

(No Model.)

2 Sheets—Sheet 1.

H. L. FERRIS.
DOOR HANGER.

No. 569,965.

Patented Oct. 20, 1896.

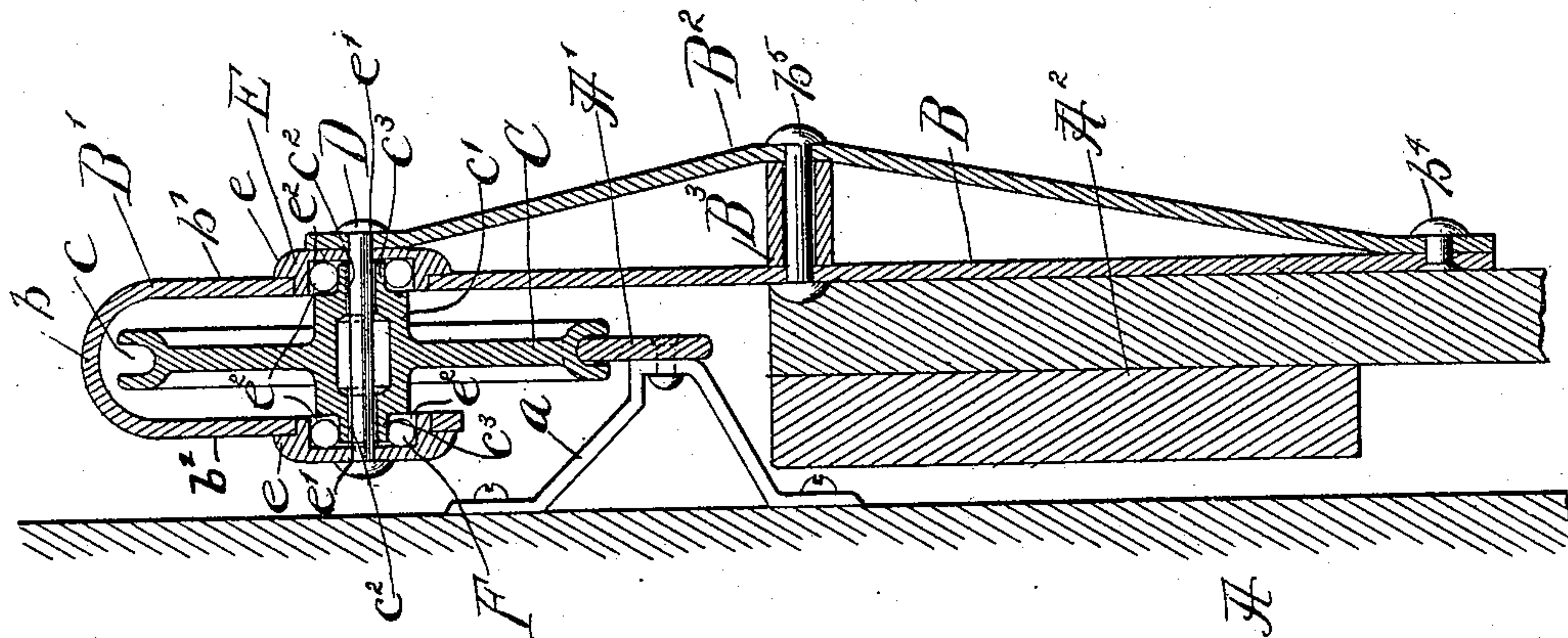


