

Jan. 14, 1941.

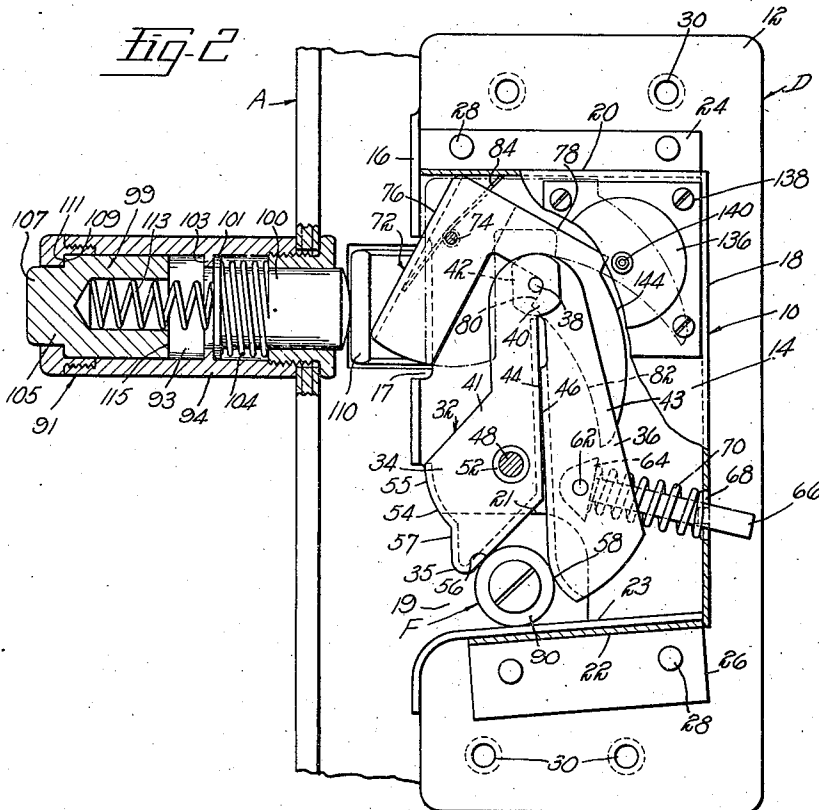
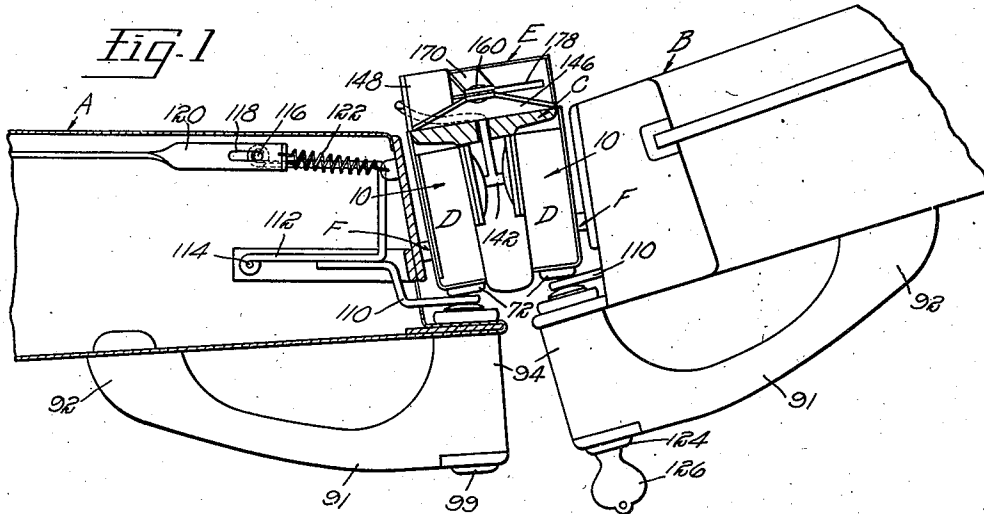
H. H. RAYMOND

2,228,674

LATCH AND LOCKING MEANS

Filed Oct. 28, 1939

3 Sheets-Sheet 1



Inventor

HORACE H. RAYMOND

Ludney & Hallard

Attorneys

Jan. 14, 1941.

