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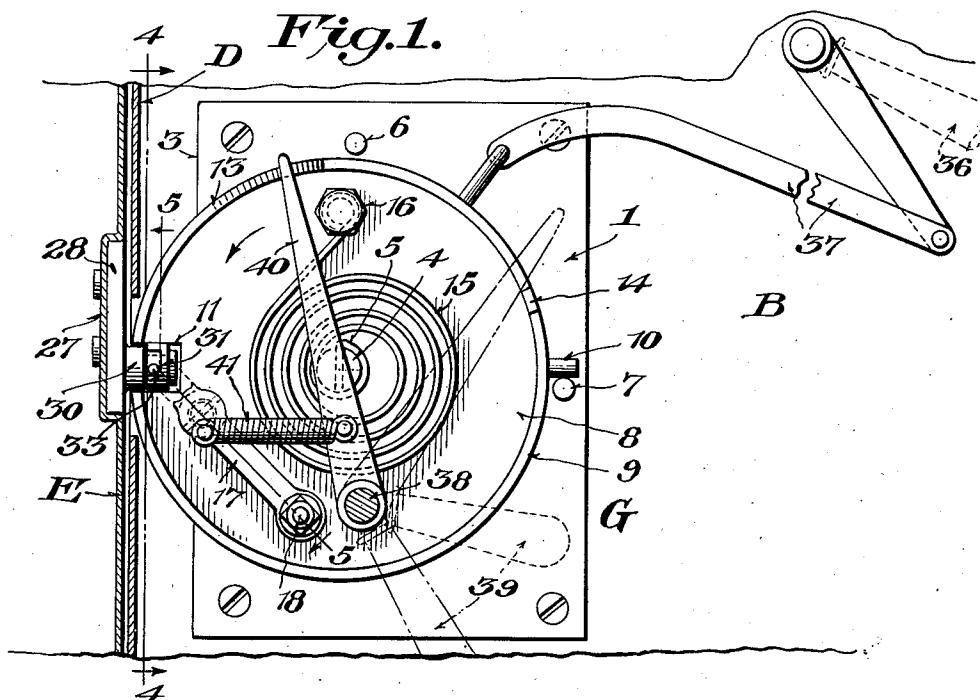
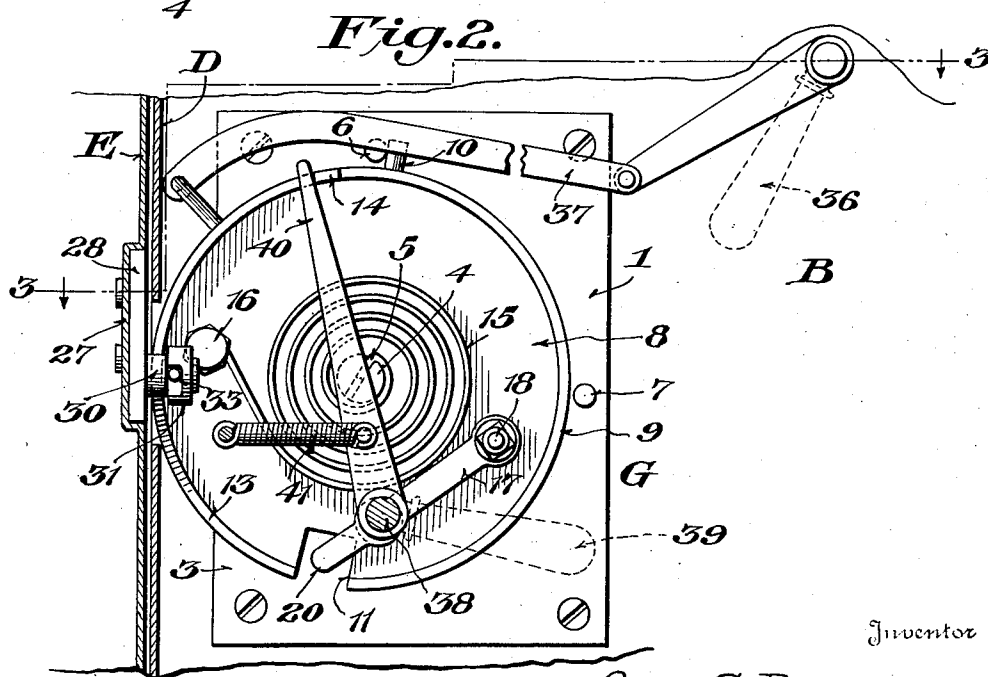
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LATCH MECHANISM

