Feb. 24, 1953 J. H. ROETHEL 2,629,621

LATCH BOLT KEEPER

Filed Dec. 17, 1949

Fig. 1.

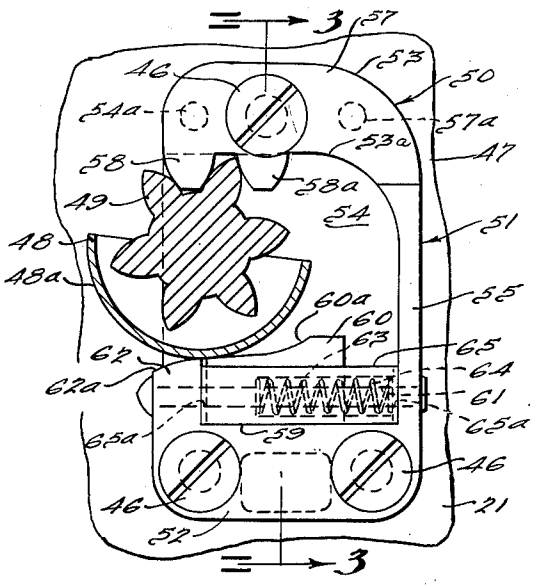


Fig. 2.

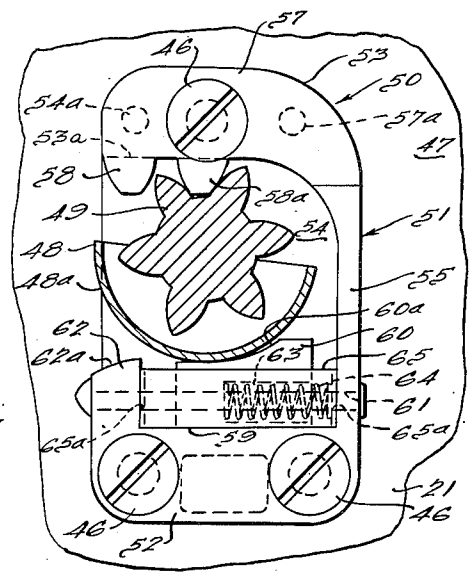


Fig. 3.

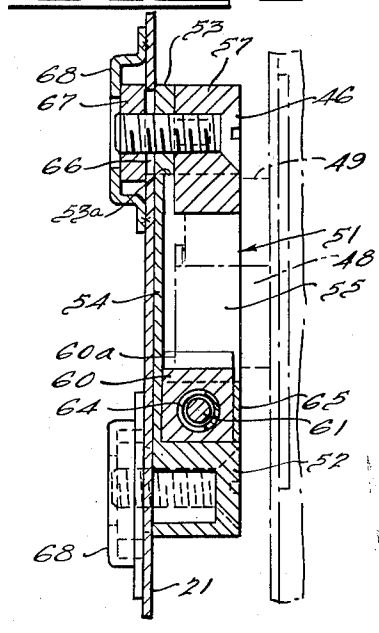
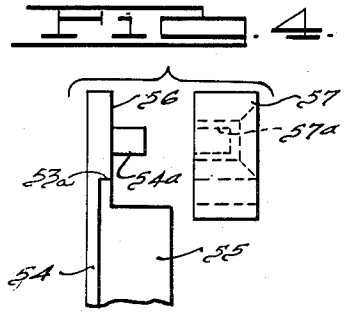


Fig. 4.



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2,629,621

LATCH BOLT KEEPER

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5 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 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 not only in holding the door firmly against movement in a vertical plane while the vehicle is in operation but also in minimizing resistance to the closing of the door.

Another and important object of the invention is to provide a striker or keeper device comprising vertically spaced body or frame portions adapted to receive therebetween a rotary toothed latch bolt and door abutment, the abutment being mounted on the door immediately below the latch bolt and preferably formed as a curved or arcuate casing embracing the lower portion of the toothed latch, said keeper device being provided with depending latch engaging teeth on the upper body portion and a spring urged wedge block slidable upon the upper surface of the lower body portion and cooperable with said door abutment as the latch rotates into meshing relation with said depending teeth, the improved construction being such that the door abutment engages the wedge block before the latch rotates into final locking position and during this final travel of the latch the wedge block moves inwardly with the door abutment, thus eliminating any relative movement between these parts tending to set up frictional resistance to the inward travel of the door abutment. An important advantage, therefore, of this construction resides in the fact that when the door latch moves inwardly toward its final locking position the wedge block by engagement with the door abutment acts primarily as a carrier ensuring that the door is properly supported yet movable with the door abutment so as to minimize resistance to travel of the latter and the rotary latch to their final positions.

A further object of this invention is to provide an improved latch bolt mechanism embodying a keeper having teeth which are engageable with a multi-toothed rotary latch bolt of a rotary latch mechanism carried on a swinging door and which

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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, 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 frame structure, it is possible practicably 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 superior to and more efficient in use than strikers heretofore made but also which is not prohibitive in cost.

