(No Model.) 2 Sheets—Sheet 1.

J. A. HESS.

DOOR OPERATOR AND SUPPORTER.

No. 485,934. Patented Nov. 8, 1892.

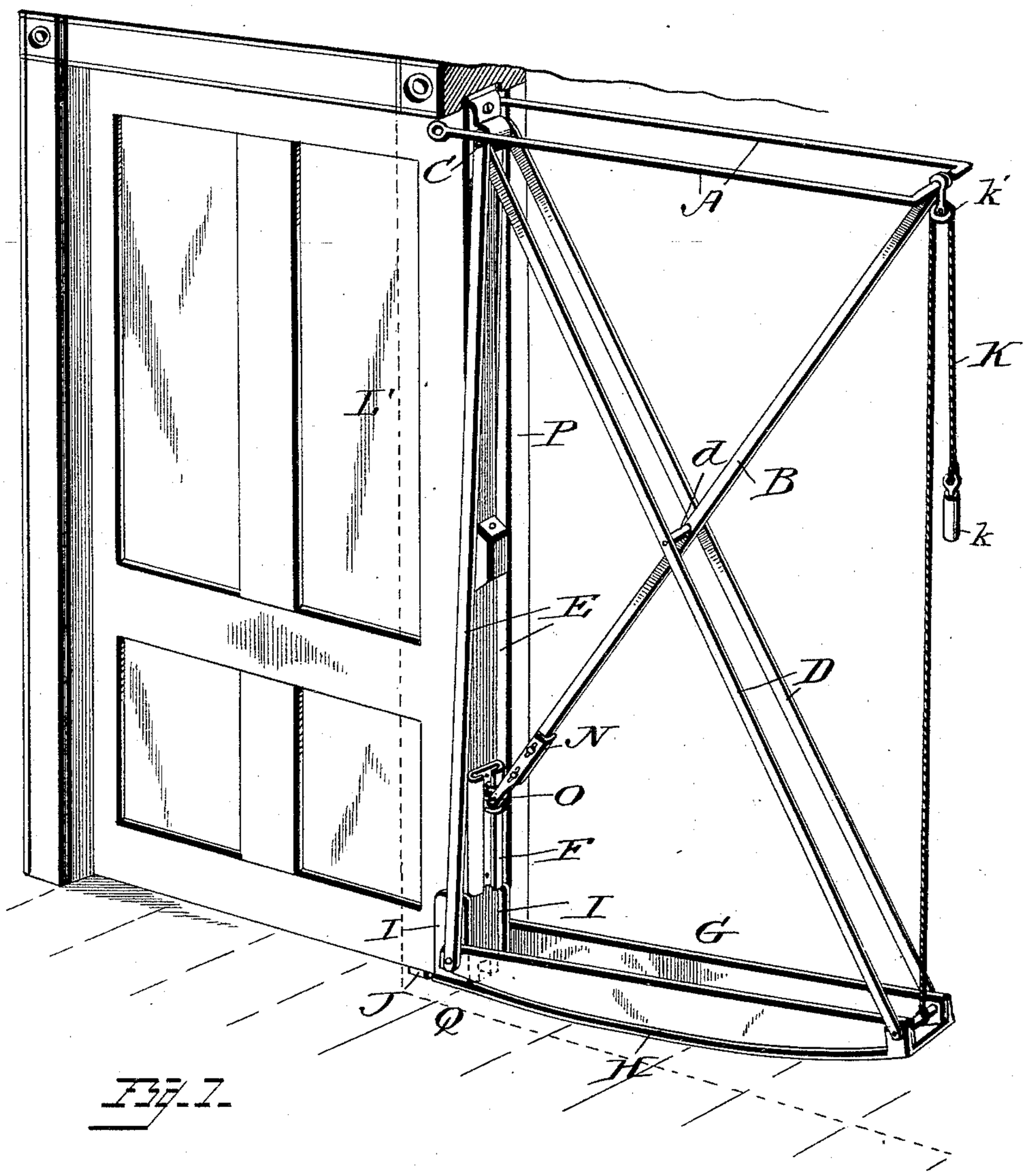

FIG. 1.

