

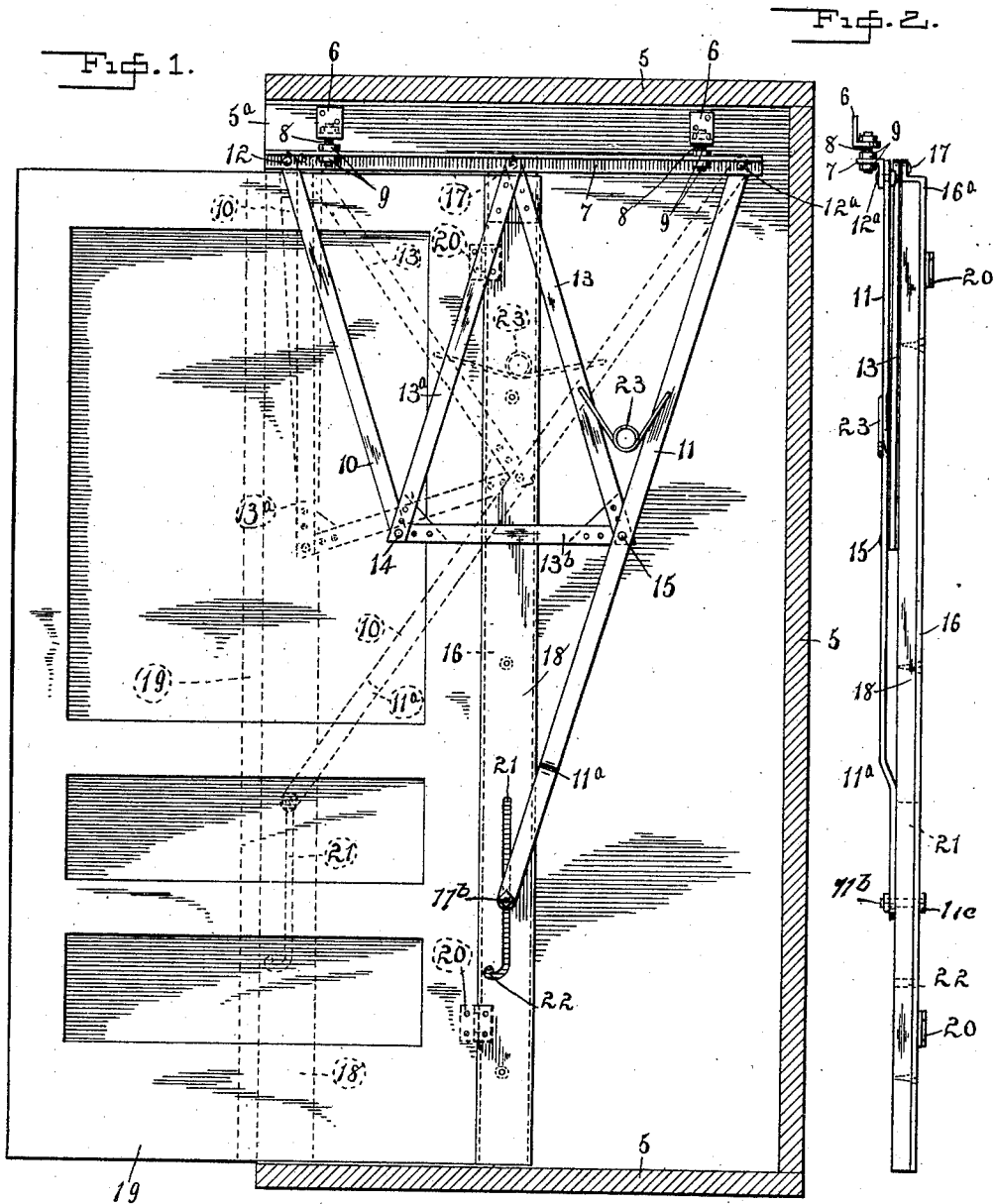
P. M. HOTCHKIN & A. J. MORGAN.

SWINGING DOOR HANGER.

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972,377.

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WITNESSES:

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UNITED STATES PATENT OFFICE.

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SWINGING-DOOR HANGER.

972,377.

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To all whom it may concern:

Be it known that we, PAUL M. HOTCHKIN and ARTHUR J. MORGAN, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Swinging-Door Hangers, of which the following is a specification.

Our invention relates to door hangers and has especial reference to means for supporting horizontally movable doors the contrivance under consideration being particularly adapted to be used for supporting closures ordinarily designated as disappearing doors, and commonly entering into the construction of cabinets or closets though adapted for use wherever a horizontally moving door is desired.

