No. 639,987. Patented Dec. 26, 1899.

A. J. IVES.

DOOR HANGER.

(Application filed May 23, 1898.)

(No Model.)

Fig. 1.

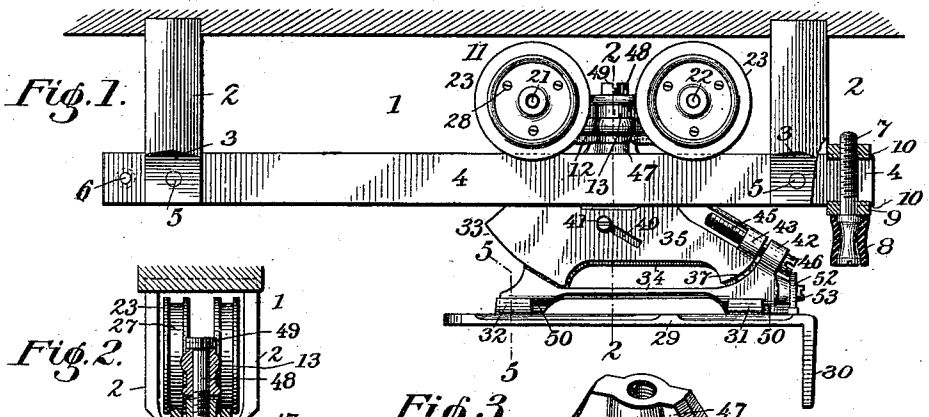


Fig. 2.

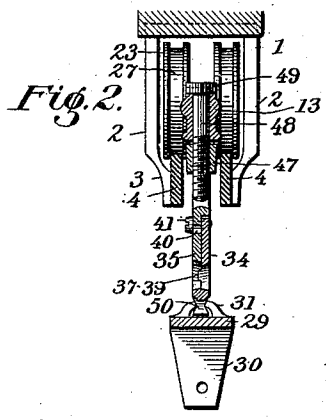
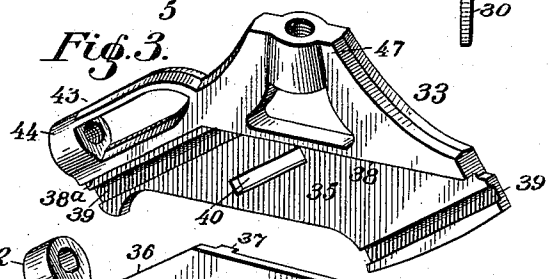


Fig. 3.



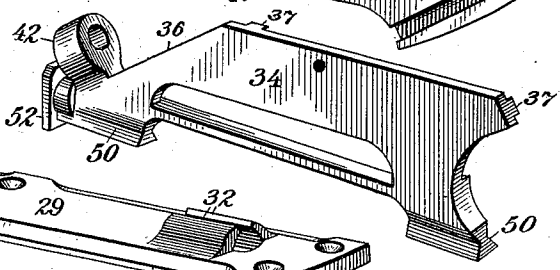


Fig. 4.

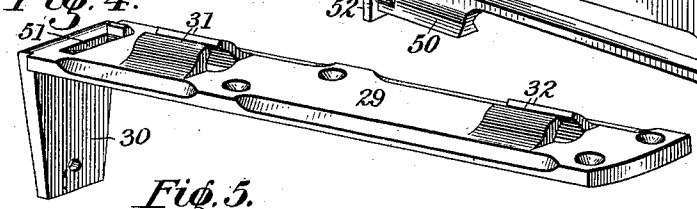


Fig. 5.

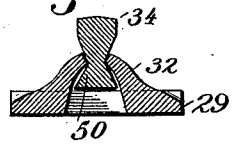


Fig. 7.

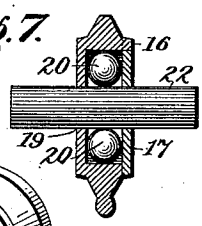


Fig. 8.

