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P. M. MERTES

3,189,374

PUSH RELEASE LATCH

Filed Aug. 30, 1963

Fig. 4.

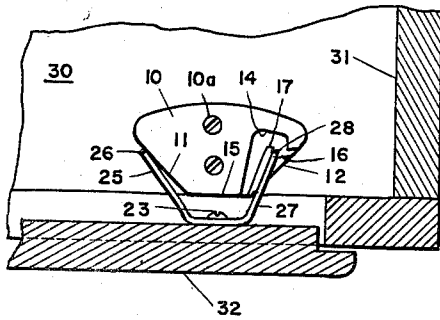


Fig. 1.

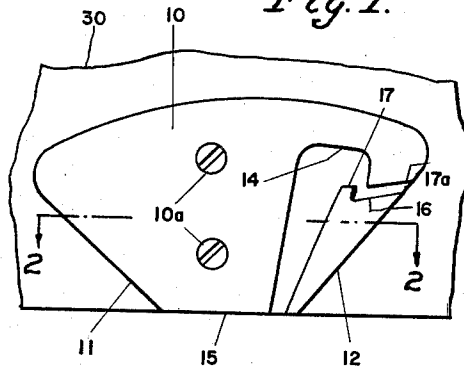
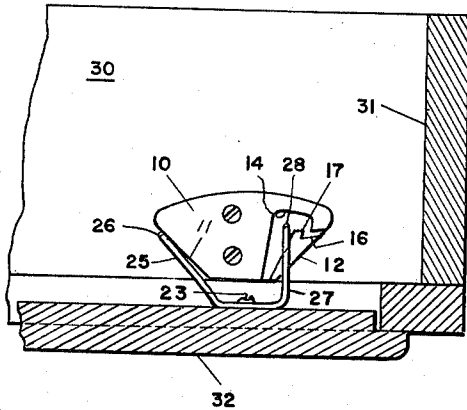


Fig. 2.

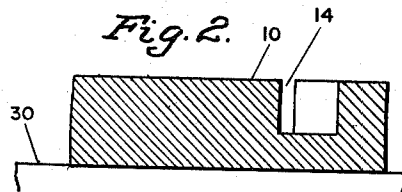


Fig. 5.

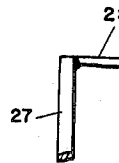


Fig. 8.

Fig. 3.

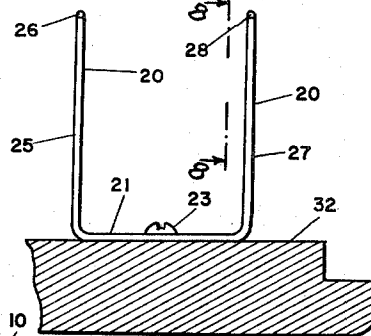


Fig. 6.

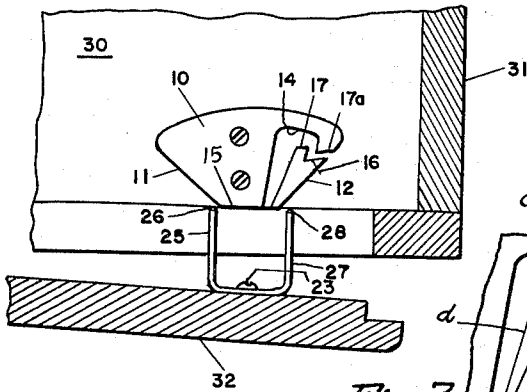
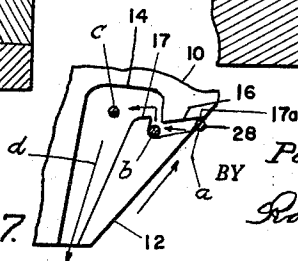


Fig. 7.



INVENTOR.

Paul M. Mertes

BY Robt. G. Pearson
ATTORNEY

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3,189,374

PUSH RELEASE LATCH

Paul M. Mertes, 10603 Tujunga Canyon Blvd.,
Tujunga, Calif.

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4 Claims. (Cl. 292-80)

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This invention relates to a latch of the push release type to hold doors and other closures in a closed position and to facilitate opening them.

In cabinets, refrigerators and many other structures it is desirable that means be provided for latching doors in a closed position by a latching means which can be quickly and easily released whenever it is desired to open them.

It is an object of this invention to provide a simplified latching means which will, in a dependable manner meet the above indicated need.

