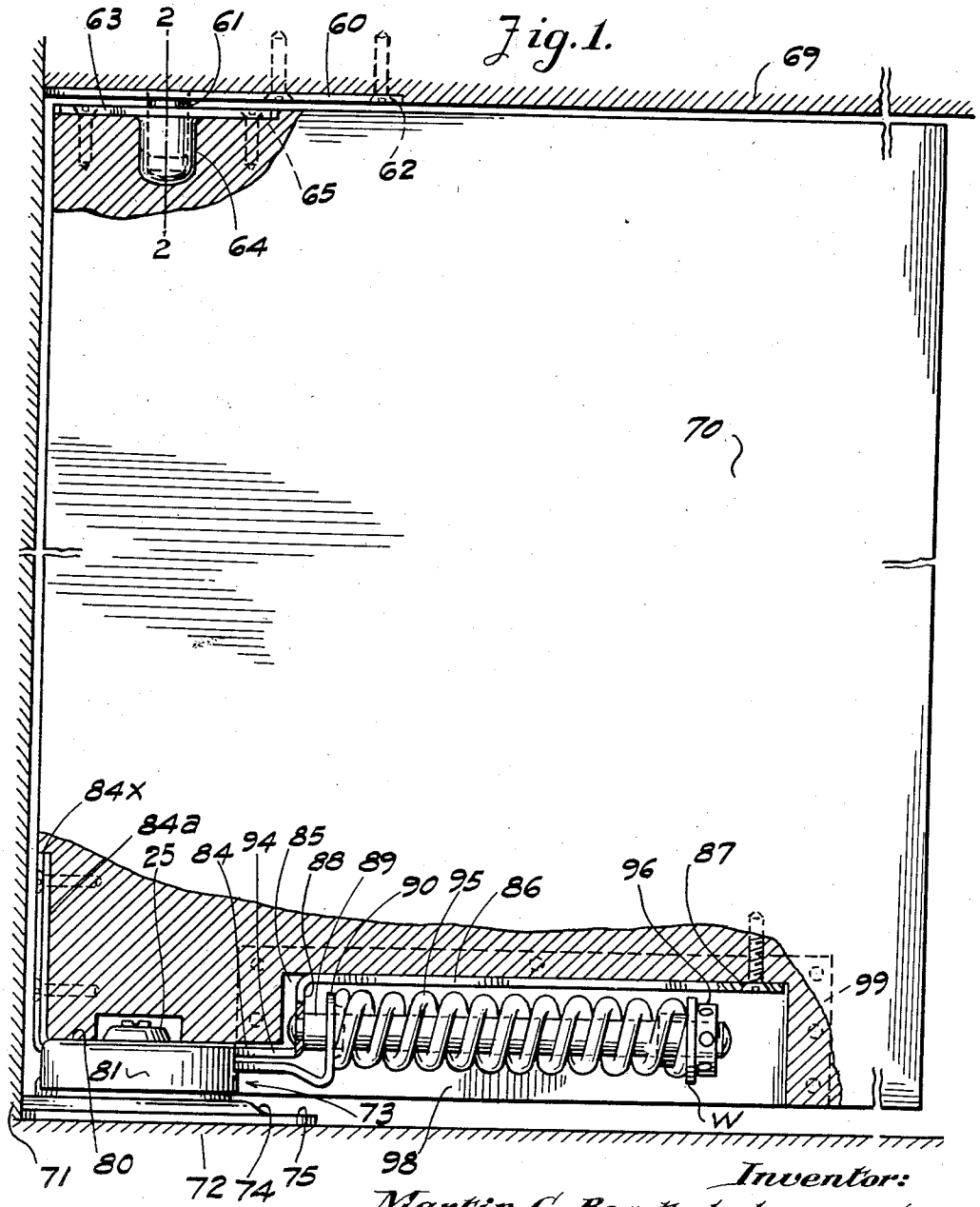
Dec. 22, 1936. M. C. BERSTED 2,064,809

CLOSURE OPERATING DEVICE

Original Filed Feb. 25, 1935 2 Sheets-Sheet 1

Fig. 1.



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Fig. 3.

