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NOISELESS LOCK UNIT
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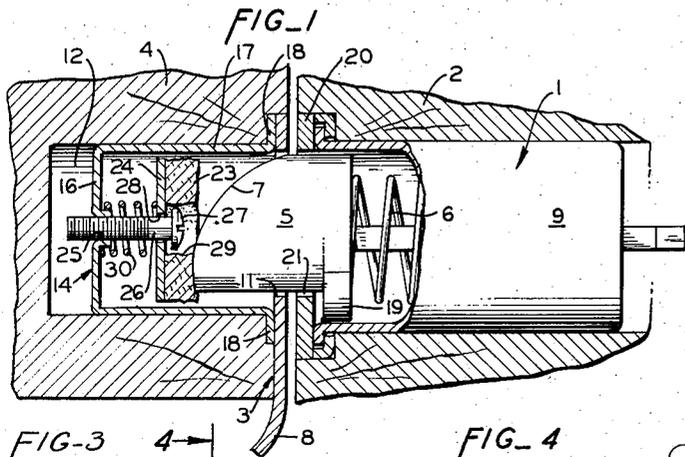
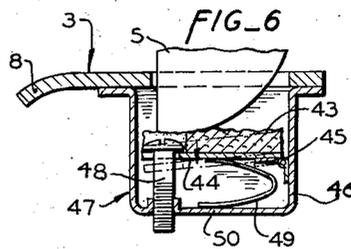
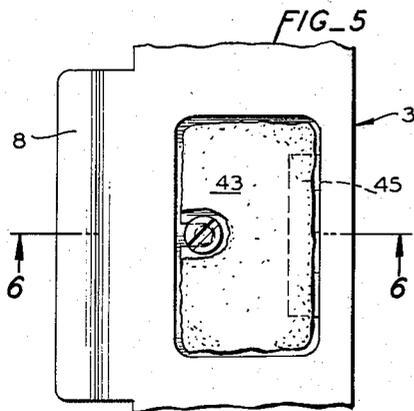
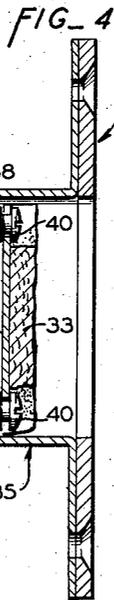
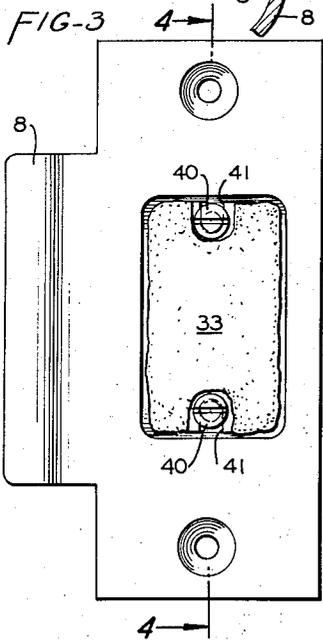
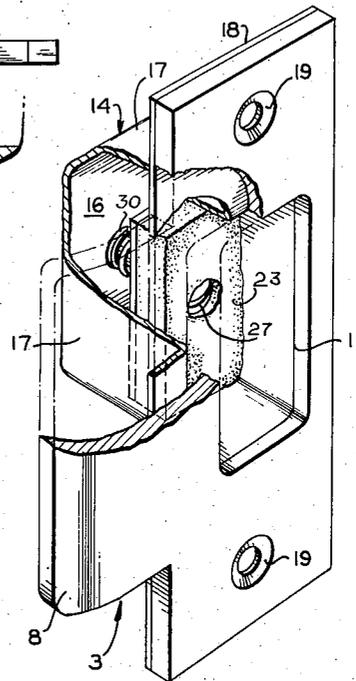


FIG-2



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NOISELESS LOCK UNIT

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This invention relates to door latch units and is especially concerned with the provision of a latch unit in which the usual noises attending the closing of the door are substantially or completely eliminated.

In the usual installation substantially all of the noise caused by closing a door is attributable to the latch bolt returning to its normal projected position under the urging of the latch bolt spring. Thus, although some slight amount of noise may be caused by the latch bolt striking against the strike plate on the door jamb during closing movement of the door, the noisy action of most doors results from the latch bolt striking a stop as it is disengaged from the strike plate and projected into the strike box. Although the stop for the latch bolt usually comprises a projection integral with the bolt which engages the face plate of the lock unit, it may be carried by the latch bar to which the bolt is secured. In any event the relatively loud noise attending the door closing results from the impact caused by metal to metal contact as the outward travel of the latch bolt under the urgency of the latch bolt spring is suddenly arrested.

It has been suggested, in the past, that such noise may be eliminated by providing a cushioning material between the latch bolt and the stop, but this procedure requires modification, or at least disassembly, of the lockset.

