June 7, 1960 E. M. TRAMMELL, JR 2,939,308

SAFETY DOOR LOCKS

Filed Feb. 4, 1957

FIG. 1.

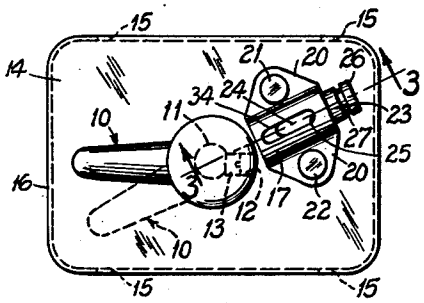


FIG. 3.

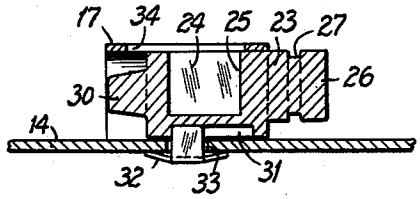


FIG. 4.

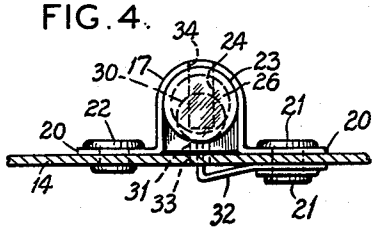


FIG. 2.

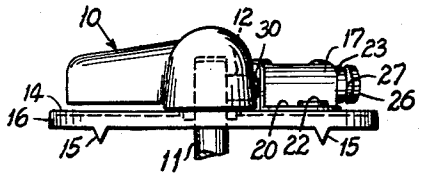


FIG. 5.

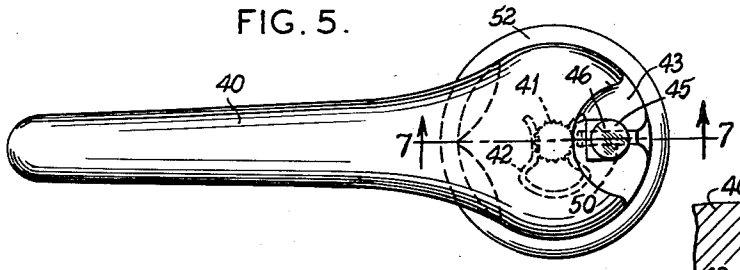


FIG. 7.

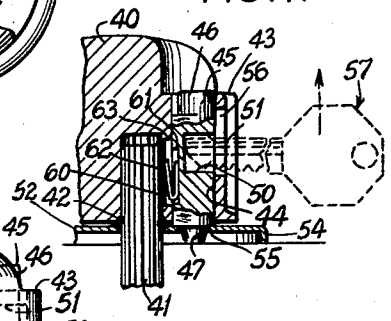
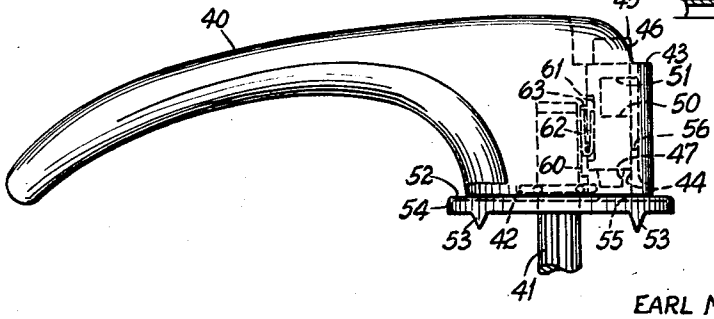


FIG. 6.



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SAFETY DOOR LOCKS

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3 Claims. (Cl. 70—210)

This invention relates generally to improvements in safety door locks, and more particularly to improvements in devices for selectively conditioning the latch mechanism of an automobile door.