A more specific object of this invention is to provide a latch structure which comprises a two-armed spring one arm of which operates to hold a closure shut when required, and the other arm of which functions slightly to open the closure when permitted to do so.

Another object is to provide, in a latch of the kind to which the invention pertains, a simplified spring member less expensive to manufacture and which can be held in its operative position by a single screw or like fastener.

It is also an object of the invention to provide, as a means for guiding the movements of the latching member, a simplified catch block which is grooved in such a manner as to insure durability.

Additional objects, advantages and features of invention will hereinafter appear.

Referring to the accompanying drawing, illustrative of a preferred embodiment of the invention,

FIG. 1 is a plan view of the catch block with which the spring member of the latch co-operates, a fragment of the shelf to which said block is attached being included in the view.

FIG. 2 is a section on line 2-2 of FIG. 1, the shelf not being shown.

FIG. 3 is a plan view of the latch spring showing it in its unstressed condition.

FIG. 4 is a plan view illustrating how the two members of the latch co-operate to hold the door in approximately a closed position.

FIG. 5 is a plan view illustrating the position of the arms of the spring member after the door has been farther pushed in to a completely closed position wherein the holding arm of the latch spring has been released.

FIG. 6 is a plan view illustrating the positions of the two arms of the spring member just after the door has been started on its opening movement or just before it has reached its approximately closed position.

FIG. 7 is an enlarged plan view of the catch plate or block illustrating diagrammatically the path of the locking pin in relation thereto.

FIG. 8 is a fragmental side view of a portion of FIG. 3 on line 8-8 of said view.

Referring in detail to the drawing, the female member of the latch consists of the deeply grooved catch block or plate 10, apertured to receive attaching screws 10a. Said plate may be variously contoured, but must have on one side or end a cam face 11 and on its opposite or end a cam face 12, said cam faces being oppositely inclined and converging toward the front.

Into the upper face of said plate 10 is deeply cut a main groove 14, which, when the block is in its operative position, leads to the front edge 15 thereof. This groove is shown as being somewhat wedge-shaped with its narrow end directed forwardly. A shorter auxiliary entrant

groove 16 connects the inner or rear portion of said main groove with the rear part of the cam face 12. Where said grooves join each other a projection 17 is formed which provides a shoulder against which a latching pin at times abuts, as will be understood when the operation of the device is described.

The male member of the latch consists of a two-armed leaf spring 20 shown in its unstressed condition in FIG. 3, where it is seen to be bent across its width in two places so as to form a rectangular U having a base portion 21 whereby it is attached to a cabinet door 32 by means of a single screw 23. One arm 25 of said spring carries a door opening pin 26, and the other arm 27 carries a latching pin 28. Said pins may be attached to the ends of the leaf spring in any convenient manner, as by soldering or by having the end portions of the spring coiled around them. When the spring is in its operative position said pins extend vertically and project considerably below the spring. In the operation of the device the latching pin 28 co-operates with the grooved portion of the catch plate, and the other pin co-operates with the edge portion 11 of said plate.

In the drawing the device is shown with its catch plate 10 attached to the front edge portion of a shelf 30 of a cabinet frame 31, and with its spring member attached to the inner side of a door 32 of the cabinet.

In FIG. 7 the path of the latching pin 28 is diagrammatically indicated by the three small circles a, b and c and by the arrow d. As the door approaches the closed position the latching pin glides over the cam face 12 until it abuts the outer shoulder 17a located at the mouth of the entrant groove portion 16. Then, when the operator releases pressure upon the door it swings outwardly a little because the door opening pin 26 is in engagement with the cam surface 11. During this slight outswinging of the door the pin 28 moves along the outwardly inclined entrant groove 16 until, as indicated at b, it abuts the inner shoulder formed by the projection 17, where it maintains the door in an approximately closed position, until the operator, desiring to open it, presses inwardly upon it, thus causing the latching pin 28 to override the projection 17 and pass from position b to position c in the exit portion of the groove. Owing to the cam surface 11 acting upon the pin 26, when the operator releases pressure upon the door it swings to a slightly open position while the latching pin moves outwardly as indicated by the arrow d, so that the operator may grasp the edge portion of the door and open it as widely as desired. Doors provided with this device do not need to be furnished with handles or knobs.