It has also been suggested that means be provided in the keeper opening for absorbing the impact of the projecting latch bolt. However, such prior art devices have involved intricate and expensive shock absorbing devices and have been considered impractical in the trade for this reason. See, for example in this connection Hurd 1,005,841, Voight 1,004,716 and Voight 1,003,219.

It is therefore the main object of this invention to overcome the disadvantages of prior art devices for silencing latch bolts.

Another object of the invention is the provision of a device for silencing a door latch unit that is relatively inexpensive to make and install.

Still another object of the invention is the provision of a noiseless latch unit that does not require modification of the latch unit itself but which may be conveniently installed in the strike box.

Yet another object of the invention is the provision of a noiseless latch unit that is readily accessible for adjustment and does not involve the use of any tools in addition to a screwdriver to perform such adjustment.

Other objects and advantages will be apparent from the attached drawings and from the following specification.

Fig. 1 is a horizontal cross section through a latch unit and its associated door and jamb showing the preferred form of the invention;

Fig. 2 is a perspective of the strike and the strike box with portions broken away and in section to show internal structure;

Fig. 3 is a front elevation of a strike showing a modified form of the invention installed in the strike box;

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Fig. 4 is a vertical cross section taken along lines 4—4 of Fig. 3;

Fig. 5 is a front elevation of a strike showing another modification of the invention installed in the strike box; and

Fig. 6 is a horizontal cross section as taken along lines 6—6 of Fig. 5.

In detail, and with reference to Figs. 1, 2 the invention is shown in combination with a latch set generally designated 1 installed in a door 2 and adapted to cooperate with a strike 3 on the door jamb 4.

Although the present invention lends itself to use with various types of latches and locksets a simple form of latch is shown in Fig. 1 having a latch bolt 5 which is spring urged to the projected position shown by a spring 6.

The latch bolt 5 is bevelled as at 7 to provide a camming action between said bolt and the flared strike lip 8 on the strike 3 as the door is closed. Such camming action causes the latch bolt 5 to be retracted inwardly into its housing 9 against the urgency of spring 6 during said closing movement.

The strike 3 is provided with a generally rectangular aperture or keeper opening 11 which is adapted to receive the outer portion of bolt 5 when the door is completely closed. The door jamb 4 is provided with a recess or mortise 12 in registration with the opening 11 and into which the bolt 5 projects.

Although not required in all instances, it is preferable to provide a strike box generally designated 14 within the mortise 12 (Fig. 1). The strike box 14 includes a bottom plate 16, sidewalls 17 and peripheral outwardly extending flanges 18. The strike plate 3 is provided with a pair of countersunk screw holes 19 (Fig. 2) for receiving therein the woodscrews (not shown) that secure the strike 3 to the jamb 4. The flanges 18 of the strike box may be correspondingly apertured to receive said screws so that the strike box 14 and strike 3 may be firmly secured to the jamb 4 at the same time.

Although the particular means for limiting the outward movement of latch bolt 5 may take various forms, in Fig. 1 such means is shown as an outwardly extending projection 19 on the latchbolt 5 that is adapted to engage the inner side of the faceplate 20 of the latchset 1. It will be understood that the faceplate 20 is provided with an opening 21 generally complementary to the cross-sectional contour of the outer portion of the latch bolt 5, except for the projection 19, so that the bolt is reciprocable within said opening. As noted above, the impact of the stop 19 (or any other portion of the latch bolt) engaging the faceplate 20 creates considerable noise unless some means is provided for cushioning such impact.

By the present invention the outward movement of the latchbolt 5 is arrested by a cushion 23 preferably of relatively loosely packed fibrous material such as felt. Obviously other materials having impact absorbing qualities such as soft rubber may be employed if desired.

In the structure of Figs. 1, 2 the cushion 23 is generally rectangular in form and is supported on a plate 24 and secured thereto as by glue or in any other convenient manner. The bottom plate 16 of strike box 14 is provided with a threaded aperture 25 for receiving therein the shank of a screw 26. Plate 24 is apertured as at 28 to loosely receive the shank of screw 26 therethrough and the cushion 23 is provided with an aperture 29 for receiving the head 27 of said screw. By this structure the screw head 27 is accessible through the opening 11 in the strike when the door 2 is open.

Interposed between bottom 16 of the strike box 14 and the plate 24 is a helical spring 30 which serves to urge the plate 24 and cushion 23 toward the strike opening 11.

By the above described structure it is seen that the cushion 23 may be adjustably positioned until it engages the bolt 5 and stops further outward movement of the latter just before the stop 19 on latch bolt 5 engages the faceplate 20. In other words, the latch bolt 5 is completely brought to rest by the cushion 23 so that no noise whatsoever results.

It will be understood that the cushion 23 should be positioned as far into the strike box 14 as is possible and still cushion the impact of the bolt. If, after a period of time, the cushion 23 loses some of its resiliency and becomes compressed so as to permit the latchbolt stop 19 to engage the faceplate 20, it is a simple matter to back out the adjusting screw 26 with a screwdriver until the desired cushioning effect is achieved.