H. H. RAYMOND

2,228,674

LATCH AND LOCKING MEANS

Filed Oct. 28, 1939

3 Sheets-Sheet 2

Fig. 3

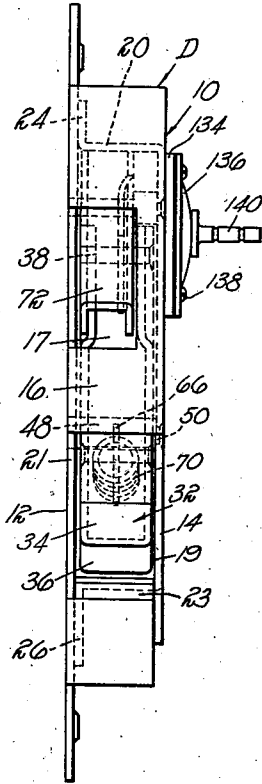


Fig. 4

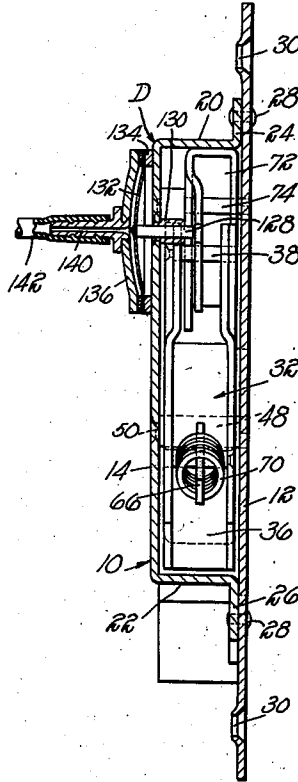


Fig. 5A

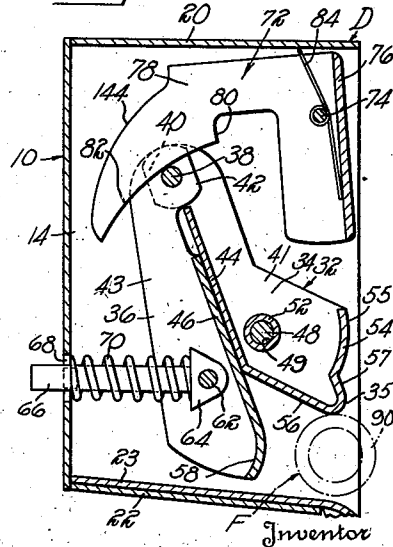
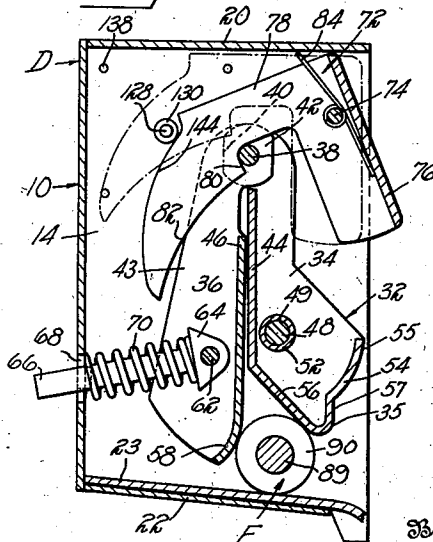


Fig. 5



HORACE H. RAYMOND

Ludley & Saville

Attorneys

Jan. 14, 1941.