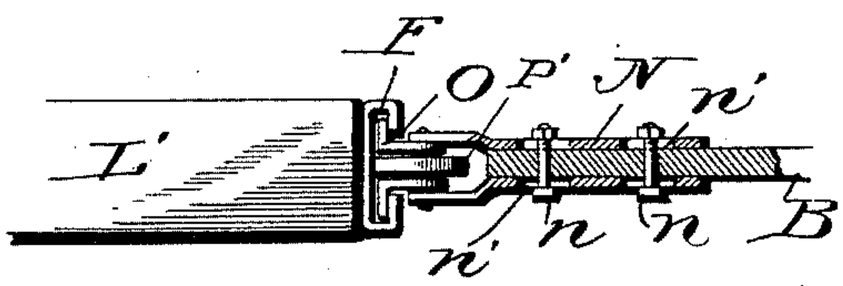

FIG. 3.

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Van Buren Hillyard.

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John A. Hess.

By his Attorneys
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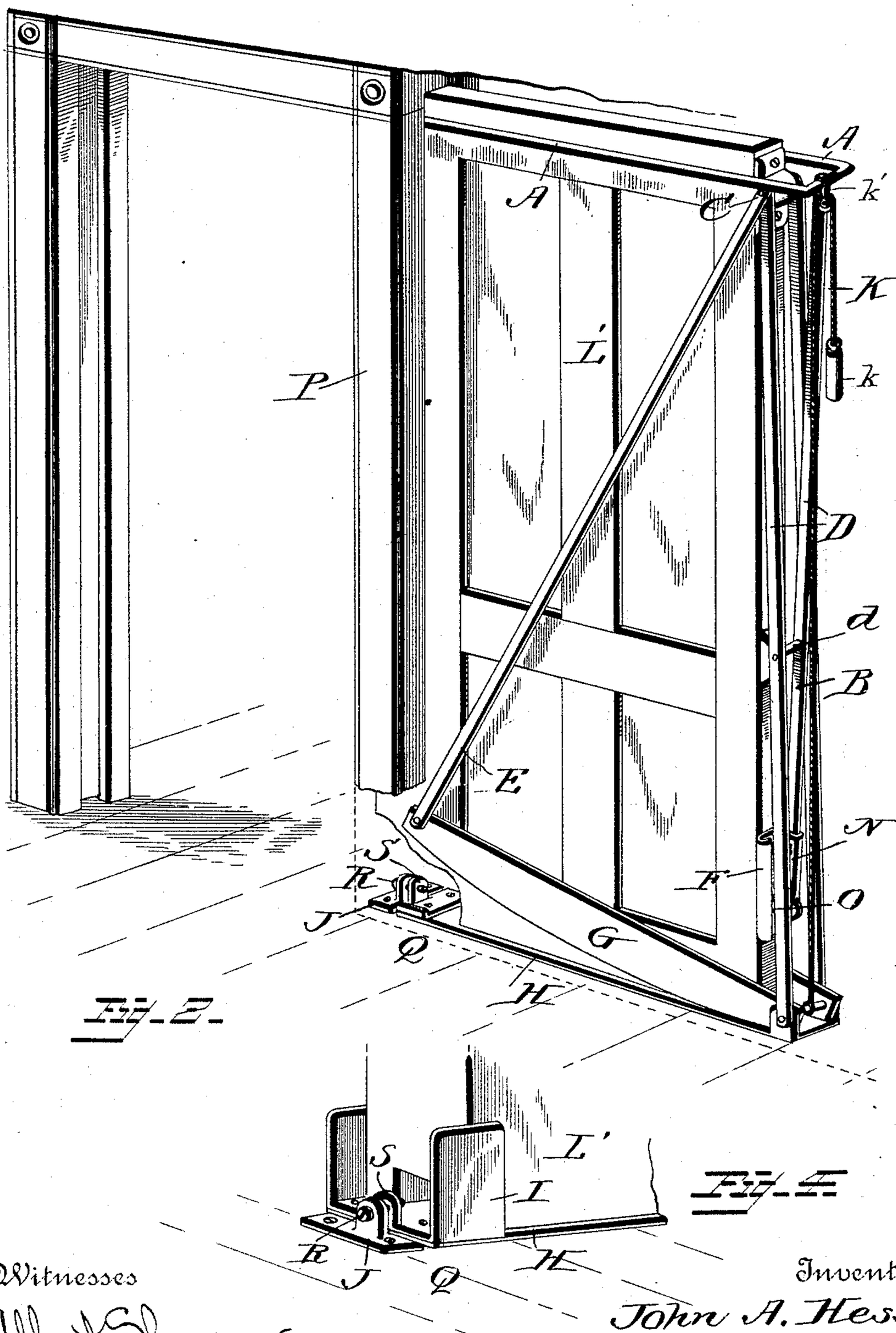

