June 11, 1957 A. JOHNSON 2,795,448

DOOR LATCH MECHANISM

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Fig. 1

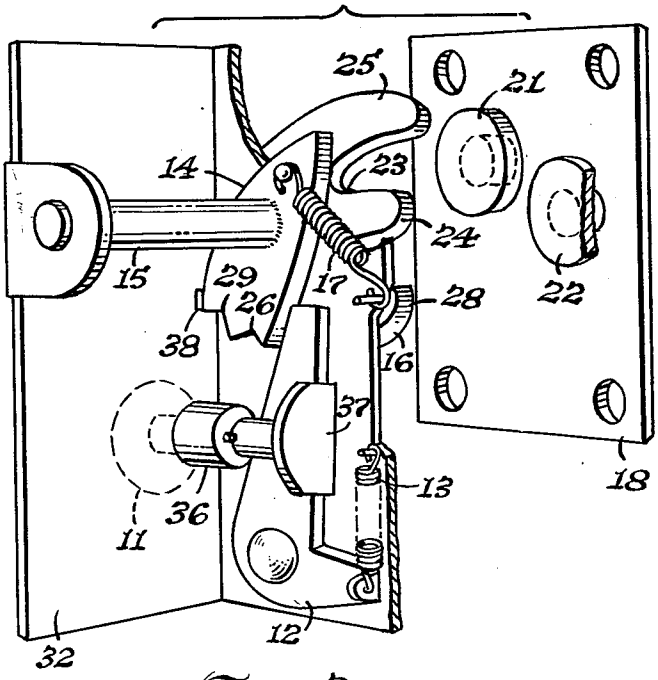

Fig. 2

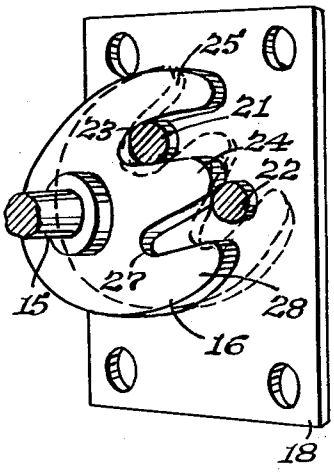

Fig. 3

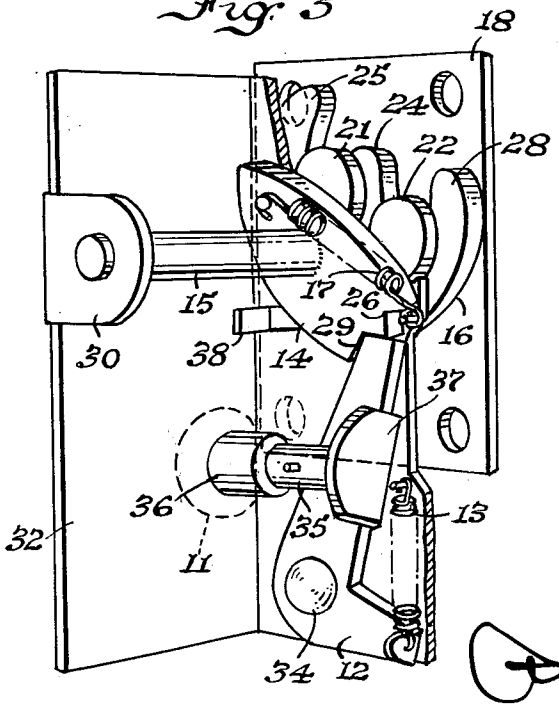

Fig. 4

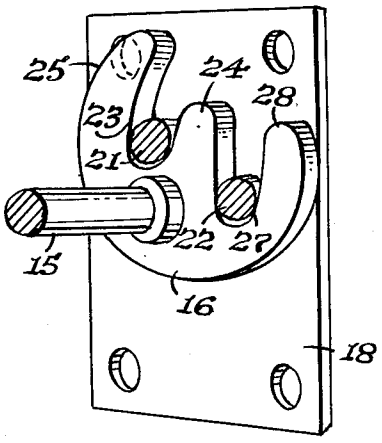

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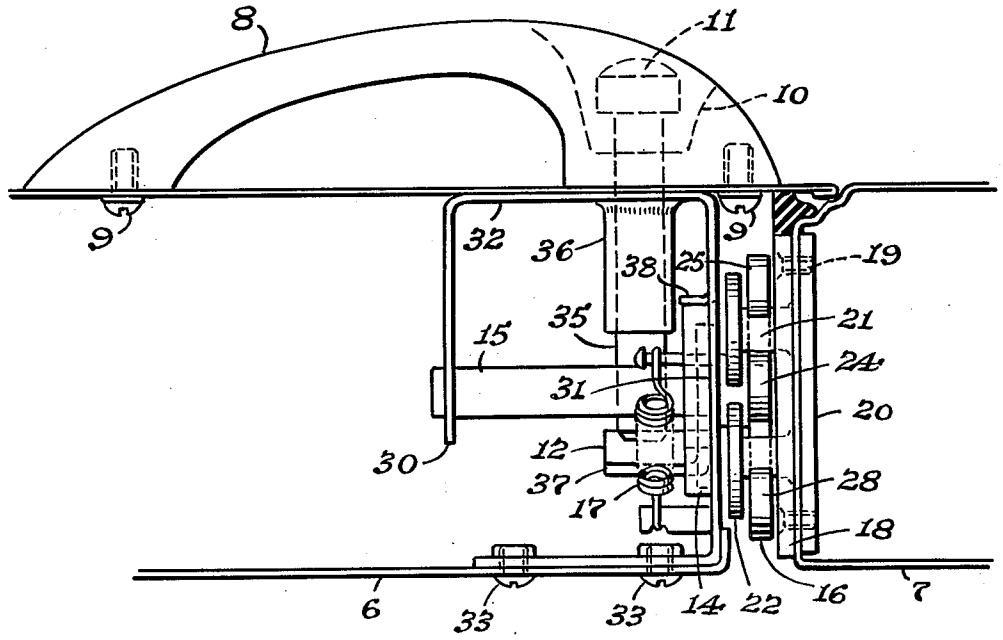
Fig. 5



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DOOR LATCH MECHANISM

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Application October 13, 1955, Serial No. 540,197

5 Claims. (Cl. 292—216)

This invention relates to a new and improved door latch mechanism especially designed and adapted for use on the doors of motor vehicles.

Many deaths in motor vehicle accidents have been due to failure of the doors to remain closed and help keep the persons safer inside the car. The doors sprung open due to the spreading apart of the door and door post under impact or as a result of unusual twisting strains imposed on the body of the car. The ordinary latch bolt slidable into and out of engagement with a striker plate was not designed to prevent spreading apart of the door and dor post. It is, therefore, the principal object of my invention to provide a door latch plate element on the door that is generally E-shaped and is rotatable in a plane parallel to the edge of the door and arranged to engage first one of two spaced headed coupling bolts on a striker plate mounetd on the door post to effect a partial coupling with that bolt disposed between the middle finger and one end finger of the E-shaped latch plate, after which the further rotation of the latch plate about the first mentioned bolt as a pivot results in the added coupling engagement of the other bolt between the middle finger and the ohter end finger of the E-shaped latch plate, so that spreading apart of the door and door post is completely prevented and there is no longer any danger of the door opening accidentally, it being a very simple matter to provide for the dogging of the E-latch plate in its locked position so that there is no danger of the E-latch plate turning and thus allowing the door to open. A two-stage catch is provided turning with the E-latch plate, and a spring-pressed pawl cooperates with the catch to lock the latch plate releasably but securely in either the first or second stage, the first stage being equivalent to what is now commonly referred to as the "safety catch" where the conventional door latches are used, while the second stage corresponds to the fully closed door condition. The spring-pressed pawl is operable conveniently by a push-button, although, of course, other means could be provided if either a rotatable door handle or a pull-out handle is preferred .