The chief objects of the improvements which constitute the subject matter of this application for patent are:—to provide a hanger for a disappearing door, of such design and furnished with mechanical movements so related, that all rollers or other anti-friction means will be eliminated from the construction, and as a consequence, no track be required; and furthermore the movements being chiefly pivotal, the action of the parts will be smooth and noiseless; to produce a door support of the character stated, that will be strong and not likely to get out of order; and, as the construction is quite simple, requiring few parts, the appliance may be economically manufactured, an additional advantage being that the device may be conveniently applied to cases or cabinets of ordinary construction.

We accomplish the desired results by employing the apparatus illustrated in a preferred form in the accompanying drawing, which forms a part of this application, the details of construction being disclosed in the following views:—

Figure 1 is a side elevation of a disappearing door embodying our invention, showing the devices attached to a cabinet, the latter being in section and the door half extended from the retracted position which it is adapted to assume within the cabinet, and Fig. 2 is a rear edge elevation of the door and hanger removed from the cabinet.

Referring to the details of the drawing, the numeral 5 indicates the top, bottom and back, and 5^a one side wall of a cabinet, or wardrobe, of usual construction, the ordi-

nary use to which such inclosures are put being that of storing and protecting articles of wearing apparel. The hanger devices are supported from the inner side of either side wall by means of brackets 6, from which a hanger bar 7 formed of angle iron is suspended in a horizontal position by bolts 8, said bar being adjustable relatively to the brackets by nuts 9 engaging said bolts above and below the bar 7.

In Fig. 1 of the drawing, the rear side wall of the cabinet is removed to disclose the operative parts of the door supporting appliance, the top, back and bottom being in section, and it is to the removed side wall that the said brackets 6 are assumed to be attached, since the form of device shown is arranged for the right hand side of the cabinet, and therefore the rear faces of the brackets are seen in the said figure. Swinging hanger levers 10, 11, are secured by pivot bolts 12, 12^a, to the front and rear ends, respectively, of the hanger bar 7, and these levers are flexibly connected by a triangular hanger frame, composed of flat side bars 13, 13^a, and a connecting base bar 13^b rigidly secured together at the corners of the frame. The lower angles are pivoted to the levers 10 and 11 by bolts 14, 15, the distance of these bolts from the upper end of the levers being equal to the length of the hanger side bars 13, 13^a. A plate 16 is pivotally suspended on the said hanger frame by a bolt 17, which is in line with the points 12, 12^a, and said plate is offset by a bend 16^a and then extends vertically downward to a point close to the floor of the cabinet. Upon the rear or inner side of said plate is applied a wood hinge strip or blind 18, this blind and the said plate 16 constituting a door rail to which an ordinary swinging door 19 is hung by hinges 20. The lower end of the said lever 11 is extended downward and inset at the point 11^a so that it will reach the face of said blind 18. The lower extremity of the said lever is provided with a stud or bolt 11^b which passes through a vertical slot 21 in said blind, a similar slot in the plate 16 registering therewith, the head 11^c of the bolt being wider than the opening, thus preventing the bolt from becoming dislodged from said slot. This bolt or stud is adapted to travel freely in the slot and the lower end of the latter is abruptly curved as indicated, and its ex-

tremity widened to form a notch 22 the end of the slot thus constituting a keeper in which the bolt 11^b will become lodged when moved to this point in a manner, and for a purpose hereinafter explained. In order to assist in the manipulation of the door, a coiled spring 23 has its extended ends attached respectively to the lever 11 and adjacent frame bar 23, the tendency of the spring being to press the lever and bar apart.

Bearing in mind that the pivotal points are at 14, 15, and 17, of the hanger, and also at 12, 12^a, on the bar 7, and that the bolt 11^b has a limited vertical travel in the slot 21, but no lateral motion until it reaches the lower end of said slot, the operation is as follows:—

In Fig. 1 the door is shown in full lines pushed half way into the cabinet and lying in the same plane as the blind 18. In this position the triangular hanger will be in an upright position with the bar 13^b, horizontal, and the pivot bolt 17 midway between the points 12, 12^a. The position which the parts will assume when the door is pulled out to its full extent and then swung on the hinges 20 to form a closure for the open front of the cabinet, is shown in dotted outlines. It will be noted that the bar 13^b of the triangular hanger frame is now in an inclined position and the outer bar 13^a has assumed an approximately vertical position near the front of the cabinet. When the door is pushed within the cabinet to the limit of its travel the said bar 13^b of the hanger frame will be inclined in the opposite direction and the bar 13 will assume a position parallel with the rear wall of the cabinet and in proximity thereto. The point 17 will travel back and forth in a straight line which passes through the pivotal points 12, 12^a, and the slide bolt 11^b is at all times in a vertical plane passing through the said pivot 17, thus the door rail formed by the blind 18 and the attached plate 16 will remain constantly vertical, and support the door in a similar position.

