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LATCH BOLT KEEPER

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Fig. 1.

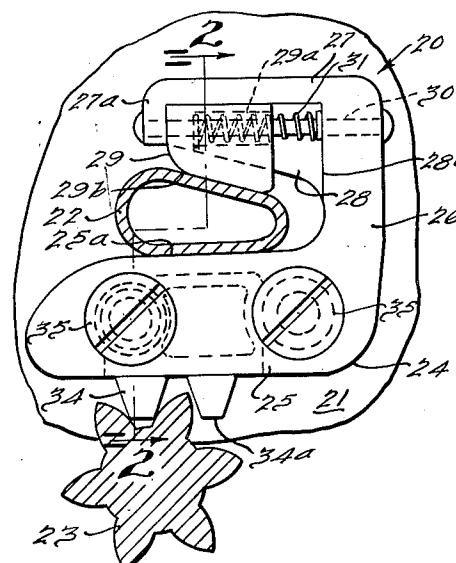


Fig. 3.

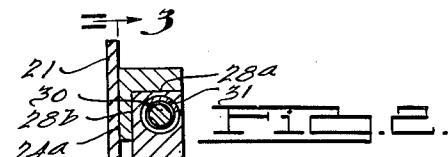
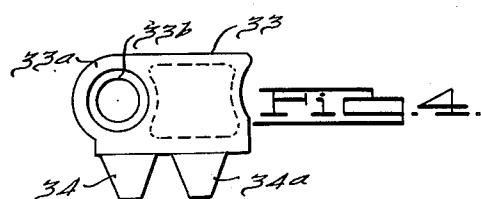
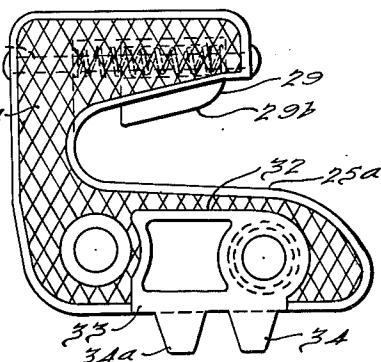
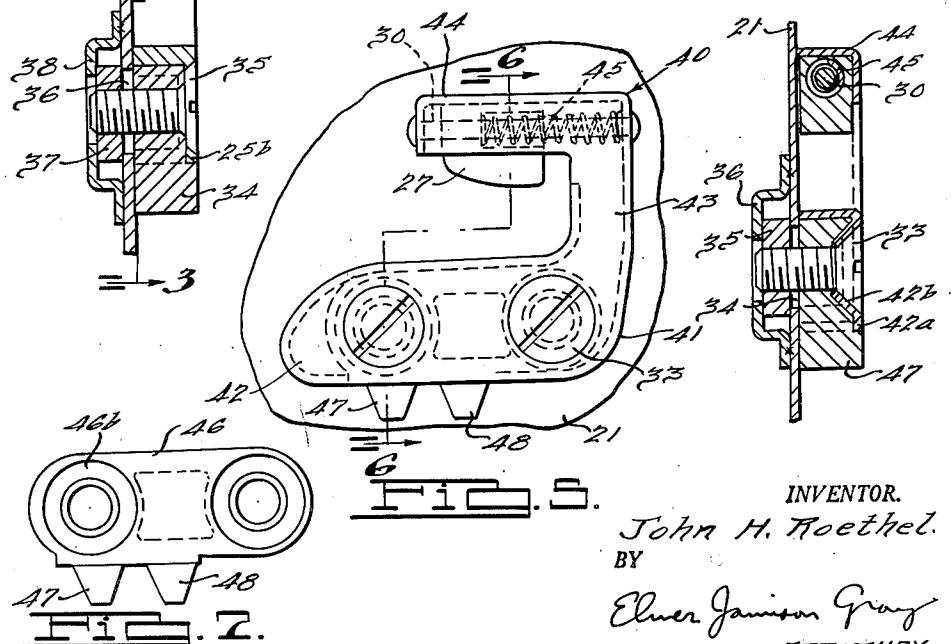


Fig. 6.



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UNITED STATES PATENT OFFICE

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LATCH BOLT KEEPER

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7 Claims. (Cl. 292—341.12)

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This invention relates to latch bolt keeper mechanism of the type constructed and arranged to be engaged by a multi-toothed latch bolt of a rotary latch mechanism mounted on a swinging door, especially a door of an automobile or other vehicle body, an object of the invention being to provide an improved latch bolt keeper mechanism which is characterized by its simplicity and compactness in construction, its ability to withstand numerous impacts of the latch bolt as 10 the door is repeatedly opened and closed, its resistance to wear at the points of frictional engagement with the latch bolt, the ease with which its parts which are subject to wear may be replaced, and its efficiency in holding the door 15 firmly against movement in a vertical plane while the vehicle is in operation.