Fig. 2

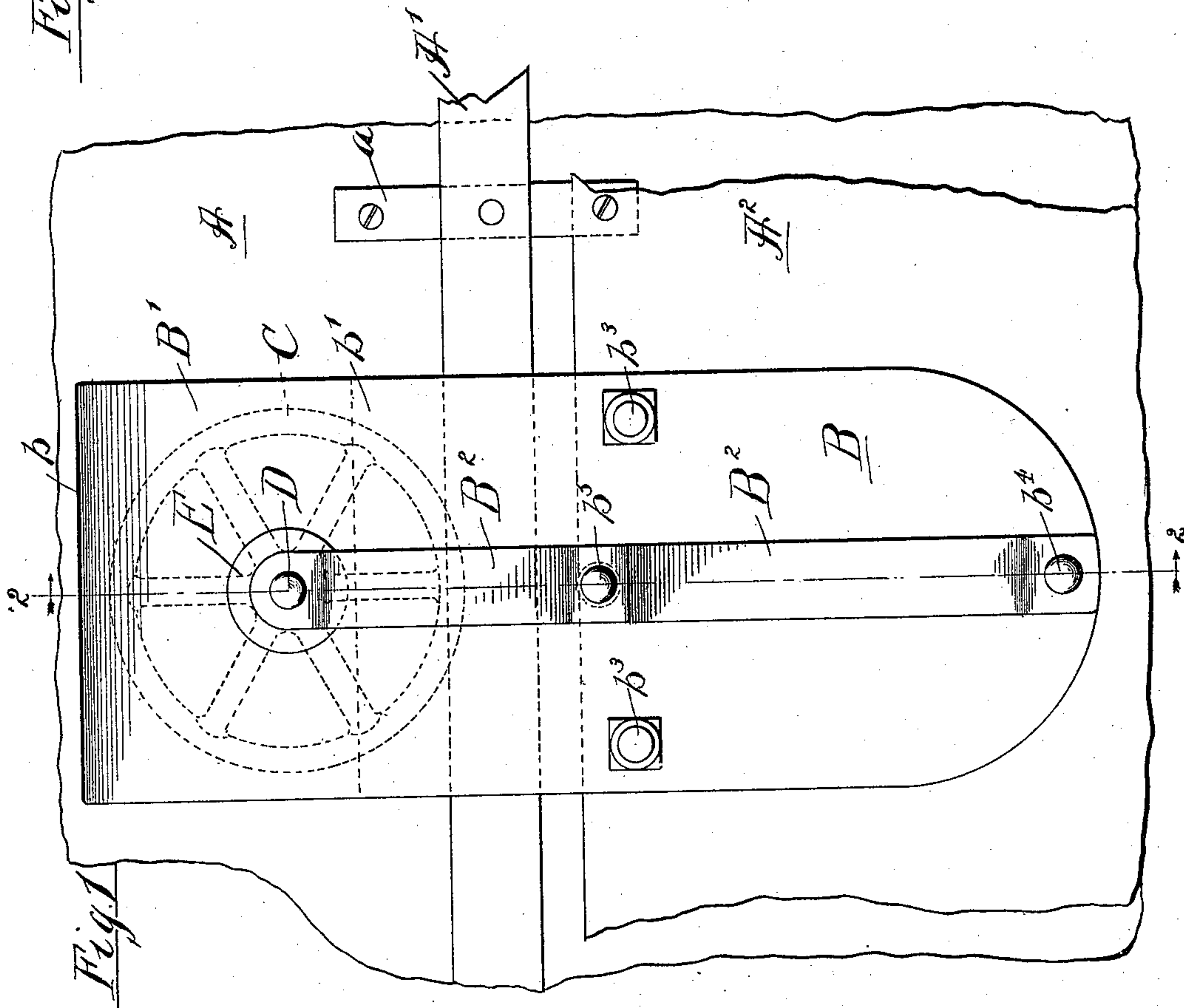


Fig. 1

Witnesses

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John W. Adams.

