed position. In the closed position, this abutment will effectively close the bolt engaging tooth opening of the turn latch to prevent relative radial movement between the closing bolt and turn latch in any direction as well as engaging the closing bolt collar or flange to prevent axial expansion during an accident. With prior art devices, it is quite common for the door and door frame to expand longitudinally relative to each other during an accident so that the door is opened with the resulting possibility of serious injury to occupants of the vehicle.

Advantageously, the above-mentioned abutment is an integral part of a heavy gauge formed sheet metal piece that has a support surface for sliding cam engagement with a correspondingly shaped mating resilient support surface on the door frame to form a tight engagement and prevent rattles; thus, forces that are absorbed by the abutment remain substantially within this integral member so that they do not seriously overload its fastening means.

The unlocking of a previously locked door during final closing movement between a position wherein the lock pawl engages a preliminary notch or rest and a final fully closed position wherein the lock pawl engages the final notch or rest is prevented by the following structure. An angular lever is in driving series between the release lever and the lock pawl, including a lost motion connection, for unlatching the lock pawl. An additional coupling lever will move the release lever to its disengaged position during normal closing of the door; however, if the outside lock operating mechanism is engaged during closing of the door, the coupling lever will not move the release lever to its disengaged position. Also, if the door is locked in a partially closed position wherein the lock pawl engages a preliminary notch, the coupling lever will not move the release lever into its disengaged position when the door is merely pushed to its fully closed position during which the lock pawl is cammed from its preliminary notch to engagement with the final notch. The mechanism is constructed such that no control movement of the additional coupling lever takes place during movement between the preliminary partial closed position to the fully closed position of the door, because a special control cam on the ratchet wheel has passed and will no longer engage a cooperating control lug on the additional coupling lever. Thus, when the door is pushed from its preliminary partial closed position to its final closed position, the release lever will not be moved into its disengaged position and the door will remain securely and safely locked.

Further 1A features and advantages of the present invention will appear more fully from the following description of the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a partial cross-sectional view of a turn latch lock according to the present invention viewed in the direction toward the inside of the base plate, with the side wall of the base plate being detached and rotated approximately 90° into the plane of the main part of the base plate only for purposes of illustration;

FIG. 2 is an illustration of the lock similar to FIG. 1, with the lock in the position it would assume when the door of the vehicle is open;

FIG. 3 is a view similar to FIG. 1 with the door partially closed and the lock pawl in its preliminary notch and the release lever in its engaged position so that the door may be opened from either the outside or the inside

FIG. 4 is a view of the lock in the same position as it is in FIG. 3, except that the release lever has been moved to its disengaged position so that the door cannot be opened from either the outside or the inside and pushing of the door to its fully closed position will not render the mechanism capable of being opened from the outside;

FIG. 5 illustrates the manner in which the coupling lever pushes the release lever to its engaged position during movement of the door from its open position to at least its preliminary partially closed position;

FIG. 6 is similar to FIG. 5, but the outside lock button has been engaged when it is desired to simultaneously close and lock the door from the outside so that the disengaged position of the release lever is maintained regardless of whether the door is moved from its fully opened position to its preliminary partially closed position or fully closed position corresponding to the engagement of the lock pawl in the preliminary notch or the engagement of the lock pawl in its main final notch;

FIG. 7 is a rear view of the closing plate showing the abutment plate engaging the resilient cam stop and the relative positions of the turn latch, closing bolt and abutment when the door is closed;

FIG. 1I is a partial cross-sectional view of FIG. 7;

FIGS. 1J 10 and 11 show progressive positions of the return latch relative to the closing bolt, schematically, as the turn latch initially engages the closing bolt, is in its preliminary position with the door partially closed, and is in its fully engaged position with the door fully closed, respectively;

FIG. 12 is a perspective view of the closing bolt and turning latch, with their supporting structure, immediately prior to closing; and

FIG. 13 is a perspective view of the latch according to FIG. 1.

