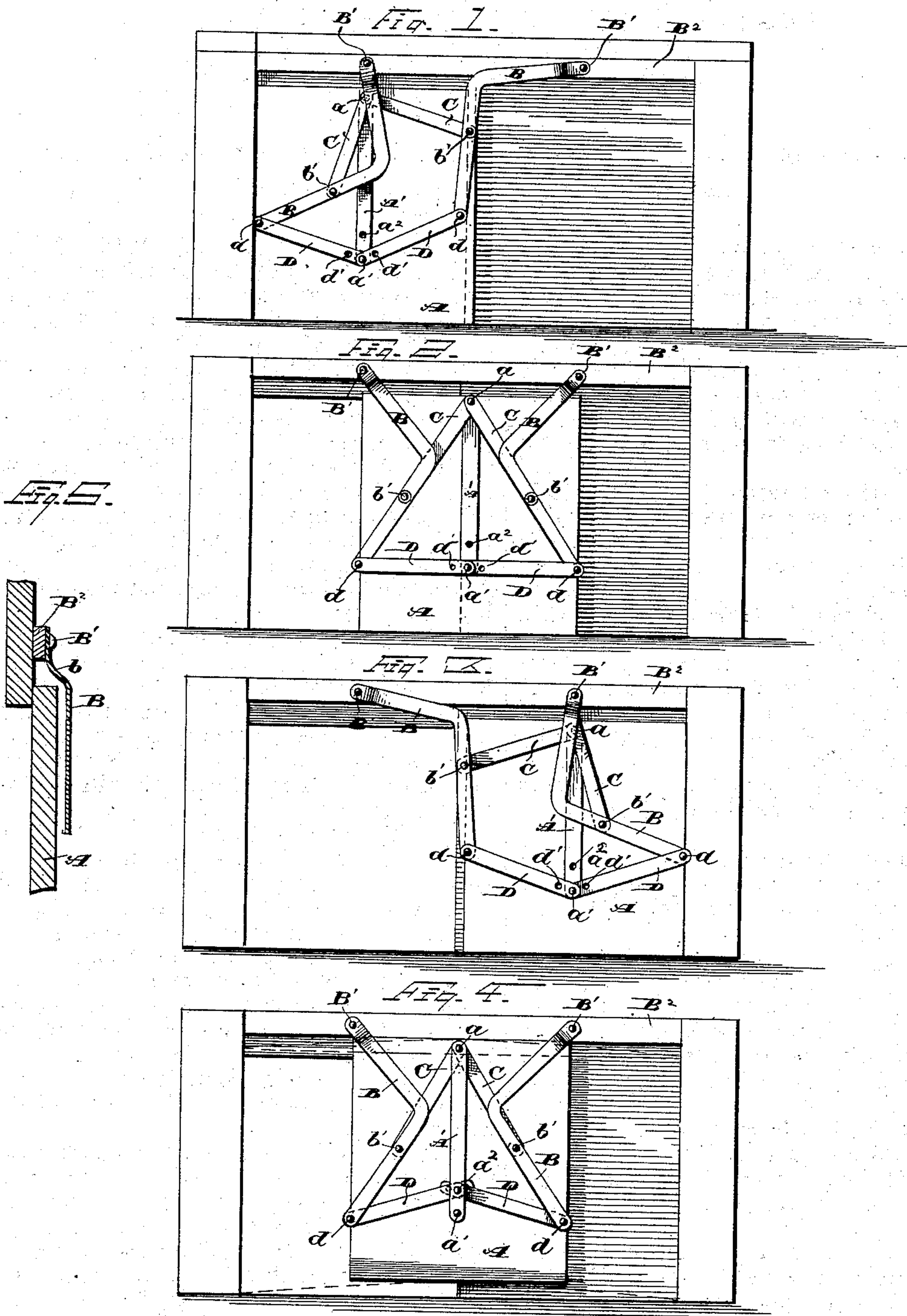


(No Model.)

C. C. RUNYAN.
SLIDING DOOR HANGER.

No. 331,258.

Patented Nov. 24, 1885.



WITNESSES

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CHARLES C. RUNYAN, OF MANSFIELD, OHIO.

SLIDING-DOOR HANGER.

SPECIFICATION forming part of Letters Patent No. 331,253, dated November 24, 1885.

Application filed October 13, 1885. Serial No. 179,791. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. RUNYAN, of Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Sliding-Door Hangers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in sliding-door hangers; and it consists in certain features of construction and in combination of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a door and hangers embodying my invention, showing the door in its closed position. Fig. 2 shows the door and hangers in position with the door midway of its throw. Fig. 3 shows the door open. Fig. 4 shows an adjustment of the hangers by means of which the door is elevated as it moves toward the center of its throw. Fig. 5 is an end view.

A represents the door, and A' a metal bar that is secured in a vertical position to the central part of the door, and to which the hangers are pivoted.

B are supporting-levers of the bell-crank variety, that are pivoted, respectively, at B' to the casing B² above the door. These two pivotal points B' should be located about in vertical line with the respective edges of the door when the latter is midway of its throw. (See Figs. 2 and 4.)

To make the door balance properly, the casing B² should project laterally about half the thickness of the door, and the upper ends of the levers B at b are offset accordingly, as shown in Fig. 5.

C are the carrying-bars that support the door and are pivoted at a to the bar A', and are respectively pivoted at b' to the levers B.