H. H. RAYMOND

2,228,674

LATCH AND LOCKING MEANS

Filed Oct. 28, 1939

3 Sheets-Sheet 3

Fig. 6

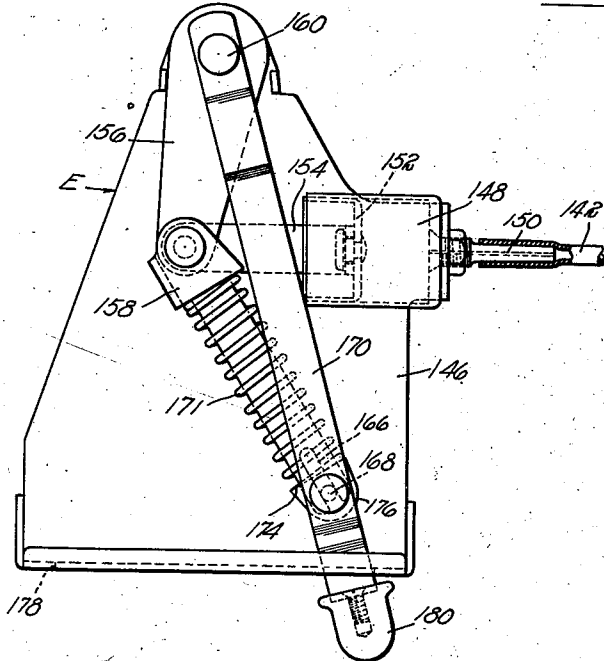


Fig. 7

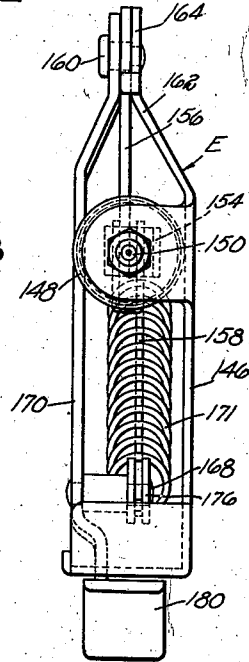
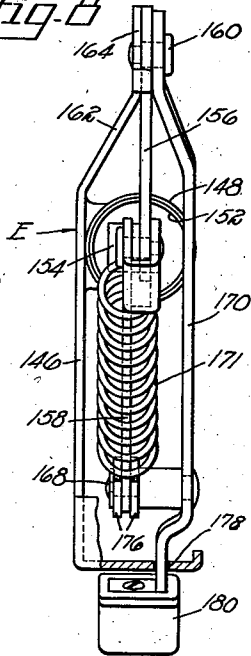


Fig. 8



Inventor
HORACE H. RAYMOND

By *Ludley K. Hubbard*

Attorneys

UNITED STATES PATENT OFFICE

2,228,674

LATCH AND LOCKING MEANS

Horace H. Raymond, Berlin, Conn., assignor to
The Eagle Lock Company, Terryville, Conn., a
corporation of Connecticut

Application October 28, 1939, Serial No. 301,682

15 Claims. (Cl. 70-264)

The present invention relates to latches and has particular reference to latches to be used in conjunction with automobile doors.

Heretofore it has been customary to place on

each door of an automobile a latching means operable from both sides of the door and means

interior of the door for locking the latch against movement from latching position. The locking

means were so arranged that upon operating of the interior means for unlatching the door the

lock would be simultaneously released. In addition, either one or both of the doors at the

driver's seat would also be provided with an exterior key operated lock for locking the door after

exit from the car. It was necessary, however, before locking the exit door to individually check

and latch each door. Moreover, so far as applicant is aware, all of the latches required an exterior operating handle which had a turning

movement, thus requiring one end of the handle to be free. As a result the end of the handle constituted a hook on which clothes could be caught

and torn and in addition, many serious injuries have occurred as a result of people being struck

by the projecting end of the handle.

Moreover, due to the fact that each door was individually latched and had individual locking

means associated therewith, it was necessary to check each of the doors to assure that they were

locked. In many instances where this was not done, doors have been opened, luggage or other

articles stolen from the car, even while the driver was in it. In other instances holdups have occurred by persons entering the car through an

unlatched door.

An object of the present invention is to provide latching means associated with each door

and a central control whereby all of the latches may be simultaneously locked and can not again

be opened except by operation of the central control. By the provision of such means the

doors are all under the control of the operator of the vehicle, and the operator, by the manipulation of the single control means, can assure

the locking of all doors, thus preventing the entry from the outside of any person or the

falling out of any person from the inside of the car through unintentional opening of the latches.

A still further object is the provision of means whereby all the doors except the door through

which the person exits from the car may be simultaneously locked, the exit door being provided with outside locking means, thus making

it impossible for anyone to unintentionally lock themselves outside of the car.

A still further object is a latch characterized by its simplicity of structure, economy of manufacture and ease and positiveness of operation.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings:

Figure 1 is a plan view partly in section of a latch structure embodying the invention herein, shown when utilized in conjunction with the doors of an automobile;

Fig. 2 is a side view of the latch in latching position with one of the side plates of the casing partly broken away to more clearly show the latching mechanism;

Fig. 3 is a front view of the latching mechanism in latching position;

Fig. 4 is a rear view, partly in section, of the latching mechanism in latching position;

Fig. 5 is a side view of the latch in latching position in reverse position to that shown in Fig. 2 and also with the side plate of the casing removed to show the details of the latching mechanism;

Fig. 5A is a view similar to Fig. 5 with the latch in its unlatched position;

Fig. 6 is a side view of the remote control mechanism for operating the latch locking means; and

Figs. 7 and 8 are opposite end views of the mechanism shown in Fig. 6.

Referring to the drawings, there is fragmentarily shown for purposes of illustrating a preferred use of the latches, a pair of automobile doors A and B of usual construction and so hinged that their free edges swing into abutment against a common body post C. Mounted in the opposite sides of the post C are a pair of latching mechanisms D adapted to cooperatively engage a strike F carried by the adjacent door and thus secure the door in its closed position.

There is further mounted on the inner surface of the post C a control means E for remotely and simultaneously operating the locking means associated with each of the latches D. In practice the control means E will be positioned on the dashboard of the car, but is shown in the present instance on the interior of the post for purposes of simplification of the drawings.

More specifically, each latch D comprises a

rectangular, relatively narrow casing 10 having parallel side walls 12 and 14, front and rear walls 16 and 18 and top and bottom walls 20 and 22. The front wall 16 has spaced apart upper and lower openings or apertures 17 and 19 therein, said apertures being arranged in respective alignment with the latch release and bolt, both subsequently described in detail. In addition, the side plate 12 is slotted at 21 in alignment with the opening 19 to allow the strike F to enter the casing and move to latching position as will hereinafter become apparent, and extending inwardly from the lower edge of the slot is a strike plate 23.

