May 8, 1956 D. H. ELLIS 2,744,779

DOOR HOLDER

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FIG. 1

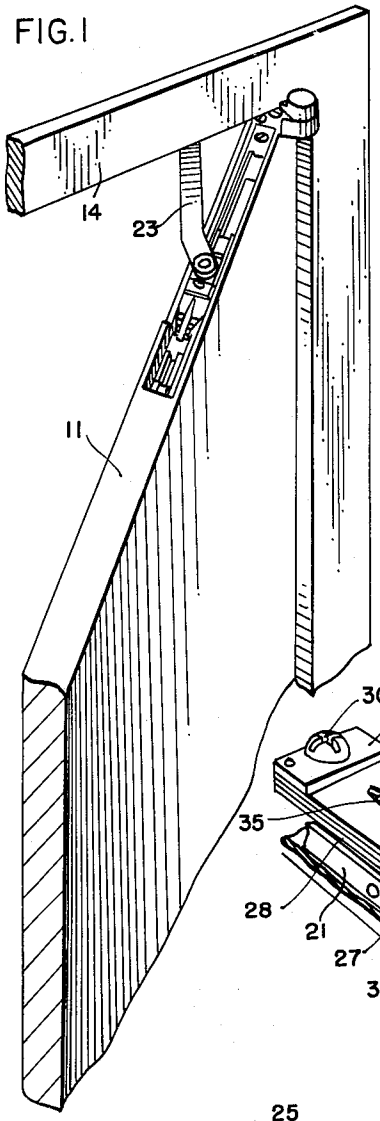


FIG. 2

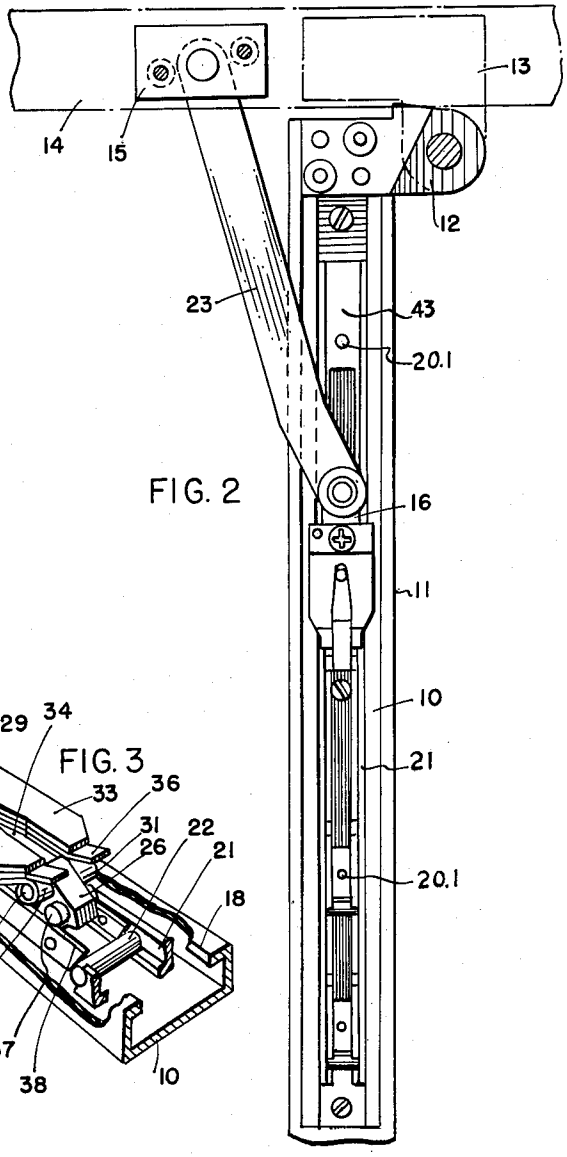


FIG. 3

FIG. 11

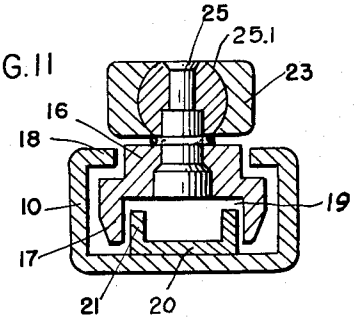
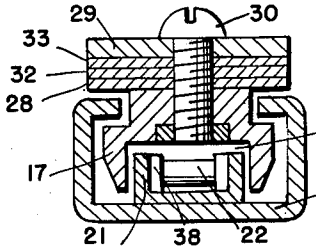