The invention is illustrated in the accompanying drawings, in which—

Fig. 1 is a perspective view of a door latch mechanism made in accordance with my invention showing the E-latch plate in unlocked position on thet approach to the striker plate;

Fig. 2 shows the E-latch plate and striker plate with the heads of the coupling bolts on the latter cut away to better illustrate the relationship of the parts when the catch has the pawl engaging it in the first stage corresponding to the conventional "safety catch" action, the latch plate being shown in full lines in the first stage of coupling and in dotted lines in the "safety catch" position;

Fig. 3 is a view similar to Fig. 1 showing the parts in fully locked position;

Fig. 4 is a view similar to Fig. 2 showing the parts in fully locked position, and

Fig. 5 is a horizontal section through portions of a door and door post showing in plan view my improved door latch mechanism as it appears installed.

The same reference numerals are applied to corresponding parts throughout the views.

Referring briefly to the drawings, the reference numeral 6 in Fig. 5 designates the door and 7 the associated door post or pillar of a motor vehicle. The door has a fixed handle 8 secured thereto as by means of screws 9 and there is a recess 10 in one end portion of the handle where a push-button 11 is provided for operating the pawl 12 against the action of its tension spring 13 when the door is to be opened. Pawl 12 cooperates with a catch 14 carried on a horizontal shaft 15 on which the double forked or E-latch plate 16 is also mounted, a coiled tension spring 17 tendig normally to turn the catch 14 and latch plate 16 with it to the unlocked position shown in Fig. 1. The E-latch plate 16 turns in a plane parallel to the edge of the door 6 and parallel to a striker plate 18 that is suitably fastened to the door post as by means of screws 19 that extend through holes in the post and thread in holes in a tapping plate 20 provided on the inside of the post, as shown in Fig. 5. There are two headed horizontally disposed coupling bolts 21 and 22 mounted on the striker plate 18 in laterally and vertically spaced relation, the bolt 21 being slightly above and forward with respect to bolt 22 so as to engage mainly in the notch 23 between the middle finger 24 and one end finger 25 of the E-latch plate 16 in the first portion of the dor closing movement, as illustrated in dotted lines in Fig. 2, this position of the parts of the latch mechanism being equivalent to the "safety catch" condition where a conventional door latch is used, the pawl 12 in tne present case being then engaged in th first notch 26 of the catch 14 to prevent the lathh plate 16 from turning enough to allow the door to open. When the door is slammed thut the latch plate 16, after engaging bilt 21 as in Fig. 2, turns farther enough to get the bolt 22 engaged all the way in in notch 27 between the middle finger 24 and the other end finger 282 of the latch plate 16, as shown in Figs. 3 and 4. The pawl 12 under these conditions engages in the second notch 29 of catch 14, as seen in Fig. 3.

The shaft 15 is supported in bearings 30 and 31 provided in a generally U-shaped bracket 32 that is fastened by means of screws 33 in the oute redge portion of the doro, as seen in Fig. 5, and the web portion of the U-shaped bracket 32, which provides the bearing 31 for shaft 15, also carris the rivet 34 on which the yawl 12 is pivoted as seen in Fig. 3 on the inner side of the bracket for cooperation with the catch 14 that is likewise disposed on the inner side of the bracket. The push-button 11 operates a plunger 35 working ina bearing 36 provided on the inner side of the bracket 32 adjacent the outer wall of the door 6, and the plunger 35 is arranged to engage at its inner end an ear 27 provided on the pawl 12. A stop lug 38 struck inwardly from one side of the bracket 32 is engaged by catch 14 under pressure of spring 17, as seen in Fig. 1, thereby always insuring the correct angularity of latch plate element 16 in unlocked position for coupling engagement with pins 21 and 22.

In operation, when the door 6 is fully closed, as shown in Fig. 5, the E-latch plate 16 has the two headed coupling bolts 21 and 22 on the cover plate 18 engaged in notches or forks 23 and 27, as shown in Figs. 3 and 4, and there is no danger whatever of the door and door post being spread apart regardless of a severe impact or unusual twisting of the body of the car, as when skidding or going up or down an embankment or over an obstacle. The door can be opened only when the latch plate 16 is free to turn and such turning is positively prevented by the engagement of the latch 12 in notch 29 of catch 14.

