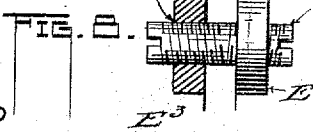
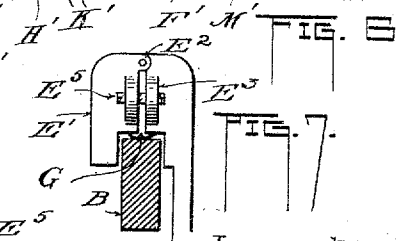
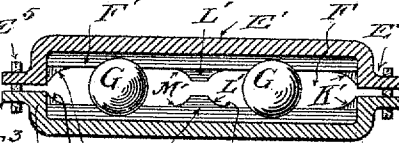
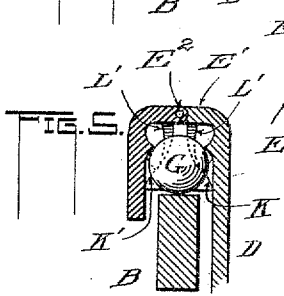
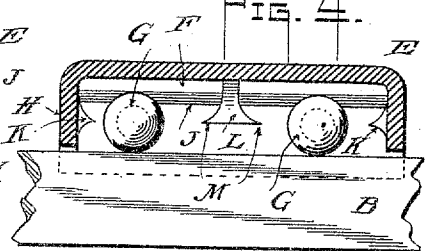
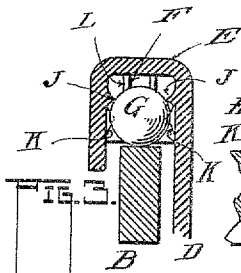
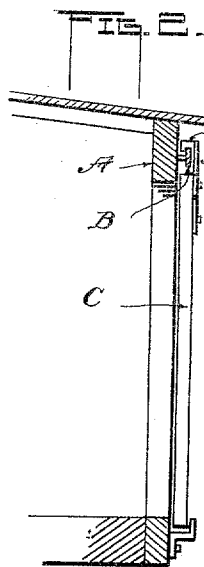
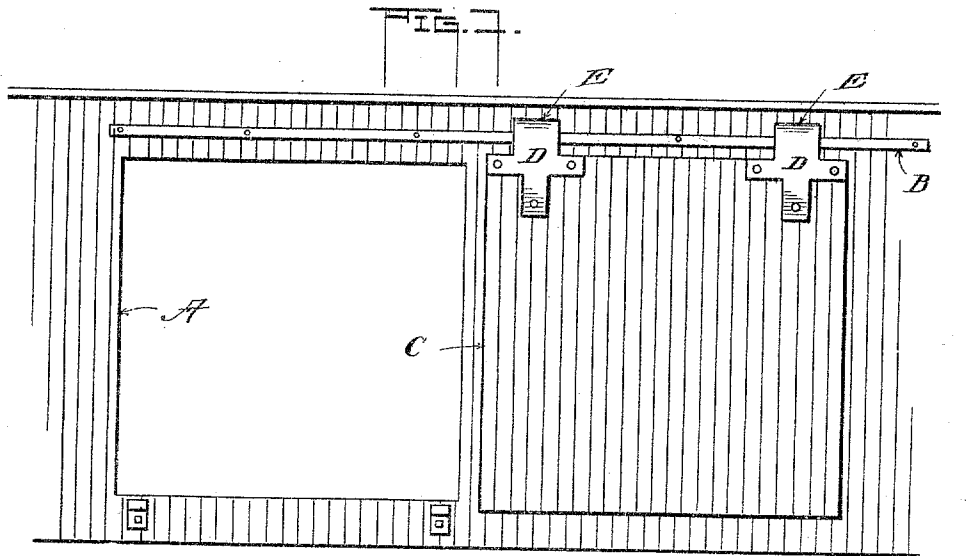


967,823.

Patented Aug. 16, 1910.



Witnesses:
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UNITED STATES PATENT OFFICE.

RICHARD NEWSAM, OF PEORIA, ILLINOIS, AND JAMES A. SCHWARTZ, OF WHITING, INDIANA.

BALL-BEARING DOOR-HANGER.

967,823.

Specification of Letters Patent.

Patented Aug. 16, 1910.

Application filed May 13, 1909. Serial No. 495,640.

To all whom it may concern:

Be it known that we, RICHARD NEWSAM and JAMES A. SCHWARTZ, citizens of the United States, residing, respectively, at Peoria, county of Peoria, and State of Illinois, and Whiting, Lake county, in the State of Indiana, have invented certain new and useful Improvements in Ball-Bearing Door-Hangers; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in sliding door hangers.

