

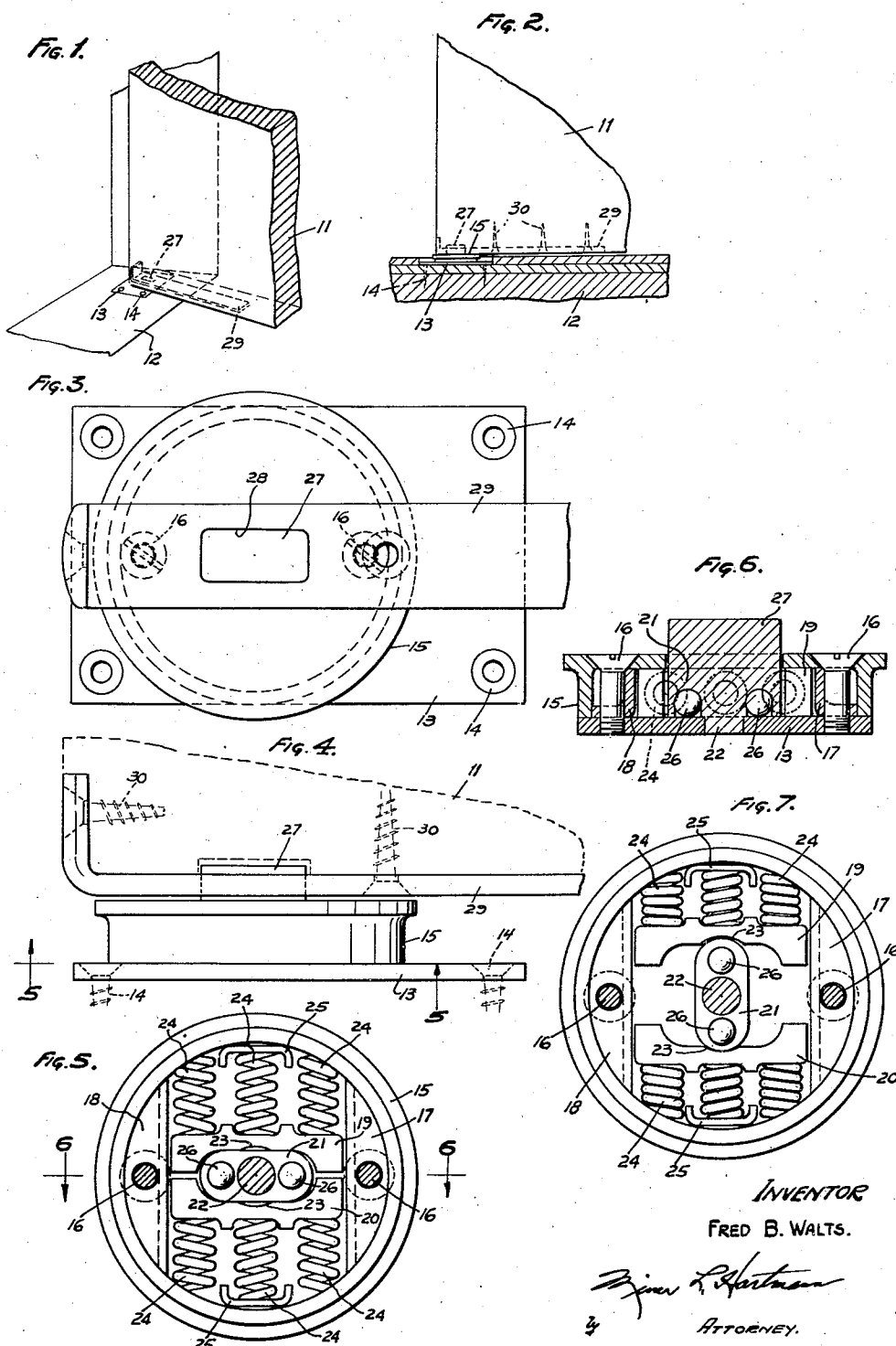
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SPRING HINGE

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2,413,475

SPRING HINGE

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6 Claims. (Cl. 16—185)

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This invention relates to spring hinges for doors. One object of the invention is to provide a double-acting spring hinge in association with a swinging door. Another object is to provide a compact coil spring hinge device which may be easily installed on the door and door-sill. Still another object is to provide a spring hinge arrangement which may be attached to a door, and to the door-sill or floor, without recessing or cutting of the door or floor.