FIG. 12

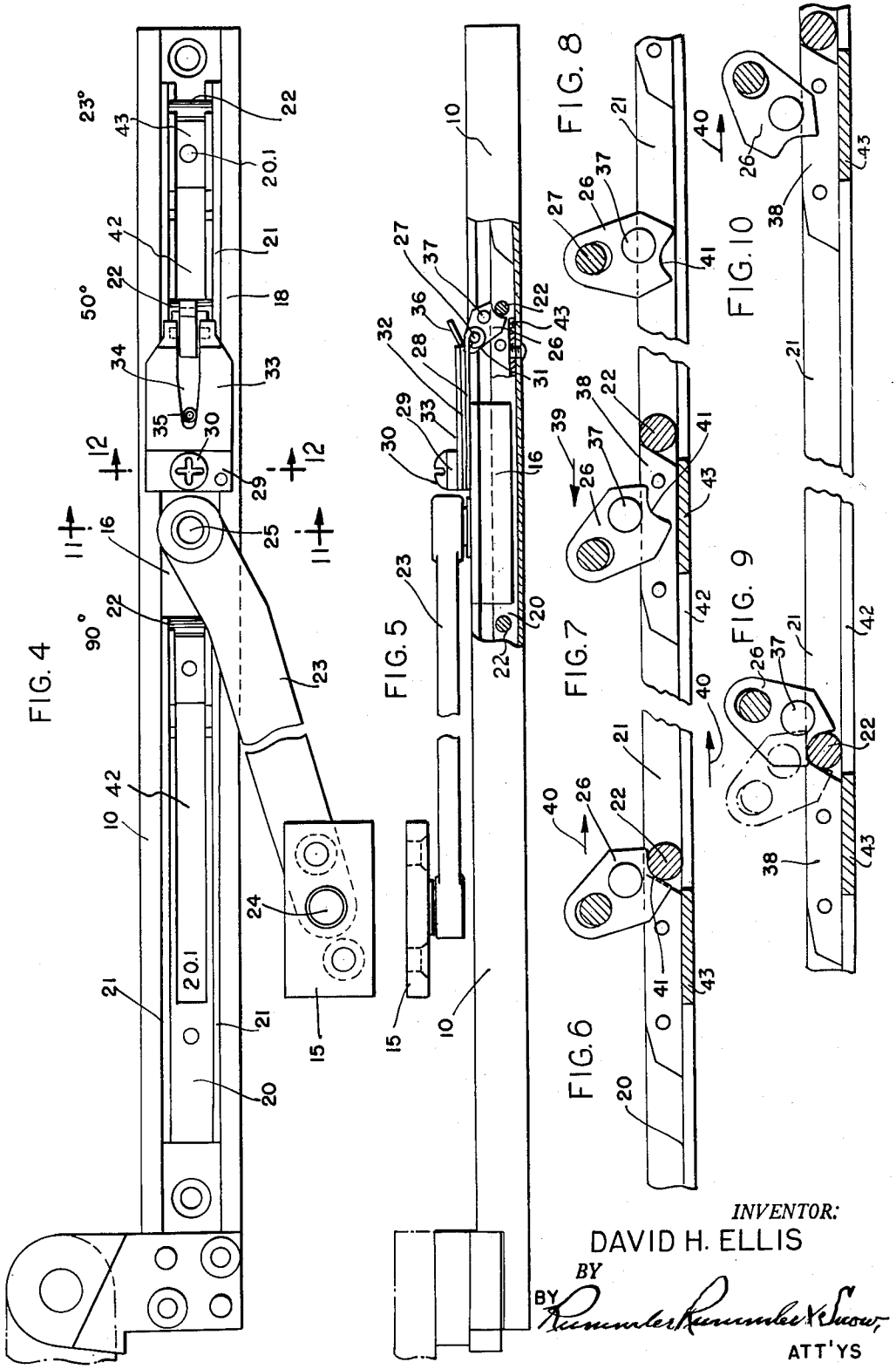


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DOOR HOLDER

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5 Claims. (Cl. 292—278)

This invention relates to door holders of the general type adapted for mounting at the top of the door and by which the door may be held in one or more positions and can be freed from such holding by slight pressure on the door without other attention.

The main objects of the invention are to provide an improved form of door holder capable of holding the door in several selective positions, and having improved mechanism that is silent in operation and suitable for use in hospitals where the slightest sound might be disturbing; and to provide improved structure of parts thereof for increasing the efficiency and useful life thereof, with complete freedom from attention for maintenance.

This invention is a specific improvement on door holding mechanism of the general form disclosed in the Patent No. 2,277,316 to F. C. Garrison of March 24, 1942.

A specific embodiment of this invention is shown in the accompanying drawings in which:

Figure 1 is a fragmentary perspective view of a door and frame equipped with a holding device constructed according to this invention.

Fig. 2 is a top plan, showing the door holder with its parts in the position corresponding to a 90° open position of the door.

Fig. 3 is a fragmentary perspective view showing the mounting of latching pawl, and its relation to the stop with which it cooperates, and to the guide that directs the pawl into holding engagement with the stop.

Fig. 4 is a top plan of the door holder with the holding pawl in an intermediate position thereon.

Fig. 5 is a side elevation of the same with parts broken away.

Figs. 6 to 10 inclusive are enlarged detailed views showing the pawl in various positions in relation to stop shoulders on the frame.

Fig. 11 is a transverse section taken on the line **11—11** of Fig. 4.

Fig. 12 is a similar section on the line **12—12** of Fig. 4.

In the form shown in the drawings, the door holder comprises a door member **10**, which is mortised into the upper edge of the door **11** and which is equipped with hinge parts **12** and **13**, and a frame member **15** that is mortised into the lintel portion of the door frame **14**.

