March 31, 1936. W. F. MOORE 2,035,823

DOUBLE ACTING SPRING HINGE

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Fig. 1.

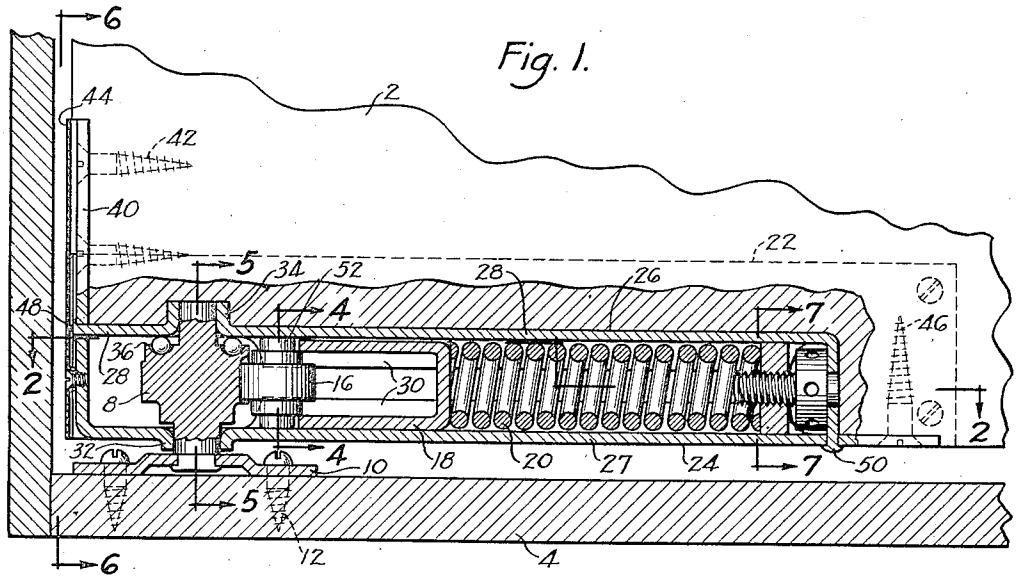
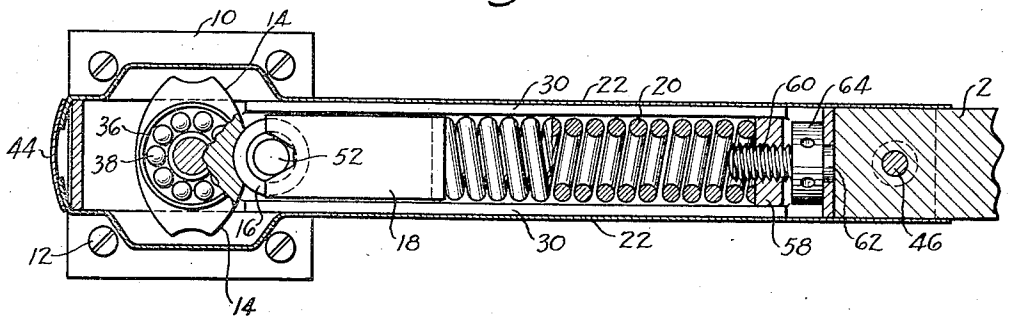


Fig. 2.



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Fig. 3.

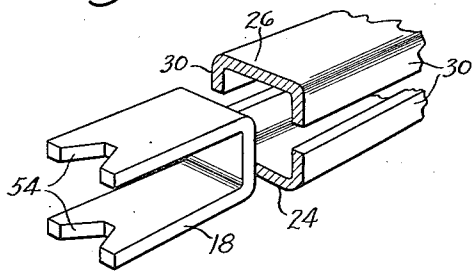


Fig. 4.

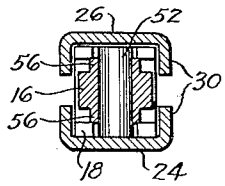


Fig. 6.

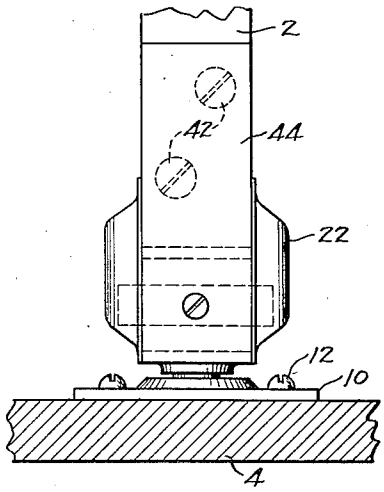


Fig. 5.