Inventor

Henry L. Ferris

by Dayton, Pooler & Brown
his Attorneys

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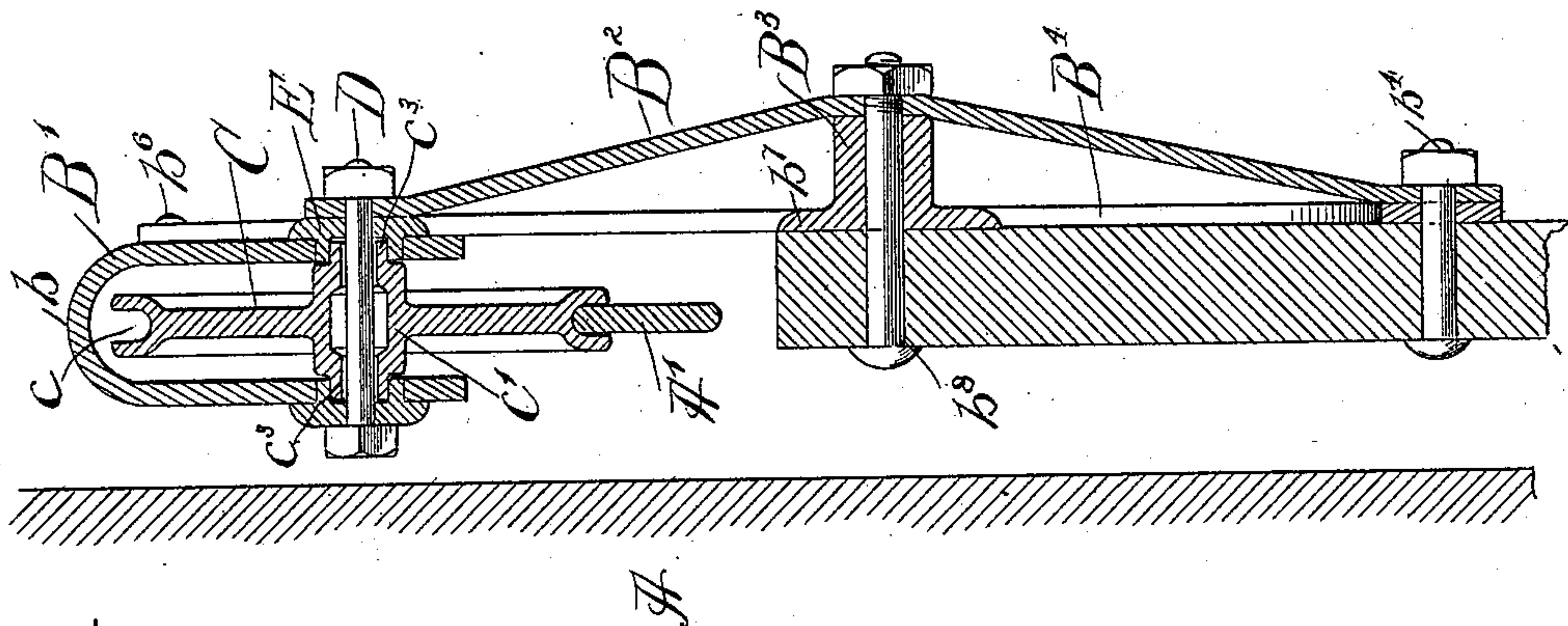