A further object of this invention is to provide an improved latch bolt mechanism embodying a keeper having teeth which are engageable with 20 a multi-toothed rotary latch bolt of a rotary latch mechanism carried on a swinging door and which teeth are formed as a part of a replaceable member instead of being formed as an integral part of the frame structure of the keeper, 25 thus permitting ready replacement of the keeper teeth when worn without requiring the entire keeper to be discarded for replacement purposes. Further, by manufacturing the member carrying the keeper teeth separately from the keeper 30 frame structure, it is possible practically to utilize materials, such as nylon plastic or special metal alloys which although more expensive than die cast steel, have highly important physical characteristics such as high resistance to impact stresses, resistance to wear and cushioning characteristics. Thus, by fabricating the striker or keeper device in this manner it is possible to produce a striker or keeper which is not only 35 superior to and more efficient in use than strikers heretofore made but also which is not prohibitive in cost.

Another object of the invention is to provide an improved latch bolt keeper mechanism so constructed that the frame member, which is not subject to direct and concentrated impact stresses or to a high degree of frictional wear at 40 its points of engagement with the cooperative members carried on a swinging door but which functions primarily to support or retain the operative parts of the keeper mechanism in proper spaced relationship, may be inexpensively fabricated as a metal stamping or formed as a die casting of suitable material such as steel, the frame member being constructed to receive a replaceable member having teeth formed thereon for engagement with the multi-toothed latch bolt of a rotary latch mechanism, and the replaceable member being formed from a material, different from the material of the frame member, having a high resistance to the stresses 45 caused by the repeated impact of the rotary

5 member 20. The keeper teeth are formed of a material which has good frictional wear resisting qualities and which is capable of being easily replaced when worn. The keeper teeth are formed to engage the teeth of the latch bolt 23 during opening and closing movement of the door and also having good frictional wear resisting qualities. In addition to the foregoing the frame member 5 is also preferably constructed to receive and support a yieldably mounted wedge member formed of the same material as the keeper teeth and engageable by an abutment on the door to assist in holding the door against movement in a vertical direction.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Fig. 1 is a fragmentary view of a door jamb equipped with a latch bolt keeper mechanism constructed in accordance with one embodiment of the present invention.

Fig. 2 is a section taken substantially through lines 2—2 of Fig. 1 looking in the direction of the arrows.

Fig. 3 is a view of the rear face of the latch bolt keeper mechanism shown in Fig. 1.

Fig. 4 is a view of the insert member which carries the keeper teeth.

Fig. 5 is a view illustrating a latch bolt keeper mechanism constructed in accordance with a second embodiment of the invention.

Fig. 6 is a section taken substantially through lines 6—6 of Fig. 5 looking in the direction of the arrows.

Fig. 7 is a view of the insert member which carries the keeper teeth as it appears in the embodiment of the invention illustrated in Figs. 5 and 6.

This application is a continuation-in-part of my copending application, Serial No. 116,499, filed September 19, 1949, now Patent No. 2,499,165, issued February 28, 1950, said application being a division of application Serial No. 75,523, filed February 10, 1949, now abandoned.

Before explaining in detail the present invention it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

The latch bolt keeper device, generally designated as 20, constructed in accordance with the embodiment of the invention illustrated in Figs. 1 to 4, is shown mounted on the fixed jamb face or edge 21 of a door frame post or body pillar where it is adapted to be engaged by a spaced apart abutment 22 and a multi-toothed rotary latch bolt 23 carried by a swinging door. The keeper device 20 comprises a die cast metal

frame member 24 of generally C-shaped construction having a substantially horizontal base portion 25, a vertical portion 26 rising from the inner end of the base portion 25, and an overhanging arm portion 27 extending outwardly from the vertical riser 26 and overlying a substantial part of the base portion 25. It will be understood that the frame member 24 is not limited to a metal die casting since it may be molded or cast of other suitable material such as a plastic composition.

The overhanging arm portion 27 is recessed as at 28, the upper surface 28a and the rear wall 28b of the recess providing a slideway for a take-up wedge 29. The wedge 29 is preferably made of a non-metallic material such as a plastic composition and in preferred practice is made of nylon plastic. The wedge 29 is supported in sliding relationship to the surfaces 28a and 28b by a guide rod 30 which extends through the wedge and has its inner end suitably anchored in the vertical riser 26 and its outer end anchored in the portion 27a of the overhanging arm. To resiliently urge the wedge 29 in an outward direction along its guiding surfaces, a coiled spring 31 is provided, the spring surrounding the inner end portion of the guide rod 30, with one end abutting the inner wall 28c of the recess 28 and its other end lying in a recess or counterbore 29a of the wedge.