D are links that are respectively pivoted at d to the lower end of the levers B, and are pivoted on a stud or bolt to the bar A', either at a' or a². If the door is to move on a straight line, the pivotal point is a', and when the door is in position midway of its throw should be located so as to be approximately in line with

the points d. (See Fig. 2.) With this arrangement of parts the door will move substantially in a straight line. A hole, a², in the bar A' and holes d' in the links D are made to fit the pivotal stud or bolt.

If it is desired to have the door rise as it moves toward the center of the throw, the links are drawn together far enough to place the stud in the holes d' of the links, and in the hole a² of the bar A'. With this adjustment the door will move as indicated by the curved dotted lines shown above and below in Fig. 4, while the straight dotted lines above in this figure indicate the movement of the door when the links are adjusted as shown in Figs. 1, 2, and 3.

By referring to Fig. 2 it will be seen that in drawing the lower end of the levers B toward each other, to place the stud in the holes d' and a², the pivotal points b' are raised, which will of course raise the door, and also the carrying-bars C are brought to a more acute angle with each other, which will still further elevate the door.

Now, by referring to Figs. 1 and 3, it will be seen that the distances d d' and a a² being equal, the stud may be placed in the holes d' a² without changing the position of the levers B, and consequently the door at either termini would not be effected by the change of the stud and consequent shortening of the links. We have, then, with either adjustment shown the door at its termini in the same position, but in the one case moving in a straight line and in the other case moving in a curved line, the highest part of which is at the center of the throw.

The latter adjustment is desirable when the door is hung so that in its closed position it hugs the floor closely, as with such adjustment the door will ride over dirt and other obstructions. It will be observed that there are no sliding parts, but that the joints are all pivotal, whereby the wear and friction are reduced to a minimum. By means of the bell-crank form given to the levers B the latter do not protrude beyond the edges of the door.

With the adjustment shown in Figs. 1, 2, and 3, when the door is at either extreme of its throw it is supported by one lever, B, the supporting-pivot of such lever being directly

over the center of the door. In such position of parts the bars C and links D serve more or less in the capacity of braces and tie-rods to hold the different parts in their proper relative position; but the weight of the door is sustained by the pivot B', that is above the center of the door, and consequently the door will stand in such position without fastening.

In the central position (shown in Figs. 2 and 4) the center of gravity of the door being midway between the pivotal points B', and the levers B standing at equal angles to a perpendicular line, the door of course will stand without fastening. At other points along the route of the door the levers B assume, respectively, positions at angles to a perpendicular, greater or less inversely in proportion to the load that the respective levers carry.

As a lever B swings farther away from the perpendicular its load decreases just in proportion as the other lever approaching the perpendicular assumes the load, by reason of which the door will stand without fastening at any point along its route.

With the adjustment shown in Fig. 4 there is a slight tendency of the door, when not directly at the center of its throw, to move toward the nearest terminal point. The down grade from the center in either direction is so slight that the gravity of the door will not usually overcome the slight friction of the joints; but it is noticeable that the door moves easier from than toward the center.

A continuous bar, A', is not essential, but is more convenient in attaching the hangers to the door. Otherwise two plates, representing the ends of the bar A', would answer the purpose.

Another adjustment might be made (but I do not see that there would be any call for it) in which, by lowering the stud that connects the links with the bar A' to a point below a' and lengthening the links to correspond, the door could be made to move in a line curving downward. Although I have shown this device in connection with a door, it is equally applicable to shutters, gates, and other similar structures. I therefore do not wish to be understood as restricting my invention to doors, but claim it for all purposes to which it is adaptable.

I will further add in the way of suggestions for making these hangers, taking the door in its central position, as shown in Fig. 2, for an illustration, as follows, to wit: Make the pivotal points a & d equidistant, so that lines

connecting these points would form an equilateral triangle. For locating the pivotal points b' and a' , subdivide, respectively, the sides and base of the triangle. I would then have the links D equal in length with the bars C. This arrangement will give satisfactory results. What possible changes in the location of these pivotal points might be made without interfering with the perfect working of the door I have not had time to consider.

What I claim is—

1. In sliding-door hangers, the combination, with swinging levers pivoted above the line of the door, of links pivoted to the bottom of the levers and carrying bars pivoted to the levers at or near the central point of the latter, said links and bars being pivoted in pairs to the door or door attachment on the central vertical line of the door, substantially as set forth.

2. In sliding-door hangers, the combination, with swinging levers pivoted above the line of the door and offset near the top end of the same to balance the door, of the carrying-bars C and links D, the said links and bars being pivoted to the levers and to the door, substantially as set forth.

3. In sliding-door hangers, the combination, with swinging levers pivoted above the line of the door, said pivotal points being separated a distance about equal to the width of the door, and arranged substantially as described, whereby the levers are pivoted above the center of the door in the open or closed position of the latter, of the links D and carrying-bars C, substantially as set forth.

4. In sliding-door hangers, the combination, with the levers B, carrying-bars C, and links D, the parts being arranged substantially as described, of devices, substantially as indicated, for adjusting the said links, by means of which the door may be made to move in a straight or in a curved line.

5. In sliding-door hangers, the combination, with swinging levers of the bell-crank variety pivoted above the line of the door and arranged in reverse order, of the bars C and links D, the parts being arranged and operated substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 3d day of October, 1885.

CHARLES C. RUNYAN:

Witnesses:

J. S. FARMER,
W. W. SMITH.