The object of the invention is to provide a door hanger which will be simple, strong and durable, thoroughly reliable and efficient in its operation and above all one in which friction is greatly minimized.

A further object is to provide a ball-bearing door hanger of peculiar construction such as will give the best results from the use of the balls.

Other objects and advantages will appear in the following specification aided by the accompanying drawing in which:—

Figure 1 is an elevation of a side of a car showing its track and a door suspended therefrom. Fig. 2 is a transverse section of a portion of a car and its track showing the door suspended from the latter. Fig. 3 is a transverse section of the track and parts of the hanger. Fig. 4 is a longitudinal section of the same. Fig. 5 is a transverse section of the track and a modified form of the hanger. Fig. 6 is a horizontal section of the hanger viewed from its under side. Fig. 7 is an end elevation of the hanger shown in Fig. 5, and Fig. 8 is a view of a portion of what is shown in Fig. 7, but much enlarged.

The real purpose of our invention is to provide a hanger, in which balls are used, of such a construction and arrangement that though the recess in which the balls travel is limited in length, provides for the free and easy movement of the door throughout its entire distance of travel on the track on which it is suspended such construction providing for permitting the balls to readily turn without dragging upon the track or being injured in any way. In order that this result may obtain the hanger is so constructed interiorly that in place of hanging upon the top of the ball as in other ball-

bearing devices, it lies upon that part of the ball which lies between the top surface and its axis; that is to say, said hanger bears upon that part of the periphery of the ball which lies nearer its axis than it ordinarily does in other forms of this class of devices so that in a full revolution or turn of the ball upon the track the extent of movement of the ball and hanger relatively will be much less than the distance of movement of said ball and track relatively all of which will appear presently.

A indicates the car, or other structure provided with any usual form of track indicated at B.

C indicates the door and D the hanger for suspending it from said track. The hanger is secured in any suitable manner to the door and has a head E which, in its simplest form, has a recess F for receiving a ball or a plurality of balls, preferably two, indicated at G. Said head is closed at each end, as shown in Fig. 4 at H, and overhangs the track in position so that the balls held therein will run upon the track (Figs. 3 and 5). Instead of providing a curved surface or flat surfaces in the recess to form a "race" for the balls we provide a longitudinal inwardly extended flange or lip J for the inner surface of each of the walls of the head. These said flanges extend toward each other and each has a hardened and polished bearing point which are so disposed relatively that each lies upon one side of the ball between its top surface (ordinarily the bearing point in other forms of hangers) and the axis about which the top of said ball turns or so that said ball lies between them. If the head E of the hanger rested directly upon the top of the ball, in one revolution of the latter said hanger would have a distance of movement along the track equal to the distance of travel of the ball or a distance equal to the circumference of the said ball, but the flanges J lie some distance down upon the sides of the ball as shown in Fig. 3 and also in Fig. 4 wherein the dotted circles on the ball indicate the path of the flanges. Now it is clear that the length of the path on the ball where the flanges bear is very much less than the circumference of the ball so that, for instance, if the ball were one and one-half inches in circumference and in consequence moved one and one-half inches along the track in each revolution

and the path for the flanges on the ball were three quarters of an inch long then the hanger would move one half as far as the distance the balls travel upon the track.

5 In order to provide the hardened and polished surfaces in the easiest manner the recess is made quite large above the ball so that the flanges can be extended from the walls, and since these are of comparatively
10 small bulk they can be easily and quickly case hardened, if of cast metal, and readily polished whereas a larger bulk of metal would consume more time in the same treatment. Furthermore, the flanges because of
15 their small bulk and because of jutting into the recess, can be ground off to allow them to drop as far down upon the sides of the balls as desired. These advantages are not found in the older forms of structures.