Fig. 4

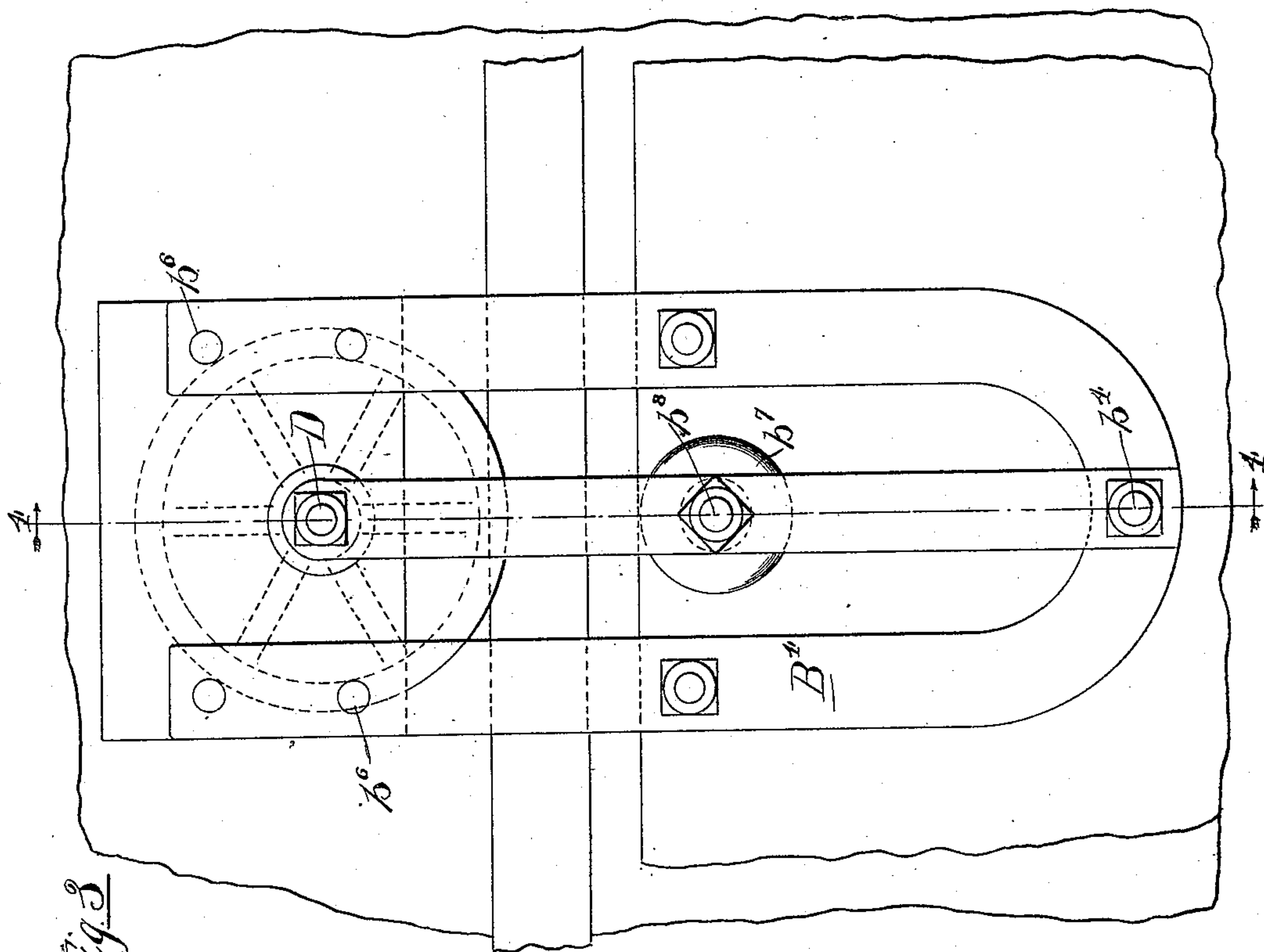


Fig. 3

Witnesses

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UNITED STATES PATENT OFFICE.

HENRY L. FERRIS, OF HARVARD, ILLINOIS, ASSIGNOR TO HUNT, HELM & FERRIS, OF SAME PLACE.

DOOR-HANGER.

SPECIFICATION forming part of Letters Patent No. 569,965, dated October 20, 1896.

Application filed January 20, 1896. Serial No. 576,098. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. FERRIS, of Harvard, in the county of McHenry and State of Illinois; have invented certain new and useful Improvements in Door-Hangers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in door-hangers, and more particularly to that class of door-hangers comprising a revoluble wheel mounted in a strap or frame, the latter to be secured to a door, the frame having an overturned portion or housing adapted to protect the wheel from the weather, and in which the wheel is supported upon a track or rail suitably secured to the building.

The improvements more particularly relate to a method of securing the wheel and its frame to the door and prevent a buckling of the frame, and also means for securing the wheel within the housing and to the frame in a manner that will greatly reduce friction, obviate the necessity of oiling, and secure an easy movement without the liability of creaking.