DETAILED DESCRIPTION OF THE DRAWING

As shown in FIGS. 7—12, a stationary closing plate 1 is mounted on the stationary frame of a motor vehicle generally perpendicular to the plane of the door opening. A closing bolt 2 is rigidly mounted on the closing plate 1 to extend outwardly into the door opening and has a collar or flange 2*a* on its outer free end. An elastic supporting cam member 3 is mounted on an interned upper flange portion of the closing plate 1. A turning latch 4 having at least one gear tooth type opening is mounted on the door to cooperate with the closing bolt 2 as shown in sequence in FIGS. 9—11. The turn latch 4 is fixedly mounted on a rotatable shaft 5, which is secured for rotation within a bearing sleeve 6. The bearing sleeve 6 is rigidly attached to the U-shaped or channel-shaped heavy gauge formed plate 7 and the base plate 8. The upper flanged portion of the plate 7 is provided with an inturned flange to present a cam surface for cooperating with the elastic cam 3 to provide for tight engagement between the turn latch 4 and the closing bolt 2, and generally to prevent rattles in the lock mechanism. The lower end of the plate 7 is provided with a flange extending toward the frame and having an abutment 7*a* that generally closes the gear tooth opening in the turn latch 4 when the door is in its closed position. Also, as seen in FIG. 8, the turn latch 4 and abutment 7*a* substantially surround the closing bolt 2 immediately behind the collar or flange 2*a* so that axial movement longitudinally of the vehicle between the door and door frame during an accident will be prevented and the door will not open. It is contemplated that the closing bolt 2 may be riveted to the closing plate 1 and the elastic cam 3 may be screwed into the closing plate 1, but other methods of attachment may be used according to the broader aspects of the invention.

The base plate 8 may be securely fixed to the FIGS. by means of screws passing through the threaded bushings 8*b*, FIG. 6. The base plate 8 is formed of sheet metal and is provided with a side wall 8*a* at an angle to the main portion of the base plate, for example, at 90°.

Within the door housing, a ratchet wheel 9 is fixedly secured on the shaft 5 for rotation therewith, for example by riveting. As shown in FIG. 1 the ratchet wheel 9 carries a control cam 10 and is spring urged in the counterclockwise direction by means of the spring 11. A reduced diameter extension of the shaft 5 rotatably carries an intermediate lever 12 secured for rotation thereto by the washer 34. One end of the lever 12 pivotally mounts the release lever 13 by means of the bolt 22 extending only through the levers 12 and 13. A spring 14 is securely mounted on a bolt 19 extending into the main portion of the base plate 8 for resiliently urging the release lever 13 in the counterclockwise direction, as seen in FIG. 1.

An angular lever 15 is pivotally mounted onto the main portion of the base plate 8 by means of the bolt 20. A flanged abutment portion 15*a* on one end of the angular lever 15 extends into the plane of pivotal movement of the abutment portion 13*a* of the release lever 13 as shown in FIG. 1; with the abutment portions 13*a* and 15*a* thus aligned as in FIG. 1, the release lever 13 is in its engaged position. When the intermediate lever 12 is rotated counterclockwise around the shaft 5 from its position of FIG. 1 into the position of FIG. 4, the recessed portion 13*b* of the release lever 13 will be in aligned position with the abutment portion 15*a* of the angular lever 15 so that the portions 15*a* and 13*b* will not engage during normal pivotal movement of the levers 13 and 15; this constitutes the disengaged position of the release lever 13.