These and other objects are attained by my invention, which will be understood from the detailed description below, reference being had to the accompanying drawing which forms a part of this specification, in which:

Fig. 1 is an isometric view showing my device attached to a swinging door, in open position;

Fig. 2 is a side view of an assembly including my hinge attached to a door and to the door-sill, the parts being partly countersunk;

Fig. 3 is a plan view of my spring hinge device;

Fig. 4 is a side elevational view showing the attachment of my spring hinge device to the lower corner of a door and to the floor or door-sill;

Fig. 5 is a bottom view of the hinge device, with the base or bearing plate removed;

Fig. 6 is a cross-sectional view taken on the line 6—6 of Fig. 5, and showing the bearing plate in position;

Fig. 7 is a cross-sectional view similar to Fig. 5, showing the positions of the parts when the door is at the open position, as in Fig. 1.

Referring to the drawing, the swinging door structure is indicated as 11 and the door-sill or floor as 12. In the hinge device, a bearing plate 13 is adapted to be attached by screws in holes 14 to the floor 12. A casing 15 is attached by screws 16 to the bearing plate 13, the inside of the case having two parallel guide surfaces 17 and 18 between which the slide members 19 and 20 may move. The guide surfaces 17 and 18 may be formed integrally with the casing, or may be formed and suitably attached inserts in the casing cavity. The slide members 19 and 20 are arranged on either side of cam 21, which is attached to or a part of the pivot member 22; and the slide members are provided with cam surfaces against which the cam member 21 operates. These cam surfaces include a slight groove or notch 23 at the open-door position, into which the narrow ends of the cam 21 may rest to hold the door in the open position, as shown particularly in Fig. 7, which also shows the cam at right angles to the position shown in Fig. 5, with the springs fully compressed. The slide members 19

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and 20 are pressed against the cam 21 by coiled compression springs 24 abutting between the outer surfaces of the slide members 19 and 20 and the inside wall of the casing 15. A separator 25 is shown on one of the springs adapted to keep the springs aligned, and pins or depressions in the casing inner surface, or other means may be provided to keep the springs positioned.

The contacting surface, or thrust bearing between the under surface of the cam 21 and the top surface of the bearing plate 13 is preferably provided with anti-friction means, and as shown two steel balls 26 are seated in suitable sockets in the underside of cam member 21.

The pivot member 22 having the cam member 21 at its lower end, as above described, extends or protrudes through the top of the casing 15, and terminates in a non-rotatable end portion, here shown as a rectangular hub 27, removably attached by means of the slot 28 in the lever bar 29 which is adapted to be attached to the lower edge of the door by screws 30, the inner end of this lever bar preferably being bent upwardly at right angles and attached by screws to the inner or back edge of the door 11, as shown particularly in Fig. 4.

My device is simple in construction and is particularly advantageous in the mounting of a door. Since the thickness of my device may be kept small, because of the use of coil springs in the cylindrical housing, it is possible to use it without cutting or countersinking either the bearing plate or the casing in the floor or door-sill, or the lever bar in the edge of the door, and hence much time is saved in installing swinging doors. If the clearance between the lower edge of the door and the floor is desired to be small, the bearing plate or the bearing plate and the casing may be countersunk in the floor, and the lever bar may be countersunk in the door edge, although this is not usually necessary for inside doors where greater clearance is even desired, for avoiding rubbing of the door edge on carpets and rugs. The springs may be selected to give the desired compressive force against the cam, as determined by the weight of the door, the leverage, and the desired resistance to movement of the door. The hinge is usually installed at the bottom of the door, with a simple pivot bearing at the top, but it may be used at the top also, or at both positions. The hinge may be filled with hard grease before installation, and thereafter it will need no attention for many years.