The door member **10** is an elongated rail of channel-shaped cross section which forms an upwardly open groove or guideway for a slide block **16**, which is a carrier for a holding pawl. This block **16** is preferably made of self-lubricating bronze and its cross sectional form, as shown in Fig. 11, is of inverted channel-shape, providing runners **17** that slide along the way formed by the rail **10**. These runners **17** are offset outwardly from the body of the block **16** and held against upward displacement by the inwardly directed flanges **18** on the tops of the side walls of the member **10**.

A longitudinal channel **19** in the bottom of the slide block **16** straddles a channel bar **20** that is secured to the bottom of the member **10**. The bar **20** is secured along the center line of the bosom of the member **10** by rivets

20.1. For lightness portions of the base web of the bar **20** are cut away between the cross strips through which the rivets **20.1** extend, leaving upstanding rails **21** that provide support for transversely extending pins **22** located at selected positions along the member **10** for engaging a pawl carried by the slide block **16** for holding the door open at certain predetermined angles with respect to the door frame. The form and function of this pawl will be hereinafter described.

The slide block **16** is connected to the frame member **15** by means of an operating arm in the form of a link **23** having a pivotal connection **24** with the frame member **15** and a pivotal connection **25** with the slide block **16**. These pivotal connections are in the form of ball joints as indicated at **25.1** in Fig. 11 to allow for mounting misalignment.

A free swinging pendant pawl **26** hangs into the bosom of the channel bar **20** in position to engage the stop pins **22**. The pawl **26** is pivotally suspended from the slide block **16** by a pivot pin **27**, carried by a spring arm **28** which is part of a three-leaf spring clamped to the top of the slide block **16** by means of a block **29** and screw **30**.