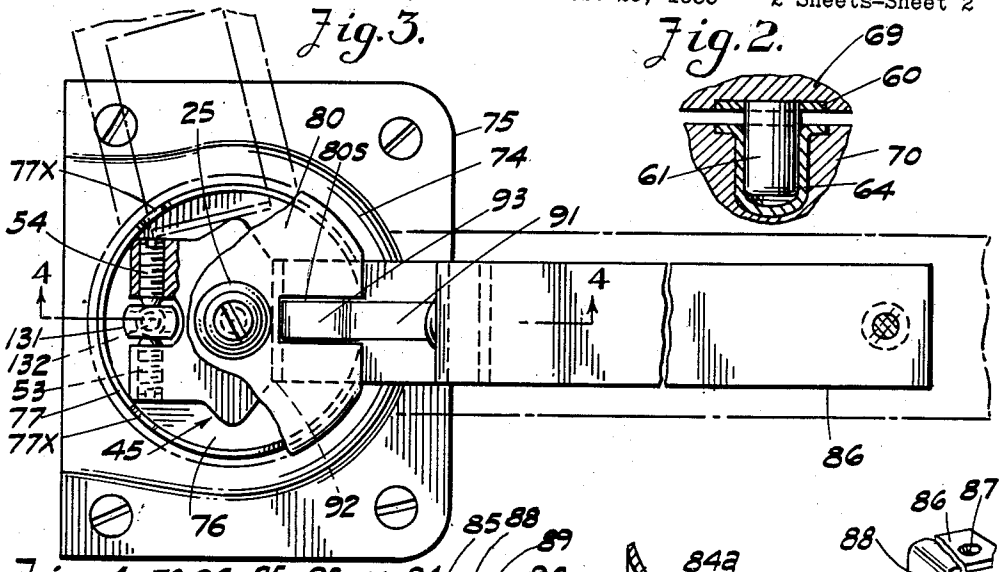


Fig. 2.

Fig. 4.

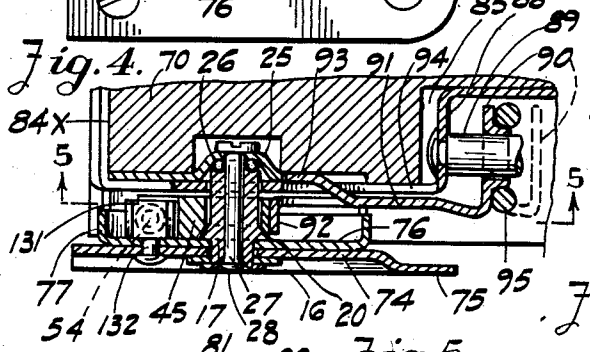


Fig. 7.

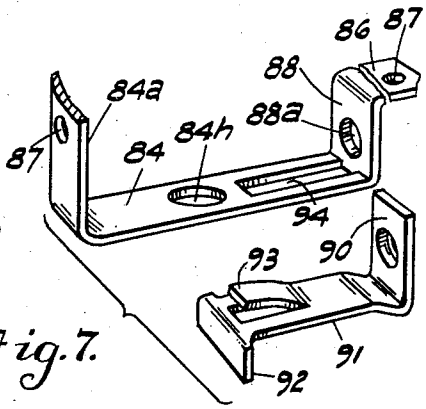


Fig. 5.

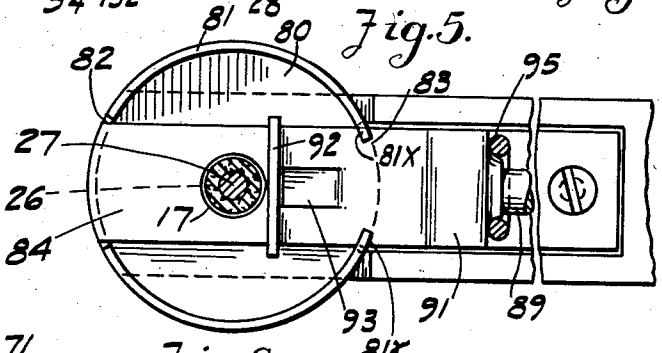


Fig. 8.

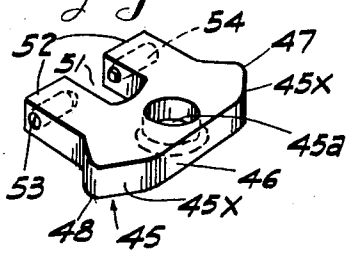
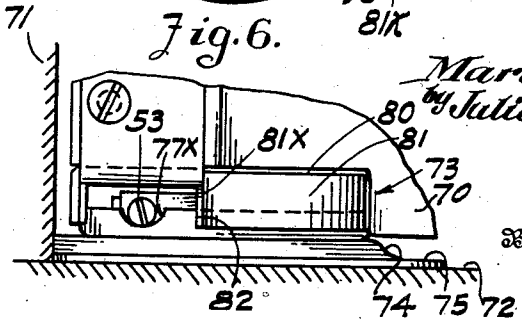


Fig. 6.