For convenience and economy in manufacture the side wall 12, front wall 16 and strike plate 23 are stamped and formed from one piece of suitable sheet metal and the remaining casing members stamped and formed from one piece of suitable sheet metal. When so formed the top and bottom walls 20 and 22 are further provided with right angular flanges 24 and 26 extending therefrom flush with the side wall 12 and integrally joined to the latter in any suitable way such as by rivets 28. As indicated, the side wall 12 may be of substantially greater area than the wall 14 and the extending portions thereof provided with top and bottom rivet receiving openings 30.

From the foregoing it will be seen that by forming a rectangular depression in the center post C corresponding in area to the casing, the latter may be inserted therein until the side wall 12 is flush against the side face of the post C. Thereafter, by providing suitable openings in the post alignable with the openings 30 in the side plate 12, the casing may be secured to the post, by suitable screws and the side wall 12 will completely overlie the edges of the depression in the post for receiving the casing.

Referring specifically to the latching mechanism, there is arranged within the casing a compound latching means 32 including an elongated bolt member 34 and a complementary cushioning member 36 pivotally joined at their upper ends by a transverse pin 38. The pin 38 extends through aligned openings provided in ears 40 extending rearwardly from the side plates 41 of the bolt 34 and ears 42 extending forwardly from the side plates 43 of the cushioning member 36, the pivot being so arranged that the rear plate 44 of the bolt member and the front plate 46 of the cushioning member 36 will, when in abutment, lie parallel and flush against one another. The latching means 32 is pivotally mounted on the casing for movement toward and from unlatching position on a transversely arranged pivot pin 48 positioned intermediate of the upper and lower ends of the bolt member 34 and extending through aligned openings 49 in the side plates 41 thereof. The pivot pin 48 is secured in the casing by positioning the reduced end 50 thereof in a suitable opening in the side plate 14 and then peened over to nonrotatably secure the pin in position. The pin receiving openings 49 in bolt member 34 may also have frictionally fixed therein a bushing 52 adapted to overlie the pin 48 and thus provide a complete transverse bearing between the bolt 70 and pin 48.

The bolt member 34 is so constructed that the lower end or nose 35 thereof is in the form of a V to provide a forward face 54 and a rear strike retaining face 56 extending angularly upwardly from the lower end of the face 54. As

indicated in Fig. 2, the forward face 54 of the bolt includes an upper curved portion 55 and a lower portion 57 arranged parallel to the rear wall 44. The curvature of the upper portion 55 is such that when the latching means are in latching position the upper edge of the face 54 is positioned rearwardly of the front wall 16 of the casing and upon pivoting of the latching means to unlatched position the nose 35 of the bolt will be free to move outwardly through a range of movement limited only by engagement of the lower portion 57 of the forward bolt face with the top edge of the lower front plate aperture 19.

The rear strike retaining face 56 of the bolt 15 also describes an angle of approximately 45 degrees with the forward wall 46 of the cushioning member 36, the latter wall extending downwardly a sufficient distance below its point of meeting with the strike retaining face 56 to provide a forwardly facing strike abutment 58.

With the foregoing construction the strike retaining face 56 and strike abutment 58 define therebetween an inverted V and together with the strike plate 23 make a three-point engagement with the strike F when the latter is in latching position, the full advantage of this structure being hereinafter fully apparent.

Unitary pivoting of the latching means 32 towards unlatching position about pivot 48 is obtained by a compression member compressing a coiled spring 70 so positioned as to normally urge the latching means to unlatched position. To position member 70 there is mounted between the side plates 43 of cushioning member 36, a pivot pin 62 having its center positioned slightly below the center of the bolt pivot 48. Pivotally mounted on the pivot pin 62 is the enlarged head of a link 66, the link extending rearwardly and having its outer end extending through and slidably pivoted in an aperture 68 provided therefor in the rear wall 18 of the casing 10, the aperture being positioned below the latching means pivot 48 whereby when the latching means are in latched position link 66 is at an angle to the horizontal. Link 66 provides a support for spring 70 which is positioned thereon between the head 64 and the rear casing wall 18 whereby the spring 70 is under tension when the latching means are in latched position, thus normally pivoting the trip 36 about the connecting pin 38 to position the forward wall 46 of the trip against the rear wall 44 of the bolt and tending to pivot the bolt about its pivot 48.

Obviously due to the pivotal mounting of the member 36 on the bolt 34 and the pivotal mounting of the link 66 on the cushioning member, the cushioning member constitutes one link of a toggle and the link 66 the other link of the toggle. As the pivot 62 of link 66 is located below the center of the bolt pivot 48 the tendency of the toggle break due to the force of the spring 70 results in a normal tendency to pivot the bolt outwardly towards unlatching position.