The spring leaf **28** is bifurcated, as shown in Figs. 3 and 4, to form a pair of arms that are curled to form bearings **31** for the pivot pin **27** on which the pawl **26** is mounted. The leaf spring **28** is reinforced by leaves **32** and **33** which are likewise bifurcated with a central longitudinal slot **34** which provides clearance for the free movement of the pawl **26**.

A pin **35**, driven into a hole in the slide block **16**, at the narrow inner end of the tapered slot **34** coacts with the screw **30** to keep the leaf springs properly alined with each other and with the guideway member **10**. The bifurcated arms of the leaf **32** are extended beyond the pivot **27** to form stop shoulders **36** above laterally projecting lugs **37** on the pawl to limit the upward throw of the pawl. The lugs **37** on the pawl **26** also have the function of controlling the disposition of the pawl with respect to the stop pins **22**. For this purpose pairs of spaced guide plates **38** are attached to the side flanges **21** of the inner channel bar **20** adjacent to each stop pin **22** on the side thereof that faces toward the hinges. The lugs **37** on opposite sides of the pawl **26** extend outward a sufficient distance to ride upon the guides **38** but terminate inward of the flanges **21** of the bar **20**. Thus, the pawl **26** is free to hang vertically and to swing forward or backward without obstruction at all times except when the lugs **37** are riding on the guides **38**. In order that the pawl **26** may be free to swing forward and back beyond its vertical position and require a minimum of space for the operation of the slide **16** and its connected mechanism, the bottom web of the channel bar **20** is cut away along the path of the pawl, as indicated at **42** in Fig. 4, leaving cross connections **43** between the rails **21** of that bar only in the vicinity of the guides **38** and at the ends of the bar for connecting the rails rigidly together and for fastening the bar **20** to the channel member **10**. On the opening movement of the door, the guides **38** position the pawl for holding engagement with the respective stop if the movement of the door is reversed while the lugs are on the guides.

The operation of the device shown is as follows:

Experience has shown that three stop pins **22** are sufficient for most practical needs, one being located for holding the door at an opening of 90° and the other two being at selected intermediate positions.

From the drawings, it will be noted that the pawl **26** is free to swing and ride over the stop pins **22** without obstructing the movement of the door in either direction, except at times when the opening movement of the door is stopped and reversed while the lugs **37** of the pawl are

riding on the guides **38**. As the door opens, the link **23** causes the slide **16** to move toward the hinged end of the door member **10**, as shown by the arrow **39** in Fig. 7. If at such time the movement of the door is reversed, as indicated by the arrow **40** of Fig. 6, then the pawl **26** will abut the stop pin **22** and hold the door against further closing movement. For this purpose the stop engaging end of the pawl **26** is notched at **41** to fit about and partly embrace the pin **22** with sufficient resistance to stop the movement of the door against the pull of ordinary door-closing devices or springs.

If, however, a person applies slight amount of pressure to the door to move it toward its closed position, the spring mounting of the pawl will yield and allow the pawl to pivot on the stop pin and ride over the stop pin **22**, as shown in Fig. 9.

In Fig. 10 the position of the pawl in riding over the guide members **38** during the closing movement of the door is indicated.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the structure shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

I claim:

1. In a door holder, a rail of channel-bar shape, a channel-like inner bar extending along the bosom of said rail and spaced from the side flanges thereof, said inner bar having upstanding side walls, a block slidable along said rail over said inner bar, a leaf spring secured at one end to said block and having a free end overlying said inner bar, a pendant pawl pivotally mounted on a transverse axis at the free end of said leaf spring and hanging freely into the bosom of said inner bar, a transverse stop pin carried by said inner bar in the path of said pawl, said pawl having a notch at its free end adapted to partly embrace said stop pin, a laterally projecting lug on said pawl, and a guide member located adjacent said stop pin at one side of the path of said pawl in position to engage said lug when the pawl is moving in one direction and hold said pawl in tilted position for engaging said stop pin in said notch upon reversal of direction of pawl movement, said guide member projecting a predetermined distance beyond one side of said stop pin in said one direction of movement and terminating in a downwardly sloping top edge surface at the end remote from said stop pin for disengaging from said lug and allowing said pawl to hang free when said lug is moved beyond said guide, said sloping guide edge being adapted to engage said lug and lift said pawl to an oppositely tilted position when said pawl is moved in an opposite direction from the free hanging position.

