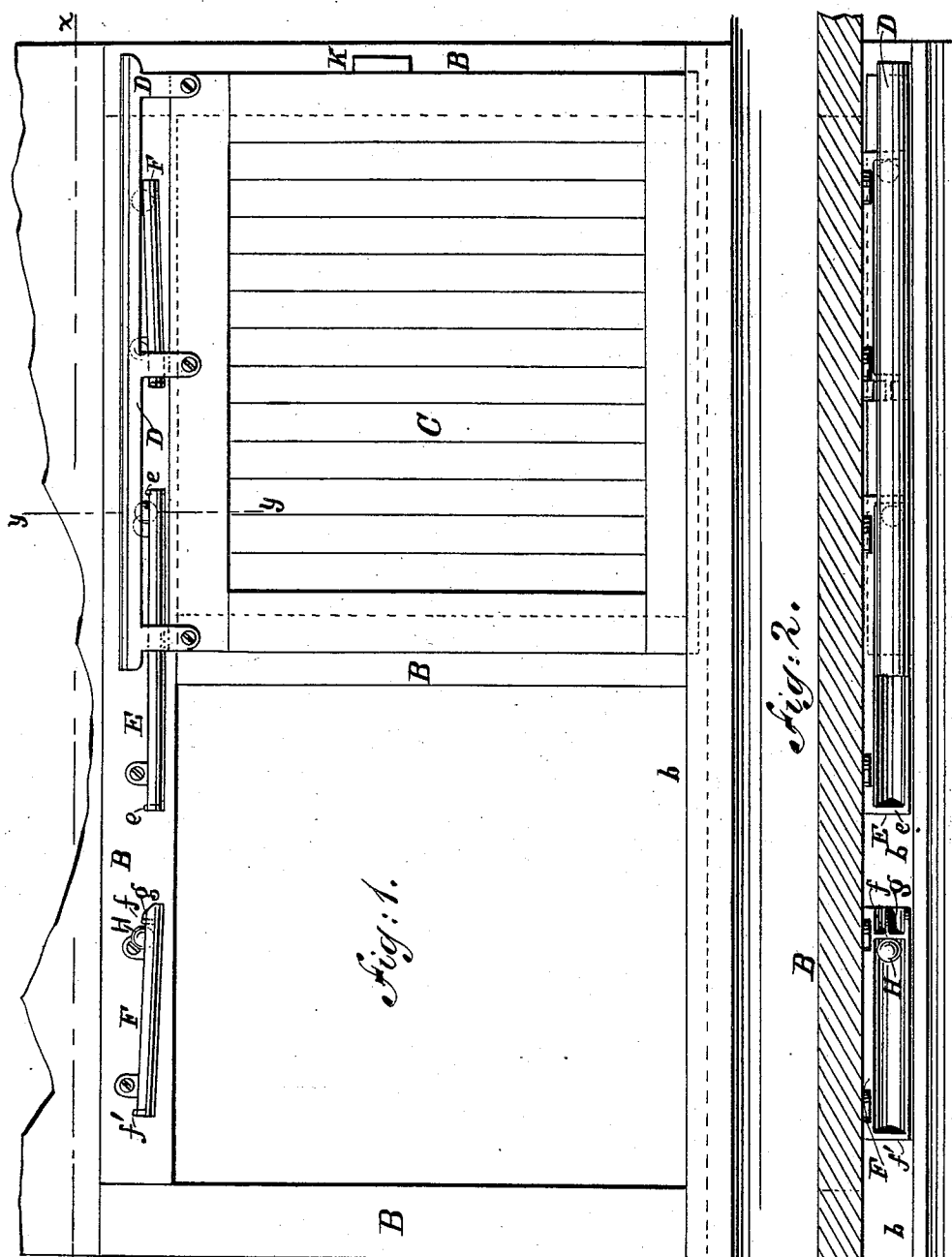


(No Model.)

F. C. HAMMOND.
DOOR HANGER.

No. 469,043.

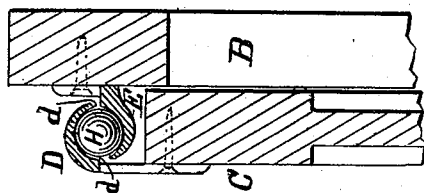
Patented Feb. 16, 1892.



WITNESSES:

Chas. Nida.
Harold Binney

Fig. 3.



INVENTOR:

Fred C. Hammond

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UNITED STATES PATENT OFFICE.

FRED C. HAMMOND, OF SPRINGFIELD, VERMONT.

DOOR-HANGER.

SPECIFICATION forming part of Letters Patent No. 469,043, dated February 16, 1892.

Application filed December 31, 1890. Serial No. 376,335. (No model.)

To all whom it may concern:

Be it known that I, FRED C. HAMMOND, a citizen of the United States, and a resident of Springfield, Windsor county, and State of Vermont, have invented a new and useful Improvement in Door-Hangers, of which the following is a description.

My invention relates, particularly, to inside overhead hangers adapted to be used on the doors of stables, store-houses, and other buildings; and it consists in the improvements hereinafter described, illustrated, and claimed reference being had to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is an elevation of my invention as applied to one form of door. Fig. 2 is a plan of the same, the wall of the building being shown in section on the line *xx* in Fig. 1. Fig. 3 is a cross-sectional view taken on the line *yy* in Fig. 1.