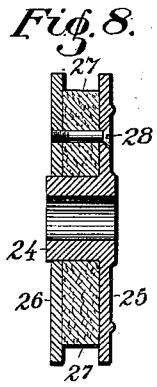
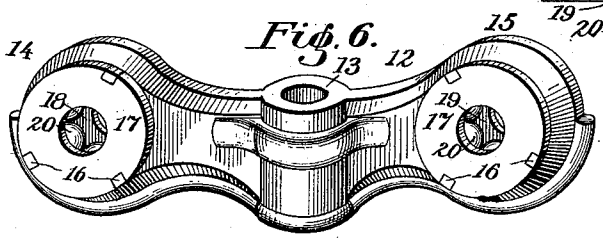


Fig. 6.



Witnesses
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UNITED STATES PATENT OFFICE.

ALBERT J. IVES, OF AURORA, ILLINOIS, ASSIGNOR OF ONE-HALF TO CYRUS RABER, OF SAME PLACE.

DOOR-HANGER.

SPECIFICATION forming part of Letters Patent No. 639,987, dated December 26, 1899.

Application filed May 23, 1898. Serial No. 681,492. (No model.)

To all whom it may concern:

Be it known that I, ALBERT J. IVES, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented a new and useful Door-Hanger, of which the following is a specification.

My invention relates to door-hangers of the class shown by prior Letters Patent Nos. 343,994 and 358,613, issued to me on June 24, 1886, and March 1, 1887, respectively; and the objects that I have in view in my present improvements are, first, to provide an improved construction of a door-plate adapted to be firmly fastened to the top edge and vertical face of the door; second, to provide an improved construction of the hanger in which the parts are firmly joined together and are capable of adjustment in a vertically-inclined plane; third, to provide an improved construction of the trolley-truck in which ball-bearings are provided for the support of the wheel axles or journals; fourth, to provide an improved construction of trolley-wheel to support the hanger; fifth, to provide a vertically-adjustable loose connection between the hanger and the trolley-truck, and, finally, to provide an improved type of track in which the hanger is adapted to travel freely without hindrance from the supporting devices of the track-rails.

With these ends in view the invention consists in the novel combination of elements and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand the invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a side elevation illustrating the improved hanger fitted to a track, parts being broken away to show the location of the buffer. Fig. 2 is a vertical transverse sectional elevation through the track and hanger on the plane indicated by the dotted line 2 2 of Fig. 1. Fig. 3 is an enlarged perspective view illustrating the two plates of the hanger separated from each other to more clearly show the construction of the hanger itself. Fig. 4 is a detail perspective view of the door-plate. Fig. 5 is an enlarged detail cross-section through the vibratory slip-joint between the door-plate and the hanger, the plane of section being indicated by the dotted line 5 5 of Fig. 1. Fig. 6 is a detail perspective view of the truck-bar, showing the same in its inverted position. Fig. 7 is a detail cross-sectional elevation through one of the axle-bearings of the truck-bar. Fig. 8 is a detail cross-sectional view through one of the trolley-wheels.

Like numerals of reference denote like and corresponding parts in each of the several figures of the drawings.

1 designates the track, which is adapted to sustain the hanger that carries a sliding door. This track consists of a series of brackets 2, which are substantially of inverted-U-shaped form, each bracket being cast in a single piece of metal. The brackets are fastened rigidly to the top rail of the door-frame by bolts or screws, and the lower free ends of the legs of said brackets are offset or bent inwardly toward each other, as at 3. The track-rails 4 4 are arranged parallel with each other within the offset ends 3 of the hangers, and said rails are rigidly secured to said offset hanger ends 3 by rivets 5 or other suitable devices. The rails 4 are spaced apart a proper distance to adapt the trolley-wheels for free traveling movement thereon, and the space between these track-rails is less than the space between the arms of the hangers, so that the trolley is adapted to travel within the brackets 2 and upon the rails without hindrance or interference from the brackets which sustain the track-rails. The track-rails 4 are joined together at one end by means of a rod or screw 6, which serves to limit the traveling movement of the hanger in one direction on the rails, and at the opposite end of the track I employ a buffer screw or post 7, which lies in the path of the hanger, to limit the play thereof in the opposite direction. This buffer screw or post is arranged between the track-rails, below which it extends a suitable distance, and it is attached to said rails by a clamp, which is shown as consisting of a pair of plates 9. The clamping-plates are provided in their opposing faces with grooves 10 for the purpose of fitting snugly to the upper

and lower edges of the track-rails, and one of these plates is provided with a threaded socket to receive the threaded extremity of the buffer-post 7, while upon the other plate bears a cushion or pad 8, which is rigidly attached to the buffer-post, whereby the post may be adjusted to draw the two plates 9 firmly upon the track-rails for the purpose of sustaining the cushion or pad in the path of the door-hanger.

