Feb. 14, 1950 B. S. BERNHARD 2,497,830

DOOR HOLDER

Filed Oct. 4, 1945 2 Sheets-Sheet 1

FIG. 2.

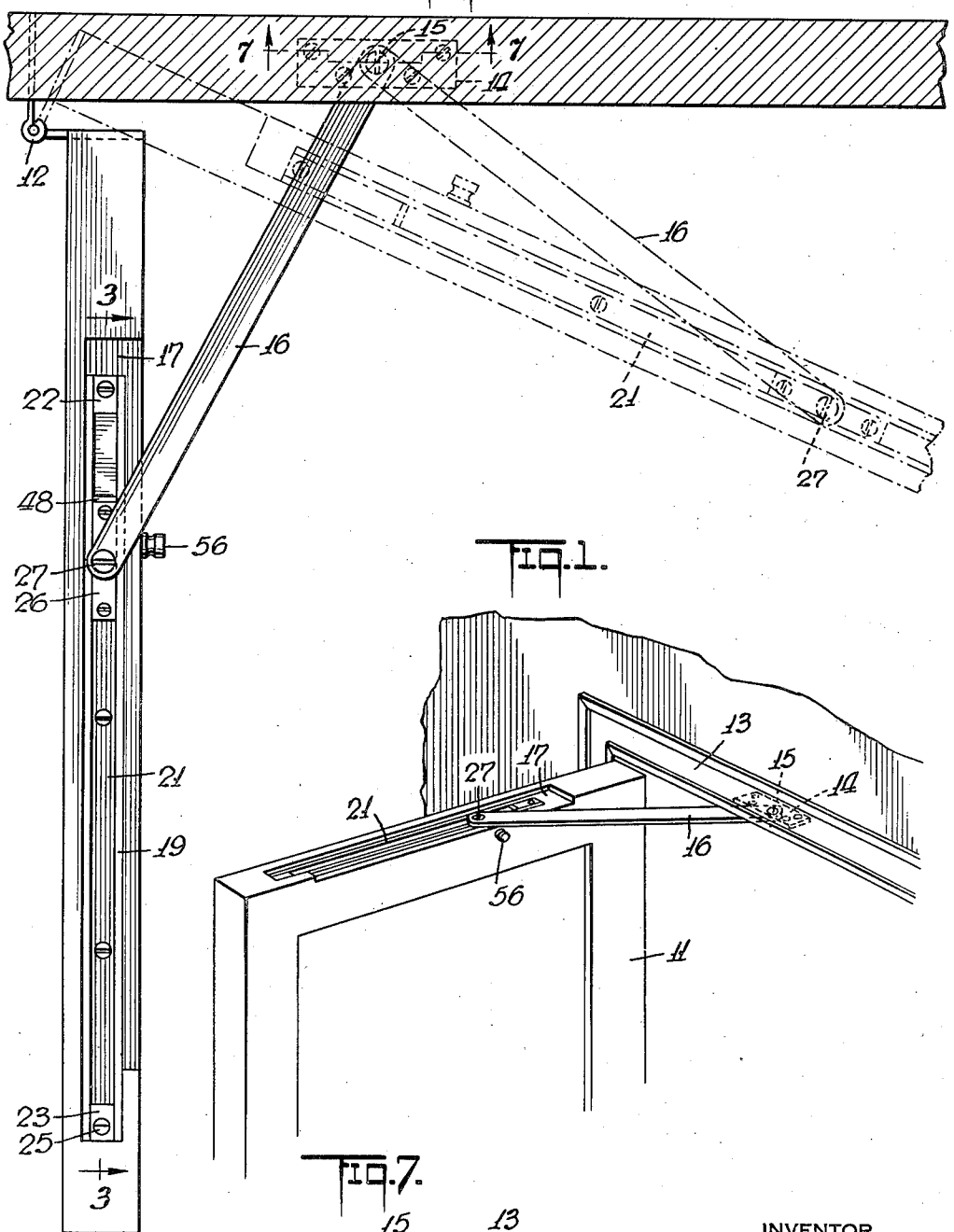
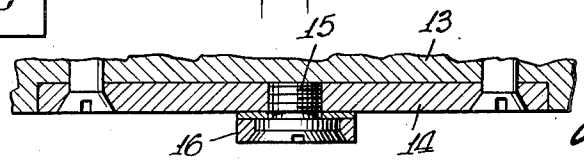


FIG. 1.