A modified form of the invention is shown in Figs. 3, 4 wherein a generally rectangular cushion 33 is mounted on a plate 34 positioned as before within a strike box 35.

In this instance the bottom 36 of the strike box 35 is provided with a pair of upper and lower threaded apertures for receiving a pair of screws 38. In this case the screws 38 are provided with flanges 39 spaced from the heads 40 of the screws to provide annular grooves into which U-shaped slots 41 in plate 34 are received. By this structure it is seen that no spring is required and the plate 34 and cushion 33 may be adjustably moved by turning screws 38 until the cushion is properly positioned as explained above.

Still another modification is shown in Figs. 5, 6 wherein a hinged plate 44 is provided for supporting cushion 43. This plate 44 may be secured by means of a hinge 45 to one sidewall 46 of the strike box 47 and a screw 48 provided as in Fig. 1 cooperating with the bottom 50 of the strike box 47 and the plate 44. In this instance a flat spring 49 is interposed between bottom 50 and the plate 44 to urge the plate and cushion toward the latch-bolt 5.

It will be noted in Fig. 6 that the hinge 45 should be positioned on the side of the bolt 5 opposite the leading edge so that the plate may be swung a considerable amount to the dot-dash position shown without interference with the latch bolt except at said leading edge.

It will be apparent that the present invention provides an extremely simple means for silencing a latchbolt that is inexpensive to install and which may be readily adjusted to compensate for wear without requiring the lock-set to be disassembled or modified.

The very specific embodiments above described should not be taken as restrictive of the invention since it is obvious that minor variations in design may be resorted to without departing from the spirit of the invention or from the structure defined in the following claims.

I claim:

1. For use with a door latch unit including a latch bolt, a spring urging said bolt to projected position, and opposed shoulder means for limiting the extent of projection of said latch bolt, the combination of: a strike adapted to be engaged by said latch bolt for retracting said bolt upon closing movement of such door, said strike being provided with an opening adapted to receive said bolt therethrough when such door is closed, a strike box in registration with said opening for receiving said bolt therein, a plate positioned in said box, means mounting said plate below the level of said opening for limited adjustable movement toward and away from said opening, and a stop of yieldable cushion material carried by said plate and adapted to be engaged by said bolt when the latter is projected to substantially its full extent for noiselessly absorbing the impact of said shoulder means.

2. For use with a door latch unit including a latch bolt, a spring urging said bolt to projected position, and opposed shoulder means for limiting the extent of projection of said latch bolt, the combination of: a strike

adapted to be engaged by said latch bolt for retracting said bolt upon closing movement of such door, said strike being provided with an opening adapted to receive said bolt therethrough when such door is closed, a strike box in registration with said opening for receiving said bolt therein, a plate positioned in said box, means mounting said plate below the level of said opening for limited adjustable movement toward and away from said opening, and a stop of yieldable cushion material carried by said plate and adapted to be engaged by said bolt when the latter is projected to substantially its full extent for noiselessly absorbing the impact of said shoulder means, said means including a spring in said box urging said plate toward said opening and a screw accessible through said opening and threadedly carried by said box for urging said plate against said spring.

3. For use with a door latch unit including a latch bolt, a spring urging said bolt to projected position, and opposed shoulder means for limiting the extent of projection of said latch bolt, the combination of: a strike adapted to be engaged by said latch bolt for retracting said bolt upon closing movement of such door, said strike being provided with an opening adapted to receive said bolt therethrough when such door is closed, a strike box in registration with said opening for receiving said bolt therein, a plate positioned in said box, means mounting said plate below the level of said opening for limited adjustable movement toward and away from said opening, and a stop of yieldable cushion material carried by said plate and adapted to be engaged by said bolt when the latter is projected to substantially its full extent for noiselessly absorbing the impact of said shoulder means, said means including a headed screw accessible through said opening threadedly carried by said box and provided with a head having a slot for receiving a portion of said plate therein.

4. For use with a door latch unit including a latch bolt, a spring urging said bolt to projected position, and opposed shoulder means for limiting the extent of projection of said latch bolt, the combination of: a strike adapted to be engaged by said latch bolt for retracting said bolt upon closing movement of such door, said strike being provided with an opening adapted to receive said bolt therethrough when such door is closed, a strike box in registration with said opening for receiving said bolt therein, a plate positioned in said box, means mounting said plate below the level of said opening for limited adjustable movement toward and away from said opening, and a stop of yieldable cushion material carried by said plate and adapted to be engaged by said bolt when the latter is projected to substantially its full extent for noiselessly absorbing the impact of said shoulder means, said plate being swingably secured to said box for movement toward and away from said opening, and said means comprising a spring in said box for urging said plate toward said opening and an adjustment screw threadedly carried by said box and accessible through said opening for urging said plate against said spring.

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