The bolt is restrained against such pivoting by a trigger 72 pivotally mounted on a pivot pin 74 and so positioned that upon movement of the bolt to latching position the trigger 72 will automatically engage same and hold it against movement to unlatching position. To accomplish this the trigger includes an actuating arm 76 and a restraining arm 78 extending rearwardly from and at right angles to the actuating arm 76. The lower edge of the restraining arm 78 is positioned above the pivot pin 38 and normally maintained in engagement therewith by a spring 84 mounted

on the trigger pivot pin 74. The spring 84 has one end extending upwardly and into engagement with the top wall 26 of the casing and the other end extending downwardly and into engagement with the rear surface, the actuating arm 76 of the trigger, thus tending to normally pivot the trigger and maintain the lower surface of the restraining arm 78 in contact with the pivot pin 38. As best seen in Figs. 5 and 5A the lower edge of the trigger restraining arm 78 is provided with a downwardly extending shoulder 80 adapted to engage behind the pin 38 and a downwardly facing cam surface 82 extending rearwardly and angularly downwardly from the shoulder 80.

With the latching means and trigger so constructed, upon pivoting of the trigger the restraining arm 78 thereof will be raised to move the shoulder 80 from behind the pin 38 whereupon the toggle comprising the cushioning member 36 and link 66 will be free to break resulting in a pivoting of the latching means to unlatched position and simultaneously causing pin 38 to move rearwardly into the casing and beneath the cam surface 82 of the trigger as indicated in Fig. 5A. When in this position upon the closing of the door the strike F will move past the lower end of the bolt 34 until it engages the strike abutment 58 of the cushioning member 36 causing same to pivot inwardly to raise the link pivot 62 and tend to straighten out the toggle. However, inasmuch as the pin 38 is not fixed, the tension exerted will cause the straightening of the toggle and will pivot the bolt 34 simultaneously therewith about its pivot 48. Upon the pin 38 coming into alignment with the trigger shoulder 80 the trigger spring 84 will cause the trigger to automatically snap and position the shoulder 80 behind the pin 38, thus restraining the latching means in latching position.

Due to the fact that the door of a car is of considerable weight, the swinging thereof will result in the door being carried past its normal closed position, this being particularly so in present day cars where compressible weather stripping and sound or shock absorbing means are placed around the door frame. As a result means must be provided to permit relative movement of the strike to the bolt so that the force of closing is not taken up by the latching means. In the latch illustrated, the shock is absorbed by the cushioning member 36, it being apparent that as the strike moves past its normally closed position the cushioning member is free to pivot about the pivot pin 38 and relative to the bolt 34, this pivoting resulting in a further compression of toggle spring 70. Thus no shock is transmitted to the latching mechanism and when the door has come to a stop and springs back the cushioning member 36 will likewise be forced back by the spring 70 into the latching position shown in Fig. 5.

Preferably the strike F is of such diameter that when in latching position a relative pivoting movement of the member 36 to the bolt 34 has occurred, this movement spreading the normally engaging front and rear surfaces and the cushioning member 36 will exert a forward pressure on the strike and thus prevent rattling thereof. Moreover, upon actuation of the trigger release to release the pin 38 from behind the shoulder 80 the spring 70 in addition to pivoting the latching means also forces the strike F out of the latch and thus assures positive opening of the closure.

For further ease in operation, the strike F may

comprise a pin 89 fixed into the end plate of the door and carrying an anti-friction roller 90.

It will also be noted that the strike plate 23 inclines upwardly from the forward face plate 16 of the casing towards the rear plate thereof, this inclination assuring a positive latching despite any sagging of the doors as the strike will always ride up on to the strike plate and into its proper position relative to the bolt and cushioning member.

In order to operate the latch when used in conjunction with automobile doors, there is arranged on the outside of each door a handle 91, fixed at its opposite end portions 92 and 94 directly to the door as no turning thereof is required. The elimination of the necessity for a pivoted handle is accomplished by providing in the portion 94 of the handle 91 a bore 93 arranged in alignment with the latch pivot actuating arm 72. Mounted within the bore is a plunger 99 so mounted that upon being pushed inwardly it will operate the trigger. In the particular embodiment shown the plunger comprises an inner member 100 having its innermost end extending through the door and its outermost end provided with a shoulder 101 adapted to abut against a circumferential shoulder 103 provided on the interior of the bore 93. The member 100 is normally maintained in its outermost position by a spring 104 positioned intermediate of the shoulder 101 in the innermost end and the bottom of the bore 93. Movement of the member 100 is accomplished by depression of an outer member 105, which member is provided with a reduced end 107 terminating in a circumferential shoulder 109 adapted to abut against the circumferential shoulder 111 in the end of the bore to maintain it positioned therein. Disposed between the member 105 and the member 100 is a spring 113 of greater strength than the spring 104 and thus, when the plunger member 105 is forced inwardly the motion thereof will be transmitted through the spring 113 to the inner member 100 and the latching trigger operated. When the latch is in locked position by the means hereinafter described it can not be damaged by forcing of the plunger member 105 for, if sufficient force is applied to the outer end 107 thereof and the inner member is restrained against movement due to the locking of the latch means, the member 105 will simply compress spring 113 until its inner end 115 abuts the bore shoulder 103 and the force will then be dissipated through the supporting door.