I claim:

1. A spring hinge comprising a casing adapted

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to be attached to a door sill or the like; a pivot mounted in said casing, and protruding from the top thereof; a detachable lever bar on the protruding end of said pivot; a cam member within the casing on said pivot; a thrust bearing at the other end of said pivot; a pair of slide members having cam-engaging surfaces bearing against opposite sides of the cam member on said pivot, said slide members being adapted to slide laterally toward and away from said pivot; and coil compression springs within said casing adapted to press said slide members against said cam member; and detent grooves in said slide member cam surfaces adapted to engage the ends of the cam member in one predetermined position of the cam.

2. A spring hinge comprising a casing adapted to be attached to a door-sill or the like; a pivot mounted in said casing, a detachable lever bar at one end of said pivot; a cam member within said casing on said pivot; a pair of slide members with cam-engaging surfaces adjacent the cam surfaces of said cam member, said slide members being adapted to slide laterally toward and away from said pivot; said casing including spaced parallel walls forming guide means for opposite ends of said slide members and coil compression springs within said casing adapted to press said slide members against said cam member cam surfaces.

3. A spring hinge comprising a casing; a pivot mounted in said casing; a detachable lever bar at one end of said pivot; a cam member on the other end of said pivot, having a thrust bearing comprising balls carried in recesses in the underside of the cam member and engaging said bottom wall; two slide members with cam-engaging surfaces adjacent the cam surfaces of said cam member, said slide members being adapted to slide laterally toward and away from said pivot; and coil compression springs within said casing adapted to press said slide members against said cam member cam surfaces.

4. In a spring pivot hinge for a swinging door, a flat casing including two parallel vertical walls, and smooth inner surfaced top and bottom plates forming an enclosed slide-way for movement of oppositely disposed slide members; two slide members adapted to slide in said slide-way, provided on their outer lateral surfaces with multiple coil spring-positioning bosses, and with opposed alike cam surfaces on their inner lateral surfaces

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adjacent a pivot centrally disposed in the casing between said slide members; parallel multiple coil springs in said slide-way between the outer surfaces of said slide members and the adjacent wall of the said casing, a pivot member mounted in said casing between said slide members and protruding through the casing top cover; and a cam member attached to said pivot member within the casing and adapted to be slidably engaged with the cam surfaces of the two slide members to actuate said pivot.

5. In a spring pivot hinge for a swinging door, a flat casing including two parallel vertical walls, and smooth inner surfaced top and bottom plates forming an enclosed slide-way for movement of oppositely disposed slide members; two slide members adapted to slide in said slide-way, provided with opposed alike cam surfaces on their inner lateral surfaces adjacent a pivot centrally disposed in the casing between said slide members; parallel multiple coil springs in said slide-way between the outer surfaces of said slide members and the adjacent wall of the said casing, a pivot member mounted in said casing between said slide members and protruding through the casing top cover; and a cam member attached to said pivot member within the casing and adapted to be slidably engaged with the cam surfaces of the two slide members to actuate said pivot.

6. In a spring pivot hinge for a swinging door, a flat casing including two parallel vertical walls, and smooth inner surfaced top and bottom plates forming an enclosed slide-way for movement of oppositely disposed slide members; two slide members adapted to slide in said slide-way, and with opposed alike cam surfaces on their inner lateral surfaces adjacent a pivot centrally disposed in the casing between said slide members, parallel multiple coil springs in said slide-way between the outer surfaces of said slide members and the adjacent wall of the said casing, a pivot member mounted in said casing between said slide members and protruding through the casing top cover; a cam member attached to said pivot member within the casing and adapted to be slidably engaged with the cam surfaces of the two slide members to actuate said pivot, and detent grooves in said slide member cam surfaces adapted to engage the ends of the cam member in one predetermined position of the cam.

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