March 9, 1937. E. LEFEVRE 2,073,017

LATCH MECHANISM

Filed July 16, 1934 2 Sheets-Sheet 1

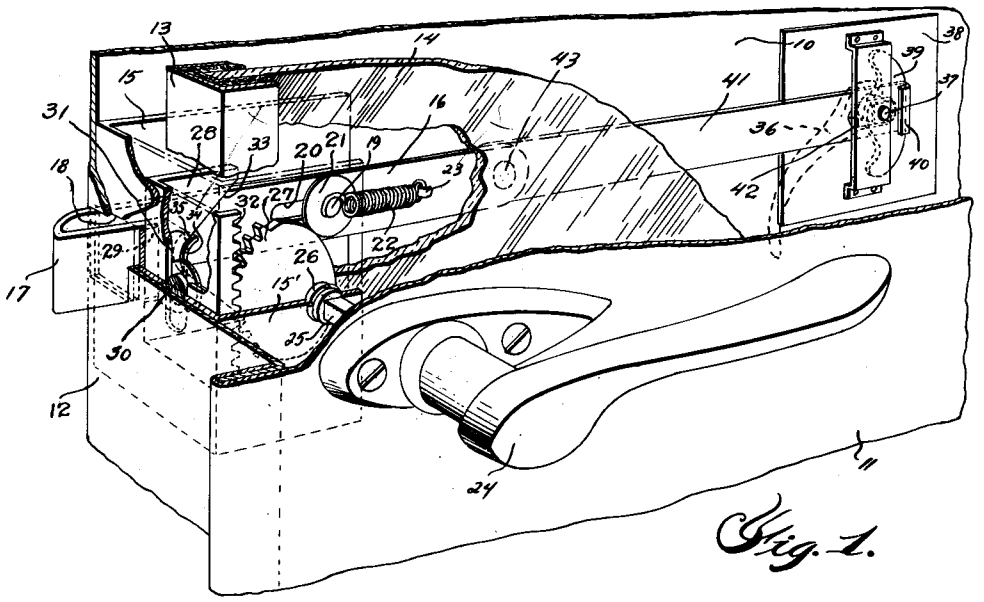


Fig. 1.

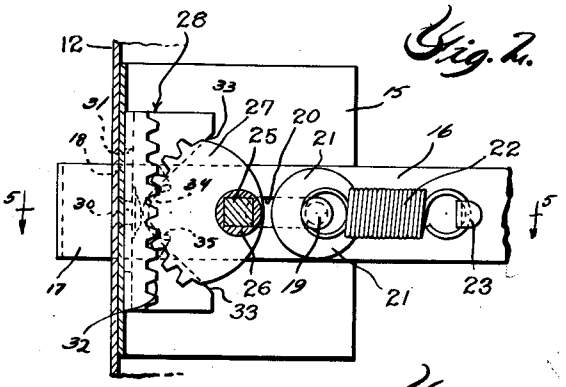


Fig. 2.

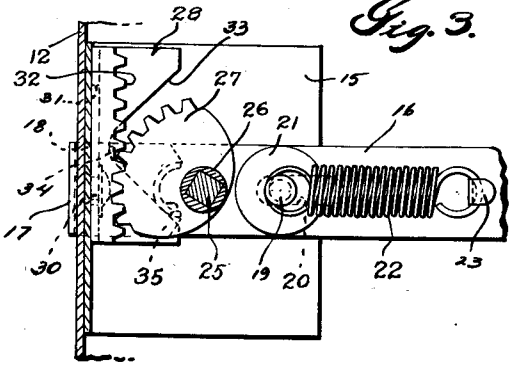


Fig. 3.