In the case of automobile doors there must further be provided means for operating the latch from the interior thereof, but in instances where such means is omitted, the plunger 99 would directly engage the releasing trigger 72 below the pivot thereof, whereby when the plunger is pushed inwardly the trigger will be moved to releasing position. In the present instance however, there is positioned between the end of the plunger 99 and the releasing trigger, a lever 110, which lever extends forwardly from a U-shaped member 112 positioned in the door. The lever 112 has the base of one leg pivotally mounted to the door at 114 and the base of the other leg provided with a pin 116 receivable within a slot 118 in an actuating lever 120. The lever 120 is connected in any suitable way to an actuating handle (not shown) inside the door whereby when the handle is turned the lever 120 will move longitudinally and pivot the U-shaped member 112 to cause lever 110 to actuate the release trigger. Suitable spring means 122 may be provided to normally return

the lever 120 to its inoperative position. Due to the lost motion connection between the U member pin 116 and the slot 118 in lever 120 the depressing of the plunger 99 when it is desired to open the door from the exterior thereof will also pivot the U-shaped member without transferring the motion to the lever 120. In order to lock the door from the exterior the plunger 105 may include any usual type of cylindrical lock 124 actuated by a suitable key 126, thus preventing longitudinal motion thereof.

By utilizing the latches described herein a number of advantages are obtained which have not heretofore been obtained by the latches presently used. The possibility of using a non-turning handle not only eliminates the disadvantages heretofore set forth but inasmuch as the handle is fixed at both ends a much stronger door pull is obtained. In addition the handle lends itself to streamlining of the car and can be partially or wholly sunk within the car door. Likewise by positioning the actuating latches within the body post instead of in the door as heretofore has been the practice, the size of the door window frames can be materially reduced as the window guides will not have to be set in as far as heretofore required in order to clear the latch casing when mounted in the door, and greater vision through the windows is obtained.

As previously indicated, each latch has associated therewith locking means for locking same in its latched position. In the present instance this latching means comprises a locking pin 128 slidable in a sleeve 130 carried by the casing wall 14 and movable therein into and out of the path of movement of the trigger restraining arm 78. As best seen in Fig. 4 the outer end of the pin 128 is secured centrally of a circular diaphragm 132, which diaphragm is positioned between a spacer 134 mounted adjacent the casing wall 14 and an outer cover member 136, the cover member and spacer being secured to the wall 14 by suitable screws or rivets 138 passing through aligned openings provided for therein. The diaphragm 136 has two positions of stability to either side of the center thereof and thus, when pressure is applied, it will flex past dead center and move the pin into or out of the path of the trigger restraining arm 78. As best seen in Fig. 5 the trigger restraining arm 78 is also provided with an upwardly facing cam surface which, when the trigger is in latch restraining position, is positioned beneath the path of movement of the locking pin 128 and thus when the pin is actuated it will overlie the camming surface 144, preventing operation of the trigger, and thus lock the latching means in latching position. However, when the latch means is in unlatched position the locking pin 128 lies opposite the side face of the restraining member 78 and the clearance therebetween is so small that when pressure is applied to the diaphragm 132 the latter will not throw over dead center but will only move sufficiently to cause the end to strike the trigger.

Actuation of the locking means is obtained herein by pneumatic pressure and to accomplish this the cover member 136 has secured thereon a nozzle 140 connecting through suitable tubing 142 to the remote control means E, which means, when actuated, creates a variation in pressure to either side of the diaphragm 132 causing it to flex past dead center. The remote control means E comprises a supporting plate 146 on which there is rigidly supported a cylindrical chamber 148 having on its outer end a nozzle

150 adapted to be interconnected to the diaphragm chamber nozzles 140 through the interconnecting tube 142. Mounted within the chamber 148 is a piston 152 which piston, when moved forwardly will compress the air contained therein, thus creating a pressure and throwing the respective latch locking means diaphragms past dead center if the latches are in latching position. Upon movement of the piston rearwardly a vacuum will be created whereupon the diaphragms will again flex past dead center to the unlocking position.