The subject of this invention constitutes improvements over the subjects of other patents issued to this applicant, namely, Patent No. 2,694,917 issued November 23, 1954, and entitled Locking Plunger Assembly for Automobile Door Latches, Patent No. 2,708,845 issued May 24, 1955 and entitled Lock-Plunger Guarding Devices, Patent No. 2,735,289 issued February 21, 1956 and entitled Plunger-Guard Assemblies for Automobile Doors, and co-pending applications Serial No. 610,805 filed September 19, 1956 and entitled Devices for Guarding Latch Conditioning Elements, and Serial No. 608,926 filed September 10, 1956 and entitled Protective Devices for Latch-Conditioning Elements.

These safety door locks are particularly useful on the rear doors of four-door closed automobiles and serve selectively to prevent a latch conditioning element located on the inside of such door from being manually moved to a door unlocking position, and hence prevent the door from opening while the vehicle is in motion. Thus it becomes impossible for children occupying the rear seat to open the door, and the hazard of a child falling from a moving vehicle is eliminated.

It is a major objective of the present invention to provide protective arrangements for pivoted door-latch elements utilized on automobile dors, the devices selectively preventing the unintended, casual or otherwise unwanted manipulation of such pivoted door-latch elements from door-locking position to door-unlocking position.

Other important advantages are realized in that the guarding devices permit the usual normal operation and use of the pivoted door-latch element when desired in conditioning the latch mechanism, and yet are capable of being selectively utlized when the specific need arises to avoid the hazards discussed above.

An important object is realized in one embodiment of the invention by the provision of a housing located closely adjacent a pivoted arm that is operatively connected to the door-latch mechanism, the housing being adapted to shield and receive slidably a plunger, and the arm being provided with a recess adapted to receive the plunger when the arm is moved to a lock position and the plunger is moved into the housing, whereby to preclude unintended movement of the arm from the lock position. The housing, plunger and arm are structurally arranged so that the plunger cannot be digitally moved out of the recess without the use of a thin instrument such as an automotive ignition or door key.

Still another important object is realized in a modified embodiment of the invention in which is pivoted arm operatively connected to the latch mechanism provides a housing for slidably receiving and shielding the above mentioned plunger, and in which an element located closely adjacent the arm provides a recess that is alignable with and is adapted to receive the plunger when

the arm is pivotally moved to a door-latched position. The arrangement and structure of the component parts preclude digital actuation of the plunger operatively from the recess and housing, yet permit such operation by a thin instrument.

The foregoing and numerous other objects and advantages of the invention will more clearly appear from the following detailed description of two embodiments of this invention, particularly when considered in connection with the accompanying drawing, in which:

Fig. 1 is a front elevational view of one embodiment of my invention, the dotted lines indicating the latched position of the pivotally mounted arm;

Fig. 2 is a side view of the safety door lock shown in Fig. 1;

Fig. 3 is an enlarged cross sectional view as seen along line 3—3 of Fig. 1;

Fig. 4 is an end elevational view, partly in cross section, as seen from the right of Fig. 3;

Fig. 5 is a front elevational view of another embodiment of my invention;

Fig. 6 is a bottom plan view of the device shown in Fig. 5, and

Fig. 7 is a fragmentary cross sectional view as seen along line 7—7 of Fig. 5, the dotted lines indicating an actuating instrument such as a key.

Referring now by characters of reference to the drawing, and without present indication as to preference, there is first described that embodiment of the subject matter disclosed in Figs. 1–4 inclusive. This safety door lock utilizes a lock arm generally indicated at **10** that is attached and pivotally mounted to a connecting shaft **11**, and thence connected by usual and conventional linkage mechanism to the latch mechanism of the door. Many automotive vehicles of closed body types now in service in the United States are equipped on the rear doors with a pivotally mounted lock arm of the type noted, such lock arm being well known and commonly utilized to condition the latch mechanism of the door against operation from either the inside or the outside of the door. For reasons which will appear later, the arm **10** is provided with a radially disposed recess **12** that constitutes a socket. A set screw **13** is threadedly inserted into recess **12** and engages shaft **11** to fix arm **10** on shaft **11**. It will be particularly noted that set screw **13** does not occupy all of recess **12**, but rather a considerable space is provided from set screw **13** to the outermost surface of arm **10**.