FIG. 7.



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DOOR HOLDER

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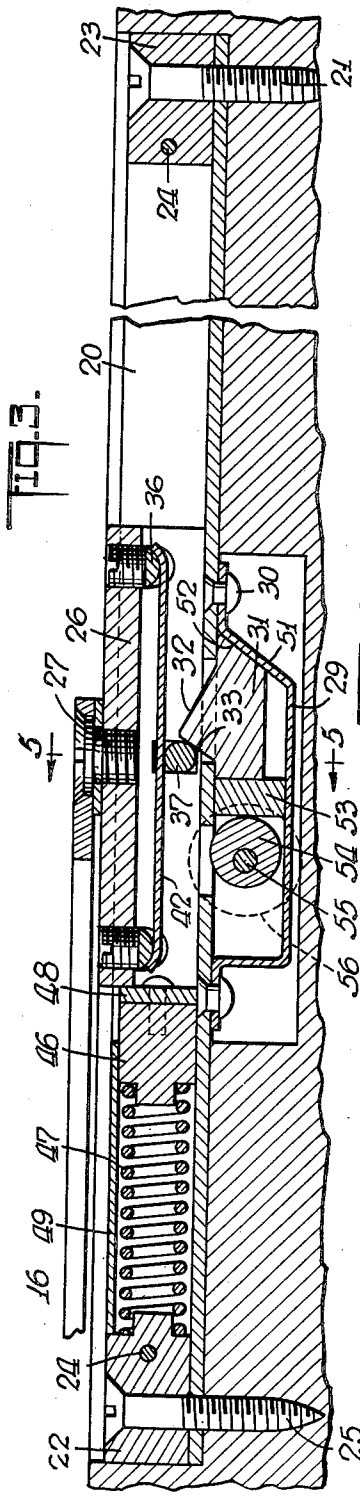


FIG. 3.

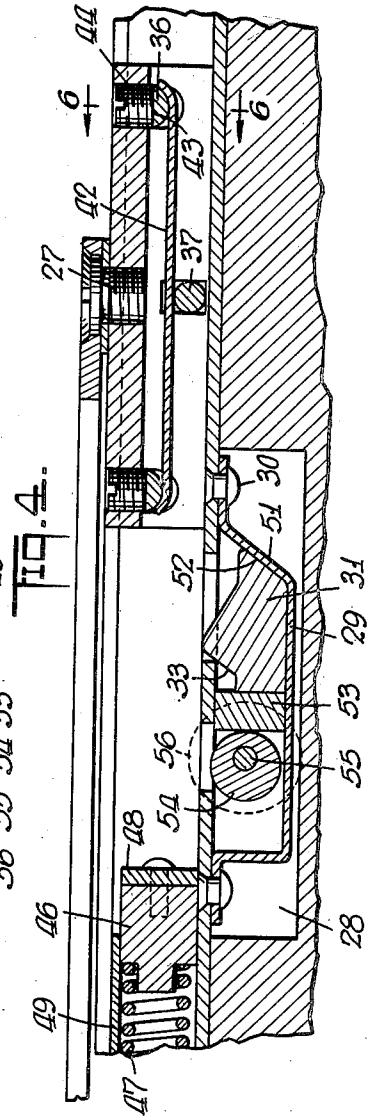


FIG. 4.

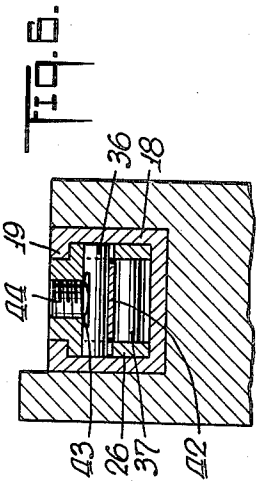


FIG. 6.