The movement of the piston is accomplished by providing it with a rearwardly extending piston rod 154 having pivotally connected to its outer ends the lower end of one toggle link 156 and the upper end of a second toggle link 158. The upper end of the upper toggle link 156 is pivotally mounted on a pin 160 mounted in the support plate 146, the upper portion of the plate being bent inwardly at 162 and then upwardly at 164 to position the toggle 156 in alignment with the piston rod. The lower end of the second toggle link 158 is bifurcated at 166 to receive a pin 168 carried by an actuating lever 170 thus providing a lost motion connection therebetween. There is further mounted on the toggle link 158 a spring 171 having its upper end abutting a shoulder on the link and its lower end abutting the upwardly facing surfaces 174 of a pair of spacing members 176 carried on the pin 168. The actuating lever 170 has its upper end also mounted on the pivot pin 160 and to provide a guide for the lever the lower end of the supporting plate 146 is turned inwardly and at right angles and provided with an elongated slot 178 through which the lower end of the lever 170 extends. The lower end of the lever may further be provided with a suitable handle 180 secured thereon in any suitable way for convenient manipulation thereof.

From the foregoing it is apparent that upon pivoting of the lever 170 to move the lower end 180 thereof to the left as viewed in Fig. 6 the toggle formed by the links 156 and 158 will initially straighten out and then be thrown to the other side of the lever to move the piston 152 forwardly and create a pressure in the system. Upon moving the lever in the opposite direction the reverse action will occur whereupon the piston will be moved rearwardly to create a vacuum. By utilizing the toggle a rapid movement of the piston is obtained, thus getting a sudden variation of pressure within the system. However, the piston is given a loose fit allowing sufficient leakage so that the system almost instantaneously thereafter equalizes to atmospheric pressure, the reason for this being subsequently pointed out.

Thus it will be apparent that upon operation of the lever 170 if all the doors are closed the locking pins 128 will all move into the path of the trigger members of the respective latches and thus an opening of the door can not result. This is advantageous in that all doors may be simultaneously locked by a single operation. In like manner upon reverse operation of the lever 170 all the latches will be unlocked.

It is apparent that at the discretion of the operator all the doors of the car may be locked in their latched position and no one else within the car can unintentionally unlatch an individual door. If it is desired to leave the car the person will exit through a door having an exterior locking means in addition to the latch locking

means and upon opening of this door the latching means in its unlatching position prevents operation of the locking means thereof, however, all of the remaining latches may be simultaneously closed by the operation of the control means E. As the pressure in the system will equalize immediately after the operation of the control means E, sufficient time will elapse between the operation and the closing of the exit door so that the locking means thereof will not be actuated and upon the closing of the door it will be necessary to lock it by the exterior locking means. It is impossible therefore for anyone to exit from the car and then lock themselves out.

It is likewise apparent that in addition to the manufacture of the casing members from metal stampings, substantially all of the remaining parts of the latching mechanism may likewise be made from metal stampings, thus greatly reducing the cost of manufacture of the device. Although shown in conjunction with automobile doors, it is quite apparent that the latching mechanism is susceptible for use in any device wherein a closure is movable into and out of abutment with a jam or the like.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In a latch mechanism a casing, a bolt pivotally mounted in the casing, means restraining said bolt against pivoting, a cushioning member pivotally mounted on said bolt and resilient means normally urging said cushioning member into abutting relation with said bolt.

2. In a latch mechanism a casing, compound latching means positioned in said casing and including a pair of members pivotally mounted together for relative movement to one another, said members having opposed faces paralleling one another, means pivotally mounting one of said members in said casing, means normally urging said other member towards said first member to position said opposed faces in abutting relationship and means releasably restraining said first member against pivotal movement.

3. In a latch mechanism a casing, compound latching means positioned in said casing and including a pair of members pivotally mounted together for relative movement to one another, the lower ends of said members defining therebetween an inverted V, means pivotally mounting one of said members on said casing, resilient means normally urging said other member into normal abutting relationship with said first member and releasable means for restraining said first member against pivotal movement.

4. In a latch mechanism a casing including a strike plate, an elongated bolt mounted in said casing and pivotally mounted intermediate of its ends, means releasably restraining said bolt against pivoting with the lower end thereof positioned adjacent the strike plate, a cushioning

member pivotally mounted on said bolt above said bolt pivot and having its lower end extending downwardly and defining with the lower end of the bolt an inverted V, spring means normally urging said cushioning member into abutting relationship with said bolt member whereby the lower ends of said bolt member and cushioning member and said strike plate define a three-point contact for restraining a strike therein.

