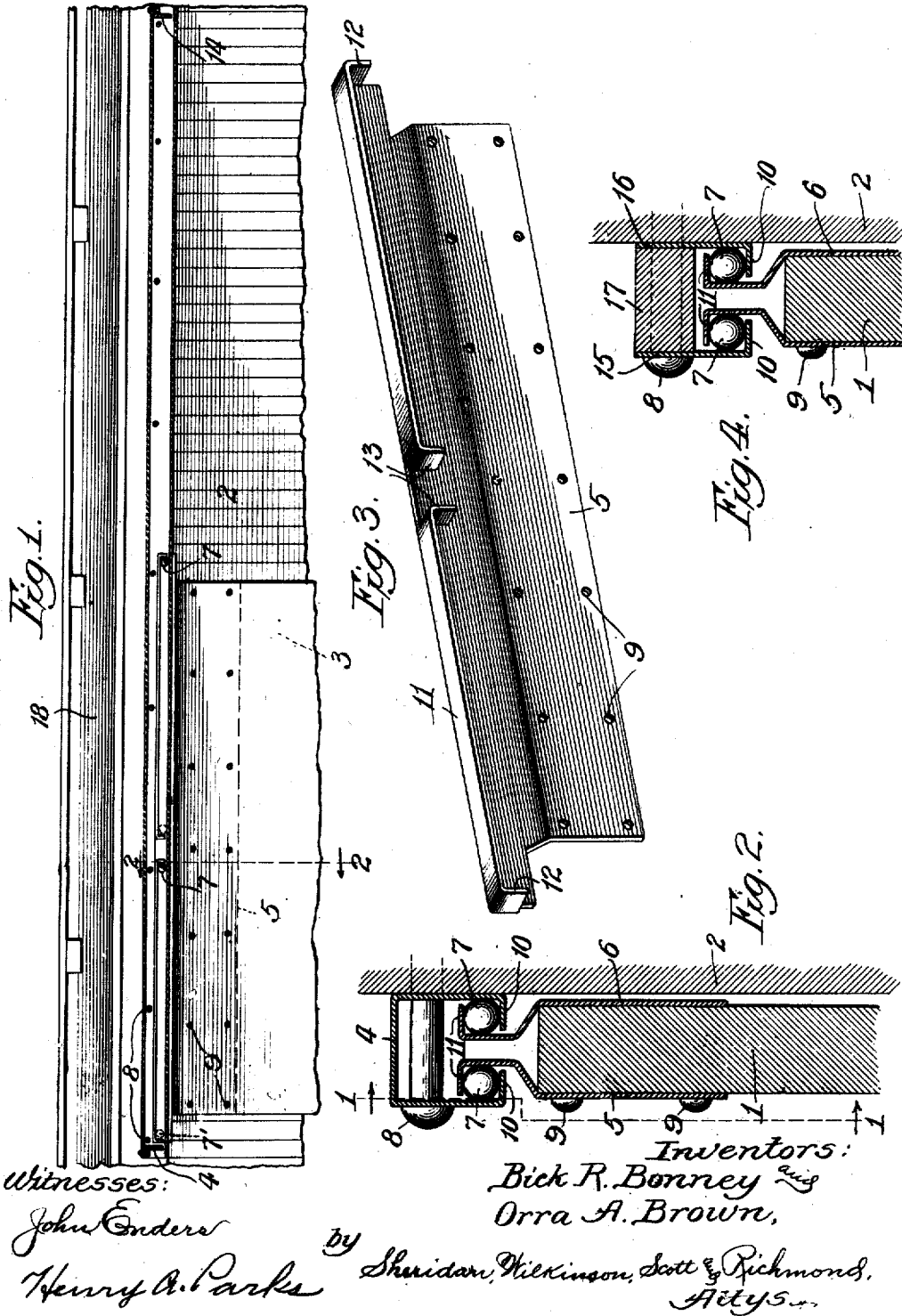


B. R. BONNEY & O. A. BROWN.
DOOR HANGER.
APPLICATION FILED SEPT. 26, 1910.

1,004,140.

Patented Sept. 26, 1911.



Witnesses:
John Enders
Henry A. Parks

by

Shuridan, Wilkinson, Scott & Richmond,
Attys.

Inventors:
Bick R. Bonney
Orra A. Brown,

UNITED STATES PATENT OFFICE.

BICK R. BONNEY AND ORRA A. BROWN, OF WICHITA, KANSAS.

DOOR-HANGER.

1,004,140.

Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed September 26, 1910. Serial No. 583,822.

To all whom it may concern:

Be it known that we, BICK R. BONNEY and ORRA A. BROWN, citizens of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Door-Hangers, of which the following is a specification.

Our invention relates to improvements in combined door hangers and tracks generally and more particularly to hangers for doors on freight cars.

The principal object of our invention is to provide an improved anti-friction ball bearing door hanger which shall be simple in construction which shall support the door at or near each end for all positions of the door, and which shall be self adjustable.