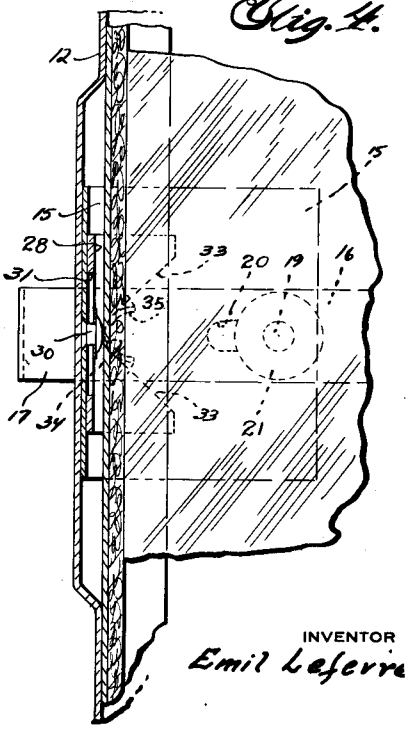


Fig. 4.

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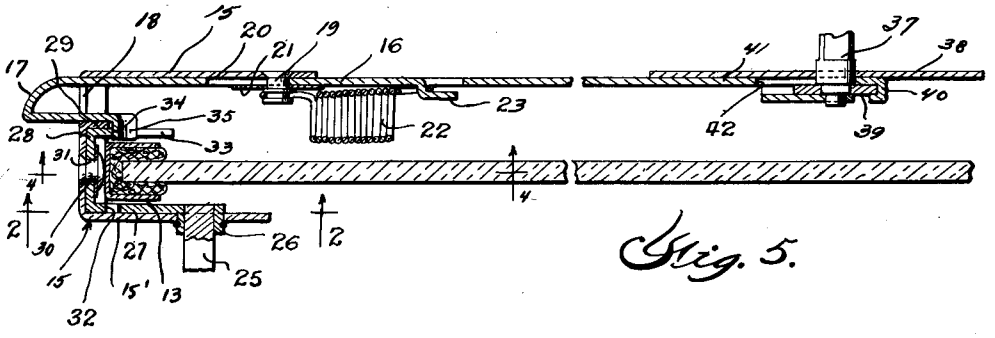


Fig. 5.

Fig. 7.

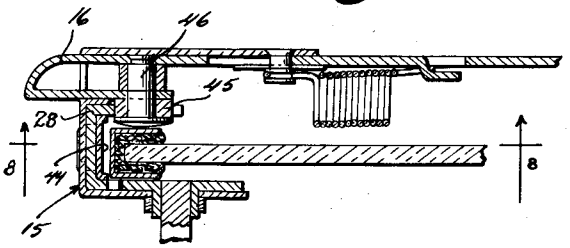
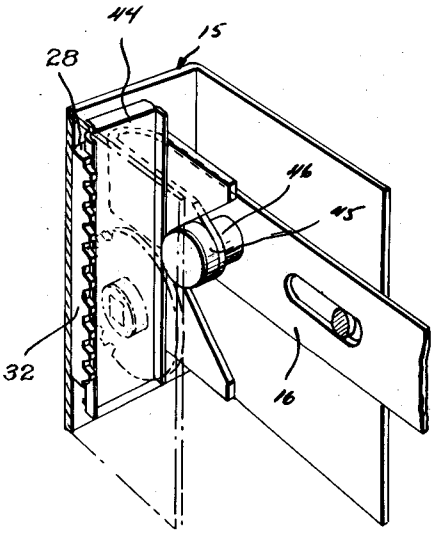


Fig. 6.



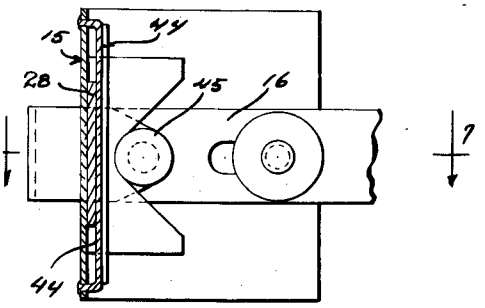


Fig. 8.

