Feb. 2, 1926. 1,571,334

F. E. HOWARD

DOOR HANGER

Filed August 25, 1924

Fig. 1.

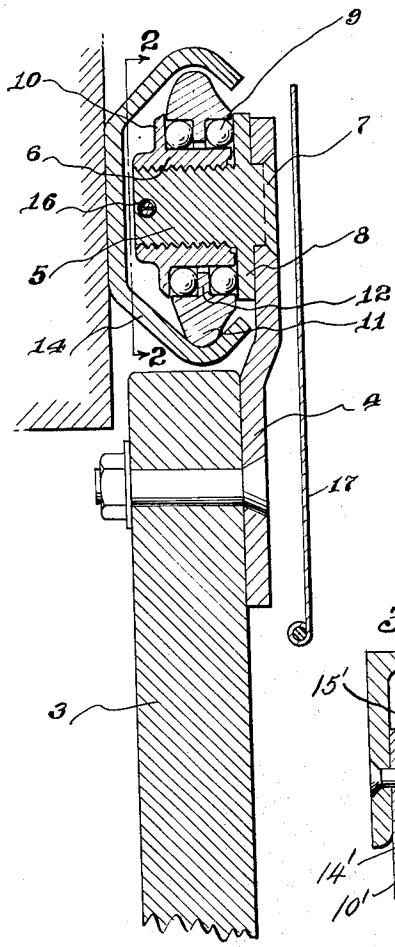


Fig. 2.

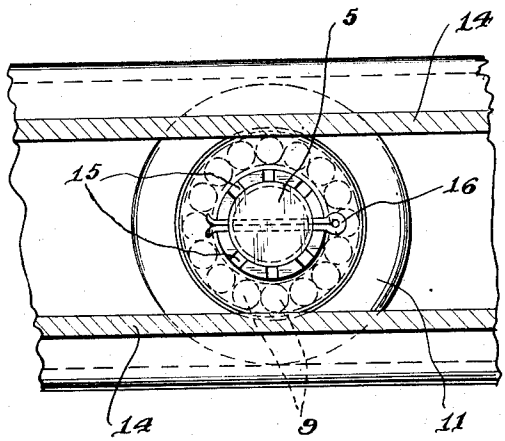


Fig. 3.

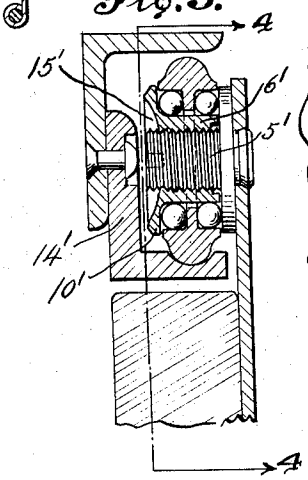
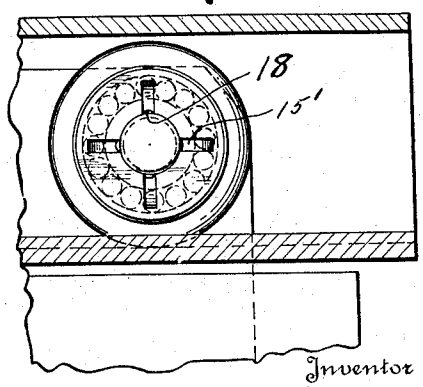


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK E. HOWARD, OF HARTFORD, CONNECTICUT, ASSIGNOR TO JAMES L. HOWARD AND COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

DOOR HANGER.

Application filed August 25, 1924. Serial No. 734,087.

To all whom it may concern:

Be it known that I, FRANK E. HOWARD, a citizen of the United States of America, and a resident of Hartford, Connecticut, have invented certain new and useful Improvements in Door Hangers, of which the following is a specification.

The principal object of my invention is to provide an improved door hanger of the type employing a combined radial and thrust bearing for the sheave, which can be readily disassembled and assembled, and any worn part replaced by a new one, should such be required.

Another object is to so construct the hanger that the central or pin portion can be left soft for riveting, while the outer and inner ball races may be made as hard as desirable.

With these and other objects in view, which will become more apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts hereinafter more fully described and claimed.

In the drawings,—

Figure 1 represents a vertical sectional view taken transversely through a door-hanger, and associated parts, constructed in accordance with my invention.

Figure 2 represents a sectional view taken on the line 2—2 of Figure 1.

Figure 3 represents a view similar to Fig. 1, of another form of the invention, parts of the mechanism being shown in elevation, and

Figure 4 represents a sectional view on the line 4—4 of Fig. 3.

Referring more particularly to the drawing, the door is indicated at 3, a fixed horizontal track above the top of the door, and on which the sheave of the hanger rolls, is indicated at 14, and one of the metal plates, from which the door is suspended, is indicated at 4. A pin 5 is threaded for the reception of a cylindrical bushing 6, the pin being preferably made of metal sufficiently soft that its outer end 7 may be riveted, as indicated, to the plate 4. The pin 5 is provided with an integral flange or collar 8, which abuts against the inner surface of the plate 4, and such flange forms a thrust bearing surface for one row of a double row of bearing balls 9.

The bushing 6 is turned up on the pin 5 and such bushing is made of metal as hard as desirable, since its outer cylindrical surface is to operate as the inner race-way or inner radial bearing surface for the double row of bearing balls. The flange 10 integral with the bushing 6, forms a thrust bearing surface spaced from the flange 8, for the other row of balls.

