Feb. 19, 1952 E. C. LARSON 2,586,066

SAFETY DOOR LOCK

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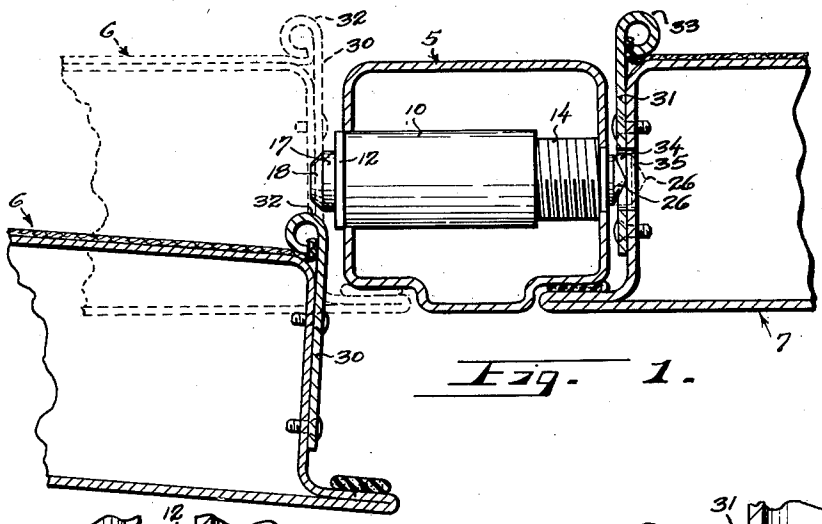


Fig. 1.

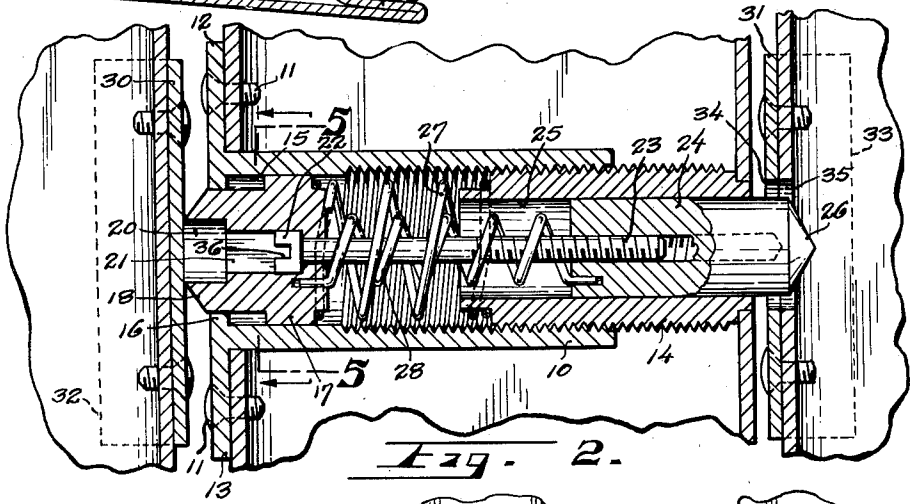


Fig. 2.

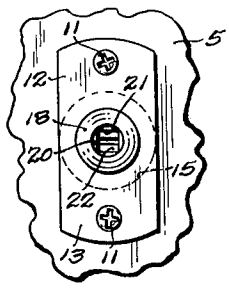


Fig. 3.

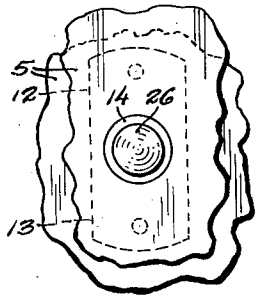


Fig. 4.

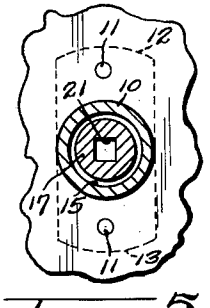


Fig. 5.