The other end of the angular lever 15 is pivotally connected to one end of the lock pawl 17 by means of a lost motion connection 18. The lock pawl 17 is mounted for rotation on the main portion of the base plate 8 about the support bolt 21. The other end of the lock pawl 17 is provided with a tooth for engagement in the correspondingly shaped notch in the adjacent portion of the ratchet wheel 9 to lock the ratchet wheel 9 in the position to which it has been turned by rotation of the turning latch 4 when the turning latch 4 engages the closing bolt 2. When the turning latch 4 is in the position of FIG. 10, the door will be partially closed and the tooth of the lock pawl 17 will be engaged in a preliminary notch with the ratchet wheel 9 as shown in FIG. 4; when the door is fully closed, the turning latch 4 will be in the position of FIG. 11 and the ratchet wheel 9 will have been turned further counterclockwise until the tooth of the lock pawl 17 engages into the final or main notch as shown in FIG. 1. In either the preliminary position of FIG. 3 or the final position of FIG. 1, the outside pushbutton 33 may be operated to pivot the release lever clockwise, to engage the aligned abutment portions 13*a* and 15*a*, to pivot the angular lever 15 counterclockwise, to pivot the lock pawl 17 clockwise through the lost motion connection 18, to withdraw the tooth of the lock pawl 17 from the corresponding notch of the ratchet wheel 9, and to allow the ratchet wheel 9, shaft 5, and turning latch 4 to rotate under the influence of their spring so that the door may be opened. If the outside operating pushbutton 33 is actuated when the release lever 13 is in its disengaged position as shown in FIG. 4, the release lever 13 will pivot clockwise, but there will be no engagement between the release lever 13 and the angular lever 15, because the recessed portion 13*b* is aligned with the abutment portion 15*a;* thus, the door is securely locked and cannot be opened from the outside without benefit of a key. If a key is used, the pushbutton 33 may be rotated so that its off-center axial extension will engage the release lever 13 and lift it upwardly into its engaged position.

When the door is pushed closed, the ratchet wheel 9 will rotate counterclockwise under the influence of the turning latch 4 and shaft 5 so that the lock pawl 17 will be cammed clockwise just prior to its tooth dropping into either the preliminary notch or the main notch; because of the lost motion connection 18 the angular lever 15 will undergo a corresponding counterclockwise rotation which will have no effect upon the release lever 13.

An additional coupling lever 16 is rotatably mounted on the main portion of the base plate 8 by means of the support bolt 21 and rotatably mounted with respect to the lock pawl 17. When the door is moved from its fully open position to the position where the tooth of the lock pawl 17 engages in the preliminary notch of the ratchet wheel 9, the control cam 10 engages the adjacent camlike surface on the coupling lever 16 to rotate the coupling lever 16 clockwise so that its abutment portion 16*a* will engage the flanged abutment portion 13*c* of the release lever 13 as shown in FIG. 5 to push the release lever 13 upwardly from its disengaged position to its engaged position as the intermediate lever 12 rotates clockwise. If it is desired to maintain the latch mechanism in its locked position, that is, the release lever in its disengaged position, during closing of the door, the pushbutton 33 is actuated to rotate the release lever 13 clockwise as shown in FIG. 6 so that clockwise rotation of the coupling lever 16 will be ineffective to move the release lever 13 and the release lever 13 will be retained in its disengaged position during closing of the door. If the door is locked, that is, the release lever is in its disengaged position, and partially closed, that is, the lock pawl tooth is engaged in the preliminary notch of the ratchet wheel 9, as shown in FIG. 4, then the door cannot be opened by merely actuating the pushbutton 33; if an unauthorized person pushes the door to its completely closed position so that the lock pawl tooth engages in the final notch of the ratchet wheel 9, the control cam 10 will not engage any corresponding cam on the coupling lever 16 during the clockwise rotation of the ratchet wheel 9 so that the release lever 13 will be retained in its disengaged position and the door will remain locked so that actuation of the pushbutton 33 will not open the door.

At all times, the lock pawl **17** is urged in its counterclockwise direction into engagement with the ratchet wheel **9** by means of the spring **11** extending between the bolt **30** mounted on the ratchet wheel **9** and the bolt **31** mounted on the lock pawl **17**.

The above description primarily relates to an opening of the door from the outside. Following is the description primarily concerned with the closing and opening of the door from the inside.

