

Oct. 23, 1956

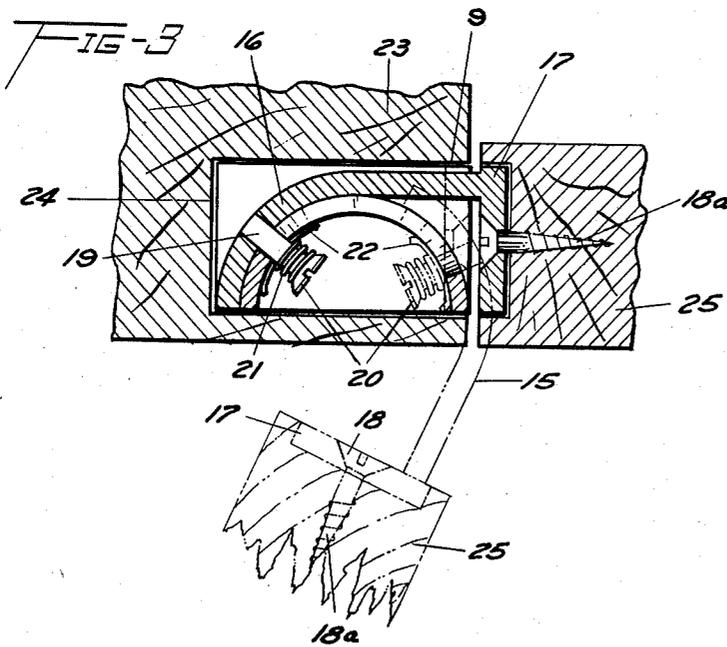
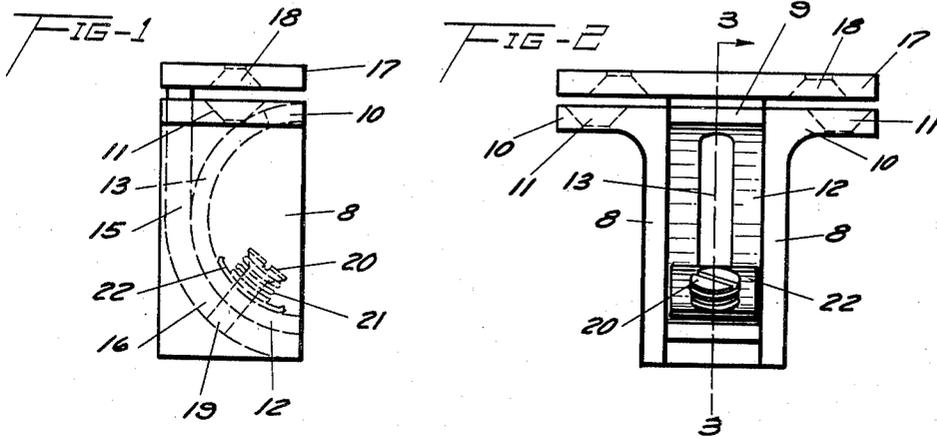
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2,767,425

CONCEALED HINGE FOR DOORS AND THE LIKE

Filed March 27, 1952

2 Sheets-Sheet 1



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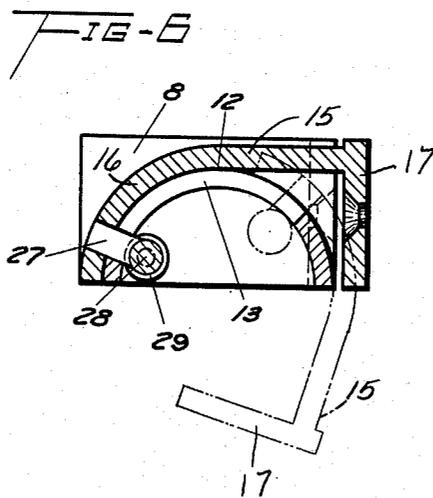
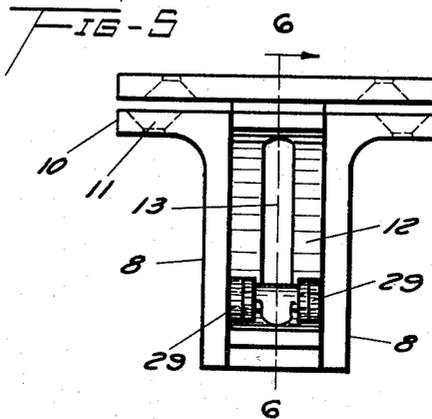
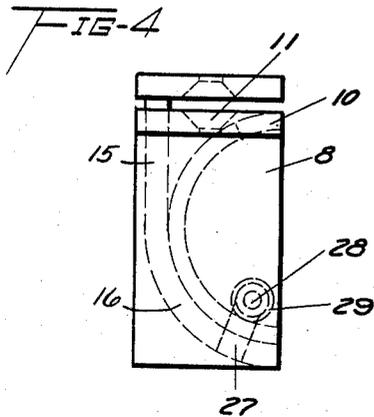
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CONCEALED HINGE FOR DOORS AND THE LIKE

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4 Claims. (Cl. 16—178)

My invention has reference to a concealed door hinge, and aims to modify and simplify devices of that type which are now in use, and increase the rigidity and ease of operation thereof. It includes a relatively fixed part and a relatively movable part for respective connection with a fixture and a door, with parts having a slidable relation with each other designed to change the position of the door from a closed to an open position, and the reverse. This is accomplished by the slidable coaction and cooperation of two arcuate parts in which a longitudinal motion of the slidable part operates to vary the line of movement thereof and cause the door to swing outwardly or inwardly. These parts are of cast steel or similar metal, which are heat-treated and extremely hard, so that the movement of one of such parts upon the other is one of ease and perfection. To render the operation of these parts more effective and complete they are provided with devices having an anti-friction effect, giving a limited freedom of movement to the slidable contact of said parts.