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SAFETY DOOR LOCK

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8 Claims. (Cl. 292—182)

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This invention relates to safety door-locks, and particularly a safety lock for use on four-door automotive vehicles. The purpose of the invention is to provide a device which will permit the rear door to be opened only by first opening the front door, thus to provide a device which will secure the rear door in closed position while the car is in motion and thereby give positive assurance that a child occupying the rear compartment will not, by pulling on a rear door handle, cause the latter to open and either fall or be pulled by force of suction through the open door.

As further and particular objects the invention aims to provide a safety lock for this purpose which may be inexpensively constructed, one which may be quickly and easily installed and which will be entirely concealed from view when the doors of the vehicle are closed, which will give a positive locking action, and which, however, will enable the rear door to remain open while the front door is closed and yet permit such rear door to be then freely closed without first opening the previously closed front door.

Having the above and still additional objects and advantages in view which will appear and be understood in the course of the following description and claims, the invention consists in the novel construction and in the adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawing:

Figure 1 is a horizontal sectionl view portraying, fragmentarily, the front and rear doors together with the dividing post of a four-door vehicle body and showing the now preferred embodiment of the present invention in its operating association therewith, full and dotted lines being employed to indicate the front door in both open and closed positions.

Fig. 2 is a vertical sectional view thereof taken to an enlarged scale on the longitudinal median line of the safety-lock, the front door being here shown in closed position.

Figs. 3 and 4 are front and rear elevational views, respectively, of the door-lock and incorporating, in each instance, a fragmentary showing of the dividing post; and

Fig. 5 is a fragmentary transverse vertical sectional view on line 5—5 of Fig. 2.

Referring to said drawing, the numeral 5 designates the dividing post of a four-door vehicle body, and 6 and 7 the front door and the rear door, respectively, and which are each indicated as being hinged along the end edge remote from

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the post. While the doors are presumed to carry the usual or suitable means which interact with complementing means provided upon the post for releasably locking the doors in their closed position, the operation of the present safety-lock is entirely independent of the operation of these ordinary door-locking instrumentalities and I have therefore deleted from the drawing any illustration of the latter.

According to the present invention, and having reference to the illustrated preferred embodiment, there is provided a tubular casing open at both ends and so mortised into the dividing post as to have one of said end openings exposed to the front face and the other end opening exposed to the back face of the post, the casing being composed of two telescopically associated parts so admit of the same being contracted or expanded in adapting the same to various widths of posts to which the device may be applied. The casing member which opens to the front face of the post, and which I designate 10, is made secure to the post by counter-sunk screws 11 which are received through wing-flanges 12 and 13, and the other casing member, designated 14, has a reduced terminal neck which fits in a hole of corresponding size drilled through the back wall of the post. A thread connection between the two casing members gives the necessary endwise adjustment to cause the shoulder which is defined by such neck to be brought firmly to bear against the inner face of said wall.

The casing member 10 has its threads cut internally, and these threads extend forwardly for only a portion of the length of the member whereat there occurs a smooth bore 15 which is interrupted at the end extremity of the member by an inwardly directed annular lip 16. A piston 17 is received for endwise sliding movement in this bore, and presented by the piston is a reduced axial prolongation which fits the inner perimeter of the lip and projects forwardly beyond the frontal face of the casing, this prolongation terminating in a tapering nose 18. The piston has a through center-bore and is also counter-bored, as at 20, from the frontal end, and there is provided, extending inwardly from the counter-bore, a co-axial and relatively deep socket 21 which, sectionally considered, is desirably of a square shape. Accommodated by the socket is the squared head 22 of a draw-bar 23 and such draw-bar extends rearwardly from the piston and presents a threaded end which screws into a lock-bolt 24, the lock-bolt being journaled for sliding movement within a center-

bore 25 of the casing member 14. The exposed end 26 of the lock-bolt is tapered.

Contained within the casing are two co-axially applied spiral compression springs of different diameters and the larger of these springs, denoted 27, is caused to exert its thrust from the casing member 14 to the piston 17, thus acting to yieldingly influence the piston in a forward direction, and which is to say such as will project the tapering nose 18 outwardly beyond the frontal face of the dividing post 5. The other or smaller spring, denoted 28, likewise bears upon the piston but exerts its thrust force therefrom to the lock-bolt, consequently projecting the lock-bolt directively from the piston but within a travel limit prescribed by the permitted movement of the draw-bar. For the purpose of localizing the lock-bolt and the piston against liability of relative rotary movement, the two ends of the last-mentioned spring are directed parallel to the axis and find engagement in mating sockets provided by the lock-bolt and by the piston.