Devices of the character referred to must be strong and durable to withstand the severe usages to which they are put, usually upon barn, stable, or other heavy sliding doors, and must also be of cheap construction. It is found in practice that inasmuch as the frame which connects the door with the bearing-wheel is one side of the line of draft, which passes through the bearing-wheel, and the supporting-track, over which the wheel runs, the said frame has a tendency to and does, in fact, bend and buckle at a point slightly above the door, which, in addition to other inconveniences, causes the door to swing away from the building and not close properly. This difficulty I overcome by so constructing the frame as to embody with it a strap arranged in the form of a truss, one end of which truss is secured to the frame and the door and the other end of which is secured to the upper portion of the frame at a point above the door and opposite the roller or wheel-bearing, while the central portion of

said strap or truss is properly supported at or near the upper margin of the door. I find this expedient not only corrects the fault above indicated heretofore existing in barn-door hangers, but possesses other advantages.

Heretofore it has been customary to mount the bearing-wheel upon a short shaft or spindle and to provide suitable bearings in the frame or housing within which the ends of said shaft may rotate, and it has also been the practice in some of the cheaper forms of hangers to mount the shaft or spindle non-rotatively in the housing or frame and to permit the wheel to revolve over it. In both of these constructions considerable friction is developed, and, moreover, the parts speedily wear out, unless a specially-prepared shaft or spindle is provided having accurately-fitting journal-bearings. Such latter construction is, however, undesirable because of the expense. To lessen the friction at this point I have provided apertures in the housing, and have partially filled each of said apertures with a flanged thimble. The hub of the wheel is provided with a relatively large opening. A common bolt is then passed through the flanged thimbles and through the opening in the hub of the wheel, and by placing a nut on the bolt the parts will be firmly secured together. In this construction the hub of the wheel has no interior bearing upon the bolt, which does not have the function of an axle or spindle, but solely that of a tie-bolt. The outer ends of the wheel-hubs are slightly reduced in diameter, first, to form the shoulders against which the frame or housing may be drawn by the said tie-bolt, and, secondly, to form journals which rest within suitable bearings within the said flanged thimbles. As a special improvement I enlarge the aperture or journals in the flanged thimbles, so as to afford a space between the journals and the ends of the hubs that shall constitute a runway or race for antifriction-balls, which when used reduce the friction to a minimum.

The invention will be more fully understood by reference to the accompanying drawings, in connection with the description and the subjoined claims.

In the drawings, Figure 1 represents in a side view a portion of a door with my im-

proved hanger attached in position upon a rail. Fig. 2 is a central vertical section of the same, taken on the line 2 2 of Fig. 1, and looking in the direction indicated by the arrows. Fig. 3 is a view similar to that of Fig. 1, illustrating a modified form of the frame. Fig. 4 is a vertical sectional view taken on the line 4 4 of Fig. 3 and looking in the direction indicated by the arrows.

In said drawings, A represents the side of any suitable building, to which a track A' is secured by means of any suitable bracket-support a.

A² indicates a door. The frame consists of a plate B of suitable length and width bent upon itself at b, so as to form at its upper end a suitable housing B' with two sides b' b², between which the wheel C is mounted. The plate B may be secured at convenient points to the door A² by means of bolts b³ or otherwise.

D is a tie-bolt, rivet, or the like adapted to secure the wheel C in position in the housing B', and B² is a strap suitably bent in its middle portion and secured to the plate B at its lower end by a rivet b⁴ or otherwise and secured at its upper end by the same bolt or rivet D that secures the other parts together. A thimble or spreader-block B³ rests upon the plate B and the strap B², and a bolt or rivet b⁵ passes through suitable apertures in the plate, spreader-block, and the strap and secures the same together in an obvious manner. It will thus be noticed that the strap B² with the spreader-block B³ forms a truss with the plate B and by greatly strengthening and stiffening the latter prevents all tendency to bending and buckling at any point above the upper margin of the door.