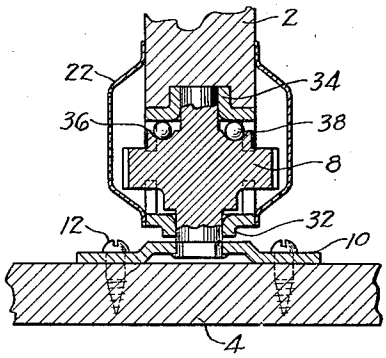


Fig. 7.

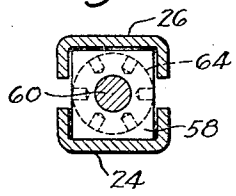
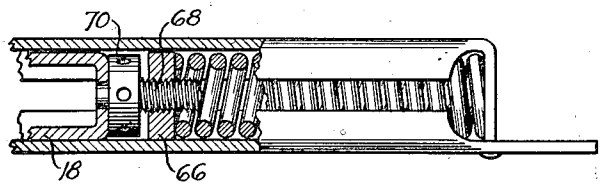


Fig. 8.



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UNITED STATES PATENT OFFICE

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DOUBLE ACTING SPRING HINGE

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Application March 24, 1933, Serial No. 662,448

2 Claims. (Cl. 16—85)

My invention relates to spring hinges for doors, and has special reference to double acting spring hinges for doors that swing in both directions.

The principal object of my invention is to provide a device of this character which is simple, strong and durable in construction, and efficient in operation.

The several features of the invention will be readily understood from the following description and accompanying drawings, in which:

Figure 1 is a longitudinal sectional view of a door and door casing having my improved hinge in its preferred form applied thereto;

Fig. 2 is a sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a detail perspective view of a slide member and a portion of the frame or casing of my improved device;

Figs. 4 to 7 are detail sectional views on lines 4—4, 5—5, 6—6 and 7—7 of Fig. 1 respectively; and

Fig. 8 is a side elevation, partly in section, of a modified construction.

My improved device as illustrated in the drawings is shown applied to a door 2 and a door casing 4, the device being set into a recess in the lower edge of the door. The device comprises a pivot member 8 having its lower end fastened in a plate 10 which may be secured to the floor by screws 12. The pivot member is provided with the usual cam surface 14 which is engaged by a roll 16. This roll 16 is pressed toward the cam surface by a plunger or slide 18 that is acted upon by a coiled spring 20, the roll 16, slide 18 and spring 20 being arranged within a casing that is pivotally mounted at its forward end portion on the pivot member 8. Finish plates 22 are secured to opposite sides of the door and close the sides of the recess in the door.

In accordance with the present invention, the casing or frame of the device is made up of two members 24 and 26 of sheet metal. The two members are provided with horizontal longitudinally extending portions 27 and 28 which form the bottom and top walls of the casing, respectively. These two horizontal portions are provided with longitudinally extending flanges 30 which project toward each other and are spaced apart, each portion being of substantially U-form in cross section. The lower horizontal portion 27 of the member 24 is provided with a downwardly flanged aperture 32 which receives the lower portion of the pivot member 8, and the horizontal portion 28 of the member 26 is provided with an upwardly flanged aperture 34 which receives the upper end of the pivot member 8.

The flange of the aperture 34 forms a cylindrical stud-like projection that is adapted to fit into a cylindrical recess in the underside of the door so as to serve as a centering means in initially positioning the hinge and to assist in firmly holding the pivot end of the hinge from lateral movement.

The upper end of the body of the pivot member 8 is provided with an annular groove 36 that forms a raceway for bearing-balls 38 on which the under side of the frame member 28 rests, so as to provide a firm ball bearing support.

The member 24 is provided with an upwardly extending portion 40 which is set into a recess in the inner edge of the door, and is secured to the door by screws 42, said portion 40 being covered by a finish plate 44 secured thereto. The horizontal portion 27 is secured to the door by a screw 46 which extends through an aperture in its outer end.

The inner end of the horizontal portion 28 of the member 26 is riveted or otherwise secured to the vertical portion 40, as indicated at 48. The outer end of the portion 28 is turned downwardly so as to form the outer end wall of the casing or frame, and is riveted or otherwise secured to the horizontal portion 27 as indicated at 50.