Located immediately below arm **10** and around shaft **11** is a base plate **14**, preferably having a rectangular configuration as is shown in Fig. 1, provided with a plurality of points **15** on an inturned peripheral flange **16**, the points **15** being adapted to fasten to the inside of the door in order that the base plate **10** maintain the safety door lock assembly in the desired position.

An inverted U-shaped housing **17** having integral lateral flanges **20** is secured to base plate **14** by rivets **21** and **22**. The housing **17** includes opposite open ends having one end disposed closely adjacent arm **10**, and is arranged so that the longitudinal axis of the housing **17** is disposed radially with respect to the pivotal axis of arm **10**.

Slidably disposed and received in housing **17** is a plunger **23** that is movable through the opposed ends of housing **17**. As is more clearly shown in Fig. 3, the plunger **23** includes a recess **24** that affords an abutment **25**. Plunger 23 consists of a head portion **26** at one end that normally extends out of the outer end of housing **17** when the plunger **23** is disposed in its inoperative position. The head portion **26** includes an annular groove **27** usually marked with a red color to indicate visually that the plunger is disposed in the inoperative

position and that the lock arm 10 is capable of being digitally moved to an unlock position, and hence indicate a potentially unsafe condition. The other end of plunger 23 consists of a reduced portion 30 formed to interfit recess 12 of arm 10 when the plunger 23 is moved into housing 17 and arm 10 is located in the lock position shown by dotted lines in Fig. 1. When plunger 23 is located in the inoperative position shown in Fig. 3, the reduced end portion 30 is located out of recess 12 and preferably is located within housing 17.

A retaining means is provided in this safety door lock which serves to maintain or stay the plunger 23 in longitudinally adjusted position within housing 17 and serves to determine the limits to which plunger 23 is movable. The retaining means consist of a longitudinal groove 31 provided in the lowermost portion of plunger 23, and a leaf spring 32 having one end secured to base plate 13 by rivet 21 and having the opposite end projecting through an opening 33 in base plate 14 and into groove 31. It is seen that spring 32 engages plunger 23 with a resilient pressure, and tends to urge plunger 23 against housing 17 to afford a staying action. Moreover, it is seen that spring 32 engages one end of groove 31 to prevent withdrawal of plunger 23 from housing 17.

Provided in housing 17 is an aperture 34 that is aligned with recess 24 of plunger 23. The aperture 34 is of reduced size to preclude digital actuation of the plunger 23 through such aperture, and yet is of sufficient size to permit the insertion of an actuating instrument such as an automotive door or ignition key for access to abutment 25 formed by plunger recess 24. The actuating instrument engages abutment 25 upon translatory movement along aperture 34 to move plunger 23 to its inoperative position in which reduced plunger end 30 is removed from recess 12 of arm 10.

With plunger 23 disposed in the inoperative position shown by Figs. 1 and 3, lock arm 10 may be utilized in the conventional manner, i.e., moved digitally to either the unlock position shown in full lines in Fig. 1 or to the lock position shown in dotted lines, thus selectively conditioning the latch mechanism of the door against operation from either the inside or the outside.

The safety features of this door lock device may be used selectively when the need arises, such need existing when children occupy the rear seat of a four-door automobile. In that event, the arm 10 is moved to the lock position shown in dotted lines shown in Fig. 1, in which recess 12 is axially aligned with plunger 23. Then, plunger 23 is moved digitally into housing 17. In this operative position of plunger 23, the reduced plunger end 30 interfits recess 12 and prevents digital movement of arm 10 from the locked position. Moreover, it is seen that plunger 23 is completely shielded by housing 17 to preclude any effective gripping of head portion 26, and the housing 17 together with arm 10 arranged closely adjacent thereto prevents effective gripping of reduced plunger end 30. Under these conditions, children cannot digitally move lock arm 10 to the unlock position, and hence cannot cause the door to be opened.

When it is desired to unlock the door, an actuating instrument such as an ignition or door key is inserted into aperture 34 and into plunger recess 24. The key is moved into engagement with abutment 25 and moved along aperture 34 so that plunger 23 is moved to its inoperative position shown in Figs. 1 and 3 in which plunger head portion 26 is located out of housing 17 and reduced plunger end 30 is moved out of arm recess 12 and into housing 17. Then arm 10 can be digitally moved to the unlock position shown in full lines in Fig. 1 to permit the door to be opened.