As the complements of the taper-nosed piston and the lock-bolt, there are screwed or otherwise firmly secured upon the end faces of the vehicle doors 6 and 7 a respective strike-plate, as 30 and 31, placed to extend transverse to the end face and in each instance providing an inwardly rolled lead-in shoe, as 32 and 33, located upon the inner side of the door. The strike-plate 30, and namely the plate for the front door 6, is an imperforate plate whereas the plate 31 presents a bolt-hole 34 which, with an underlying hole 35 drilled in the end wall of the rear door 7, is adapted upon a closing of the door to be brought into mating registration with the lock-bolt. The bolt openings 34 and 35 are preferably given a diameter somewhat greater than the diameter of the bolt, thus to give the bolt free access to the openings. Also, when the bolt is shot and the vehicle is in motion, the fact of these holes being oversize eliminates possibility of chatter and yet accomplishes the intended and necessary end of positively preventing the back door from being opened.

The operation of my safety-lock device is believed to be clear. The piston 17 acts as a push-button and, when the front door 6 is opened, the spring 27 exerts its thrust to press this push-button outwardly into the exposed position in which it is shown in Fig. 1, and the lock-bolt 24 is responsively retracted in that the head 22 of the draw-bar 23, bottoming against the floor of the socket 21, then ties the lock-bolt directly to the push-button as a trailing appendix thereof. Having drawn the bolt, the rear door may perforce be opened by operation of the ordinary handle controls provided for this purpose. As the front door is now closed, and which operation may be performed whether the rear door has been first closed or remains in an open position, the strike plate 31 forces the nose of the push-button inwardly and the lock-bolt moves in concert therewith due to the action of the spring 28 in yieldingly influencing the bolt directively therefrom. Should this action take place while the rear door occupies an open position the rear door may be thereafter freely closed in that the contact of the lead-in shoe 33 with the tapering end of the bolt presses the bolt inwardly counter to the yielding thrust of the spring, the head of the draw-bar being simply backed up in its socket 21 until the door's closing movement brings the holes 34—35 into registration with the bolt whereupon the bolt is shot home by the suppressed load of the spring 28. My safety lock is, in consequence, substantially proof against liability of damage in that either door may be closed while the other door is open or closed, but at the same time precluding the back door from being opened excepting by first opening the front door.

In order to adjust the "throw" of the bolt, it is only necessary to exert thumb-pressure upon the exposed end of the bolt and force the same inwardly in a degree sufficient to cause the head 22 to clear the socket 21, whereupon a screw-driver may be applied to the cross-slot 36 of the exposed head and the draw-bar screwed to either a greater or lesser extent into the bolt to modify the spacing between the bolt and said head 22. The depth of the socket 21 is perforce such as will preclude the head from being backed out of the socket by normal operating movements of the bolt.

While I have illustrated and described my now-preferred embodiment, it is apparent that changes may be made in the details of construction without departing from the spirit of the invention. In this connection it should, perhaps, be here pointed out that the invention is in no sense limited to that type of four-door vehicle body in which the doors both close against the dividing post. It is entirely feasible to insert and slidably mount, within a door hinged to the post 5, a rod of such length as to extend from one to the other end edge of the door, and cause the outer end of this rod to serve as the locking bolt while thrust-actuating the inner end from a functioning counterpart of the bolt 24. Also, the lock-bolt could be manually controlled from a remote point by means of a wire housed in a flexible conduit, in which event the wire would desirably run downwardly through the post and lead under the floor of the front compartment to the instrument panel or any other convenient point of operation, the preferred arrangement, for this type of control, being to employ a bell-crank in lieu of the piston 17. With these and other arrangements in mind, and which will be largely self-evident having knowledge of the illustrated and described embodiment, it is my intention that no limitations be implied and that the hereto annexed claims be given a scope fully commensurate with the broadest interpretation which the employed langauge permits.