It will be seen that, until the operator presses upon the closed door to open it, the latching pin 28 holds the door almost completely closed, in opposition to the tendency of the spring arm 26 to open it, as shown in FIG. 4. The pin 28 of the spring arm which carries it prevents the latching pin 28 from overriding the projection 17 until the operator presses the door into a completely closed position. As the door is closed or slammed in all the forward force will be taken up between the door and cabinet. At this point the latching pin 28 will be in a position to enter the groove 16 and move on to the shoulder 17, which it cannot pass over until the door is pushed farther in. The angle or forward inclination of the groove 16 is just the amount required to bring the door to the locked position shown in FIG. 4.

Providing the device with the grooved one piece catch block 10, which has been described, affords a very stable structure and reduces cost of manufacture.

Although what is deemed to be a preferred embodiment of the invention has been illustrated and described, yet it is to be understood that various changes therein, within

the purview of the claims, may be made without exceeding the scope of the invention.

I claim:

1. A latch of the kind described comprising a U-shaped spring attachable to a cabinet door with its arms on the same level and projecting inwardly from said door, a pin carried by and projecting downwardly from each of said arms, one of said pins being a latching pin and the other a door opening pin, a thick catch plate which, viewed in its operative position, has a front side portion and end edge portions which converge forwardly and join said front side portion, a groove in the upper face of said plate, said groove having an entrant portion for said latching pin leading in from the rear part of one of said end edge portions and an exit portion leading thence to said front side portion of the plate, an outer stop shoulder for said latching pin at the mouth of said entrant portion of said groove, an inner stop shoulder for said latching pin at the juncture of the entrant and exit portions of said groove, said entrant groove portion being forwardly inclined from said outer to said inner stop shoulder, and means to secure said catch plate upon the front edge portion of a cabinet shelf in a position for the door opening pin to engage the inclined end edge of said catch plate farthest from the entrant groove portion and for the latching pin under stress to engage the said outer shoulder when the door is closed, thence to travel along the entrant portion of the groove to said inner stop shoulder when pressure upon the door is released, renewed pressure upon the door causing said latching pin to override said inner stop shoulder and allow said door opening pin slightly to open the door.

2. The subject matter of claim 1, and said spring being a leaf spring bent across its width to give it its U-shape.

3. A latch of the kind described comprising a spring portion mountable on a cabinet door and having an arm carrying a downwardly projecting latching pin; and a thick catch plate mountable upon the front edge portion of the floor or of a shelf of a cabinet, there being in the upper face of said plate a groove with a laterally directed entrant portion and a forwardly and rearwardly extending portion for said latching pin to traverse, said groove portions opening out at edge portions of the plate, said spring portion having a part which tends to swing the door slightly open whenever the latching pin occupies any part of the aforesaid groove, the entrant portion of said groove being forwardly inclined from its inner end and having at its outer end a shoulder against which the latching pin first abuts while under stress against the edge of the plate when the door is swung toward closed position until

its movement is arrested, there being also a shoulder at the inner end of the entrant groove portion in a position to arrest the movement of the latching pin at a point wherein it holds the door in an approximately closed position so that, when the door is pressed farther in the latching pin overrides this shoulder and enters the exit portion of the groove, allowing the door opening portion of the spring to swing the door to a slightly open position, and the spring portion of the latch comprising a U-shaped spring one arm of which carries said latching pin, and a cam portion on said plate, which acts upon the other arm of said spring to swing the door slightly open.

4. A latch of the kind described comprising a spring portion mountable on a cabinet door and having an arm carrying a downwardly projecting latching pin; and a thick catch plate mountable upon the front edge portion of the floor or of a shelf of a cabinet, there being in the upper face of said plate a groove with a laterally directed entrant portion and a forwardly and rearwardly extending portion for said latching pin to traverse, said groove portions opening out at edge portions of the plate, said spring portion having a part which tends to swing the door slightly open whenever the latching pin occupies any part of the aforesaid groove, the entrant portion of said groove being forwardly inclined from its inner end and having at its outer end a shoulder against which the latching pin first abuts while under stress against the edge of the plate when the door is swung toward closed position until its movement is arrested, there being also a shoulder at the inner end of the entrant groove portion in a position to arrest the movement of the latching pin at a point wherein it holds the door in an approximately closed position so that, when the door is pressed farther in the latching pin overrides this shoulder and enters the exit portion of the groove, allowing the door opening portion of the spring to swing the door to a slightly open position, and said spring being a leaf spring right-angularly bent across its width at each end of its basal portion.

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M. HENSON WOOD, JR., *Primary Examiner.*

THOMAS J. HICKEY, *Examiner.*