20 We have shown in the last four figures of the drawing a construction wherein the flanges may be adjusted relative to one another. The head of the hanger in this instance is indicated by E' and is divided longitudinally; the resulting parts being hinged at the top as at E^2 and at each end of each part is an ear E^3 having a hole E^4 having right and left hand threads to engage the corresponding threads on a screw E^5 . Both
25 screws are slotted at their ends, or otherwise have provision by which they may be turned, and it will be seen that by turning the screws in one direction or the other the two parts of the head will be moved relatively so that
30 the flanges therein, in this case indicated by F' , will be moved toward each other or separated, as the case may be, to adjust them to the proper position to rest upon a desired part of the ball. At each end of the recess
35 upon the end walls H in Fig. 4, or H' in Fig. 6, we provide two points or projections K and K' , in the respective figures named, so disposed within the recess as to receive the balls at the points thereof corresponding to
40 the place of contact therewith of the longitudinal flanges. The points are rounded and polished so as to present the least possible friction to the revolution of the balls and their purpose will now be described. As
45 the door is shifted from one limit of its movement to the other the balls in rolling from one end to the other of the recess will at some time in their travel contact with the points before the door has reached its said
50 limit of movement and the ball having reached said points will still revolve since the points in being close to the axis of revolution will set up but little retarding action to the revolution of the ball as the latter
55 travels on the track. In addition to the points K and K' we may provide lugs L at the middle of the recess which depend from above as shown in Figs. 4 and 5 which have points M extending in opposite direc-
60 tions to limit the travel of the balls when

two of the latter, for instance, are used, these serving in the same capacity and in the same manner as the points K K' so that the two balls will be prevented from contacting with one another. In that form of our device in
65 which the head of the hanger is divided into two portions the lugs are adjusted simultaneously with the flanges or lips F' as will be understood.

Our arrangement of hanger eliminates a
70 very large amount of friction usually resident in devices of this class since the balls even after having reached the end of their travel in the hanger can still readily revolve and will not act to retard the free movement
75 of the door.

The invention is adaptable to all forms of doors for whatever purpose used, being especially adapted for double doors, as for
80 instance, as employed in cars on street railways where but a very short movement of the door section is required.

Evidently various changes may be made in the device that will still lie within the meaning and intent of the invention.

We claim—

1. In a ball bearing door hanger, the combination with the hanger having a recessed head and comprising in its construction oppositely disposed flanges extending from its
85 inner walls toward the middle of the recess, and a bearing ball in said recess to receive the flanges at opposite points of the circumference thereof substantially as and for the purposes set forth.

2. In a ball bearing door hanger, the combination with the hanger having a recessed head and comprising in its construction longitudinal oppositely disposed flanges extending from two of its opposite inner walls
90 toward one another and providing bearing edges for a ball, members lying at two other opposite positions in the head and between the flanges and having points extending toward each other, and a bearing ball lying
95 in the recess and having the edges of the first said flanges resting thereon, said ball meeting the points of the members in the limits of its travel beneath the flanges.

3. In a ball bearing door hanger, the combination with the hanger having a recessed head, comprising in its construction two oppositely placed parts each having a flange on its inner face, one of said parts being
100 movable relatively to the other, of a bearing ball in said recess and seated upon the flanges which bear thereon at opposite points of the circumference thereof and means including an adjusting screw connecting said parts to adjust one of the said
105 parts relatively to the other.

4. In a ball bearing door hanger, the combination with the hanger having a recessed head comprising in its construction two oppositely placed portions each having a flange
110

on its inner face, one of said portions being movable relatively to the other, of a bearing ball in said recess and seated upon the flanges, said flanges being associated therewith at opposite points of the circumference thereof, and means including ears on said portion and an adjusting screw connecting said ears to adjust one of the flange carrying portions relatively to the other.

10 5. In a ball bearing door hanger the combination with the hanger having a head comprising in its construction a fixed and movable part forming a recess, said parts provided with oppositely placed flanges lying within the recess, of a ball seated in the recess upon the flanges, the head also having ball receiving projections within the recess at the extremes of travel of the ball, and means including ears on said parts and an adjusting screw connecting said ears to adjust the movable part relatively to the other.

20 6. In a ball bearing door hanger, the combination with the hanger having a head comprising in its construction a fixed and movable part forming a recess, said parts provided with oppositely placed flanges lying within the recess, and a pointed member

within the recess at each end thereof and having also points depending within said recess between its ends, of a ball seated upon the flanges at opposite points of the circumference thereof, and means including a screw to adjust one of the flange carrying parts relatively to the other.

7. A hanger for sliding doors comprising a recessed member of two portions hingedly connected, a ball therein to run upon a track and support said hanger, and means including a screw to adjust said portions and to secure them positively in a desired adjustment.

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

RICHARD NEWSAM.
JAMES A. SCHWARTZ.

Witnesses to the signature of Richard Newsam:

L. M. THURLOW,
A. KEITHLEY.

Witnesses to signature of James A. Schwartz:

C. D. DANDSEN,
PEARL L. TRAVERSE.