Fig. 2.

Fig. 1.

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UNITED STATES PATENT OFFICE.

JOHN A. HESS, OF BENTON HARBOR, MICHIGAN.

DOOR OPERATOR AND SUPPORTER.

SPECIFICATION forming part of Letters Patent No. 485,934, dated November 8, 1892.

Application filed November 10, 1891. Serial No. 411,509. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. HESS, a citizen of the United States, residing at Benton Harbor, in the county of Berrien and State of Michigan, have invented certain new and useful Improvements in Door Operators and Supporters; 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 appertains to make and use the same.

This invention relates to door operators and supporters, and aims to provide simple and efficient means for mounting sliding doors in relation to the tracks and which will admit of convenient manipulation in the opening and closing of the said doors.

The improvement consists of the novel features and the peculiar construction and combination of the parts, which will be hereinafter more fully described and claimed, and which are shown in the annexed drawings, in which—

Figure 1 is a perspective view showing the relative disposition of the lever when the door is closed. Fig. 2 is a perspective view showing the relative disposition of the parts when the door is opened, parts being broken away. Fig. 3 is a detail view of the guide, which is attached to the lower edge of the door, the slide working in connection therewith, and the adjustable connection between the said slide and the lever, which is connected directly therewith. Fig. 4 is a detail view of the guide, which protects the rocker from injurious contact with the sides of the door, also showing the mechanism for adjustably connecting the said guide with the floor or other support.

The door L′ is of ordinary construction and is adapted to slide in the pocket formed by the posts P in the usual manner. The bars A, located at the upper end of the said pocket and extending in an approximately-horizontal plane, are secured at their front end to the posts P, located at the entrance therein of the said pockets, and are connected together at their inner or rear ends, which ends have pivotal connection with the upper end of the lever B, which is provided at its lower end with the slide O. The coupling N, having the slide O at its lower end, is adjustably connected with the lower end of the lever B, preferably by fastenings *n*, which pass through said lever B and slots *n′* in the said coupling N. The guide F, secured to the rear edge of the door near the lower end thereof, receives the slide O and guides the same in its vertical movements. The slide O and guide F are so constructed as to mutually interlock and prevent lateral displacement of the said slide without interfering with the free vertical movement of the same. The roller P′, journaled in the slide O, travels on the guide F and relieves the friction thereon. The rocker G is composed of two members, between which the door L′ travels when opened and closed. The vertical bars E are connected at their lower ends with the front ends of the rocker G and at their upper ends with the rear portion of the door L′ near the upper ends thereof, preferably by having pivotal connection with the block C, which is secured to the rear edge of the said door. The parallel bars composing lever D cross the lever B midway of their ends and are pivotally connected at their lower ends with the rear ends of the rocker G and are pivotally connected at their upper ends with the rods E, preferably by the same fastenings which connect the said rods E with the block C. The levers B and D are pivotally connected together at their point of crossing, as shown at *d*. The flexible strip H, which is connected at its inner or rear end with the inner end of rocker G, is adjustably connected at its front end with the floor or support Q to permit of the plumbing of the door by adjusting the rocker G in the pocket. It will be seen that the adjustment of the said rocker G will effect a movement of the lower end of lever D and cause the same to tilt on the pivot *d* and move the upper end of the door to or from the perpendicular in the proper direction. The stop J, secured to the floor or support Q, receives the set-screw R, which is provided to pass through the vertical extension S, which is provided at the front end of the flexible strip H. The extension S is provided with a threaded opening to receive the threaded end of the set-screw R. By means of the set-screw R and the extension S the rocker G is adjusted within the pocket to plumb the door in the manner aforesaid. The lower end of the door is longitudi-

nally grooved to receive the stop J and extension S, which work therein and guide the door when opening and closing.