On the parallel track-rails 4 4 is adapted to travel a hanger-truck 11, which consists of a single longitudinal truck-bar, axles journaled loosely in bearings at the ends of the truck-bar, and a series of trolley-wheels mounted on the axles and adapted to travel on the rails. The truck-bar is shown in detail by Figs. 6 and 7 of the drawings, and it is indicated generally by the numeral 12. This truck-bar is cast in a single piece of metal with an enlarged middle portion forming a vertical sleeve 13 between the axle-bearings at the ends of said truck-bar. Said ends of the truck-bar are enlarged into substantially disk form to produce the bearings 14 and 15, each of which has a recess or chamber which opens through one face of the truck-bar, while the other side of the chamber is closed partly by the metal of the truck-bar. On the face of the truck-bar around the opening formed by the bearings 14 and 15 is provided a series of lugs 16, that extend laterally from the truck-bar and serve to unite the face-plates 17 against the open side of the bearings. The axle-openings 18 and 19 are formed in the closed side and face plate of each bearing 14 or 15, and the space or chamber within each bearing constitutes a ball-race adapted to receive a series of bearing-balls 20.

21 22 designate the carrying-axles of the trolley-truck, and these axles are disposed at opposite ends of the longitudinal truck-bar 12, at right angles thereto. The axles are fitted in the bearings 14 and 15 of the truck-bar to ride upon the ball-bearings 20 in the raceways thereof, and to the opposite ends of each axle 21 or 22 are applied the trolley-wheels 23. In my trolley-truck I employ a pair of axles each equipped with a pair of wheels, and the axles and their trolley-wheels are disposed on opposite sides of the connection between the hanger and the trolley-truck, whereby the truck is adapted to sustain the hanger in proper relation to the track. The trolley-wheels are of peculiar construction to properly fit the parallel rails 4 4 of the track, and said wheels travel on the track in a manner to prevent the derailment of the truck. In Fig. 8 of the drawings I have illustrated the construction of one of the trolley-wheels, and it is shown as consisting of a metallic sleeve or hub 24, the metallic face-plates 25 26, and a composition core or body 27. The face-plate 25 is preferably made integral with the metallic sleeve or hub 24 of the wheel, while the other face-plate 26 is removably fitted to one end of said sleeve or hub. The core or body 27 is made, preferably, of a suitable composition, such as wood fiber, molded into proper shape and subjected to pressure, and this composition core is perforated centrally for the purpose of fitting it upon the metallic sleeve or hub 24 and against the integral face-plate 25 thereof. After the core has been properly fitted to the sleeve and against one face-plate thereof the other face-place 26 is adjusted in position to fit the free end of the sleeve 24 and bear against the opposite side of the core, and the parts are then firmly united or bound together by transverse rivets or screws 28, which pass through the face-plates and the core. This composition core 27 is of less diameter than the face-plates 25 and 26, between and within which it is arranged concentrically, and this pressed composition core is thus adapted to form the tread-surface of the trolley-wheel, while the protruding edges of the disks serve as guide-flanges to the wheel to prevent it from leaving the track-rail. My improved trolley-wheel thus possesses one of the chief elements which contribute to the durability of the hanger, and the wheel is simple in construction and cheap of manufacture.

The hanger is adapted to be connected to the upper edge of a door by means of a plate 29, which is formed at one end with a vertical lip 30, the plate and its lip being cast in a single piece of metal. The plate 29 is designed to be fitted to the top edge of the door, and its lip 30 bears against the vertical end face of said door. The plate is attached to the door by screws which pass through the plate and its lip, as shown by Fig. 1, to provide a substantial and strong connection of the plate to the door. This plate is provided on its upper face with two pairs of attaching-flanges 31 32, which are disposed in the opposite ends of said plate, each pair of flanges being curved or inclined toward the axial line of the plate and adapted to form a loose connection and slip-joint between the door-plate and the hanger for the plate and door to have limited swaying movement in a lateral direction below the fixed track.