When the door is closed, the slidable take-up wedge 29 has cooperative engagement with the abutment 22 on the door and acts to clamp or wedge the abutment 22 between the lower surface 29b of the wedge 29 and the top surface 25a of the base portion 25 and effectively restricts vibratory motion of the door in a vertical plane while the vehicle is in motion.

The base portion 25 is cored out or otherwise formed to provide a recess 32 for an insert member 33 which carries the keeper teeth 34 and 34a. The recess 32 is formed inwardly from the rear serrated face 24a of the frame member and opens through the lower edge of the base portion 25. The depth of the recess 32 is less than the thickness of the base portion 25 thus leaving a wall 25b forming the bottom of the recess. The insert member 33 is press fitted into the recess 32 with the keeper teeth 34 and 34a projecting downwardly from the base portion 25 into position to be engaged by the teeth of the rotary bolt 23. To ensure that the insert member 33 will remain rigidly held in place the outer upper portion 33a thereof is shaped so that it can be bored at 33b to receive the outer one of the two screws 35 which hold the keeper mechanism on the jamb face.

In operation, as the swinging door carrying the spaced apart abutment 22 and the multi-toothed rotary latch bolt 23 approaches the final degrees of travel in a closing direction of movement, the bottom surface of the abutment 22 makes initial contact with the surface 25a of the base portion of the keeper and the multi-toothed latch bolt engages and meshes with the keeper tooth 34. The tooth 34 provides the safety locking position of the bolt and even if further closing movement of the door ceases, the door will be held by the tooth 34 against movement in an opening direction until the latching mechanism is released. When the door is completely in a closed position, the abutment 22 will be clamped or wedged between the surface 29b of the wedge 29 and the surface 25a of the base portion 25 thus ensuring that there will be no movement of the door in a vertical plane due to vibrations oc-

curring while the vehicle is in motion and further ensuring that the rotary latch bolt will be firmly maintained in latching engagement with the keeper tooth 34a which provides the final locking position of the bolt.

The latch bolt keeper device, generally designated as 40, constructed in accordance with the embodiment of the invention illustrated in Figs. 5 to 7, inclusive, is in many respects similar to the first embodiment hereinbefore described. It comprises a generally C-shaped frame structure 41 having a base portion 42, a vertical portion 43 rising from the inner end of the base portion 42, and an overhanging arm portion 44 extending outwardly from the upper portion of the vertical riser 43. The major difference in this embodiment is that the frame structure 41 is a sheet metal stamping.

The slidable wedge 29 is mounted within the overhanging arm portion 44 similarly to the manner in which it was mounted in the overhanging arm 27 of the keeper device 20. However, a longer spring 45 is employed to resiliently urge the wedge outwardly along the guide rod 30.

The insert member 46 carrying the keeper teeth 47 and 48 is larger in this embodiment than the insert member 33 so that both the screws 35 can be used to retain it in proper position. It is desirable to use both the screws 35 because the sheet metal base portion 42 of the frame structure 41 is not rigid enough to rely upon a press fit of the insert member 46, as in the previous embodiment, to retain it within said base portion.

The front face 42a of the base portion 42 and the front face of the insert member are correspondingly countersunk as at 42b and 46b, respectively. This construction aids in the assembly of the parts since the countersunk portion 42b acts as a locating means in aligning the insert member 46 relative to the base portion and also allows the screw heads to lie flush with the surface 42a of the base portion. Other than the foregoing differences in construction the keeper device in the embodiment of Figs. 5 to 7 is substantially the same as the keeper device in the embodiment of Figs. 1 to 4 inclusive, and functions in the same manner.

The foregoing embodiments of the invention each provide a latch bolt keeper structure wherein the frame member, which is not subject to direct and concentrated impact stresses or to a high degree of frictional wear at its points of engagement with the cooperative members carried on a swinging door but which primarily functions as a means for retaining the operative parts of the keeper mechanism in proper spaced relationship, may be inexpensively fabricated as a metal stamping or formed as a die casting of suitable material. The keeper teeth being the portion of the device subject to the most stresses and greatest wear are formed as a part of a removable member thus allowing full advantage to be taken of newly developed materials such as nylon plastic or some metal alloys, which although more expensive than die cast steel, have highly important physical characteristics such as high resistance to impact stresses, resistance to wear and cushioning characteristics. Thus by fabricating the striker device in the foregoing manner it is possible to produce a striker which is not only superior to and more efficient in use than strikers heretofore made but also which is not prohibitive in cost. The foregoing construction also reduces the replacement cost of the device since only the member carrying the keeper teeth need be replaced when worn and not the

entire device as would be the case were the keeper teeth made integral therewith.

