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F. E. HOWARD

1,901,648

DOOR HANGER

Filed April 10, 1931

Fig. 1

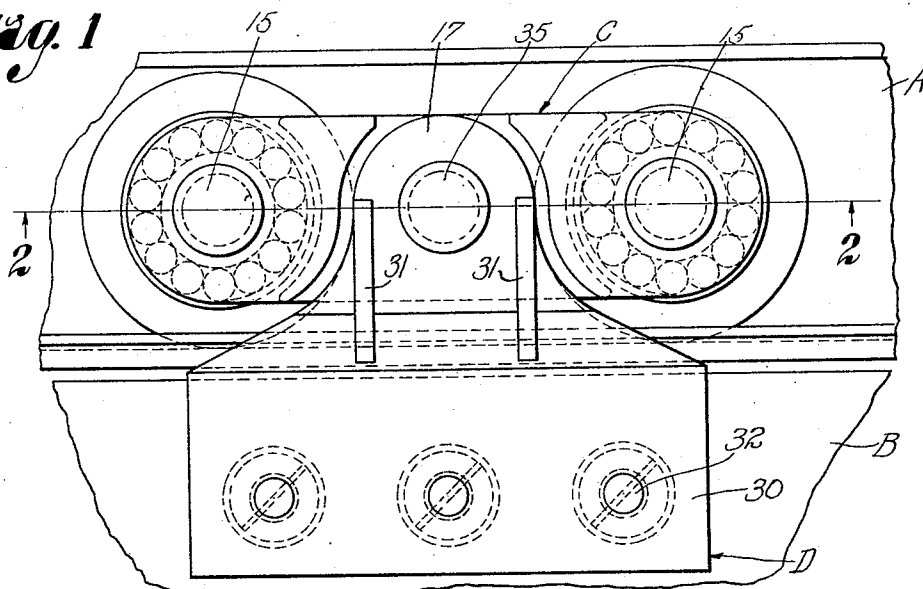


Fig. 2

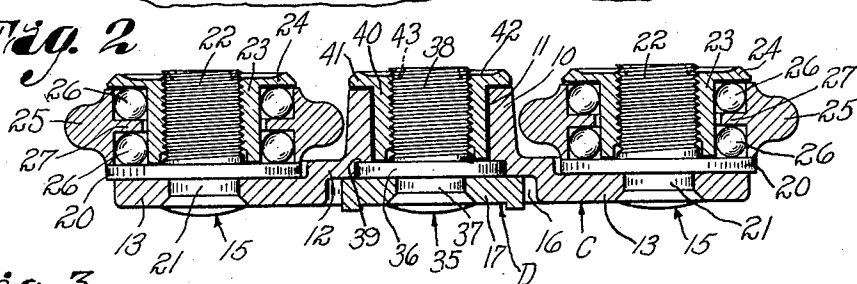


Fig. 3

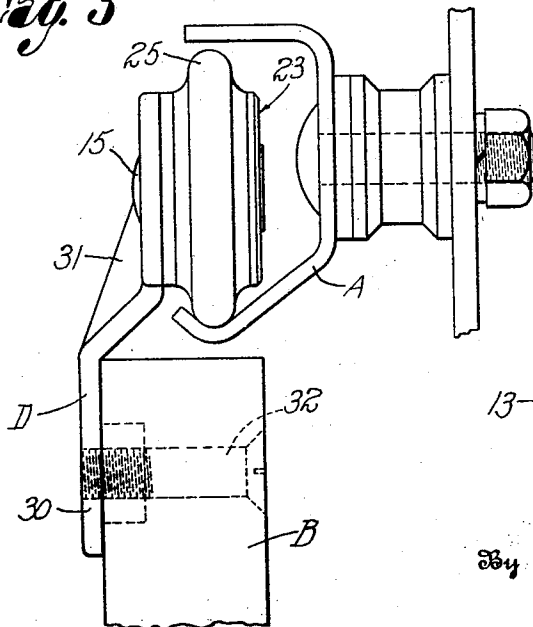
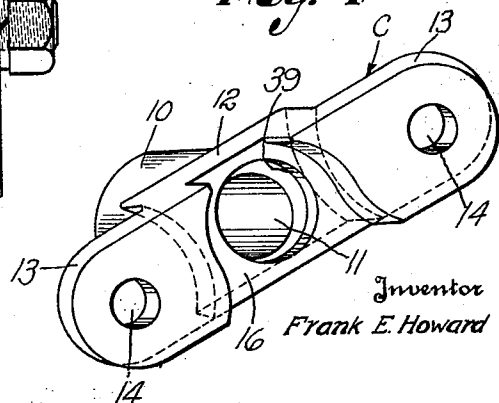


Fig. 4



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DOOR HANGER

Application filed April 10, 1931. Serial No. 529,027.