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 the present invention.

Fig. 2 is a view similar to Fig. 1 illustrating the relation of the parts in the final locking position of the rotary latch bolt.

Fig. 3 is a section taken substantially through lines 3—3 of Fig. 1 looking in the direction of the arrows.

Fig. 4 is a fragmentary exploded view of the upper portion of the keeper mechanism shown in Fig. 1 illustrating the manner in which the member carrying the keeper teeth is located on the rear wall of the frame or body structure.

This application is a continuation in part of my copending applications Serial No. 75,523, filed February 10, 1949, now abandoned, and Serial No. 126,869, filed November 12, 1949.

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 at 50, constructed in accordance with the embodiment of the invention herein illustrated, is shown mounted on the fixed jamb face 47 of a door frame post or body pillar where it is adapted to be engaged by an abutment member 48 and a multi-toothed rotary latch bolt 49 carried by a swinging door, the door abutment and latch bolt, as hereinafter described, being preferably a unit which moves into and out of door latching position with respect to the keeper device which is mounted in fixed position upon the body pillar.

In the present embodiment the keeper device 50 comprises preferably a generally C-shaped frame member 51 which may be formed as a die casting of suitable material, such as steel. The frame member 51 in the present instance comprises a lower body portion 52 and an upper or overhanging body portion 53 which are spaced apart vertically and joined by a vertical back wall 54 and a vertical end wall 55. Thus, the frame member 51 is substantially C-shape in construction and is installed on the body pillar so that the opening of the C faces outwardly to receive the rotary latch bolt on the door.

The overhanging or upper portion 53 of the frame member 51 is recessed at 56 to receive an insert member 57 carrying the keeper teeth 58. It will be noted that the lower edge 53*a* of the upper body portion is substantially in alignment with the bases of the keeper teeth 58, see Figs. 1 and 2. Or as seen in Fig. 3, there is a space between the adjacent faces of the vertical back wall 54 and the teeth 58. This construction is preferred so as to ensure that the teeth of the rotary bolt do not come in contact with any part of the frame member 51 but only with the teeth 58. The member 57 is located with respect to the frame member 51 by two dowel projections 54*a* protruding integrally from the back wall 54 and projecting into locating holes 57*a*.

The top of the lower body portion 52 of the frame member 51 provides a surface 59 on which the wedge block 60 is slidable. This wedge block is guided in its sliding movement by a rod 61 secured at one end to an abutment 62 on the frame member 51 and at its other end to the end wall 55. In order to resiliently urge the wedge member 60 in an outward direction along its supporting surface 59, a spring 64 is mounted on the rod 62 and extends into a recess 63 in the wedge, the spring being interposed between the base of the recess and the end wall 57.

The latch keeper device is fastened to the jamb face 47 by three screws 46 the upper of which also rigidly fastens the insert member 57 to the upper frame portion 53 as shown in Fig. 3. Each of the screws 46 projects through openings 66 in the jamb face where they are engaged by nuts 67 held in place by brackets 68 which are welded to the inside of the door frame post or pillar. Thus, the insert member is rigidly held in place within the recess 56 against displacement by means of the dowel projections 54*a* and the upper screw 46.

A light gauge channel-shaped metal shield 65 is provided to partially conceal the guide rod 61 and the spring 64. Each leg of the channel has a hole 65*a* therein through which the guide rod extends thereby holding the shield in position.

The door abutment of the latch mechanism, previously referred to, comprises a casing which is rigidly fastened to the latch mechanism selvage plate and which embraces the lower portion of the rotary latch bolt 49. The bottom wall 48*a* of the casing is arcuate in shape and is adapted to engage the curved upper surface 60*a* of the wedge block 60.

In operation, as the swinging door carrying the abutment 48 and the multi-toothed rotary latch bolt 49 moves toward closed position, the bottom surface of the abutment casing 48 makes initial contact with the curved or tapered surface 62*a* of the portion 62 of the base 52 of the keeper frame and the latch bolt initially engages and meshes with the keeper tooth 58. The tooth 58 provides a safety locking position of the bolt and even after further closing movement of the door ceases, the door will be held by the tooth 58 against movement in an opening direction, as shown in Fig. 1, until the latch mechanism is released. Contact between the abutment casing 48 and the wedge block 60 is initiated approximately at the safety position of the latch bolt, as shown in Fig. 1. As the door moves toward its final closed position from the safety position the bottom curved surface 48*a* of the abutment casing firmly engages the curved surface 60*a* of the wedge block whereupon as the latch bolt rotates from its safety position in engagement with the tooth 58 to its final locking position in engagement with the tooth 58*a*, as shown in Fig. 2, the wedge block 60 slides inwardly with the abutment casing 48 without any relative movement occuring between these parts to set up frictional resistance. Thus, as the latch bolt rotates into tight mesh with the tooth 58*a* no binding action occurs between the abutment casing 48 and the wedge block 60 tending to resist the final closing movement of the door. The wedge block 60, therefore, acts as a carrier movable inwardly with the door abutment and latch bolt unit, carrying the weight of the door, and ensuring a smooth and easy closing action.