As there are no rollers and the movements are all pivotal with the exception of the sliding contact of the bolt 11^b with the plate 16, the device is practically noiseless as previously mentioned and as the weight of the door rests entirely upon the hanger frame composed of the triangular frame and the levers 10 and 11, which has a swinging or oscillating movement, the manipulation of the device requires only a minimum of muscular effort.

When the door is pushed entirely within the cabinet the bolt or stud 11^b will travel downwardly in the slot 21 and engage the notch 22 and thus latch or lock the door in its retracted position. To release the door from this latched position it is only necessary to give a slight pull upon the door,

when the said bolt will slip from the notch, the spring 23 aiding in extending the door from the cabinet.

Having thus described our invention, what we claim as new, is:—

1. In a device of the character specified, the combination of a suitable support, a hanger-frame pivotally connected at points in horizontal alinement on said support, a hinge member pivotally connected with said frame at a point in horizontal alinement with the pivotal connections of the hanger-frame to said support, and a slidable connection between said member and said frame.

2. In a device of the character specified, the combination of a horizontal supporting means, a hanger-frame pivotally suspended from said means, a hinge member arranged perpendicularly to said supporting means and pivotally supported on said hanger frame at a point in horizontal alinement with the pivotal connections of the hanger-frame with its supporting means, and a slidable connection between said hinge member and said frame.

3. In a device of the character specified, the combination of a suitable support, a hanger-frame pivotally suspended from said support, a hinge-strip pivotally connected to said frame at a point in horizontal alinement with the pivotal points of the hanger frame, and a slidable connection between said hinge-strip and said frame.

4. In a device of the character specified, the combination of a supporting bar, levers pivoted to said bar, a rigid frame pivotally connecting said levers, a hinge-strip pivoted to said frame, and a sliding connection between said strip and one of said levers.

5. In a cabinet, the combination of a pair of cooperating levers pivotally connected to said cabinet, a rigid triangular frame pivotally connecting said levers, a hinge-strip pivoted to the upper end of said frame, and a sliding connection between said strip and one of said levers.

6. In a device of the character specified, the combination of a hanger-bar, means for adjustably attaching said hanger-bar to a support, a pair of co-acting levers pivoted to said bar and adapted to oscillate in the same plane, a rigid frame pivotally connected with said levers, a door hinge-strip pivoted to said frame at a point in horizontal alinement with the pivotal connections of said levers with the hanger-bar, and a sliding connection between said strip and one of said levers.

7. In a device of the character described, the combination of a horizontal bar, means for adjustably attaching said bar to a support, a pair of co-acting levers pivoted to said bar, a frame pivotally connecting said levers, a door hinge-strip pivoted to said frame, a sliding connection between said

strip, and one of said levers, said connection comprising a stud and a keeper for said stud.

8. In a device of the character described, the combination of a horizontal bar, means
5 for attaching said bar to a support, a pair of co-acting levers pivoted to said bar, a frame pivotally connecting said levers, a spring connecting said levers and said frame, a door hinge strip rail pivoted to said frame,
10 and a slidable connection between said strip and one of said levers.

9. In combination with a cabinet and a door adapted to be moved into and out of said cabinet, means for supporting said door,
15 said means consisting of a strip hinged to the door, a frame pivoted at the upper end of said strip, coöperating levers pivotally connected with the lower portion of said frame, one of said levers being extended be-
20 low said frame and pivotally and slidably connected with said strip, and means connecting the upper ends of said levers with said cabinet.

10. In combination with a cabinet and a
25 door adapted to be moved into and out of said cabinet, means for supporting said door,

said means consisting of a door strip, and a frame swingingly connected with the cabinet and with the door strip whereby the door is supported and guided by said frame. 30

11. In combination with a cabinet and a door adapted to be moved into and out of said cabinet, means for supporting said door, said means consisting of a frame swingingly
35 connected with the cabinet and pivotally connected with the door, and means for limiting the sliding movements of the door.

12. In combination with a cabinet and a door adapted to be moved into and out of said cabinet, means for supporting said door,
40 said means consisting of members swinging on said cabinet, a frame pivoted on said door and pivotally connected with said swinging members, and a sliding and stop connection
45 between one of said members and the door.

In testimony whereof we affix our signatures in the presence of two witnesses.

PAUL M. HOTCHKIN.
ARTHUR J. MORGAN.

Witnesses:

EVERLY L. HAINES,
W. M. HOWARD.