2. In a device of the class described, a slide block movable endwise along a predetermined path, a multiple leaf spring secured to said block and extending longitudinally thereof above and beyond one end thereof, said spring being bifurcated at its free end, a pendant pawl suspended pivotally between the bifurcations of the lower leaf of said spring, said pawl having a notch at its free end for embracing engagement with a cylindrical stop element disposed across the path of said block and having a pair of laterally aligned lugs located between said notch and said spring, and a pair of laterally disposed cams mounted along the path of said block for engaging said lugs to swing said pawl about its pivotal axis, a second leaf of said spring having its bifurcated ends extended to overhang said lugs and limit the upward swing of said pawl.

3. In a device of the class described, an upwardly open channel bar, a slide block mounted to travel along and within the channel of said bar, said slide block having a groove in its bottom extending lengthwise thereof, a second bar having parallel spaced side rails secured to the web of said first-named channel bar and extending lengthwise thereof through the groove in said slide block, a leaf spring secured to said block and extending longitudinally above said rails above and beyond one end of said block, a pendant pawl pivotally suspended on the free end of said leaf spring, a stop pin extending crosswise between said side rails across the path of said pawl, said pawl having its free end notched to engage said pin, a pair of alined lugs projecting from opposite sides of said pawl between its notched end and its pivotal axis, a pair of stationary cam tracks at respectively opposite sides of the path of said pawl adjacent to said stop pin and adapted to be engaged by said lugs to guide said pawl into and out of engagement with said stop pin.

4. In a device of the class described, an upwardly open channel bar, a slide block mounted to travel along and within the channel of said bar, said slide block having a groove in its bottom extending lengthwise thereof, a second bar having parallel spaced side rails secured to the web of said first-named channel bar and extending lengthwise thereof through the groove in said slide block, a leaf spring secured to said block and extending longitudinally above said rails above and beyond one end of said block, a pendant pawl pivotally suspended on the free end of said leaf spring, a stop pin extending crosswise between said side rails across the path of said pawl, said pawl having its free end notched to engage said pin, a lug projecting laterally from one side of said pawl between its notched end and its pivotal axis, a stationary cam track at the side of the path of said pawl adjacent to said stop pin and positioned to be engaged by said lug to guide said pawl into and out of engagement with said stop pin.

5. In a device of the class described, an upwardly open channel bar having a bottom web, a second upwardly open channel bar mounted within and on the bottom web of said first-named channel bar and having side rails spaced from the sides thereof, a slider block mounted to travel lengthwise within the first-named bar and straddling the second, a multiple leaf spring secured to said block and extending longitudinally thereof above and beyond one end thereof, said spring being bifurcated at its free end, a pendant pawl suspended pivotally and swingably between the bifurcations of the lower leaf of said spring, said pawl having a longitudinally directed notch at its free end and having a pair of laterally projecting alined lugs located between said notch and the pivot connection with said spring, a second leaf of said spring having its bifurcated ends extended to overhang said lugs to limit the upward swing of said pawl, a stop pin extending crosswise between said side rails across the path of said pawl, a pair of stationary cam tracks at respectively opposite sides of the path of said pawl adjacent to said stop pin and positioned to be engaged by said lugs to guide the notched end of said pawl into and out of engagement with said stop pin.

References Cited in the file of this patent

UNITED STATES PATENTS

1,728,693	Moore et al.	Sept. 17, 1929
2,277,316	Garrison	Mar. 24, 1942