This invention relates, generally, to sliding doors and has particular reference to hangers therefor. As an instance of a use to which the structure of the present invention may be applied, reference may be had to the hanging of doors of subway cars and the like.

The aim of the invention is to provide an improved hanger having various features of novelty and advantage and which is particularly characterized by its strength and durability, by its simplicity, by its effectiveness in operation, and by the ease and facility with which the parts may be made, assembled and dis-assembled.

More particularly, my invention comprises a carriage supported by a pair of sheaves adapted to ride upon a track, and a plate to which the door is connected and from which it is suspended, the parts being so related that the plate may have a limited swinging movement in the plane of the door. The plate is so supported by and associated with the carriage as to properly distribute the weight of the door on the sheaves. The pivot pin to which the plate is connected is supported in a novel and advantageous manner so as to permit of ready assembly and to prevent excessive wear or derangement of the parts.

Other objects will be in part obvious and in part pointed out more in detail.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawing, wherein I have shown, for illustrative purposes, one embodiment which the present invention may take:

Figure 1 is a front view of my improved door hanger, a portion of the track, and a portion of the door;

Fig. 2 is a longitudinal horizontal section taken substantially on line 2—2 of Fig. 1 and looking in the direction of the arrows;

Fig. 3 is an end view of what is shown in Fig. 1; and

Fig. 4 is a perspective view of the carriage.

Referring to the drawing in detail, A denotes a track of any suitable sort on which the sheaves of the hanger are adapted to roll, and B is a door suspended by means of the hanger.

My improved hanger includes a carriage C which preferably comprises an integral member formed by casting or drop forging operations. The carriage C comprises an elongated link having, at its central portion, a rearwardly projecting boss or hub 10, the opening 11 of which extends entirely through the carriage. The link has a central portion 12, from the opposite ends of which extend ears 13 preferably of lesser thickness than the central portion. These ears have openings 14 adapted to receive the pins 15 on which the sheaves are supported. The forward face of the central portion has a recess 16 which is adapted to accommodate the ear 17 of the attaching plate D.

Each of the sheaves is supported in a manner similar to that disclosed in my Patent No. 1,571,334 issued February 2nd, 1926 and entitled "Door hanger". In accordance with that disclosure, each of the pins 15 has an integral flange 20, a stud 21 projecting forwardly from the flange, and a rearwardly extending body portion having threads 22. The stud 21 is adapted to engage in the opening 14, the pin being preferably made of a metal sufficiently soft that the outer end of the stud may be riveted or headed, as illustrated. The flanges 20 engage against the inner faces of the respective ears 13 of the carriage. Threaded onto the pins 15 are bushings 23 having integral flanges 24 at their rear ends. Surrounding the bushings, and interposed between the flanges 20 and 24, are sheaves or rollers 25, and between these sheaves and the cylindrical portions of the bushings are anti-friction members or balls 26, two rows of such balls being shown in each instance. The rows of balls may be separated by a web 27 on the sheave.

The attaching plate D may be of any suitable construction, it here having a body portion 30 and the ear 17 offset rearwardly from the body portion. The numeral 31 designates

strengthening ribs. Obviously, the attaching plate may be flat, and it may be secured to the door in any suitable manner, as by means of screws 32.