A still further object is to provide a hanger which shall be plain and inexpensive in construction, efficient in operation and durable in use.

As various forms of roller bearing door hangers have previously been disclosed by others we do not claim such a device broadly, but rather with respect to the particular novel features hereinafter set forth.

One advantage of our construction is that two separate parallel race-ways are provided with virtually an elastic and transversely expansible hanger between them adapted to engage the balls both laterally and vertically and roll smoothly thereon.

Another feature of our device that is especially advantageous in a ball bearing hanger is the extension of the carrier or hanger beyond the sides of the door and the leaving of a corresponding dead and unused space between the active portions, thus at all times assuring substantial support for both front and rear edges of the door. Otherwise the balls tend to roll under one side exclusively when the door is fully opened or closed. We aim to avoid this and

without the use of ball retainers or spacers. These and other objects will be more fully set forth and made apparent in the following specification and claims in connection with the accompanying drawings showing a preferred embodiment in which a form particularly adapted to freight cars is shown and in which—

Figure 1 is a side elevation of a freight car showing applicants' device, the upper

part being shown in section along the line 1—1 of Fig. 2. Fig. 2 is a vertical cross section through the wall, track, hanger and door along the line 2—2 of Fig. 1. Fig. 3 is an outer perspective view of the outer one of the door hanger plates designated 5. Fig. 4 is a vertical cross section similar to Fig. 2 of a modification of our hanger structure.

Like reference numerals apply to like parts in all the drawings.

The principal parts of our improved door hanger are a track fastened to the wall on the upper side of the doorway, and a hanger proper or carrier comprising a pair of flanged hanger plates attached to the upper edge of the door and adapted to be reciprocally mounted on the said track, with provision for spherical rollers to coact between the said track and hangers. These parts thus constitute a complete ball bearing hanger.

The track preferably consists of an integral hollow channel bar preferably of iron or steel with the depending side flanges turned inwardly toward each other at the bottom, thus producing a long rectangular box-like structure having a long narrow central opening on the under side. Means are provided for fastening this track in place by means of screws or bolts 8 passing through the upper part and extending into or through the wall over the doorway. The inwardly turned flanges or lips 10 on the under side of the track provide parallel tracks for the ball bearings with an open slot between.

The carrier or hanger proper, preferably consists of two similar longitudinally disposed parallel flanged plates 5 and 6 attached to the opposite sides of the upper edges of the door and extending along its whole length. These plates 5 and 6 are attached to the door by suitable means such as screws or bolts 9. The upper portions of these plates are turned inwardly toward each other above the door, but not engaging each other and then directly upward between the inwardly turned lips 10 of the depending track above described. The upper edges 11 of these hanger plates are oppositely turned and extend over the inwardly turned track lips 10 and rest upon the balls 7. The balls 7 are held laterally on the out-

side by the depending flanges of the track 4 and on the inside by the upwardly extending flanges of the hanger plates 5 and 6.

It is apparent that the raceways for the balls comprise in their formation the side flanges of the track 4, the lips 10, plates 5 and 6, and the lips 11 carried by said plates. By a peculiar feature of construction of the lips 11 the raceways are each divided into two equal lengths by means of dependent stops 13 formed by turning down the upper lips 11 at their middle points. This makes substantially four separate raceways, each adapted to accommodate a single ball bearing. The outer end of each raceway is terminated by a stop 12 similar to stops 13.

Since the ball in bearings of this character ordinarily moves only half as far as the door, it is only necessary to provide runways sufficiently long to let the balls roll half the distance that the door is designed to move. This makes it necessary that the total distance between stops on each raceway should be equal to one half the door movement plus the diameter of the ball roller. Moreover, on account of turning down the upper edge of lip 11 to form stops 13 there is a considerable space longitudinally between the adjacent raceways. This space, however, between raceways is not detrimental, but on the other hand is advantageous because the resultant wider longitudinal spacing of the raceways insures a more stable balance when the door is not at an intermediate position, for the bearings supporting opposite ends of the door are thus kept spaced more widely apart for all positions of the door. On account of the requirements above noted it is obviously necessary that the track must extend over more than double the length of the door movement and therefore project beyond the sides of the doorway. Moreover, that part of the hanger plates which extends above the top of the door and especially that portion which constitutes part of the ball raceways must project beyond the edges of the door on each side enough to compensate for the unused or dead space between the raceways and also for the diameters of two ball bearings. Since half of this extra length is disposed of on each side of the door the projection on each side will be substantially half the sum of the dead space and the diameter of one of the balls. The dead space may be considerably increased beyond what is occasioned by the stops above. This results in spacing the bearings wider apart and giving correspondingly greater stability to the hanger especially in view of sudden opening and closing forces applied to the door. The preferred construction providing for this is shown in Fig. 1 at the left end where the door is shown in its closed position. This construction is shown particularly in Fig. 3 where

the hanger plate 5 is shown with the upper portion and lips 11 extending out over the ends of that part of the plate which attaches to the door. The fixed or track part of the raceways are provided with special stops 14 at each outer end. These stops are removable in order to permit the insertion of the hanger plates 5 and 6 in the slot of the track 4, said plates being previously secured to the door. The balls 7 may readily be inserted or removed when one of these stops 14 is removed.