However, even assuming that the door has not been slammed shut and that the latch plate **16** has accordingly been turned only partway, by cam action of finger **24** on bolt **22**, as shown in dotted lines in Fig. 2, the present latch mechanism will still afford a high degree of safety by preventing spreading apart of the door and door post, because there again the opening of the door is possible only when the latch plate **16** is free to turn, and, under the conditions assumed, the pawl **12** has engagement in the first notch **26** of catch **14** to prevent such turning. The spring **17** tending to turn the latch plate **16** toward unlocked position helps to make the opening of the door much easier when the button **11** is pushed, because this spring offsets the friction drag which the latch plate **16** would otherwise be subject to in the door opening operation. Stop **38** limits the spring return of latch plate **16** by engagement with catch **14** and positions the latch plate **16** at the correct angle for coupling engagement with pins **21** and **22**, as previously described.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. A door latch mechanism comprising, in combination, a pair of vertically spaced, parallel, horizontal coupling bolts projecting from the inner side face of a door post toward the edge face of a door to be latched to said post, one of said bolts being closer to the outer side of the door post than the other, a rotary double forked latch plate element on the door disposed in a plane parallel to the edge face of said door and rotatable in said plane on a horizontal axis from a coupling and uncoupling position in which the forks are horizontally disposed and directed toward the bolts and free to receive or leave the bolts to a locked position in which the forks receive said bolts and are disposed crosswise with respect to the first mentioned position, spring means normally urging said latch plate element to turn to the coupling and uncoupling position, said latch plate element being arranged to be turned against the action of said spring means toward locked position by entry of one of the bolts in one of the forks in the closing of the door, means for releasably locking said latch plate element in locked relation to said bolts, and manually operable means for effecting the release of the last mentioned means.

2. A door latch mechanism as set forth in claim 1, wherein said coupling bolts have radially enlarged but relatively thin head portions on the outer ends thereof, and the latch plate element is disposed in spaced relation to the edge face of the door leaving working clearance therebetween for the head portions of said bolts.

3. A door latch mechanism as set forth in claim 1, wherein one of said coupling bolts has a radially enlarged but relatively thin head portion on the outer end thereof, and the latch plate element is disposed in spaced relation to the edge face of the door leaving working clearance therebetween for the head portion of said bolt.

4. A door latch mechanism comprising, in combination, a pair of vertically spaced, parallel, horizontal coupling bolts projecting from the inner side face of a door post toward the edge face of a door to be latched to said post, one of said bolts being located forward with respect to the other closer to the outer side of the door post, a rotary double forked latch plate element on the door disposed in a plane parallel to the edge face of said door and rotatable in said plane on a horizontal axis from a coupling and uncoupling position in which the forks are horizontally disposed and directed toward the bolts and free to receive or leave the bolts to a locked position in which the forks receive said bolts and are disposed crosswise with respect to the first mentioned position, spring means normally urging said latch plate element to turn to the coupling and uncoupling position, the axis of rotation of said latch plate element being vertically spaced relative to said forward bolt, whereby said latch plate element is arranged to be turned against the action of said spring means toward locked position by engagement of the forward bolt in the fork associated therewith in the closing of the door, means for releasably locking said latch plate element in locked relation to said bolts, and manually operable means for effecting the release of the last mentioned means.

5. A door latch mechanism as set forth in claim 4, wherein at least one of said coupling bolts has a radially enlarged but relatively thin head portion on the outer end thereof, and the latch plate element is disposed in spaced relation to the edge face of the door leaving working clearance therebetween for the head portion of said bolt.

References Cited in the file of this patent

UNITED STATES PATENTS

2,038,876	Sonabend	Apr. 28, 1936
2,094,413	Schonitzer	Sept. 28, 1937
2,231,075	Lakin	Feb. 11, 1941
2,458,751	Voight	Jan. 11, 1949
2,665,160	Puzik	Jan. 5, 1954

FOREIGN PATENTS

649,314	Great Britain	Jan. 24, 1951
1,077,170	France	Nov. 4, 1954