Surrounding the bushing 6, and interposed between the flange 8 and the flange 10, is a sheave or roller 11, having a centrally positioned inwardly extending web 12, which separates the double row of balls. The inner cylindrical surface of the sheave forms the outer race-ways or outer radial bearing surface for the rows of bearing balls. Similarly to the bushing 6, the sheave or roller is made of metal of the desired hardness.

In assembling the device the bushing is turned up on the pin 5 until the two rows of balls bear upon the inner web 12 of the roller 11, and upon the flanges 8 and 10 of pin 7 and bushing 6 respectively. The bushing is then given a backward turn just sufficient to free the balls and is set in this position either by the use of a locking pin or by prick punching as described below.

The vertical pressure caused by the weight of the door is taken by the double row of balls, between the cylindrical outer surface of the bushing, and the inner cylindrical surfaces of the sheave. Any horizontal side pressure, produced by wind, or any other cause, presses the web 12 against the row of balls opposite to the direction from which the pressure comes, the balls in turn, pressing against either the flange 10 of the bushing or the flange or collar 8 of the pin, as the case may be.

The outer end of the bushing 6 is provided with two or more slots or recesses 15, and the bushing may be locked in position on the pin by the use of a split pin 16 which is passed through two opposed slots, and through a hole in alignment therewith, drilled through the pin 5. A portion of the usual housing in indicated at 17.

From the foregoing it will be observed that the sheave and associated parts of the hanger may be readily disassembled by removing the spit pin 16, and unscrewing the bushing, whereupon the sheave and the balls may be readily removed. Any worn part of the hanger may be readily replaced, and the

hanger again easily and quickly assembled, and all of this without the use of any special tools.

In the structure shown in Figs. 3 and 4, the horizontal track 14′ is made in two parts of the shape shown. The flange 10′ on the bushing 6′ is located at the end of the bushing, rather than inwardly of the end as in Fig. 1, and this flange is provided with the slots 15′ into one or more of which, in assembling the device in the manner above described, the threads of the pin 5′ are prick punched as indicated at 18. It will be understood that either of the methods described for locking the parts in assembled and adjusted position may be used in connection with either form of the invention.

The foregoing detailed description has been given for clearness of understanding and no undue limitations should be deduced therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a door-hanger, the combination of a plate, a threaded pin of relatively soft metal having one end riveted through the plate, said pin having an integral flange bearing against said plate, an interiorly threaded bushing of relatively hard metal threaded on said pin, and adjacent its outer end being provided with an integral circumferential flange, the outer surface of said bushing between the said flanges forming an inner ball race-way, a sheave of relatively hard metal surrounding and spaced from said bushing, and interposed between the flange on said pin and the flange on said bushing, and being provided with an inwardly extending web, and a double row of balls interposed between the sheave and bushing and between the flange on the pin and the flange on the bushing, and being separated by and bearing against said web, said bushing at its outer end being provided with notches, and a split pin extending through said notches and through an alined opening in said pin.

2. In a door-hanger, the combination of a plate, a pin of relatively soft metal having one end projecting through and riveted to said plate, said pin being provided with an integral flange bearing against said plate, a bushing of relatively hard metal threaded on said pin and adjacent its outer end being provided with an integral flange spaced from the said flange on the pin, means for preventing accidental turning movement of the bushing relatively to the pin, and a sheave surrounding the bushing and interposed between the flange thereon, and the flange on the pin, and bearing balls interposed between the sheave and the bushing and the said two flanges.

3. In a door-hanger, the combination of a plate, a threaded pin riveted at one end through said plate and having an integral flange bearing against said plate, a bushing turned on the pin and having a circumferential flange, a sheave surrounding the bushing and having an inwardly extending web, a row of balls on one side of the web and bearing against the bushing, the web, the sheave and the flange on the bushing, a row of balls on the other side of the web and bearing against the bushing, the web, the sheave and the flange on the pin, and means for locking the bushing relatively to the pin.

4. In a door-hanger, the combination of a plate, a pin having one end riveted in said plate, and having an integral flange bearing against said plate, a bushing threaded on the pin, and provided with an integral flange spaced from the first said flange, and a sheave and bearings therefor, surrounding the bushing and interposed between the flange thereon and the flange on the pin.

5. In a door-hanger, the combination of a plate, a pin having one end secured to the plate and having a flange adjacent to said plate, a bushing threaded on the pin and having a flange spaced from the flange on the pin, a sheave surrounding the bushing and disposed between the said flanges and having an inwardly extending web, a row of balls on one side of the web and bearing thereagainst and also bearing against the bushing and the sheave and the said flange on the bushing, a row of balls on the other side of the web and bearing thereagainst and also bearing against the bushing and the sheave and the said flange on the pin, and means for locking the bushing relatively to the pin.

6. In a door-hanger, the combination of a plate, a pin secured at one end to the plate and at its other end being free and having a flange adjacent to said plate, a bushing threaded on the pin and having a flange spaced from the flange on the pin, a sheave and bearings therefor, surrounding the bushing and interposed between the flange thereon and the flange on the pin, and means for locking the bushing relatively to the pin.

In testimony whereof I hereunto affix my signature.

FRANK E. HOWARD.