5. In a latch mechanism a casing, a bolt pivotally mounted in said casing, a cushioning member pivotally connected to the bolt above the pivot thereof and extending below the other end of said bolt to lie in the path of a strike, a link having one end pivotally connected to said cushioning member below said bolt pivot and its other end slidably pivoted in said casing, a spring mounted on said link between the casing and cushioning member and normally tending to pivot said cushioning member into abutment with the bolt and the bolt about its pivot and means releasably holding said bolt against pivotal movement.

6. In a latch mechanism casing, an elongated bolt pivotally mounted in said casing intermediate of its ends, a toggle comprising a cushioning member and a link member pivoted on said cushioning member, said cushioning member having its free end pivotally connected to the bolt above the bolt pivot and the free end of the link member pivotally mounted in the casing, said toggle including a compression member adapted on breaking of said toggle to pivot the bolt to unlatching position, one of said toggle links lying in the path of a strike and engageable thereby upon movement thereof to straighten the toggle and pivot said bolt to latching position and means for releasing said bolt from latching position.

7. In a latch mechanism a casing, a bolt pivotally mounted in the casing, releasable means engaging one end of the bolt to restrain it against pivoting, a toggle comprising a cushioning member and a link member pivoted thereon, said toggle having one member pivotally connected adjacent the restrained end of the bolt and the other member mounted for pivotal movement in the casing, spring means on said toggle normally tending to break same to pivot said bolt about its pivot to an unlatching position, said toggle lying in the path of movement of a strike and adapted upon engagement thereby to be straightened whereby said bolt will be pivoted towards latching position.

8. In a latch mechanism a casing, a strike retaining member pivotally mounted in the casing, a strike abutment pivotally mounted on said strike retaining member above the pivot thereof, spring means normally urging said abutment into engagement with said strike retaining member and pivoting said retaining member about its pivot and out of the path of movement of a strike and means for releasably restraining said strike retaining member against pivotal movement.

9. In a latch mechanism a casing, a bolt pivotally mounted in the casing, said bolt having a normally rearwardly facing strike retaining surface, cushioning means pivotally mounted on said bolt, said cushioning means extending below and at an angle to said bolt strike retaining surface, spring means normally urging said cushioning means into abutment with said bolt and to pivot said bolt into unlatched position whereby said bolt will lie out of the path of a strike and said cushioning member in the path of a strike to absorb the blow thereof, and means releasably

restraining said bolt against pivotal movement.

10. A latch comprising a casing to be attached to a stationary part, a strike receiving opening in said casing a bolt pivotally mounted in the casing and in normal alignment with said opening when in latched position, a cushioning member pivotally mounted on said bolt member means normally urging said cushioning member into engagement with said bolt and for pivoting said bolt to unlatching position whereby said bolt will be out of alignment with said strike receiving opening and said cushioning member in alignment therewith, and a strike mounted on a movable part adapted to engage said cushioning member to pivot same relative to the bolt whereby the bolt will be pivoted to latching position and releasable bolt pivoting restraining means automatically engageable upon pivoting of the bolt to latching position.

11. In a latching mechanism a casing, a bolt mounted in the casing, a cushioning member pivoted to the bolt, said cushioning member and bolt having the lower ends thereof angularly arranged relative to one another to enable a strike to be held therebetween, means for restraining said bolt in latching position, spring means normally pivoting said cushioning member towards said bolt when the bolt is in latching position and for pivoting said bolt to unlatched position upon release of said restraining means whereby said bolt will be moved out of the path of a strike and said cushioning member into the path of a strike.

12. In combination with a plurality of closure members, a latch for each member mounted on a stationary part, a strike carried by each of said members for latching engagement with the latch associated therewith, latch actuating means carried by each of the closures for releasing the latch

associated therewith and means carried by the stationary part for simultaneously locking each of the latches when said latches are in locking position.

13. In a latching mechanism a casing, bolt means mounted in said casing for moving into and out of latching position, means for restraining said bolt in latching position, locking means for locking said bolt restraining means in latching position, said locking means comprising a member movable into the path of movement of said bolt restraining means, a chamber mounted on the casing, a diaphragm having two positions of stability mounted in said chamber and connected to said locking member and means for creating a variation in pressure in said chamber to flex said diaphragm and operate the locking member.

14. In a latching mechanism a casing, a bolt pivotally mounted in said casing, means for releasably restraining pivotal movement of said bolt, a locking member on said casing for restraining movement of said releasable means when said means is in bolt restraining position, said locking member and said releasable means having intersecting paths of movement whereby said locking member is operable only when said releasing member is in bolt restraining position.

15. In a latch mechanism a casing, latching means comprising a pivotally connected bolt member and cushioning member, said bolt being pivotally mounted on said casing, means normally tending to pivot said cushioning means into abutment with said bolt and said bolt about its pivot and means releasably holding said bolt against pivoting movement on its pivot.

HORACE H. RAYMOND.