As shown in the various FIGS., a slide member **24** is mounted for sliding reciprocation in the vertical direction; the slide member **24** is provided with an abutment portion **24***a* that engages a corresponding abutment portion on the lock pawl **17**, FIG. **3**, so that downward movement of the slide member **24** will rotate the lock pawl **17** in the clockwise direction to release the ratchet wheel **9**. The upper end of the slide member **24** is pivotally mounted by a bolt **23** to an operating lever **25**. The operating lever **25** is pivotally mounted on the side portion **8***a* of the base plate by means of a bolt **26**. The other end of the operating lever **25** is provided with an aperture or the like for connection to the conventional inside door handle operating mechanism so that actuation of the inside door handle will rotate the operating lever **25** in the counterclockwise direction to move the slide member **24** downwardly and release the ratchet wheel **9**.

A safety lever **29** is rotatably mounted on the sidewall **8***a* of the base plate **8** by means of the bolt **27**. Safety lever **29** is held in its two extreme positions by means of the spring **28** that suitably cooperates with an extension of the sidewall **8***a*. An internal safety linkage **32** may be actuated by a vehicle passenger from the inside of the vehicle to selectively pivot the safety lever **29** between its two end positions. The opposite end of the safety lever **29** has a forklike opening for engaging an extension of the intermediate lever **12** so that rotation of the safety lever **29** counterclockwise into one position as shown in FIG. **3** will correspondingly rotate the intermediate lever **12** in a clockwise direction to lift the release lever **13** into its engaged position; the rotation being accomplished by an upward force exerted on the internal safety linkage **32**. If the safety linkage **32** is moved downwardly to rotate the safety lever **29** in the clockwise direction, a corresponding counterclockwise direction of the intermediate lever **12** will move the release lever **13** downwardly into its disengaged position as shown in FIG. **4**. When in the position of FIG. **4**, an abutment portion **29***a* of the safety lever **29** is in aligned interference position with respect to the abutment portion **25***a* of the operating lever **25** to prevent counterclockwise rotation of the operating lever **25** and thus prevent opening of the door by means of the inside handle. When the internal safety linkage **32** is moved into the position of FIG. **3** so that the release lever is moved into its engaged position, the abutment portions **25***a* and **29***a* will no longer be in aligned interference positions so that the inside handle may be actuated to counterclockwise rotate the operating lever **25** and open the door.

It is thus seen that the internal safety linkage **32** may lock the door so that operation of the inside handle will not open the door, particularly for the safety of children and during accidents. Also, the outside control button may be rotated to either lock or unlock the door. Furthermore, movement of the door between its preliminary partially closed position and its final fully closed position will not unlock a locked door. Also, the latch is designed to prevent axial spreading apart between the door and door frame during an accident so that the door will not open and the passengers will not by thrown from the automobile.

Although the above specifically described preferred embodiment has been set forth for purposes of illustrating the present invention, further embodiments, variations and modifications of the present invention are contemplated.

I claim:

1. A turn latch lock, particularly for doors of motor vehicles having a frame, comprising: a door; a turn latch rotatably mounted on said door; a turn latch closing cam means mounted on the frame for rotating said turn latch into a closed position during closing of the door; lock pawl means for holding said turn latch in its closed position and movable to release said turn latch; means for releasing said lock pawl means, including a release lever and an intermediate lever being pivotally mounted on said door; said release lever being pivotally supported on said intermediate lever; safety means for selectively pivoting said intermediate lever to move said release lever bodily between an engaged position operative to release said lock pawl means and a disengaged position inoperative to release said lock pawl means, wherein said door has a base plate having a main portion at the interface of the door and a side wall extending at an angle to said main portion at the inside of said door; said turn latch being rotatably mounted on said main portion; said releasing means being operable from the outside of said door; and additional means for releasing said lock pawl means from the inside of said door, including an operating lever pivotally mounted on said side wall; said safety means including a safety lever pivotally mounted on said side wall; said release lever intermediate lever and lock pawl means being pivotally mounted on said main portion of said base plate, including a shaft fixedly mounting said turn latch; and said intermediate lever being rotatably mounted on said shaft.