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Patented Dec. 22, 1936 2,064,809

UNITED STATES PATENT OFFICE

2,064,809

CLOSURE OPERATING DEVICE

Martin C. Bersted, deceased, late of San Diego, Calif., by Julie Bersted, administratrix, San Diego, Calif., assignor, by decree of court, to Julie Bersted, widow of said Martin C. Bersted, deceased

Original application February 25, 1935, Serial No. 8,105. Divided and this application February 24, 1936, Serial No. 65,374

7 Claims. (Cl. 16—185)

This invention relates to a spring controlled door hinge construction whereby a swinging door is yieldingly maintained either in open positions or in a closed position.

An object of the invention is to provide improved means for positioning the door per se with relation to its mounting means, thereby causing the door when closed to be more accurately positioned in the door opening, and also determining more precisely the points at which the door will come to a stop when it is swung in either direction to an open position.

Still other objects and advantages reside in the compactness, simplicity and low cost of manufacture of the claimed structures for swingingly supporting a door or other swingable closure element.

The present application is a division of the application for Letters Patent on Closure operating device filed February 25, 1935; Ser. No. 8,105 and carries forth the objects outlined therein, and reiterated above.

Other objects, advantages and features of the invention will hereinafter appear.

In the accompanying drawings, which illustrate the alternate or second embodiment divided out of the parent case—

Fig. 1 is a side elevation of the complete device, surface portions being broken away to disclose underlying structure.

Fig. 2 is a fragmentary vertical mid-section taken on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary plan view of the door controlling device, some parts of which are broken away to show hidden structure in detail.

Fig. 4 is a vertical section on line 4—4 of Fig. 3.

Fig. 5 is a transverse section looking up from line 5—5 of Fig. 4.

Fig. 6 is a fragmental side elevation showing a corner portion of the door partly open in order to illustrate the means to afford access to the screw adjustment.

Fig. 7 is a perspective view showing in a disconnected relation the spring actuated element and the guide means therefor.

Fig. 8 is a perspective view of the cam block, the main cam face being observable.

Referring in detail to the drawings, the door 70, which swings in both directions, is shown in an assembled relation to its lintel 69 and casing member 71.

The tubular pivot pin 17 forms the lower hinge of the door. At the upper side of the door a combined hinge plate and gage plate 60 is provided, said plate having a downwardly directed hinge pin 61 and with screw holes 62. With said hinge plate 60 cooperates a T-shaped socket member 63 having a socket portion 64 to receive said pin and a wing at each side having a screw hole 65 to receive screws directed downwardly into the upper edge of the door. The door 70 is recessed as indicated in Fig. 1 to receive the socket member 64.

As viewed in Fig. 1, the center of the upper hinge pin 61 is located the same distance from the inner (left) end of the gage strip 60 as the center of the lower hinge pin 17 is spaced away from the left side of the base plate 74, which engages the casing. This arrangement provides for mounting the door quickly in a truly vertical position, which is insured by abutting the left end of the gage strip 60 against the upper part of the door casing while the left side of the attached base plate 74 engages the lower portion of the door casing.

The lower pivotal mounting of the door upon the threshold 72 includes the cam device 73, the base plate 74 being interposed between said threshold and cam device. Said base plate is preferably rectangular, and it has a depressed foot portion 75 extending along three sides thereof thus elevating its body portion sufficiently to provide under it a clearance to receive a washer 16 and the peened over lower end of the tubular pivot pin 17. A lower housing plate or disc 76 is superimposed upon said base plate and has its upper face engaged by an annular bead or shoulder 20 formed around tubular pin 17 thus clamping together the parts 74 and 76 (see Fig. 4) when the lower end of said pin 17 is peened over against the lower side of the washer 16.

The cover member 80 is furnished with a central circular rise 25 which cooperates with the top portion of the hollow pin 17 to form a raceway for the ball bearing members 26, this part of the bearing structure being completed by means of the headed central pivot pin 27, the upper end of which extends loosely thru said cover member and the lower end of which is peened over at 28.

The disc 76 has an upstanding peripheral flange 77, two notches 77x (see Fig. 3) being made in said flange to aid in forming openings to admit a tool for regulating the screw threaded adjusting means.