The construction is also such as to do away with the lever connections with which some of these devices have been fitted, adding greatly to the simplicity and economy of production.

The invention is set forth herein as applied to doors in buildings, but it is also applicable to use with the doors of automobiles, refrigerator doors, and other closures of a heavy type.

A preferred form of the device can be more fully understood from the following specification, reference being had to the accompanying drawings, in which:

Fig. 1 is a side view of a hinge embodying the invention, in closed position, with the operative parts shown in broken lines.

Fig. 2 is a plan view taken at a right angle from Fig. 1.

Fig. 3 is a medial sectional view on the line 3—3 of Fig. 2, with parts in open position in broken lines.

Fig. 4 is a view similar to Fig. 1, with a modification of parts.

Fig. 5 is a view similar to Fig. 4, at a right angle therewith.

Fig. 6 is a medial section on the line 6—6 of Fig. 5.

As shown in the first three figures of the drawings the invention embraces a housing or casing having a pair of parallel side plates 8. The plates 8 are provided at one end with angular extensions 10 having screw openings 11 to aid in attachment of the casing to a fixture. Said plates 8 are united by a bearing 12, semi-circular as shown, extending through the greater part of the length whereof is a slot 13.

Movably installed between the plates 8 is an arm 15 projected at the inner end into an arcuate portion 16, coinciding with the degree of curvature of the bearing 12, so as to be capable of a slidable and rocking co-action therewith. The other end of the arm 15 extends beyond the end of the casing, and is attached to a plate 17, the ends of which are fitted with screw openings 18, providing

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seats for devices for securing the plate to a movable part, such as a door.

Near its inner end the arc 16 has inserted therein a pin 19, with a head 20, beneath which is a coiled spring 21, the outer end of which bears against a plate 22, slidable on the inner face of the bearing 12. This provides a friction device and holds said parts in a relatively tight and compact relation, with a free movement of one upon the other. The efficiency of this operation is aided by forming the slidable parts of metal which has received a heat-treatment, and the contacting faces of which are perfectly smooth.

In Fig. 3 of the drawing the casing is shown installed within a cavity 24 in a door frame part 23, while the part 17 is attached to a door indicated in part at 25 by means of screws as at 18a. By this means the door can be swung to one side, as indicated in broken lines, with the plate 17 and door at a little more than a right angle with their original positions and the passage through the door frame entirely cleared by the door. The degree of outward movement is limited by the pin 19 reaching the outer end of the slot 13. A variation can be had by shortening the bearing 12, and setting such bearing farther down in the casing. It will be understood that a door will be equipped with two or more of the devices, spaced from each other in the usual manner, to provide a satisfactory working outfit.

By reason of the fact that the device embraces a single supporting arm, and cooperating parts of a limited character, a maximum of simplicity and strength has been attained. The space between the plates 8 need be of little greater width than the thickness of the arm 15, and the danger of any torsion or binding of the parts is reduced to a minimum. Devices of this kind are now known and in use which are fitted with pairs of arms or similar parts, with pivotal connections, which type is eliminated by the present invention. Changes can be made in the form shown, so long as the simple rocking movement of one part upon the other, with a coexisting arcuate or other eccentric contact is retained, with some style of anti-friction mechanism to work therewith.

In Figs. 4 to 6 of the drawings there is shown a form of the invention in which the pin 19 has been substituted by a pin 27 fixed in the part 16 of the arm 15, and provided with a cross-pin 28, on the ends of which are rollers 29 operating upon the inner face of the bearing 12. This latter is also an anti-friction device permitting a free sliding movement of the arc 16 upon the opposite face of said bearing. This is also augmented by the heat-treating of the contacting parts, as before explained for the other form of hinge.

The action of the main part of the hinge is the same in both forms, and in Fig. 6 the plate 17 is shown in open position in broken lines, this part being attached to the edge of the door as in the former case, and turning the door to a point out of line with the door passage, as in the first-named case. Two or more of the hinge outfits are used for a door, as before.

It will be obvious that in the movement of the arm 15 outwardly the arcuate part of said arm will ride upon the curved part of the bearing 12, with a corresponding change in the angle of the plate 17. Upon a return movement this action is reversed, until the plates 10 and 17 are again in parallel relation, with the door closed.

It is to be noted that the device is of a rugged and rigid character, with no likelihood of side play or distorted movement in any direction, which insures a perfect means of support for a door, and a perfect harmony in the manner of opening and closing the same.

What I claim and desire to secure is:

1. A concealed door hinge having, in combination, a cast housing adapted to be set into a door jamb and hav-

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 ing a horizontal inner surface from which a vertical curved wall of substantially uniform thickness extends upward, a slot in said vertical wall extending in a horizontal plane along said vertical wall through more than 90 degrees of arc, a door-supporting casting attached to the edge of a door and having a rigid finger which extends into said housing and rests on said horizontal surface and is also tangent to the outside of said vertical curved wall and also has a curved part extending for some distance along the outer arcuate surface of said wall, a stud in said curved portion of the finger so located that it extends through said slot when the finger is bearing on the horizontal surface, a piece carried by said stud engaging the convex inner surface of said wall throughout the movement of the finger relative to the vertical wall by the opening or closing of the door.

2. In a hinge as defined in claim 1, means carried by the stud for pressing said piece against said inner wall comprising a spring carried by the stud and engaging said piece.

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 3. In a hinge as defined in claim 1, wherein said piece comprises a roller carried by the stud.

4. In a hinge as defined in claim 1, means carried by the stud for regulating the friction between said curved wall and finger comprising a coil spring on said stud and engaging said piece, said stud having a head engaging said spring.

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