What I claim is:

1. In a safety door-lock for four-door vehicle bodies of the character having a dividing post between the front and rear doors, the combination of a cylindrical casing open at both ends and secured to the post to have its front end exposed to the front face and its back end exposed to the back face of the post, a push-button provided with a through center-bore and mounted in the forward part of said casing for endwise sliding movement into and out of a position exposing the nose of the push-button beyond the front face of the post, the nose of said push-button being formed with an axial socket dimensionally larger than the bore, a bolt mounted in the rear part of said casing for endwise sliding movement into and out of a position exposing an end thereof beyond the rear face of the post, a spring acting upon the push-button to urge the same forwardly, a second spring exerting its thrust from the push-button to the bolt for urging the latter rearwardly, and a headed draw-bar slidably received through the bore of said push-button with its headed end bearing against the floor of the socket and connecting by its other end with the bolt.

2. In a safety door-lock for four-door vehicle bodies of the character having a dividing post between the front and rear doors, the combination of a cylindrical casing open at both ends and mortised into the post to have its front end exposed to the front face and its back end exposed to the rear face of the post, a push-button provided with a through center-bore and mounted in the forward part of said casing for endwise sliding movement into and out of a position exposing the nose of the push-button beyond the front face of the post, the nose of said push-button being formed with an axial socket dimensionally larger than the bore, a bolt mounted in the rear part of said casing for endwise sliding movement into and out of a position exposing an end thereof beyond the back face of the post, a spring acting upon the push-button to urge the same forwardly, a second spring exerting its thrust from the push-button to the bolt for urging the latter rearwardly, and a headed draw-bar slidably received through the bore of said push-button with its headed end bearing against the floor of the socket and having the rear end adjustably threaded in the bolt.

3. The structure of claim 2 providing means normally holding the bolt and the draw-bar against relative rotary movement in order to maintain the adjustment given to the draw-bar.

4. Structure according to claim 3 in which the head of the draw-bar is non-circular and with the axial socket being sectionally of a corresponding shape.

5. In a safety door-lock for four-door vehicle bodies of the character having a dividing post between the front and rear doors, the combination of a casing open at both ends and mortised into the post to have its front end exposed to the front face and its back end exposed to the rear face of the post, a push-button mounted in the forward part of said casing for endwise sliding movement into and out of a position exposing the nose of the push-button beyond the front face of the post and formed to provide, open to the nose end and located axially thereof, a bore having a non-circular reduced socket extending inwardly as a prolongation thereof and with the socket connecting in turn with a smaller bore open to the inner end of the push-button, a bolt mounted in the rear part of said casing for endwise sliding movement into and out of a position exposing an end thereof beyond the back face of the post, a spring acting upon the push-button to urge the same forwardly, a second spring exerting its thrust from the push-button to the bolt for urging the latter rearwardly, and a headed draw-bar slidably received through the smaller bore of said push-button with its headed end bearing against the floor of the socket and having the rear end adjustably threaded in the bolt, the head of said draw-bar having a non-circular shape closely fitting the socket, and said socket having a depth exceeding the stroke travel of the bolt.

6. The structure of claim 5 providing means normally holding the bolt and the draw-bar against relative rotary movement in order to maintain the adjustment given to the draw-bar.

7. In a safety door-lock for a vehicle body of the character providing front and rear passenger compartments with a door to each said compartment and with the door openings being separated by a hollow dividing post, a housing structure comprising an open-ended tubular casing formed to provide a flange at one end and having the other end necked down providing a reduced terminal neck, said flange being pierced with screw holes and said terminal neck having a length approximating the thickness of the wall of the post, the post providing co-axial openings in its front and rear walls one of which accommodates the body proper of the casing and the other of which provides a mating fit for the terminal neck, the flange being screwed tight against the outer face of one side of the post to bring the shoulder defined by said terminal neck snugly to bear against the inner face of the other side of the post.

8. Structure according to claim 7 in which the tubular casing is comprised of two telescopically associated parts threadedly interconnected to accommodate the casing to posts of different widths.

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