2. The lock of claim **1**, wherein said releasing means includes a pushbutton manually operable from the outside of said door to engage and rotate said release lever; spring means for biasing said release lever toward said pushbutton; said pushbutton having an eccentric projection engaging said release lever constituting means for bodily moving said release lever from its disengaged position to its engaged position by rotation of said pushbutton.

3. The lock of claim **2**, said safety lever drivingly engaging said intermediate lever; internal safety linkage means manually operable from the inside of the door for selectively pivoting said safety lever between a first position corresponding to said disengaged position of said release lever and a second position corresponding to said engaged position of said release lever; said operating lever and said safety lever having cooperating abutment means for engaging to prevent movement of said operating lever in the first position of said safety lever and providing clearance for the movement of said operating lever in said second position of said safety lever.

4. The lock of claim **3**, wherein said closing cam is a cantilevered bolt having a radially extending flange at its outer free end; said turn latch being provided with a gear tooth recess for engaging around said closing bolt behind said flange; said door being provided with abutment means for substantially closing the opening of said gear tooth recess on the opposite side of said bolt in the closed position of said door and together with said turning latch constituting expansion safety means substantially completely surrounding said closing bolt axially behind said flange for preventing longitudinal spreading movement between said door and the frame during an accident.

5. The lock of claim **4**, wherein said door is provided with a cam; said frame is provided with a resilient cam means for cooperating with said door cam for resiliently pushing said turning latch into engagement with said closing cam during closing movement of said door to prevent rattles in the lock; said door including a U-shaped, relatively rigid, formed metal plate including said abutment means and said door cam; and said flange extending around the entire periphery of said bolt.

6. The lock of claim **5**, wherein said lock pawl means includes a ratchet wheel mounted for rotation with said turn latch and a pivotally mounted lock pawl; said lock pawl and said ratchet wheel having interengaging means defining a preliminary latch position corresponding to partial closing of said door and a final latch position corresponding to the fully closed position of said door; additional means separate and independent from said lock pawl for moving said release lever from its disengaged position to its engaged position during movement of said door from its fully open position to its partially closed position corresponding to said preliminary latch

position, and being ineffective to move said release lever during movement of said door from its partially closed position corresponding to said preliminary latch position to its fully closed position corresponding to said final latch position; said lock pawl means being ineffective to move said release lever during any closing movement of said door.

7. The lock of claim 6, wherein said additional means includes a coupling lever pivotally mounted with respect to said door about an axis; said lock pawl being pivotally mounted about said coupling lever axis.

8. The lock of claim 7, including a separate lever pivotally mounted on said door for driving engagement with said release lever at one end and driving engagement with said lock pawl at its other end.

9. The lock of claim 8, wherein said ratchet wheel and one end of said coupling lever have cooperating cam means for transferring movement of said ratchet wheel to said coupling lever only between the door fully open position and the preliminary latch position; means drivingly connecting the other end of said coupling lever and one end of said release lever during rotation of said coupling lever in one direction to move said release lever bodily from its engaged position to its disengaged position.

10. The lock of claim 9, including a member slidably mounted on said base side wall, and having one end drivingly engaging said lock pawl and its other end pivotally connected to said operating lever.

11. A turn latch lock, particularly for doors of motor vehicles having a frame, comprising: a door; a turn latch rotatably mounted on said door; a turn latch closing cam means mounted on the frame for rotating said turn latch into a closed position during closing of the door; lock pawl means for holding said turn latch in its closed position and movable to release said turn latch; means for releasing said lock pawl means, including a release lever and an intermediate lever being pivotally mounted on said door; said release lever being pivotally supported on said intermediate lever; safety means for selectively pivoting said intermediate lever to move said release lever bodily between an engaged position operative to release said lock pawl means and a disengaged position inoperative to release said lock pawl means, including a shaft fixedly mounting said turn latch; and said intermediate lever being rotatably mounted on said shaft.