5 For the purpose of pivotally connecting the attaching plate to the carriage, a pin 35 is provided, this pin also preferably being made of a metal which is sufficiently soft to permit heading of its outer end. This pin
10 has an integral flange 36, a stud 37 extending forwardly from the flange, and a rearwardly extending body portion threaded as at 38. The flange 36 is seated in a rabbet 39 at the
15 forward end of the opening 11, and the forward face of the flange is engaged by the rear face of the ear 17 of the attaching plate. The stud 37 extends through an opening in the ear and its outer end is headed or riveted as illustrated. The stud is swelled in the
20 opening so as to prevent rotation between the pin 35 and the attaching plate. The numeral 40 designates a hardened bushing threaded on the pin 35 and engaging in the boss 10 of the carriage. This bushing has,
25 at its rear end, an integral flange 41 overlying and adapted to engage the rear end of the boss 10. The bushing 40 is adapted to rotate or turn in the boss 10 so as to permit of swinging movement of the door relative to
30 the carriage. The rear end of the bushing 40, as shown in Fig. 2, may have recesses 42 with which a spanner or other tool is adapted to cooperate when it is desired to turn the bushing relative to the pin 35. The bushing may
35 be locked in any position of adjustment on the pin 35, as by means of staking, as indicated at 43. The bushings 23 may also be provided with recesses corresponding to the recesses 42.

40 It will readily be seen from the foregoing description, taken in connection with the accompanying drawing, that the parts may be readily assembled and dis-assembled. The sheave units may be connected to the carriage
45 as described in my said Patent No. 1,571,334. The pin 35 may be first connected to the plate D by riveting the stud 37 in place. Then the hanger plate is brought to position where the threaded portion of the pin 35 projects
50 through the hub 10. The bushing 40 is then threaded onto the pin 35. The bushing 40, the pin 35 and the plate D constitute an assembled unit which is adapted to turn relative to the carriage, bearing surfaces being provided
55 between the bushing and the wall of the opening 11. The pin is held against axial movement due to the engagement of the flange 36 and the flange 41 on the opposite ends of the hub 10.

60 It will further be observed that the boss 10 projects rearwardly from the link portion of the carriage and is located between the sheaves, and also the ear of the attaching plate is substantially in the plane of the link
65 portion of the carriage, this arrangement per-

mitting of a compact structure and one wherein the strains and stresses are distributed to the best advantage.

As many changes could be made in the above construction and many apparently
10 widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or
15 shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features
30 of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In a door hanger, the combination of a carriage having a link provided with a centrally disposed rearwardly extending boss, said link also having a recess at its central
90 portion and in its forward face, said boss having a through opening, there being provided a rabbet at the forward end of said opening, pins connected to the respective ends of said link and extending rearwardly therefrom, sheaves carried by said pins, an attaching plate having an ear positioned in the recess of said carriage, a pin secured to said ear and having a flange engaging the rear
95 face of the ear and a threaded body portion extending rearwardly from the flange, said flange engaging in said rabbet and said threaded body portion extending into said boss, a bushing screwed onto the threaded portion of said pin and journaled in said boss, and means on said bushing for preventing withdrawal of the pin and bushing from the boss.

2. In a door hanger, the combination of a carriage provided with a centrally disposed and rearwardly extending boss, sheaves
110 mounted in spaced relation upon said carriage at opposite sides of said boss, an attaching plate having an ear adapted to fit against the carriage in register with said boss, a pin carried by said ear and extending into the boss and having a flange adjacent the ear adapted to abut against the adjacent end of the boss, and a bushing threaded upon
115 said pin and extending into said boss to provide a bearing for the pin against the boss, said bushing having a flange upon its rear end engaging the adjacent end of the boss to cooperate with said flange of the pin and hold the boss against axial movement with respect to the pin.

3. In a door hanger, the combination of a carriage having a link provided with a centrally disposed and rearwardly extending boss, said link also having a recess at its central portion and in its forward face, said
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boss having a through opening and provided
with a rabbet at the forward end of the open-
ing, sheaves mounted on the opposite end
portions of said link, an attaching plate for
5 connection to a door and provided with an
ear fitting in the recess of said carriage, a pin
secured to said ear and having a flange en-
gaging the rear face of the ear adapted to
seat in said rabbet of the boss, said pin hav-
10 ing a threaded body portion extending into
the boss, a bushing screwed on to the thread-
ed portion of said pin and journaled in said
boss, and means on said bushing for prevent-
ing withdrawal of the pin and bushing from
15 the boss.

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