The embodiment of this invention disclosed in Figs. 5–7 inclusive consists of a handle assembly that may be utilized on either the front or rear doors of an automobile. The device includes a pivotally mounted handle 40 which constitutes an arm attached to shaft 41 by

retaining element 42. Shaft 41 is operatively connected to the latch mechanism of the door so that upon rotation of handle 40 to an unlock position, the handle 40 actuates the latch mechanism to open the door. The handle 40 is constructed to provide a housing 43 having an internal passageway 44 that is open at opposed ends. Slidably received in housing 43 and passageway 44 is a plunger 45 having a head portion 46 at one and a reduced portion 47 at the opposite lower end. The plunger 45 is provided with a recess 50 defined in part by an abutment 51.

Located closely adjacent handle 40 and housing 43 and around shaft 41 is a base plate 52 that is provided with points 53 on an integral inturned peripheral flange 54 which engage and clamp to the inside of the door. The base plate 52 is provided with a recess or opening 55 that is aligned with one end of passageway 44 when handle 40 is disposed in its inoperative position, the recess 55 being adapted to engage and receive the reduced plunger end 47 when plunger 45 is moved into housing 43. The reduced plunger end 47 and recess 55 are completely shielded by the close relationship of housing 43 and base plate 52.

An aperture 56 is provided in housing 43 which is aligned with plunger recess 50, the housing aperture 56 being of reduced size to preclude digital actuation of the plunger 45 through aperture 56, yet being of sufficient size to permit an actuating instrument such as an automotive ignition or door key indicated generally at 57 in Fig. 7, to be inserted for access to abutment 51 for plunger actuation.

A retaining means is provided between housing 43 and plunger 45 which includes a recess 60 formed in housing 43 and communicating with passageway 44, and includes a compatible recess 61 formed in plunger 45 and aligned with housing recess 60. Disposed in recesses 60 and 61 are the angularly related arms of a V-shaped spring 62 which exert a yielding pressure on plunger 45. The spring 62 tends to urge plunger 45 against housing 43, and hence serves to stay the plunger 45 in adjusted position. One arm of spring 62 engages the upper end 63 of recess 60 to determine one limit in the range of movement of plunger 45 as plunger 45 is moved to its inoperative position shown in Fig. 6, and to prevent withdrawal of plunger 45 from housing 43. The other limit of the range of movement is determined by engagement of plunger 45 with base plate 52 when plunger 45 is moved into housing 43 and plunger end 47 is moved into recess 55.

When the safety door lock shown in Figs. 5–7 is utilized on the rear door of an automobile, the handle 40 may be utilized in the conventional manner to open the door upon pivotal movement when plunger 45 is in the raised inoperative position shown in Fig. 6. The head portion 46 of plunger 45 is marked with a red color which is clearly visible when plunger 45 is in such inoperative position, thus clearly indicating that a potentially hazardous condition exists wherein children occupying the rear seat may manipulate the handle 40 and cause opening of the door while the vehicle is in motion. To eliminate this hazardous condition, the safety features of this door lock assembly are utilized.

With the door closed and handle 40 located in its inoperative position, the plunger 45 is axially aligned with recess 55 formed in base plate 52. Then, plunger 45 is digitally depressed into housing 43 so that the reduced plunger end 47 interfits recess 55. The extent of plunger movement is determined by abutment of the plunger with base plate 52. It will now be seen that engagement of plunger 45 with base plate 52 prevents pivotal movement of handle 40, and hence precludes operative actuation of handle 40 and opening of the door. It is apparent also that plunger 45 cannot be digitally moved back to its inoperative position to release handle 40 since the plunger 45 is completely and effectively shielded by housing 43 and base plate 52.

In the present day automobiles, the outside latch handle is designed to actuate the latch mechanism of the door independently from the inside door handle. Utilization of the safety door lock of Figs. 5–7 realizes an additional safety feature in that while the door cannot be opened from the inside, the door can be opened from the outside if such need arises as in the case of an accident where it is necessary to release occupants of the automobile from the outside.