12. A turn latch lock, particularly for doors of motor vehicles having a frame, comprising: a door; a turn latch rotatably mounted on said door; a turn latch closing cam means mounted on the frame for rotating said turn latch into a closed position during closing of the door; lock pawl means for holding said turn latch in its closed position and movable to release said turn latch; means for releasing said lock pawl means, including a release lever and an intermediate lever being pivotally mounted on said door; said release lever being pivotally supported on said intermediate lever; safety means for selectively pivoting said intermediate lever to move said release lever bodily between an engaged position operative to release said lock pawl means and a disengaged position inoperative to release said lock pawl means, wherein said releasing means includes a pushbutton manually operable from the outside of said door to engage and rotate said release lever; spring means for biasing said release lever toward said pushbutton; said pushbutton having an eccentric projection engaging said release lever constituting means for bodily moving said release lever from its disengaged position to its engaged position by rotation of said pushbutton.

13. A turn latch lock, particularly for doors of motor vehicles having a frame, comprising: a door; a turn latch rotatably mounted on said door; a turn latch closing cam means mounted on the frame for rotating said turn latch into a closed position during closing of the door; lock pawl means for holding said turn latch in its closed position and movable to release said turn latch; means for releasing said lock pawl means, including a release lever and an intermediate lever being pivotally mounted on said door; said release lever being pivotally supported on said intermediate lever; safety means for selectively pivoting said intermediate lever to move said release lever bodily between an engaged position operative to release said lock pawl means and a disengaged position inoperative to release said lock pawl means, said safety lever drivingly engaging said intermediate lever; internal safety linkage means manually operable from the inside of the door for selectively pivoting said safety lever between a first position corresponding to said disengaged position of said release lever and a second position corresponding to said engaged position of said release lever; said operating lever and said safety lever having cooperating abutment means for engaging to prevent movement of said operating lever in the first position of said safety lever and providing clearance for the movement of said operating lever in said operating lever in said second position of said safety lever.

14. A turn latch lock, particularly for doors of motor vehicles having a frame, comprising: a door; a turn latch rotatably mounted on said door; a turn latch closing cam means mounted on the frame for rotating said turn latch into a closed position during closing of the door; lock pawl means for holding said turn latch in its closed position and movable to release said turn latch; means for releasing said lock pawl means, including a release lever and an intermediate lever being pivotally mounted on said door; said release lever being pivotally supported on said intermediate lever; safety means for selectively pivoting said intermediate lever to move said release lever bodily between an engaged position operative to release said lock pawl means and a disengaged position inoperative to release said lock pawl means, wherein said closing cam is a cantilevered bolt having a radially extending flange at its outer free end; said turn latch being provided with a gear tooth recess for engaging around said closing bolt behind said flange; said door being provided with abutment means for substantially closing the opening of said gear tooth recess on the opposite side of said bolt in the closed position of said door and together with said turning latch constituting expansion safety means substantially completely surrounding said closing bolt axially behind said flange for preventing longitudinal spreading movement between said door and the frame during an accident.

15. A turn latch lock, particularly for doors of motor vehicles having a frame, comprising: a door; a turn latch rotatably mounted on said door; a turn latch closing cam means mounted on the frame for rotating said turn latch into a closed position during closing of the door; lock pawl means for holding said turn latch in its closed position and movable to release said turn latch; means for releasing said lock pawl means, including a release lever and an intermediate lever being pivotally mounted on said door; said release lever being pivotally supported on said intermediate lever; safety means for selectively pivoting said intermediate lever to move said release lever bodily between an engaged position operative to release said lock pawl means and a disengaged position inoperative to release said lock pawl means, wherein said lock pawl means includes a ratchet wheel mounted for rotation with said turn latch and a pivotally mounted lock pawl; said lock pawl and said ratchet wheel having interengaging means defining a preliminary latch position corresponding to partial closing of said door and a final latch position corresponding to the fully closed position of said door; additional means separate and independent from said lock pawl for moving said release lever from its disengaged position to its engaged position during movement of said door from its fully open position to its partially closed position corresponding to said preliminary latch position, and being ineffective to move said release lever during movement of said door from its partially closed position corresponding to said preliminary latch position to its fully closed position corresponding to said final latch position; said lock pawl means being ineffective to move said release lever during any closing movement of said door.