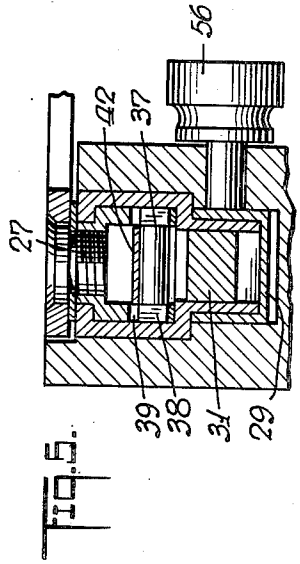


FIG. 5.

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DOOR HOLDER

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Application October 4, 1945, Serial No. 620,287

8 Claims. (Cl. 292—275)

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This invention relates to door holders.

In many instances, more particularly in hospitals, offices, public buildings and the like, it is often desirable to have a door held open to provide free access, avoid slamming, etc. Various forms of door stops and holders are known but for the most part they are subject to one or more objections; for example, many of them require inconvenient manipulations, others are unsightly or involve complicated and expensive mechanisms.

It is an object of the present invention to provide simple and effective means for holding a door in open position.

More particularly it is an object of the invention to provide improved door holding means that come into play automatically by the mere act of moving the door to a predetermined open position and are automatically releasable at will.

With these and other objects and advantages in view, the invention consists in the combinations, features, details of construction and arrangements of parts which will first be described in connection with the accompanying drawings and then more particularly pointed out.

In the drawings:

Fig. 1 is a perspective view of a door and doorway having associated therewith a holder constructed in accordance with the invention, the door being shown in open position.

Fig. 2 is a top plan view of the same on an enlarged scale, the door being shown also, by broken lines, in near closed position;

Fig. 3 is an enlarged sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a similar view showing a different position of the parts;

Fig. 5 is a detail sectional view taken on the line 5—5 of Fig. 3;

Fig. 6 is a detail sectional view taken on the line 6—6 of Fig. 4; and

Fig. 7 is a detail sectional view taken on the broken line 7—7 of Fig. 2.

Referring to the drawings, Figs. 1 and 2 illustrate a door 11 hinged, as at 12, in a door frame 13.

There is provided an arm or holding link for connecting the door and door frame and means whereby one end of the link is so mounted as to extend outwardly when the door is open and fold into the doorway when the door is closed. To this end, as here shown as an example, mortised into the underside of the top of the door frame is a plate 14 which carries a stud 15 on which is pivoted one end of the arm or holding link 16. This end of the link has a pivotal movement only. The

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other end, which may be termed the outer end, is pivotally and slidably connected with the door.

In the embodiment here illustrated as an example, there is a recess 17 formed in the top edge of the door in which is mounted a track in the form of a channel piece 18 the sides of which have inturned flanges 19. The part 18 forms a channel 20 and the flanges define a top slot 21. The channel 20 is closed at the ends by abutment blocks 22, 23 secured in place by pins 24. The channel unit is secured to a door by screws 25 which pass through the end blocks 22, 23.

Movable in channel 20 is a slide unit comprising a short channel piece 26. The top of this slide element is rabbeted to form shoulders underlying flanges 19, the narrowed portion of the slide riding in slot 21. Slide 26 carries a stud 27 on which is pivoted the outer end of holding link 16. When the door is closed, a position approached by the broken line view in Fig. 2, slide 26 is at the far end of channel 20, i. e. the end away from the door hinge, and link 16 lies over the top edge of the door, paralleling the same. In this position, as will be apparent, the various parts of the holding device are entirely concealed from view. As the door is opened, slide 26 moves inwardly of channel 20, the outer end of link 16 swinging in an arc centered on its inner pivot 15.