When it is desired to open the door from the inside, an actuating instrument such as key **57** is inserted through housing aperture **56** and into plunger recess **50**. Then, key **57** is raised into engagement with plunger abutment **51** and moved along housing aperture **56** to raise plunger **45** from its operative position shown in Fig. 7 to its inoperative position shown in Fig. 6, thus releasing reduced plunger end **47** from base plate recess **55**. Then handle **40** can be operatively, pivotally moved to actuate the latch mechanism of the door in order to effect a door opening.

It is also apparent that the safety door lock of Figs. 5–7 can be advantageously utilized on the front doors of automobiles in the same manner as discussed previously as to use on rear doors, in order to preclude unwanted opening of the door from the inside.

It will now have appeared that the forms of the safety door locks described will serve fully to attain the several objectives and purposes of the invention, and that although these structures have been described by particularized reference to selected physical forms, the description should be understood solely in an instructive, rather than in any limiting sense, many variants being possible within the fair scope of the claims hereunto appended.

I claim as my invention:

1. In a device for conditioning the latch mechanism of an automobile door, an element pivoted to the inside of the door and operatively connected to the latch mechanism, a plate element adjacent said pivoted element, a plunger carried by one of said elements, a housing slidably receiving said plunger, the housing having opposed open ends, the other element having a socket alignable with one end of the housing in one position of said pivoted element, the plunger extending out of one end of the housing for digital actuation when in an unlocked position, and located within the housing in shielded relation to prevent digital actuation when in a locked position yet extending out the other end of the housing to interfit the socket, the plunger being movable into said housing and into said socket to preclude actuation of the pivoted element, the plunger being provided with an abutment, the housing being provided with an aperture through which any thin actuating instrument may be inserted for access to said abutment for plunger actuation, the aperture being of reduced size so as to preclude digital actuation of the plunger through the aperture.

2. In a device for conditioning the latch mechanism of an automobile door, an arm pivotally mounted to the inside of the door and operatively connected to the latch mechanism, a base mounted on the door adjacent said arm, a housing carried on said base and having opposed open ends, one of said ends being located closely adjacent said arm, a plunger slidably received in said housing, said plunger and housing having their longitudinal axes arranged radially with respect to the pivotal axis of said arm, the arm being provided with a socket alignable with the plunger in one position of the arm to receive the plunger when moved into said housing so as to preclude actuation of said arm, the socket being arranged radially relative to the pivotal axis, the plunger extending out of one end of said housing for digital actuation of said plunger when in an unlocked position, and located within the housing in shielded relation to prevent digital actuation when in a locked position yet extending out the other end of the housing to interfit the arm socket, said plunger being shielded by said housing and said arm to preclude digital actuation of the plunger when the plunger is moved into said housing and into said socket, the plunger being provided with an abutment, the housing being provided with an aperture through which any thin actuating instrument may be inserted for access to said abutment for plunger actuation, the aperture being of reduced size to preclude digital actuation of the plunger through said aperture.

3. In a device for conditioning the latch mechanism of an automobile door, an inside door lock handle pivotally mounted and operatively connected to the latch mechanism, a base plate located closely adjacent said handle about the pivotal axis, said base plate being provided with a socket that is shielded by said handle when the handle is moved to a latch position, a plunger carried by said handle, said handle providing a housing rotatable therewith slidably receiving said plunger, the housing having opposed open ends, the plunger being axially aligned with said socket in the latch position of said handle, the plunger being movable within limits to lock and unlock positions, said plunger extending partially out one end of said handle housing when in the unlock position and adapted to be digitally moved into said housing to the lock position in which the handle housing shields the plunger from digital actuation, the plunger extending out the other end of the handle housing and engaging said socket in the lock position to preclude actuation of said handle from the latch position, the housing precluding digital actuation of said plunger from the lock position, the plunger being provided with an abutment, the handle housing being provided with an aperture through which any thin actuating instrument may be inserted for access to said abutment for plunger actuation to the unlock position, the aperture being of reduced size to preclude digital actuation of the plunger through the aperture.

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