The hanger-body 33 is of simple and substantial construction, and its plates or members are arranged to overlap each other laterally and are adjustably coupled or united together by interlocking devices which insure extension or contraction of the plates or members in an inclined direction, whereby the door may be adjusted to hang in a level position and prevent binding in the frame or jamb. The two parts of the hanger 33 are made in the form of plates 34 and 35, each of which is cast in a single piece of metal to enable said plates to lap each other laterally, as clearly indicated by Fig. 2, thus providing an extended bearing-surface for the plates one upon the other. The lower plate 34 has a straight upper edge and an inclined edge 36 at one end thereof, and on one face or side of this lower plate 34 are provided the inclined

ribs 37, which are integral with said plate and are inclined transversely across the face of the same in planes coincident with or parallel to the inclined face 36 at one end of the hanger-plate 34. The other hanger-plate 35 has a horizontal flange 38 near its upper edge and an inclined flange 38ª at one end edge thereof, and when the two hanger-plates are fitted laterally together in their most contracted positions the flanges 38 and 38ª of the upper hanger-plate fit against the upper and inclined end edges of the lower hanger-plate. On the face of the upper hanger-plate 35, which bears against the ribbed inner face of the lower hanger-plate 34, are provided the inclined grooves 39, which are adapted to receive the inclined ribs 37, and thus the two hanger-plates are interlocked one with the other by devices which permit the plates to be extended or contracted in an inclined direction to the vertical axis of the hanger. The two hanger-plates are designed to be clamped firmly together by means of a clamping-screw which passes through an inclined slot 40 in the upper hanger-plate 35 and finds a threaded bearing in the lower hanger-plate 34, and the headed end of this clamping-screw 41 is adapted to bind or bear against the slotted hanger-plate 35, so as to draw the two plates 34 and 35 laterally together in firm solid relation to each other. At one end of the lower hanger-plate 34 is formed an integral inclined boss 42, in which is fitted an adjusting-screw 45. In the upper hanger-plate 35, at one end thereof, is formed a slotted flange 43, which at its lower end terminates in a solid boss 44, which is provided with an internally-threaded socket adapted to form a bearing for the adjusting-screw 45, and thus the adjusting-screw is arranged to have a swiveled connection with the boss on the lower hanger-plate and a threaded connection with the boss of the upper hanger-plate. The screw and its bosses are arranged in inclined positions parallel to the inclined interlocking devices between the two hanger-plates, and the screw may be adjusted to vary the positions of the hanger-plates in a vertical direction, after which the plates are bound firmly together by the clamping-screw. The inclined adjusting-screw 45 has its head 46 arranged to bear against the boss 42 of the hanger-plate 34, and said screw is housed more or less within the slotted flange 43 of the upper hanger-plate.

Prior to my invention it was customary to provide a hanger consisting of members arranged in different horizontal planes, so that the member which is connected with the trolley or truck occupies a position above the member which is connected with a door, and these members arranged as thus indicated have their edges presented to each other and are connected adjustably together. In my improved hanger, forming the subject-matter of the present application, the two members are in the form of plates disposed in different vertical planes and arranged side by side in lateral contact or engagement, and these members are joined together for adjustment in an inclined direction in relation one to the other by interlocking tongue-and-groove joints on the opposing faces of said members.

In the practical service of a hanger the door is liable to sway somewhat in a horizontal plane transversely across the line of travel of the door and the trolley in opening and closing said door. This swaying of the door in the old style of hanger imposes considerable strain on the adjustable connection between the upper and lower hanger members, in consequence of which such adjustable interlocking devices between the hanger members are liable to breakage and result in the derangement of the hanger, so as to prevent adjustment of the members one upon the other. My improved construction produces a stronger hanger than theretofore. Its members are united to relieve the interlocking joint between the same of undue strain, and the laterally-engaging members mutually strengthen or reinforce the other.

A yoke 47 is formed as an integral part of the hanger-plate 35, and within this yoke is provided a vertical female-threaded socket or opening which receives a vertical adjusting-screw 48. This vertical adjusting-screw is fitted loosely in the vertical central sleeve 13 of the truck-bar 12, and the headed end 49 of this adjusting-screw 48 is adapted to rest upon the truck-bar to suspend the two-part extensible hanger 33 from the truck. This vertical screw 48 is fitted loosely in the sleeve of the truck to permit the hanger to sway below the wheel-truck, and said screw also provides means by which the hanger may be adjusted in a perpendicular direction with relation to the truck, whereby the door may be raised or lowered in a vertical plane without involving a change in the horizontal position of the door.