The cam roll 16 is mounted to turn on a vertical pin 52, the ends of which are received in V-shaped recesses or bearings 54 in the ends of the arms of the slide 18, said slide being of U-shape with its arms arranged horizontally and directed inwardly toward the axis of the door. The upper end of the roll pin 52 is arranged closely adjacent the inner sides of the top and bottom walls of the frame so as to hold the pin from vertical movement. The cam roll 16 is held from vertical movement on its pin 52 by reduced ends 56 thereof being arranged closely adjacent the inner sides of the arms of the slide 18. The slide 18 is guided by the top and bottom walls of the frame and the flanges 30.

The coiled spring 20 is also guided by the flanges 30 and the top and bottom walls of the frame, and the inner end of the spring bears against the slide 18. To adjust the tension of the spring, a nut or block 58 is mounted to slide in the frame in engagement with the outer end of the spring. This block is adapted to be moved toward and from the axis of the door

by means of a screw 60 which is screw-threaded through a central aperture in the block. The outer end of the screw is mounted to turn in an aperture 62 in the rear end wall of the frame. The screw 60 is provided with a circular head 64 that is held in engagement with the inner side of the outer end wall of the frame. With this construction it will be apparent that upon turning the screw 60, the block 58 may be moved to vary the tension of the spring 20.

Where no adjustment of the spring 20 is desired, the screw 60 and block 58 may be omitted, the outer end of the spring then engaging the outer end wall of the frame.

It will be apparent that my improved device is of simple, strong and durable construction. The component parts 24 and 26 of the frame provide a strong and rigid construction, and may be securely mounted in the door on the pivot member 8. These frame members 24 and 26 effectively guide the slide 18 and spring 20 so that no other guiding means is required. The V-shaped bearings 54 for the ends of the pin 52 on which the roll 16 is mounted to turn insure against any looseness of parts when the bearings or pin become worn. The roll is free to turn on the pin and is held from axial movement by engagement with the under sides of the arms of the shoe. The means for tensioning the coiled spring comprising the block 58 and screw 60 may be conveniently operated without danger of binding. The parts of the device, including the cam roll 16, the slide 18, spring 20, spring adjusting block 58 and screw 60 may be easily assembled in the frame, they all being held in place by pressure of the spring 20 without interconnection of parts other than the screw and block. This construction also insures against looseness of parts due to wear, and noiseless and smooth operation.

In the construction shown in Fig. 8 instead of the spring adjusting screw being arranged at the outer end of the spring as in the construction above described, it is arranged at the inner end of the spring. As shown this device comprises a block 66, similar to the block 58, but engaging the inner end of the spring. A screw 68 is screw-threaded through an aperture in the block with its inner end mounted to turn in an aperture in the outer end of the cam roll slide. Said screw is provided with a cylindrical head 70 engaging the rear end of the slide for turning the screw.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:—

1. In a spring hinge of the class described, the combination, of a pivot member having a cam surface, a frame having its forward portion pivotally mounted on said pivot member and having top and bottom walls, a slide mounted to slide longitudinally in said frame toward and from the axis of said pivot member, said slide being U-shaped with its arms arranged horizontally and directed toward said pivot member, and the inner ends of said arms having V-shaped recesses, a roll engaging said cam surface, a shaft on which the roll is mounted to turn, said shaft having its ends mounted in the V-shaped recesses and engaging the inclined walls of the recesses a distance from the bottoms of the recesses, and said shaft being held from axial movement by engagement with the top and bottom walls of said frame, and a spring engaging the outer end of said U-shaped slide for pressing said roll against said cam surface.

2. In a spring hinge of the class described, the combination, of a pivot member having a cam surface, a frame having its forward portion pivotally mounted on said pivot member and having top and bottom walls horizontally arranged, a slide mounted to slide longitudinally in said frame, said slide being U-shaped with its arms arranged horizontally and their ends directed toward said pivot member, said ends of the arms being provided with V-shaped recesses, a roll engaging said cam surface, a shaft on which the roll is mounted to turn, said shaft having its ends mounted in said V-shaped recesses and engaging the inclined walls of the recesses a distance from the bottoms of the recesses, said roll being held from axial movement by opposed faces of said arms, and said shaft being held from axial movement by engagement of its ends with opposed faces of said top and bottom walls of the frame, and a coiled spring engaging the outer end of said slide for pressing said roll against said cam surface.

WALLACE F. MOORE.