It will be observed that the inner end of the bars A are free, and to facilitate the operation of the door it is weighted, as shown. The weight *k* is attached to the end of cord K, which passes up over pulley *k'* at the rear end of the bars A, thence down, being secured at its lower end to the rear end of rocker G. The flexible strip H forms a track for the rocker to rest and rock upon and takes up wear. On opening and closing the door the rocker G rocks upon its lower curved end and the slide O moves on the guide F, the latter, in connection with the bars A and the flexible strip H, serving to hold the parts in a fixed relative position. To prevent injurious contact of the members of the rocker G with the sides of the door, the vertical guide I is provided and located between the posts P at the entrance end of the pockets. This guide is approximately of an inverted-U shape, the vertical members being parallel with the posts P and leaving a space between the said posts and their opposing sides to permit a free movement of the rocker G.

It will be seen that any upward force applied to the rear or lower end of the lever D will facilitate the closing of the door when the latter is open and will have a tendency to hold the said door in a closed position. By having the rear ends of the bars A connected with the door by means of the lever B and the latter having pivotal connection with lever D any downward pressure on the outer ends of said bars A will materially assist in closing the door when open. The levers B and D, as shown, form in effect lazy-tongs. Obviously by pressing the rear or free ends of the said levers together the door can be the more easily closed. The weight *k* is not heavy enough to close the door by itself, but is of sufficient mass to assist in the closing of the door.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the sliding door, of the rocker G, the rods E, and the lever D, connected at their lower ends with the opposite ends of the said rocker and having pivotal connection at their upper ends with the upper end of the door, and the lever B, crossing the lever D and pivotally connected therewith at the point of crossing and having an adjustable connection at its lower end with the said door, pivotally supported at its upper end, substantially as and for the purpose set forth.

2. The combination, with a sliding door, of the rocker G, the rods E, and the lever D, connected at their lower ends with the opposite ends of the said rocker and having pivotal connection at their upper ends with the upper end of the door, the lever B, crossing the lever D and pivotally connected therewith at the point of crossing and having a pivotal connection at its upper end with a suitable support, a mutually-interlocking slide and guide secured to the lower end of the lever B and the lower portion of the said door, and means for adjusting the said rocker within the pocket, substantially as and for the purpose set forth.

3. In a sliding door, the combination, with a rocker G and connections between the rocker and door, of a flexible strip connected at its inner end with the inner end of the said rocker and constructed to form a track and wear-plate for the said rocker, and provisions for moving the said strip within the pocket, substantially as and for purpose set forth.

4. In a sliding door, the combination, with the rocker and suitable connections between the said rocker and door, of a guide, as I, located at the entrance end of the pocket and constructed to prevent injurious contact of the said rocker with the sides of the door, substantially as set forth.

5. The combination, with a sliding door, of a rocker G, the bar E, and lever D, the lever B, pivotally connected between its ends with the lever D, the guide and slide forming a connection between the lower end of the lever B and the said door, the bars A, connected at their front ends with the posts at the entrance end of the pocket and having pivotal connection at their rear end with the upper end of the lever B, and the weight *k*, connected with the rear ends of the said bars A, substantially as and for the purpose hereinbefore set forth.

6. The combination of a sliding door, the rocker G, the bars E, and the lever D, connected at their lower ends with the opposite ends of the said rocker and having pivotal connection at their upper ends with the upper portion of the door, the lever D, pivotally connected between its ends with the lever B, the mutually-interlocking slide and guide connecting the lower end of lever B with the lower portion of the door, the bars A, connected at their rear ends with the upper ends of the lever D and having pivotal connection at their front end with the post at the entrance of the door-pocket, a weight on the rear ends of the bars A, the flexible strip H, connected at its inner end with the rear end of the rocker, the threaded extension S at the front end of the said strip H, the stop J, the set-screw, and the guide I, arranged and operating substantially in the manner hereinbefore specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN A. HESS.

Witnesses:

CHAS. E. BOWMAN,

D. R. MCCLURE.