The cover member 80 has a downwardly directed peripheral flange 81 which is cut away at 82 and 83 in order to make room for mounting the strap iron 84 shown in detail in Fig. 7. Said

strap iron has a hole 84*h* to receive the tubular pivot pin 17. The lower end of the door is cut away at 85 and the strap iron 84 has an upwardly offset part 86 which underlies and is attached to this part of the door, screw holes 87 being made thru said strap iron to receive screws to attach it to the door. The strap iron 84 may be upwardly directed at 84*a* into a channel 84*x* therefor in the inner edge of the door. Between its base portion 84 and offset portion 86 the strap iron has a riser portion 88 having thru it an aperture 88*a* wherein is tightly secured one end portion of the guide rod 89. Around said guide rod is slidably fitted the upwardly directed arm 90 of the cam operated slide 91, the opposite end portion 92 of said slide being downwardly directed to cooperate with the cam block 45.

The slide 91 has an upstruck guide tongue 93 which has a working fit within a slot 94 provided therefor in the strap iron 84. Against the arm 90 of the slide 91 presses one end of a spring 95 which is loosely coiled around the guide rod 89. The opposite end of said spring (see Fig. 1) engages a washer *w* which is backed by a nut 96 screwed on to said rod.

The top of the cover disc 80 has a radial slot 80*s* (see Fig. 3) cut thereinto directly above the space thru which the tongue 93 of the slide 91 moves. Said tongue extends thru and somewhat above the guide slot 94 in the strap iron 84, and therefore moves back and forth in said slot 80*s* also. The opening 83 thru the cover flange 81 is sufficiently wide to admit the strap iron 84 and also to provide a sufficient clearance therebelow to receive with a working fit the slide 91 the body portion of which underlies said strap iron. As shown in Fig. 5 part 81*x* of flange 81 remains intact below parts 84 and 91, thus providing retaining means for them. At the opposite side of cover plate 80, the strap iron 84 passes thru opening 82 with a close fit.

A cam member, shown as a block 45 is furnished with a symmetrically located bearing aperture 45*a* (see Fig. 8) whereby it is mounted upon the bearing pin 17 with a working fit. Said block has a main central cam face 46. At one side of said cam face is a cam projection 47 and at the other side thereof a like cam projection 48, there being a guiding surface 45*x* at each side of the main cam face 46 which directs the movement of the cam operated element as it passes from the main cam face 46 to said cam projections. When the guiding surfaces 45*x* are in an abutting relation with element 92 the door is maintained partly open.

The cam block 45 may be regarded as yoke-shaped having arms 52 at opposite sides of a recess 51. Each of said arms has a screw hole extending therethru which opens into said recess. Adjusting screws 53 and 54 are screwed into these holes, the inner ends of said screws acting upon a stud 131 (see Fig. 4) having a headed contracted downward extension 132 whereby said stud is secured to plates 74 and 76 and at the same time aids in securing said plates to each other.

The adjusting screws 53 and 54 are accessible for adjustment only when the door is in partly open positions, one of which is shown in Fig. 6, where the flange opening or cut-away part 82 and notch 77*x* are seen in register with each other. Therefore unauthorized persons cannot tamper with said screws while the door is locked in a closed position.

The spring 95 and rod 89 around which it is coiled are shown housed in a recess 98 formed by cutting a rectangular piece out of the lower edge of the door and flanking the cut away part by a cover plate 99 attached to each side of the door. Or, if the door is thick enough, a groove may be channeled into the lower edge of the door to receive the parts mentioned, as shown in Fig. 5.

It will be observed that the block 45 is furnished with a series of contiguous peripheral cam faces, thus affording a simple, compact cam structure.

The strap iron 84 is deemed to be a preferred type of elongated member to cooperate with and guide the cam controlling follower 91, but it is to be understood that other elongated means may be substituted therefor without departing from the spirit of the claimed invention.

In the operation of the device the downwardly directed end flange 92 (see Fig. 7) of the spring opposed slide 91 will continually engage peripheral portions of the adjustably stationary cam block 45. When said slide abuts squarely against the main or central cam face 46 the door will be maintained in its closed position, and if the cam block screws 53 and 54 have been properly adjusted, at such time the door will accurately cooperate with any conventional or other knob-operated or other latching means with which it may be furnished. By gently swinging the door a short distance towards either open position one or the other of the cam faces 45*x* may be caused to abut squarely against the slide flange 92 thus holding the door slightly open. If the door be swung widely open in either direction the flange 92 will pass over the projection 45 or 48 of the block and will be caused to engage the block at two points, namely, the projection thus passed over and the extremity of the arm 52 at that side of the block, and the block will thereupon cooperate with the slide to maintain the door wide open. One of the side open positions of the door is indicated by dotted lines in Fig. 3.