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2,073,017

LATCH MECHANISM

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Application July 16, 1934, Serial No. 735,530

4 Claims. (Cl. 292—172)

My invention relates to latch mechanism and more especially to latch mechanism of the type which finds particular utility when used in connection with motor vehicle doors and the like, my invention having as its objects to simplify, render more efficient, and improve generally mechanism of this type.

Latch mechanisms adapted for use with automobile doors and the like must be designed so as to provide clearance for the usual sliding glass panels which in present day motor vehicle construction extend substantially the full width of the body of the door. An important object of my invention is to provide a commercially practical latch mechanism fully complying with these requirements and of such simple construction and comprising such a minimum number of parts that the same may be economically manufactured, sturdily built, and assembled and installed with facility.

Another object of my invention is to provide a latch mechanism of the type herein referred to which can be installed in either the right hand or left hand vehicle door by merely reversing the same.

Other advantages of my invention result from the novel combination, construction and arrangement of parts all of which will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawings, wherein

Figure 1 is a perspective view of my improved latch mechanism assembled with a vehicle door which is fragmentarily illustrated;

Figure 2 is a fragmentary sectional elevational view taken substantially on the plane indicated by line 2—2 in Figure 5;

Figure 3 is a view similar to Figure 2 showing the latch bolt retracted;

Figure 4 is a longitudinal sectional view taken substantially on the plane indicated by line 4—4 in Figure 5;

Figure 5 is a longitudinal sectional view through the complete latch and operating mechanism taken substantially on the plane indicated by line 5—5 in Figure 2;

Figure 6 is a perspective view of a slightly modified form of latch mechanism detached from the door;

Figure 7 is a horizontal sectional view through the structure illustrated in Figure 6 taken substantially on the plane indicated by line 7—7 in Figure 8, and

Figure 8 is a sectional view taken substantially on the plane indicated by line 8—8 in Figure 7.

Referring now to the drawings, and more particularly to Figures 1 to 5 thereof, it will be noted that in Figure 1 there is fragmentarily illustrated a vehicle door, preferably of the conventional steel construction consisting of an inner panel 10, an outer panel 11 and a jam rail 12.

The reference character 13 indicates the usual glass run channel which slidably receives and supports the usual slidable window glass panel 14. The glass channel 13 may be secured in any suitable manner to the inner face of the jam rail 12.

The latch mechanism is in the form of a unit which may be mounted interiorly of the door in the space between the inner and outer panels 10 and 11 and as here illustrated consists of a latch plate 15 substantially U-shaped in cross-section, this latch plate being secured to the door by any of the conventional accepted methods.

Slidably mounted on the latch plate is a latch bolt 16 having a head 17 which, as is customary, projects beyond the free edge of the door or the jam face 12. The latch bolt is mounted for sliding movement against the inner face of one of the sides or legs of the U-shaped latch plate 15 and the head 17 thereof projects through and is slidably mounted in an opening 18 formed in the latch plate. A stud 19 projecting from the said leg of the latch plate extends through a slot 20 formed in the latch bolt and thus cooperates with the opening 18 to slidably mount the latch bolt. The latch bolt may be held against the latch plate by means of a washer or the like 21 carried by the stud and the latch bolt is normally held in its projected position by means of a spring 22, one end of which is anchored to the stud 19 and the other end of which engages a lug or other projection 23 formed on the latch bolt.

The reference character 24 indicates an outside or exteriorly arranged operating member or handle, the stem 25 of which extends through the outer door panel 11 and into a squared opening in the hub 26 of a gear segment 27 rotatably journaled on the latch plate 15.