There is provided means for releasably latching the open door against closing movement, such means operating automatically when the door attains a predetermined open position. This may conveniently be accomplished by a stop shoulder and a follower or contact member, one of which is stationary, the other movable, and one of which is yieldable. Although capable of various constructions, in that here illustrated as an example, below channel piece 18 is a supplemental recess 28 formed in the door. In this recess is mounted a housing 29 secured to the channel piece as by rivets 30. Mounted in the housing, in a manner later described, is a dog in the form of a latching block 31 having a projecting cam portion normally extending into channel 20 through a suitable opening in the bottom of channel piece 18. One face 32 of this cam portion, the one facing to the right as viewed in Figure 3, has a relatively gentle rise. The other or detent face 33 has a relatively abrupt rise and serves as a stop shoulder.

At each end of slide 26 and extending across the channel thereof is a half-round 36 the ends of which take into holes in the side walls of the slide. Midway of the slide is a latch comprising a cylindrical contact element 37 having

squared ends 38 slidable in slots 39 in the side walls of the slide. Overlying contact element 37 and underlying the two half-rounds 36 is a leaf spring 42, its ends being slightly curved to embrace the half-rounds. The top flat faces of the half-rounds are slightly recessed as at 43 (Figure 6) to receive the ends of tensioning screws 44.

When the door starts to open, slide 26 moves toward the left as viewed in Figs. 3 and 4. As the door approaches predetermined open position, the latch 37 rides up the gentle or slow face 32 of the dog or latching block 31, yielding upwardly against its spring 42. As soon as latch 37 passes the peak of latching block 31, it snaps down behind the abrupt face 33 of block 31 under spring action. This face now serves as a stop shoulder for latch element 37 and so tends to prevent reverse movement of the slide unit, whereby link 16 firmly holds the door against closing. The tension of spring 42 is sufficient to hold the parts in this latched position against ordinary wind pressure or any other casual force which might tend to cause the door to shut. When, however, the door is firmly pushed or pulled by a person desiring to close the door, such force is sufficient to overcome the spring pressure. Thereupon follower 37 rides up stop shoulder 33 and over the peak, thus freeing the slide unit for reverse, door-closing movement.

The effective force of spring 42 may be regulated by manipulation of screws 44.

There is provided means for cushioning the stopping of the door on its opening movement and means for preventing opening of the door much past the above described latched position. This double function may be conveniently accomplished by a yieldable bumper. In the embodiment of the invention here shown as an example, spaced from end block 22 is a slidable bumper block 46. Confined between these two blocks is a coiled spring 47. The outer end of block 46 is faced with a contact plate 48 of any suitable material. The recess in which spring 47 is located may be enclosed in a sheet metal channel, the top 49 closing the top opening in channel 18 and the legs extending down inside the channel 18.

The parts are so arranged that as the door comes into the position in which it is to be latched against closing, the end of slide 26 engages contact plate 48 of bumper block 46. During the final portion of the movement of the slide, bumper block 46 is displaced slightly against its spring 47, thus providing a cushioning action against a too abrupt stopping of the door. At the same time, bumper block 46 serves as a stop to prevent opening of the door much past the predetermined position.

With the construction described, the door, as respects any casual forces such as air currents etc., is firmly held in the desired open position.

It may sometimes be desirable to use the door without any automatic latching feature. To this end, the invention in its entirety includes means whereby the latching means may be rendered inactive. This may be conveniently accomplished by withdrawing the latching block 31 out of the path of the slide unit. As here illustrated as an example, latching block 31 is adjustably mounted in housing 29. One end 51 of this housing is slanting and riding thereon is the slanting end of latching block 31. The other end of the block is flat and is engaged by a movable follower 53. This latter is, in turn, engaged by a rotary cam

or eccentric 54 mounted on a shaft 55. This shaft extends through the side of housing 29 and through the door. On its outer end is mounted an operating knob 56.