Like reference-letters indicate like parts in the several views.

In my improved hanger the friction resulting from the use of wheels or sliding bearings is quite done away with by the use of roller-balls rolling on suitable guideways, and only the friction due to rolling contact is present.

In Fig. 1 my device is shown applied to a stable-door. At B is shown the frame-work of the doorway. C is the door, and D the movable hanger carried by the upper end of the door. This movable hanger is preferably made, as shown in the three figures, of a single casting provided with a continuous semi-tubular channel or guideway *d*. The center of the way *d* should correspond with the center of the door.

Upon the frame of the doorway is carried the fixed casting E, provided with a similar and opposing tubular channel of length preferably equal to one-half the length of travel of the door plus the diameter of the roller-ball to be used. This casting E is placed in such position that when the door is at the middle of its path of travel the center of the casting E corresponds with the center of the casting D and is at such height that when the ball is interposed between the guideways the foot of the door will be at proper position relatively to the floor. At each end of the fixed hanger

E are stops *e*, which prevent the ball from rolling out of the guideway.

Near each end of the path of travel and in line with the fixed hanger E is placed a similar hanger F, of length preferably equal to one-quarter the travel of the door plus the diameter of the ball to be used and provided with stops *f f'*. The stop *f* at the end toward hanger E is of a height nearly equal to the diameter of the ball and is provided with the flange *g*, which serves to insure the proper guidance of the end of the movable hanger D onto the ball carried in the guideway of hanger F. The end of the hanger F farthest removed from the central hanger E is slightly raised to prevent the ball from rolling away from the stop *f*. The hangers *f* are placed at such distance from the hanger E that when the door is at the center of its path of travel both ends of the guideway *d* rest upon the balls in the lower ends of the fixed hangers F.

The balls are shown in the drawings at H, and the door is at the extreme right-hand limit of its travel, resting against the stop K. In this position it hangs upon the balls in the center and right-hand stationary hangers. At this position also the balls are at the extreme right-hand limit of their travel. When, however, the door is moved to the left, the two balls will move at half the velocity of the door until the door reaches its middle position. At this point the right-hand ball will obviously have reached the stop *f* in its pathway, while the ball in the central hanger E will be at its center. At this point the hanger D passes away from the right-hand ball and onto the ball in the left-hand hanger F, which is then in turn carried by the motion of the door to the extreme outer limit of its motion, which it reaches when the door reaches the left-hand limit of its travel. From this it will be seen that the door always hangs upon two of the balls H.

While I have shown a pathway in each instance of semi-tubular form and of radius somewhat greater than that of the balls, I do not limit myself to pathways of such form, but include by the term "semi-tubular" all pathways having bearing-surfaces with suitable side guides.

I am aware that attempts have been made to utilize roller-balls in door-hangers having bearing-surfaces without any side guides. Such construction, however, necessitated outside guides for the upper end of the door, and the latter, besides being cumbersome, prevented the ready removal of the door. My invention completely obviates these difficulties and at the same time does away with the friction attendant thereon and locks the door in position on its track, making it almost impossible to displace it. Moreover, at the wide-open or shut position the door will hang on two balls equidistant from its center. This balancing of the door greatly tends to preserve the door from warping or otherwise getting out of shape.

Having now completely described one form of my invention and how the same is constructed and operated, I claim as new and desire to secure by Letters Patent of the United States the following:

1. In combination with a door and doorway, a stationary hanger of length substantially equal to one-half the travel of the door, one or more stationary hangers of length substantially equal to one-quarter of the travel of the door, roller-balls for the said stationary hangers, end stops at or near the ends of the said stationary hangers, and a movable hanger on the said door provided with a continuous co-operating way for the said balls, substantially as set forth.

2. In combination with the other operating parts of a complete door-hanging device, the door and doorway, a stationary casting or hanger provided with a semi-tubular bearing-surface substantially equal in length to one-

half the travel of the door while in contact with the roller-ball in that hanger, a roller-ball therefor, and a hanger carried on the said door provided with a continuous bearing-surface for said balls, substantially as set forth.

3. In combination with a door and doorway, a hanger carried by the door and provided with a continuous bearing-surface and side guides, stationary hangers carried by the frame of the doorway and provided with opposing bearing-surfaces, side guides, and end stops, roller-balls carried in the said stationary hangers, and guides *g* for the ends of the first-named hanger, placed on one or more of the said stationary hangers, substantially as set forth.

4. In combination with a door and doorway, a central hanger provided with a bearing-surface terminating in stops and of length approximately equal to one-half of the travel of the door, a similar hanger at each side of the said central hanger and in line therewith, of length approximately equal to one-quarter of the travel of the door and provided with end stops and a guide *g*, roller-balls placed one in each of the said hangers, and a co-operating hanger provided with an opposing bearing-surface for the said balls and of length substantially equal to the travel of the door, substantially as and for the purposes set forth.

In testimony whereof I have set my hand this 24th day of December, 1890.

FRED C. HAMMOND.

Witnesses:

E. F. DANA,

ALICE M. WHEELER.