Slidably mounted on the latch plate 15 for movement in a plane substantially at right angles to the plane of the movement of the latch bolt is a latch bolt operating member 28. This operating member is here shown as substantially U-shaped in horizontal cross section and straddles the glass channel 13, being located in advance thereof between the glass channel and the jam rail or free edge of the door. This operating member 28, in the form of construction illustrated in Figures 1 to 5, is slidably mounted between one

of the legs or sides of the U-shaped latch plate and a lug or projection **29**. The lug or projection **29** is preferably formed from the material of the latch plate **15** by cutting the same on three sides and bending the same inwardly. As illustrated, this lug consists of a portion of the material displaced in forming the opening **18** through which the latch bolt head projects. Thus the latch operating member **18** is guided and slidably mounted in the channel formed by the lug or projection **29** and the leg **15'** of the latch plate **15**. For holding the operating member **28** in place, I may provide a stud **30** secured to the latch plate projecting through a slot **31** formed in the operating member **28**.

The latch bolt operating member **28** is provided along one longitudinal edge with a series of teeth **32** which engage with the teeth of the gear segment **27** so that as the gear segment **27** is rotated the operating member **28** is reciprocated. The opposite edge of the operating member **28** is provided with a pair of cam surfaces **33** which are arranged in diverging converging relation and at their juncture form a valley or dwell portion **34**.

The latch bolt has preferably formed integrally therewith a lug or projection **35** which constitutes a cam follower and normally rests in the valley or dwell portion **34** of the operating member and is adapted to be engaged by one of the cam surfaces **33** when the operating member **28** is reciprocated. The engagement of either of the cam surfaces with the cam follower will cause a retraction of the latch bolt **16** against the action of its spring **22** to thus release the latch bolt head **17** from the keeper (not shown) as will be readily apparent. This retraction of the bolt is obviously effected by rotating the handle **24** in either direction, and when the handle is released the latch bolt is returned to its normal position under the influence of its spring, and the cam follower acting upon the then operative cam surface returns the latch bolt operating means **28** to its normal position, illustrated in Figure 2. In this position of the parts the operating member **28**, and consequently the handle **24**, are held against movement by the engagement of the cam follower in the valley or dwell portion **34** between the two cam surfaces.

Remote control of the latch may be provided on the inner side of the door by the means probably most clearly illustrated in Figures 1 and 5. This operating mechanism comprises an operating member or handle **36** mounted on a shaft **37** rotatably journaled in a plate **38**. Secured to the shaft **37** is a cam member **39** which, when rotated, is adapted to engage an abutment **40** on the end of a link **41**. The link **41** is slotted as at **42** to slidably mount the same on the shaft **37**. The link **41** may be formed integrally with the latch bolt **16** or may be formed separate therefrom and pivoted thereto as at **43**. The slot **42** permits movement of the latch bolt **16** without movement of the inner operating handle **36** when the latch is retracted by the outside handle **24**. It is obvious that when the latch bolt is retracted by the inside handle **36** the cam follower **35** will be moved away from the operating member **28** and hence will not cause a movement of the outside operating handle.

With the construction thus far described, it will be apparent that the single spring **22** acts to normally hold all of the parts in position for operation of the latch bolt by either the outside or inside handle and to return the parts to the position shown in Figure 1 after retraction of the latch bolt by either of the handles.

The form of construction illustrated in Figures 6 to 8 inclusive is substantially identical with that previously described, and accordingly like reference characters will be used to designate similar parts in the two forms of construction.

In the form of construction illustrated in Figures 6 to 8, the latch bolt operating member is slidably mounted on the latch plate **15** by means of a guide plate **44** which is secured to the latch plate and spaced therefrom a distance substantially equal to the thickness of the reciprocating operating member **28**. Thus during its sliding movement the member **28** is supported on one side by the latch plate **15** and on the other side by the guide plate **44**.

Instead of forming the cam follower from a lug or extension **35** on the latch bolt this modified form of construction is provided with a roller **45** rotatably mounted on a stud **46** rigidly secured to the latch bolt **16**. Thus during actuation of the latch bolt, the roller **45** rotates to decrease friction between the parts. The remaining structure as well as the operation is the same as that described in connection with the form of construction illustrated in Figures 1 to 5 inclusive.