Filed Feb. 19, 1938

2 Sheets-Sheet 1



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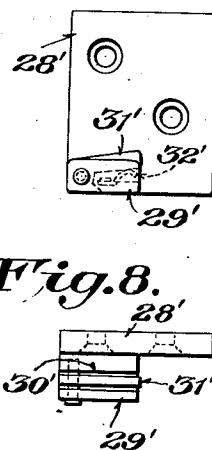
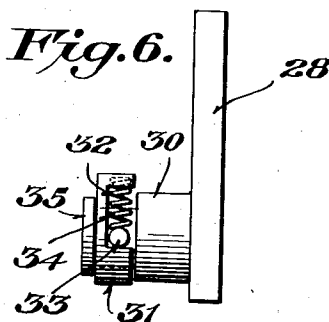
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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LATCH MECHANISM

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5 Claims. (Cl. 292—333)

This invention relates to latch mechanisms, and more particularly to that type which is used on automobile doors, although same is not restricted to such use, but may be readily adapted to other closures.

The primary important object of this invention is to provide a device of the above character, which is entirely automatic in its operation, for securing a door when the latter is moved to its closed position.

Another important object of this invention is to provide a device of the above character which, when in operation entirely eliminates rattling of the door or other closure by continuously and positively drawing the same to its closed position within its frame.

Another important object of this invention is to provide a device of the above character which is automatically set and locked in its set position when the operating means is actuated to open the door.

Another important object of this invention is to provide a device of the above character which entirely eliminates the necessity of slamming the door in order to secure same, as is usually required with the latch mechanisms at present in use.

Still another important object of this invention is to provide a device of the above character in combination with a novel form of keeper so as to insure smoothness and ease of operation.

A further important object of this invention is to provide a device of the above character which is simple in construction, and one which may be readily and cheaply manufactured and placed upon the market at a reasonable cost.

The foregoing and other objects and advantages will be readily apparent throughout the course of the following description and drawings, in which

Fig. 1 is a fragmentary vertical sectional view through an automobile door and the adjacent portion of the body, with the outer walls thereof being removed, the latch mechanism being mounted on the inner wall of the door, between the walls thereof, and shown in its inoperative or unlatched position,

Fig. 2 is a view similar to Fig. 1, taken on line 2—2 of Fig. 3, and showing the latch in its operative or latched position,

Fig. 3 is a fragmentary horizontal sectional view taken on line 3—3 of Fig. 2, showing the latch in its operative or latched position,

Fig. 4 is a fragmentary vertical sectional view taken on line 4—4 of Fig. 1, showing the door

being moved to its closed position just prior to the securing operation of the latch,

Fig. 5 is a fragmentary sectional view on line 5—5 of Fig. 1, showing the spring pressed trigger for holding the latch in its inoperative or unlatched position,

Fig. 6 is a rear elevation of the keeper disclosed in Figs. 1 to 5 inclusive,

Fig. 7 is a side elevation of a modified form of keeper, and

Fig. 8 is a top plan view of the modified form of the keeper shown in Fig. 7.

Referring in detail to the drawings, A represents a hollow metal door of an automobile having an inner wall B, an outer wall C, and an end wall D. The door A is hinged in the usual manner (not shown) within the frame E forming a part of the automobile body. The door A is formed with a bead or strip F, or other suitable means for limiting the inward or closing movement thereof within its frame.

The latch mechanism, generally designed at G, in Figs. 1 and 2 consists of a mounting base plate 1, of any suitable design, secured to the inner face of the inner wall B by any desired fasteners. The inner wall B of the door is provided with an outwardly facing notch 2 adjacent the outer edge 3 of plate 1 and which extends through the end wall D. The plate 1 is provided with an outwardly extending shaft 4 having its outer free end split as at 5, and is further provided with outwardly extending spaced stop lugs 6 and 7 for a purpose to be hereinafter more fully described.

Mounted for rotation upon the shaft 4 is a latch disk 8 formed on its periphery with an axially extending collar 9, which carries a stop pin 10 adapted to alternately engage with the stop lugs 6 and 7, so as to limit the rotary movement of the disk 8. The disk 8 is formed with an outwardly facing notch 11 extending through its periphery, which corresponds in shape to and which in one of its positions is adapted to overlap and register with the outwardly facing notch 2 formed in the free edge of the door. The collar 9 is cut away adjacent the notch 11 so as to provide a straight wall 12 and a tapered wall 13, the latter wall providing a cam surface.