The hanger plates 5 and 6 are preferably resilient especially in the upwardly extending portion above the edge of the door so as to press inwardly and so keep the ball bearings laterally engaged between the sides of the track and hangers at all times. This tends to prevent their getting out of position in case the lips 11 at any time do not engage the bearings on both sides of the hanger. In case one of the balls should get out of position there is little chance that the ball on the opposite raceway would get displaced at the same time. Even if both balls at one end of the door should get displaced at the same time the condition would be maintained only through one movement of the door during which movement they would slide instead of roll and after which they would attain their normal rolling positions.

In the modification of the track shown in Fig. 4 the track structure instead of being composed of one integral hollow member 4 is made up of two depending angle bars 15 and 16 spaced apart by a block 17 lying between their upper edges and held in place by a bolt or the like 8. The lower horizontal flanges are turned inward, but do not extend far enough to meet. The fastening means 8 preferably serve to hold the track in place against the wall. Otherwise the structure is essentially the same as above described with respect to Fig. 2. The advantage of this modified structure lies in the greater convenience of using the more common standard angle bars instead of the rather special channel bar 4 first described. If preferred the two styles may be combined to the extent of placing a filler block in the upper part of the channel bar 4, thus reinforcing same and providing a substantially smooth roof for the hanger to bump against, as in Fig. 4, in case it should be given a sudden start.

It is obvious that cylindrical rollers may be used instead of balls in our hanger and thereby make full use of the beneficial features of longitudinally spaced raceways and the corresponding overlap of the hanger beyond the side edges of the door. Spherical rollers, however, add the further advantage of frictionless lateral engagement incident to the divergent lateral tension of the car-

rier plates in our hanger. The resilience of the carrier plates cushions the effect of any sudden transverse force, as a blow on the door, and lessens the danger of breakage to the hanger parts.

It is to be noted that in the preferred embodiment of our invention, we construct the flanges 10 and 11 of less width than the diameter of the balls whereby contact between the hanger plates and the track is avoided.

We claim:—

1. A combined door hanger and track comprising a downwardly open hollow track having inturned flanges at its lower edges forming bearing rails and adapted to be secured to the side of a car above the doorway, spherical rollers seated on said rail, an upwardly extending carrier comprising two separated hanger arms adapted to be secured to the upper portion of the sides of the door, said arms provided respectively with an inturned flange, said flanges spaced apart longitudinally and provided with stops to limit the movement of said rollers.

2. A door hanger comprising, in combination, a downwardly opening hollow track having its lower edges turned toward each other forming lips slightly spaced apart providing an open slot between them, rollers carried by said lips, a carrier comprising spaced apart hanger arms extending upward through said slot and having oppositely turned flanges having longitudinally spaced portions formed by means of turned down portions of said flanges comprising stops adapted to limit the movement of the rollers.

3. In a door hanger, in combination, a track having two horizontally inturned flanges, and a longitudinally reciprocable carrier comprising separate separated hanger arms having upwardly extending plates with outwardly turned flange portions adapted to overlap the flanges of the said track, said carrier flanges being turned down at the ends and at the middle forming two longitudinally spaced compartments in each flanged portion, and four spherical rollers adapted to fit one in each of the said compartments, the length of each compartment being substantially half the maximum space normally traversed by the door plus

the diameter of one of the rollers, the motion of the door being arrested in each direction by suitable stops on the ends of said track.

4. In a door hanger and track, a track having two horizontally inturned flanges, a pair of two similar plates attached to opposite sides of the upper edge of a door and turned convergently inward and upward with oppositely turned flanges at the top, said plates being adapted to be inserted in the opening between the flanges of said track, rollers carried by said flanges, said plates being resilient and in their upwardly extended portion being separated by a narrow space, said plates being adapted to coact with said rollers.

5. In a door hanger of the character described, the combination with a track having two non-meeting horizontally return flanges providing a longitudinal slot therein, and rollers carried by said flanges, of a pair of hanger plates turned convergently inward and extending upwardly at their top, said plates being resilient and adapted to be inserted in said horizontal slot and to be movably supported on said rollers, and a door secured to the hanger plate.

6. A combined door hanger and track comprising a hollow track having a continuous slot in the under side thereof with interior bearing trackways on each side, a carrier mounted on said trackways and forming therewith a raceway, said carrier having oppositely turned bearing flanges extending over said trackways respectively, said flanges each being divided into front and rear sections separated by a dead space, each section being terminated by stops thereon, a set of rollers distributed one to each section to coact between the said raceways and flange sections and stops on said track to limit the motion of said carrier, one of these stops being removable to permit the entrance to said track of said carrier.

In testimony whereof, we have subscribed our names.

BICK R. BONNEY.
ORRA A. BROWN.

Witnesses:

E. S. WORRELL,
A. T. GLOVER.