16. A turn latch lock, particularly for doors of motor vehicles having a frame, comprising: a door, a turn latch rotatably

mounted on said door; closing cam means mounted on said frame for rotating said turn latch into a closed position during closing of the door; said closing cam means being a cantilevered bolt having a radial flange at its outer free end; said turn latch being provided with at least one gear tooth recess for engaging around said bolt behind said flange; said door being provided with abutment means radially aligned with said gear tooth recess for substantially closing the opening of said gear tooth recess on the opposite side of said bolt in the closed position of said door and together with said turn latch constituting expansion safety means substantially completely surrounding said closing bolt axially behind and at one axial distance from said flange to prevent longitudinal spreading movement between said door and the door frame during an accident, wherein said door is provided with a cam; said frame is provided with resilient cam means cooperating with said door cam for resiliently biasing said turn latch into engagement with said bolt during closing movement of said door to prevent rattles in the lock; said door including a U-shaped, relatively rigid, formed metal plate including said abutment means and said door cam.

17. A turn latch lock, particularly for doors of motor vehicles having a frame, comprising: a door, a turn latch rotatably mounted on said door; turn latch closing cam means mounted on the frame for rotating said turn latch during closing of said door; a ratchet wheel drivingly connected to said turn latch for movement with said turn latch; latch means for normally locking said ratchet wheel in the closed position of said door; release means, having an engaged position and a disengaged position for moving said latch means out of engagement with said ratchet wheel when in its engaged position and being inoperative for moving said latch means out of engagement with said ratchet wheel when in its disengaged position; said latch means and said ratchet wheel having a preliminary latch position corresponding to partial closing of said door and a final latch position corresponding to the fully closed position of said door; additional means separate and independent from said latch means for moving said release means from its disengaged position to its engaged position during movement of said door from its fully open position to its partially closed position corresponding to said preliminary latch position, and being ineffective to move said release means during movement of said door from its partially closed position corresponding to said preliminary latch position to its fully closed position corresponding to said final latch position; said latch means being ineffective to move said release means during any closing movement of said door.

18. The lock of claim **17**, wherein said additional means includes a coupling lever pivotally mounted with respect to said door about an axis; said latch means including a lock pawl pivotally mounted about said coupling lever axis and engaging said ratchet wheel.

19. The lock of claim **18**, wherein said release means includes a pivotal release lever, and a separate lever pivotally mounted on said door in driving engagement with said release lever at one end and in driving engagement with said lock pawl at its other end.

20. The lock of claim **18**, wherein said ratchet wheel and one end of said coupling lever have cooperating cam means for transferring movement of said ratchet wheel to said coupling lever only between the door fully open position and the door partially closed position corresponding to the preliminary latch position.

21. A turn latch lock, particularly for doors of motor vehicles having a frame, comprising: a door; a turn latch rotatably mounted on said door; a turn latch closing cam means mounted on the frame for rotating said turn latch into a closed position during closing of the door; lock pawl means for holding said turn latch in its closed position and movable to release said turn latch; means for releasing said lock pawl means, including a release lever and an intermediate lever being pivotally mounted on said door; said release lever being pivotally supported on said intermediate lever; safety means for selectively pivoting said intermediate lever to move said release lever bodily between an engaged position operative to release said lock pawl means and a disengaged position inoperative to release said lock pawl means, wherein said rotatable turn latch includes a bearing plate having a hook-shaped abutment means for substantially closing the opening of said turn latch in the closed position; said turn latch closing cam means being provided with a bolt having a projecting radial flange which, in the locking position of said turn latch, extends behind the hook-shaped abutment means and said rotatable turn latch, thereby retaining said bolt and preventing separation thereof from said turn latch in case of an accident.