E is a suitable thimble or bearing of such diameter as to properly fit within apertures through the sides b' b² of the housing B', and are prevented from passing entirely through said apertures by reason of the flanges e thereon. Each thimble-bearing E has a central aperture e', adapted to receive the bolt or rivet D. The bearing-wheel C is of the usual construction, having a groove or face c, adapted to engage the upper edge of the track-rail A' and provided with suitable hubs c'. Openings c² are made through the hubs c' and are of greater diameter than the diameter of the bolt or rivet D, as clearly illustrated. The ends of the hubs c' are turned down or reduced in diameter for the purpose of forming journals c³, on which to support said wheels within said thimble-bearings E. The inner side of each thimble-bearing E is provided with an annular recess or opening e² of a size adapted to accommodate the said journals c³. In the form shown in Fig. 2 these apertures or journal-bearings e² are considerably larger in diameter than that of the journals or turned-down portions c³ of the hub, whereby a ball-race is afforded, within which antifriction-balls F may be placed. If the balls are not used, the hub-

journals c³ rest directly within the apertures or journal-bearings e² in the thimbles E, as shown in Fig. 4, but I prefer to use the antifriction ball-bearings illustrated in Fig. 2 as a construction in which the friction is reduced to a minimum.

Instead of the housing B' and the plate B being of one piece, as shown in Fig. 1, it is sometimes preferable to make the housing B', as shown in Figs. 3 and 4, of a separate piece. In this form of construction a U-shaped frame-plate B⁴ is suitably bolted to the door, with its ends, which project above the door, rigidly secured to the housing by rivets b⁶. In this form of frame it is preferable to provide the spreader-block B³ with an annular flange b⁷ and to extend the bolt or rivet b⁸, that secured the strap B² to the door at its center, not only through the spreader-block, but also through the upper portion of the door. This modified form of construction constitutes a very strong and substantial frame and will usually be used where the width of the plate B would otherwise exceed three or four inches.

Of course it is immaterial, so far as the truss is concerned, whether the ball-bearings are used or whether the wheel has journal-hubs which rest directly within the thimbles. It is equally unimportant to which form of frame the truss shall be applied, and I have therefore illustrated both forms in the drawings.

The invention is neat, simple, and durable and has no complicated parts to get out of order, is easily assembled without the aid of skilled labor, and relatively cheap in construction.

What I claim, and desire to secure by Letters Patent, is as follows:

1. A door-hanger comprising a bearing-wheel and frame adapted to be secured to the door, projecting above the latter and provided with a suitable housing for said wheel of a strap secured at its lower end to the frame, a spreader interposed between the upper portion of the door and the central portion of said strap and means for securing the strap at said central portion, the upper end of the strap extending to or near the housing, and a tie-bolt for securing the sides of the housing against lateral spread and at the same time locking the wheel in position and securing the upper end of said tie-bolt, substantially as and for the purpose specified.

2. A door-hanger comprising a frame provided at its upper end with a housing and adapted to be secured at its lower end to a door, an aperture in each side of said housing, flanged thimbles, the reduced portions of which fit in said apertures, apertures extending through each of said thimbles constituting journal-bearings, a wheel, the hubs of which are suitably journaled within said thimbles, a centrally-enlarged opening extending through both hubs, a tie-bolt extending through the thimbles and through said central opening without being in contact with

the latter, and means for securing said tie-bolt ends upon the outside of said thimbles, substantially as described.

5 3. A door-hanger comprising a frame adapted to be secured at one end to a door and having at its opposite end a housing, apertures through the sides of said housing, flanged journal-bearings in said apertures, antifric-
10 tion-rollers in said bearings, a supporting-wheel mounted in the said housing between the sides thereof, provided with bearing-surfaces constituting journals supported directly

and only upon said antifriction-rollers, and a single tie-bolt passing centrally through said wheel and through the housing for securing the same together, substantially as described. 15

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 4th day of January, A. D. 1896.

HENRY L. FERRIS.

Witnesses:

J. L. KINSON,
E. B. HUNT.