The collar 9 is also formed with an axially extending lug 14.

A coil spring 15 which continuously urges the disk 8 in the direction of the arrow in Fig. 1, has one of its ends anchored within the split end 5 of the shaft 4, while its opposite end is secured

to the disk by means of a bolt 16, or other suitable fastener.

In order to prevent relative rotation of the latch disk 8 with respect to the mounting plate and to hold same in its unlatched position, a trigger 17 is provided which has one of its ends resiliently connected to the plate by means of bolt 18 and coil spring 19.

The opposite free end 20 of the trigger is disposed across the opening 11 of the disk 1. The trigger is formed intermediate its ends with a socket 21 adapted to receive one end of a bolt 22 which is retained therein by means of a pin 24. The connection between the socket 21 and pin 24 is such as to permit the latter to have slight oscillatory movement. The free end of the bolt 22 is adapted to be projected through openings 25 and 26 formed in the disk 8 and plate 1 respectively.

The end wall of the door frame E is inset as at 27 for the reception of a keeper base plate 28 formed with an outwardly projecting stud 29 upon which latter is mounted an anti-friction roller 30 and a rockable keeper head 31 of substantially cam-shaped configuration, as shown in Figs. 4 and 5. The inner side face of the keeper head is formed with transversely extending grooves 32 having outwardly divergent walls between which is received and partially housed the free ends of a cross key 33, for permitting limited rocking movement of the head.

To maintain the keeper head 31 in its normal position, a coil spring 34 is inserted between one of the walls defining one of the grooves 32 and one free end of the key 33.

In order to prevent loss of the roller 30 and keeper head 31, in the event key 33 is displaced, a retaining head 35 is secured to the free end of the stud 29, by any suitable means.

The inside operating means for moving the latch mechanism to its inoperative position, consists of a handle 36 rotatably supported by the inner wall B and connected to the disk 8 through collar 9 by the linkage 37.

The outside operating means for the latch mechanism consists of a shaft 38 rotatably supported by the front wall C of the door, carrying a handle 39 upon its outer end and upon its inner end a lever 40, which latter is moved in a clockwise direction against the tension of coil spring 41 so as to engage the lug 14 formed on the collar 9, as shown in Fig. 2. The coil spring 41 functions to return the outside operating handle to its normal position when released.

The modified form of the keeper disclosed in Figs. 7 and 8 consists of a base plate 28' formed with an outwardly extending support 29' provided with an upwardly facing groove 30', which is adapted to receive a pivoted arm 31'. The free end of the pivoted arm is normally held in slightly projected position, by means of a leaf spring 32', as shown in dotted lines in Fig. 7, so that the upper face thereof assumes an inclined position.

In the operation of the latch mechanism, assuming the door is to be opened from the outside, the disk 8 is rotated by the handle 39 and lever 40 in a clockwise direction, as shown in Fig. 1, against the tension of the coil spring 15, until stop pin 10 engages with stop lug 7. This movement will bring openings 25 and 26 in disk 8 and plate 1 respectively, into register, whereupon the bolt 22 carried by trigger 17 is projected through said openings under the pressure of spring 19 so as to hold disk 8 against retrograde or counterclockwise movement.

This operation will likewise cause opening 11 in the disk 8 to register with openings 2 in the inner and end walls B and D of the door respectively, thus permitting the roller 30 of the keeper to pass through said openings so that the door may be moved to its open position. It will be readily apparent that the foregoing operation of the latch to its released position, has also reset the mechanism for automatically latching the door.

Automatic latching of the door is accomplished by merely exerting slight closing pressure thereon until the free end 20 of the trigger 17 which is in the path of the rockable keeper head 31 engages the latter sufficiently to withdraw bolt 22 from the openings 25 and 26. Whereupon, the disk 8 carrying collar 9 will be forcibly rotated in a counterclockwise position by spring 15, thus causing the cam face 13 of the collar to engage back of the roller 30, resulting in latching the door and at the same time continuously drawing the door tightly within its frame so as to prevent vibration of the door.