It will be apparent from the foregoing construction that on the closing of the door the cooperative engagement of the curved bottom wall 48*a* of the casing 48 with the curved upper surface 60*a* of the wedge will result in the wedge actually carrying the weight of the door in final degrees of closing movement of the door. Since the wedge block is made of a material, such as nylon plastic, which has a low coefficient of friction when sliding on a steel surface, the door will close smoothly and easily. Thus, when the door is moved from an open to a closed position the wedge 60 acts primarily as a carrier ensuring that the door is properly supported during the final degrees of closing movement and thereby further ensuring that the teeth of the multi-toothed rotary latch bolt 49 will properly mesh with the keeper teeth 58. The function of the wedge block 60 as a wedge occurs when the vehicle is in motion. Any tendency that the door may have to vibrate in a vertical plane while the vehicle is in motion is quickly overcome by the fact that the wedge 60 is spring-urged outwardly and whenever any clearance exists between the bottom wall of the casing and the surface 60*a* of the wedge 60, the wedge will move outwardly and take up the clearance. Thus, the rougher the road over which the vehicle is travelling the tighter the wedging effect.

The foregoing embodiment of the invention provides 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 engage-

ment 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 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 replaceable member, thus allowing full advantage to be taken of newly developed material, 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, a frame structure comprising a generally C-shaped body having upper and lower generally horizontal body portions spaced apart vertically to provide an opening closed at one side by a vertical portion of the body rigidly connecting said upper and lower spaced portions, one vertical face of said upper body portion being recessed relative to the corresponding vertical face of said lower body portion, and a member having at least one keeper tooth formed thereon, said member being positioned against said one vertical face so that said keeper tooth will project below the bottom surface of said upper body portion, said upper body portion and said member having aligned apertures therethrough adapted to receive a means used to fasten said keeper device on a body pillar, said means thereby retaining said member on said upper body portion.

2. In a keeper device, a frame structure comprising a generally C-shaped body having upper and lower generally horizontal body portions spaced apart vertically to provide an opening closed at one side by a vertical portion of the body rigidly connecting said upper and lower spaced portions, one vertical face of said upper body portion being recessed relative to the corresponding vertical face of said lower body portion, and a member having at least one keeper tooth formed thereon, said member being positioned against said one vertical face so that said keeper tooth will project below the bottom surface of said upper body portion, said upper body portion and said member having on one pin means coacting with recesses in the other to position said member in proper relationship to said upper body portion, said upper body portion and said member having aligned apertures therethrough adapted to receive a means used to fasten said keeper device on a body pillar, said last mentioned means and said pin means coacting to immovably retain said member on said upper body portion.

3. In a keeper device, a frame structure comprising a generally C-shaped body having upper and lower generally horizontal body portions spaced apart vertically to provide an opening closed at one side by a vertical portion of the body rigidly connecting said upper and lower spaced portions, one vertical face of said upper body portion being recessed relative to the corresponding vertical face of said lower body portion, and a member having latch bolt engaging teeth formed thereon, said member being positioned against said one vertical face so that said teeth will project below the bottom surface of said upper body portion, and a spring urged wedge block mounted on the upper side of said lower body member opposite said teeth, said upper body portion and said member having on one pin means coacting with recesses in the other to position said member in fixed relationship to said wedge block, said upper body portion and said member having aligned apertures therethrough adapted to receive a means used to fasten said keeper device on a body pillar, said last mentioned means and said pin means coacting to immovably retain said member on said upper body portion.

4. In a keeper device, a frame structure comprising a generally C-shaped body having body portions spaced apart vertically to provide an opening closed at one side by a vertical portion of the body rigidly connecting said spaced portions, one vertical face of one body portion being recessed relative to the corresponding vertical face of the other body portion, and a member having at least one keeper tooth formed thereon, said member being positioned against said one vertical face so that said keeper tooth will project vertically beyond a portion of one surface of said one body portion, said one body portion and said member having aligned apertures therethrough adapted to receive a means used to fasten said keeper device on a body pillar, said means thereby retaining said member on said one body portion.

5. In a keeper device, a frame structure comprising a generally C-shaped body having body portions spaced apart vertically to provide an opening closed at one side by a vertical portion of the body rigidly connecting said spaced portions, one vertical face of one body portion being recessed relative to the corresponding vertical face of the other body portion, and a member having at least one keeper tooth formed thereon, said member being positioned against said one vertical face so that said keeper tooth will project vertically below a portion of the bottom surface of said one body portion, said one body portion and said member having aligned apertures therethrough adapted to receive a means used to fasten said keeper device on a body pillar, said means thereby retaining said member on said one body portion.

JOHN H. ROETHEL.

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