Both of the herein described constructions are so designed that they may be used for either right hand or left hand doors merely by reversing the structure, or in other words, turning the same upside down. This is obviously of considerable advantage in production as it is not necessary to produce separate quantities of right and left hand assemblies and the advantage also obtains during installation because no concern need be given to the problem of maintaining a sufficient quantity of both right and left hand latch assemblies.

With either of the herein described constructions it is possible to maintain a maximum width of sliding glass panel because the latch mechanism and particularly the connection between the latch bolt located on one side of the panel and the operating handle located on the other requires but a minimum amount of space for installation between the edge of the glass channel and free edge or jam rail of the door. In the herein described construction the operating connection between the outside handle and the latch bolt consists of the member **28** which straddles the glass runway and reciprocates in a plane substantially parallel thereto or substantially parallel to the free edge of the door, and thus requires but a minimum of space for installation.

The present construction is also distinguished by its simplicity and its minimum number of parts which enables it to be economically manufactured, sturdily produced, and assembled and installed with facility.

While two embodiments of the invention have been illustrated and described herein somewhat in detail, it will be readily apparent to those skilled in this art that changes may be resorted to in many of the non-essential details of construction without departing from the spirit and scope of this invention, and to this end reservation is made to make such changes as may come within the purview of the accompanying claims.

What I claim as my invention is:

1. A latch mechanism for a door having a runway for a movable glass panel comprising, a latch bolt upon one side of the runway, a vertically reciprocable member mounted for movement

between the runway and the free edge of the door, said member being formed with a pair of oppositely inclined cam surfaces provided with a dwell portion therebetween, a cam follower on said latch bolt engageable by one of said cam surfaces upon reciprocation of said member, and means on the other side of said runway for reciprocating said member.

2. A latch mechanism for a door having a runway for a movable glass panel comprising, a latch bolt upon one side of the runway, a vertically reciprocable member mounted for movement between the runway and the free edge of the door, said member being formed with a pair of oppositely inclined cam surfaces provided with a dwell portion therebetween, a cam follower on said latch bolt engageable by one of said cam surfaces upon reciprocation of said member, means on the other side of said runway for reciprocating said member, and a spring normally holding said latch bolt in projected position and said cam follower in engagement with the dwell portion between said cams.

3. A latch mechanism for a door having a runway for a movable glass panel comprising, a latch plate adapted to be secured within said door, a latch bolt on one side of said runway and slidably mounted on said latch plate, a substantially U-shaped member adapted to straddle the runway and mounted for vertical reciprocation on said latch plate, one leg of said U-shaped member being formed with a pair of oppositely inclined longitudinally extending cam surfaces having a dwell portion at their juncture, a cam follower on said latch bolt normally engaging said dwell portion and adapted to be engaged by one of said cam surfaces upon reciprocation of said member to retract said latch bolt, the other leg of said U-shaped member having a toothed edge, a spring carried by said latch plate and engaging said latch bolt to normally hold the latter in projected position with said follower in engagement with said dwell portion, and a gear segment rotatably journaled on said latch plate on the other side of said runway, the teeth on said U-shaped member being engageable by said gear segment for reciprocating said U-shaped member upon rotation of said gear segment.

4. A latch mechanism for a door having a runway for a movable glass panel comprising, a latch plate adapted to be secured within said door, a latch bolt slidably mounted on said latch plate, a substantially U-shaped member adapted to straddle the runway, a guide plate secured to said latch plate in spaced relation thereto providing a guideway for reciprocably mounting said U-shaped member on said latch plate, a pair of oppositely inclined longitudinally extending cam surfaces formed on one leg of said U-shaped member, a roller on said latch bolt engageable by one of said cam surfaces upon reciprocation of said U-shaped member to retract said latch bolt, a spring carried by said latch plate and engaging said latch bolt to normally hold the latter in projected position with said roller at the juncture of said cam surfaces, gear teeth formed on the other leg of said U-shaped member, and a gear segment rotatably journaled on said latch plate engageable with said gear teeth for reciprocating said U-shaped member.

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