I claim:

1. In a keeper device adapted to be fastened to a body for cooperative engagement with a latch bolt carried on a door member, a frame structure including a generally horizontally extending body portion having a recess therein extending inwardly from one of the vertical faces and opening downwardly through the bottom surface thereof, the depth of the recess being less than the thickness of the body portion thereby leaving a wall forming the bottom of the recess, an insert member having at least one keeper tooth formed thereon, said insert member being positioned within said recess so that the keeper tooth will project below the bottom surface of said base portion, and means immovably retaining said insert member within said recess against displacement by said latch bolt as said door member is moved to either an open or closed position.

2. In a keeper device adapted to be fastened to a body for cooperative engagement with a latch bolt carried on a door member, a frame structure including a body portion, the body portion having a recess therein extending inwardly from one of the vertical faces and opening downwardly through the bottom surface thereof, the depth of the recess being less than the thickness of the base portion thereby leaving a wall forming the bottom of the recess, and an insert member having at least one keeper tooth formed thereon, said insert member being positioned within said recess so that the keeper tooth will project below the bottom surface of said body portion, said wall and said insert member having aligned apertures therethrough adapted to receive a means used to fasten said keeper device on a pillar, said means thereby also immovably retaining said insert within said recess.

3. In a keeper device adapted to be fastened to a body for cooperative engagement with a latch bolt carried on a door member, a frame structure including a body portion having a recess therein extending inwardly from a vertical face and opening downwardly through the bottom surface thereof, each end wall of the recess having a curved surface, and an insert member each end of which is curved to fit the corresponding curved end wall of the recess whereby said insert member can only be inserted from said face of said base portion and will be held against longitudinal displacement by the curved end walls of said recess, said insert member having at least one keeper tooth formed thereon and being positioned within said recess so that the keeper tooth will project below the bottom surface of said body portion.

4. In a keeper device adapted to be fastened to a body for cooperative engagement with a latch bolt carried on a door member, a frame structure including a body portion having an upper and lower wall joined by a front wall, said lower wall having an opening therein, an insert member having at least one keeper tooth thereon, said insert member being positioned between the upper and lower walls and substantially abutting the inner face of the front wall with the keeper tooth thereon projecting through said opening in the lower wall, and means immovably retaining said insert member within said recess against displacement by said latch bolt as said door member is moved to either an open or closed position.

5. In a keeper device adapted to be fastened to a body for cooperative engagement with a latch bolt carried on a door member, a frame structure including a body portion having an upper and lower wall joined by a front wall, said lower wall having an opening therein, and an insert member having at least one keeper tooth thereon, said insert member being positioned between the upper and lower walls and substantially abutting the inner face of the front wall with the keeper tooth thereon projecting through said opening in the lower wall, said front wall and said insert member having aligned apertures therethrough adapted to receive a means for fastening said keeper device on a body pillar, said means thereby also immovably retaining said insert within said base portion.

6. In a keeper device adapted to be fastened to a body for cooperative engagement with a latch bolt carried on a door member, a frame structure including a body portion having an upper and lower wall joined by a front wall, said lower wall having an opening therein, an insert member having at least one keeper tooth thereon, said insert member being positioned between the upper and lower walls and substantially abutting the inner face of the front wall with the keeper tooth thereon projecting through said opening in the lower wall, said front wall having at least one aperture therein bounded by an inwardly projecting flange and said insert member having a countersunk aperture to receive said flange, said flanged aperture and said countersunk aperture forming a means for aligning said insert in said body portion and being adapted to receive a means for fastening said keeper device to a body pillar, said fastening means thereby also retaining said insert within said body portion, and means immovably retaining said insert member within said recess against displacement by said latch bolt as said door member is moved to either an open or closed position.

7. In a keeper device adapted to be fastened to a body for cooperative engagement with a latch bolt carried on a door member, a frame structure including a generally horizontally extending body portion having a recess therein extending inwardly from one of the vertical faces and opening vertically through a surface thereof, the depth of the recess being less than the thickness of the body portion thereby leaving a wall forming the bottom of the recess, an insert member having at least one keeper tooth formed thereon, said insert member being positioned within said recess so that the keeper tooth will project vertically beyond said surface of said base portion, and means immovably retaining said insert member within said recess against displacement by said latch bolt as said door member is moved to either an open or closed position.

JOHN H. ROETHEL.

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