The rockable keeper head 31, being the preferred one of the several modifications, functions by rocking about its pivot so as to permit the door to swing to closed latched position without undue friction between the parts. In other words, when the door is moved to its closed position the head 31 will rock so as to permit same to pass through the openings 2 and 11, and will then return or rock to an angle from the horizontal under the influence of spring 32 to a position so that one end thereof will engage the inner face of the disk 8 thereby to prevent opening of the door unless the disk 8 is rotated far enough in a clockwise direction to permit the wall defining opening 11 to clear the highest point of the head. At this point it is to be noted that the size of the openings, see Fig. 5, is sufficient so as to permit slight movement of the disk 8 in either direction after the bolt 22 is moved to holding position. Movement of the disk 8 toward unlatching position also causes openings 25 and 26 to again register so as to automatically receive the spring projected retaining bolt 22.

The operation of the modified form of keeper, as disclosed in Figs. 7 and 8, is similar to that of the preferred form disclosed in Figs. 1 to 6 inclusive, and therefore, repetition of such operation is deemed unnecessary.

The novel features and the operation of this mechanism will be apparent from the foregoing description. However, while the structure and operation of the mechanism is described in detail, it is to be distinctly understood that same is not limited to the exact form disclosed, but that various changes may be made therein without departing from the spirit of this invention and the scope of the subjoined claims.

Having thus described my invention, what is claimed is:

1. A latch mechanism for use with automobile doors, a pintle on the inner face of the door frame opposite to that to which the door is hinged, a roller carried by the pintle, a substantially cam-shaped rockable keeper head carried by the pintle, means for limiting rocking movement of the keeper head, means to maintain the keeper head in normal position, latching means located between the front and rear sides of the door, the door having an opening, said latching means including a member having an opening which latter in one position of the door registers with the opening of the door and through which both of said openings the keeper head is movable, a cam sur-

face on said member to engage the roller to move the door to its closed position, said rockable keeper head when in its normal position engaging the latching means to prevent opening movement of the door after the initial closing movement of the latter, means to operate the latching means to a position to release the same from the keeper head to permit opening movement of the door, means to hold the latching means in its inoperative position, and other means carried by the holding means for engaging the keeper head, whereby upon engagement of the last named means with the keeper head, the latching means is released for engagement with the roller.

2. A latch mechanism for use with automobile doors, including a keeper mounted on the inner face of the door frame opposite to that to which the door is hinged, latching means disposed between the front and rear sides of the door, means to operate the latching means exteriorly of the door, said door having an opening, and the latching means including a member having an opening which in one position registers with the opening of the door, and through both of which openings the keeper is movable, a cam surface on said member to engage the keeper to move the door to closed position, and releasable means carried solely by the member having a part disposed in the path of the keeper and formed to hold the latching means in its inoperative position and upon release to allow the latching means to move to its operative position when the releasable means is released by the keeper as the latter passes through the registering openings.

3. A latch mechanism for use with automobile doors, including a keeper mounted on the inner face of the door frame opposite to that to which the door is hinged, a tensioned rotatable latch disk disposed between the front and rear sides of the door and having a peripheral flange formed with an opening and with a camming surface, the disk opening adapted in one position of the disk to register with an opening formed in the free edge of the door to permit the keeper to pass through both of said openings, manual means to rotate the disk to unlatched position, means

carried by the disk to hold the latter in its unlatched position, and means carried by the holding means and having a part thereof formed to extend across said openings so as to engage the keeper when the latter passes through the openings, whereby to release the disk and thereby position the camming surface for movement into latching engagement with the keeper.

4. A latch mechanism for an automobile door, including a keeper having a tensioned cam movably carried by the end of the frame of the door opening opposite to that to which the door is hinged, a manually operable member rotatably carried by the door and having an opening for registry with an opening provided in the free end of the door and having a cam edge, a spring pressed member carried by the manually operable member, means carried by the spring pressed member to latch the manually operable member to the door, said cam of the keeper in one position and when said openings are in register, being movable therethrough and when the manually operable member is moved to latching position said cam is held thereby against reverse movement through the openings, and means carried by the spring pressed member for engagement with the keeper cam whereby to cause the spring pressed member to move to a position to unlatch the bolt.

5. A latch mechanism for an automobile door, including a keeper carried by the frame of the door opening and having a cam, a manually operable latching member rotatably carried by the door and having an opening for registry with an opening provided in the free end of the door, and also having a camming surface, a spring pressed member carried by the latching member and having a bolt engageable with the door to secure the latching member in inoperative position, and means carried by the spring pressed member for engagement with the keeper cam whereby to cause the spring pressed member and its bolt to move so as to release the latching member and permit movement thereof to door latching position.

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