The parts may be so adjusted that when the door is in either of the slightly opened positions already referred to, one or the other of the adjusting screws (53 or 54) will come opposite to one of the notches 77*x*, as shown in Fig. 6. This will afford ready access to the screw selected, which may then be unscrewed to the desired extent, the position of the door thereupon being reversed so that the other screw may be screwed in sufficiently to take up the lost motion which would otherwise result.

What is claimed is:

1. In a device for controlling the movements of a swinging structure, a base having a pivot upstanding therefrom, said pivot having an annular bearing surface at its upper end, a ball bearing mounted upon said bearing surface, a cover member adapted for attachment to a swinging structure, said member having a rise cooperating with said bearing surface and thereby housing the balls of said bearing, said cover member having a slot therethru which extends radially in relation to said pivot, a strap iron underlying the slotted portion of said cover plate and having a slot which registers with said slot thereof, a spring pressed follower, a cam block mounted upon said pivot and operatively related to said follower, means to connect said cover member and follower with a swinging member to swing therewith, the position of said follower being controllable by said cam block, and a spring to act upon said follower, said spring being sup-

ported by said strap iron and said follower having a guide portion which extends through both of the aforementioned slots.

2. In a device for controlling the movements of a swinging structure, a base having a pivot upstanding therefrom, a bearing mounted upon the upper end of said pivot, a cover member adapted for attachment to a swinging structure, said member having a rise cooperating with the upper portion of said pivot to house said bearing, an elongated member having a bearing opening thru which said pivot extends, a cam member mounted approximately non-rotatably upon said pivot, a follower engaging said cam member, said follower having a guiding projection which engages guiding means provided therefor on said elongated member, and a spring supported by said elongated member in a position to act upon said follower.

3. In a device of the kind described, a cam member mounted in a nearly non-rotatable position, a spring pressed follower operatively related to said member to control the positions of a door, said follower comprising a strap iron having a flange engaging said cam and having also a guide tongue struck up between the edge portions thereof, and a plate having a guide slot to receive said tongue, said follower and plate being attachable to the lower edge of a door.

4. In a construction of the kind described to regulate the swing of a door, a cam member mountable upon one of two relatively movable structures in a nearly fixed relation thereto, screw threaded adjustable means to act between said cam member and the structure upon which it is mountable to regulate their precise relative positions in relation to the directions in which the door swings, upper and lower relatively turnable plates having peripheral flanges directed towards each other thereby forming a housing for said cam member, there being registrable openings thru said flanges for the admission of a tool to regulate said screw threaded means only when the door is partly open, and spring impelled means mountable upon one of said structures and cooperating with said cam member to yieldingly maintain said door in different positions with relation to its swing.

5. In combination a door, means to pivotally mount said door, said means including a base member having a hinge pivot upstanding therefrom, mounting means to operatively relate said door to said pivot, a multiple faced cam member associated with said mounting means and adapted to retard the door's swing at partly open positions, spring pressed means acted upon by said cam member, said mounting means including upper and lower plates having respectively downwardly and upwardly extending flanges to house said cam member and the parts immediately adjacent thereto, and adjusting means to act upon said cam member to regulate the precise positions at which the door is arrested by the cam member.

6. In a construction of the kind described to regulate the swing of a door, a cam member mountable upon one of two relatively movable structures in a nearly fixed relation thereto, screw threaded adjustable means to act between said cam member and the structure upon which it is mountable to regulate their precise relative positions in relation to the directions in which the door swings, upper and lower relatively turnable plates having peripheral flanges directed towards each other thereby forming a housing for said cam member, and spring impelled means mountable upon one of said structures and cooperating with said cam member to yieldingly maintain the door in different positions with relation to its swing, said flanges being shaped and arranged to afford access to said adjusting means only when the door is partly open.

7. In a device of the kind described, a cam member, mounted in a nearly nonrotatable position, a spring pressed follower operatively related to said member to control the positions of a door, said follower comprising a strap iron having a deflected end portion engaging said cam and having also a laterally directed tongue, and guide means to cooperate with said tongue, said means and follower being attachable to the lower edge of a door.

JULIE BERSTED,
Administratrix of the Estate of Martin C. Bersted, Deceased.