The door-plate 29 and the plate or member 34 of the hanger are loosely connected or swiveled by the foot-flanges 50, which are formed integral with the plate 34, in position to engage with the two pairs of attaching-lips 31 and 32, and these lips are fitted to the flanges 50 to permit the door-plate to vibrate or sway on the hanger in a horizontal direction. The door-plate is assembled beneath the hanger by moving it endwise for its attaching-lips 31 32 to engage with the foot-flanges 50, and the plate 29 is prevented from moving endwise in either direction by a stop-plate 52, which is fitted at its lower end in a notch or recess 51, that is formed in the upper face of the door-plate 29, near one end thereof. The stop-plate 52 occupies a vertical position on one end of the hanger-plate 34, and said stop 52 is rigidly and detachably secured to the hanger-plate by a screw 53.

It is thought that the operation and advantages of my improved door-hanger will be

readily understood and appreciated by those skilled in the art from the foregoing description, taken in connection with the drawings.

While I have shown and described screws for uniting certain parts, and rivets for uniting other parts, I would have it understood that I do not restrict myself to the precise details, as screws or rivets may be used interchangeably. The adjusting part 48 may be a bolt or screw, as desired, and where certain parts are described as being cast it should be understood that they may be produced in any suitable manner within the skill of the constructor. In lieu of wood fiber for the manufacture of the trolley-wheel I may employ any equivalent material.

I am aware that changes in the form and proportion of parts and in the details of construction may be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of the invention, and I therefore reserve the right to make such modifications as clearly fall within the scope of the invention.

Having thus described the invention, what I claim is—

1. The combination of a trolley, a door-plate adapted to be fixed to a door, a hanger connected with said door-plate, and a vertically-adjustable suspension device between the hanger and the trolley, for the purpose described, substantially as set forth.

2. The combination of a trolley, a hanger having means for attachment to a door, and a vertical adjusting-bolt loosely connected to the trolley and having threaded engagement with the hanger for moving the latter in a perpendicular direction in relation to the trolley, substantially as described.

3. A trolley consisting of a longitudinal truck-bar provided with the carrying-wheels and with a vertical sleeve at a point between said wheels, in combination with a hanger, and a vertical adjusting-bolt attached to the hanger and the sleeve of the longitudinal bar, substantially as described.

4. A trolley consisting of a longitudinal bar, the wheeled axles journaled in said bar at the ends thereof, and a vertical sleeved bearing on the longitudinal bar between the wheeled axles, in combination with a hanger having a vertical threaded bearing and a vertical screw loosely fitted in the sleeve of the longitudinal bar and having a threaded engagement with the threaded bearing of the hanger, substantially as described.

5. A wheeled truck comprising a truck-bar having a bearing which forms an internal raceway and is provided on one face with projecting lugs, and a face-plate closing the open side of the raceway and united to the trolley by said lugs, combined with the axle passing through the bearing and face-plate, the bearing-balls in said raceway, a truck-wheel supported by said axle, and a hanger, substantially as described.

6. The combination with a hanger having the foot-flanges, of a door-plate provided with the attaching-flanges which loosely connect said plate to the hanger, and also provided with a notch or recess, and a stop-plate fastened to the hanger and fitted in the notch or recess to restrain the door-plate against endwise movement, substantially as described.

7. In a door-hanger, a door-plate provided at one end with a depending lip or flange adapted to embrace the vertical end face of the door, in combination with a wheeled hanger, substantially as described.

8. A track having the parallel rails, a two-part clamp fitted to opposite edges of the track-rails, a shouldered buffer-post having a threaded engagement with one of said plates and drawing the latter firmly against the rails, and a buffer mounted on the lower end of said post, combined with a trolley, and a hanger suspended by the trolley and arranged to abut against the buffer, substantially as described.

9. In a door-hanger, a trolley comprising a bar having the ball-bearing recesses at the ends and the studs or lugs, 16, the face-plates united to the open sides of the recesses, the axles, and wheels mounted on the axles, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ALBERT J. IVES.

Witnesses:
CHARLES J. MCNETT,
CHAS. A. LOVE.