Fig. 3 shows the latching block in operating position with its stop shoulder extending into channel 20 in the path of the slide unit. It is held in that position by virtue of the fact that the high point of cam or eccentric 54 is engaging follower 53 to force the same against the latching block. When it is desired to render the latching means inactive, knob 56 is actuated to give shaft 55 a half turn, thus rotating cam 54 through an angle of 180 degrees. As the cam rotates, folower 53 moves to the left, as viewed in Figs. 3 and 4, and latching block 31 moves to the left and down, from the position of Fig. 3 to the position of Fig. 4. In this adjusted position the peak of the latching block is withdrawn out of the path of the slide unit in channel 20. Thus there is no automatic latching and the door is freely closable.

When it is desired again to utilize the automatic latching feature, knob 56 is actuated to give cam 54 a reverse half turn. The action of the cam against follower 53 forces latching block 31 to the right, as viewed in Figs. 3 and 4, and the contact of its slanting face 52 against the slanting end 51 of housing 29 causes the latching block to be cammed upwardly. This oblique movement returns the latching block to active position (Fig. 3) with its stop shoulder extending into the path of the slide unit.

The operation of the door holding device as a whole will be apparent from the above without further description.

I claim:

1. In a door holder, a track, a slide slidable on said track, an arm attached to said slide, spring pressed latch means carried by said slide, a dog for engagement by said latch means, said dog comprising a block having a camming surface and a detent surface, and cam means on said block and fixedly related to said track for directing said block into operative position for engagement by said latch means, and manually operable cam means for moving said block to cause said cam means on said block and track to function.

2. In a door holder, a track, a slide slidable on said track, an arm pivotally connected to said slide, a resiliently mounted latch carried by said slide, a dog housing fixed relatively to said track, a dog in said housing, said dog and said housing having cam surfaces, whereby when said dog moves in one direction said cam surfaces will serve to direct said dog into operative position for engagement by said latch, and means for moving said dog in said direction and holding the same rigidly in fixed position.

3. In a door holder, a track, a slide slidable on said track, latch means carried by said slide, an arm pivotally connected to said slide, a dog slidably mounted on said track for engagement by said latch, cam surface means on said dog and fixedly related to said track for directing said dog into operative position when said dog is moved in one direction, and cam means for sliding said dog in said direction.

4. In a door holder, a track, a slide slidable on said track, an arm connected to said slide, a latch carried by said slide, a dog housing carried by said track, a dog in said housing, said housing and dog having coacting camming surfaces for directing a part of said dog into said track in

position to be engaged by said latch when said dog is moved in one direction, and a rotatable cam manually operated from the outside of said housing for moving said dog in said direction.

5. In a door holder, a channel track, a slide comprising a channel inverted relatively to and slidable in said track channel, a portion of the base of said slide channel being exposed through the open side of said track channel, an arm pivotally connected to said base, a latch member extending transversely across and guided for movement in the legs of said inverted channel, a plate spring engaging said latch and a pair of adjusting screws on opposite sides of said latch for adjusting the stress on said spring, and dog means carried by said track and engageable by said latch.

6. In a door holder, a track, a slide slidable on said track, an arm pivotally connected to said slide, a latch carried by said slide, a housing carried by said track, a dog in said housing, said dog and housing having cooperative surfaces for directing said dog into operative position for engagement with said latch when said dog is moved in one direction, a cam member in said housing for moving said dog in said direction and holding the same in said operative position, and a manually operated knob at the outside of said housing for rotating said cam for the purpose set forth.

7. In a door holder, a track, a slide slidably guided by said track, an arm pivoted on said slide,

a movable latch carried by said slide, a plate spring supported on opposite sides of said latch and extending over said latch for urging the latter toward a given position relative to said slide, which given position said latch is to seek to assume when latched, and a dog for engagement by said latch, for the purpose set forth.

8. In a door holder, a track, a slide slidably guided by said track, an arm pivoted on said slide, a movable latch carried by said slide, a plate spring supported on opposite sides of said latch and extending over said latch for urging the latter toward a given position relative to said slide, which given position said latch is to seek to assume when latched, adjusting means effective at one of said opposite points of support for adjusting the stress on said plate spring, and a dog for engagement by said latch, for the purpose set forth.

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