

(No Model.)

3 Sheets—Sheet 1.

H. HINCKLEY.

HANGER FOR DOORS AND BLINDS.

No. 353,788.

Patented Dec. 7, 1886.

Fig. 1.

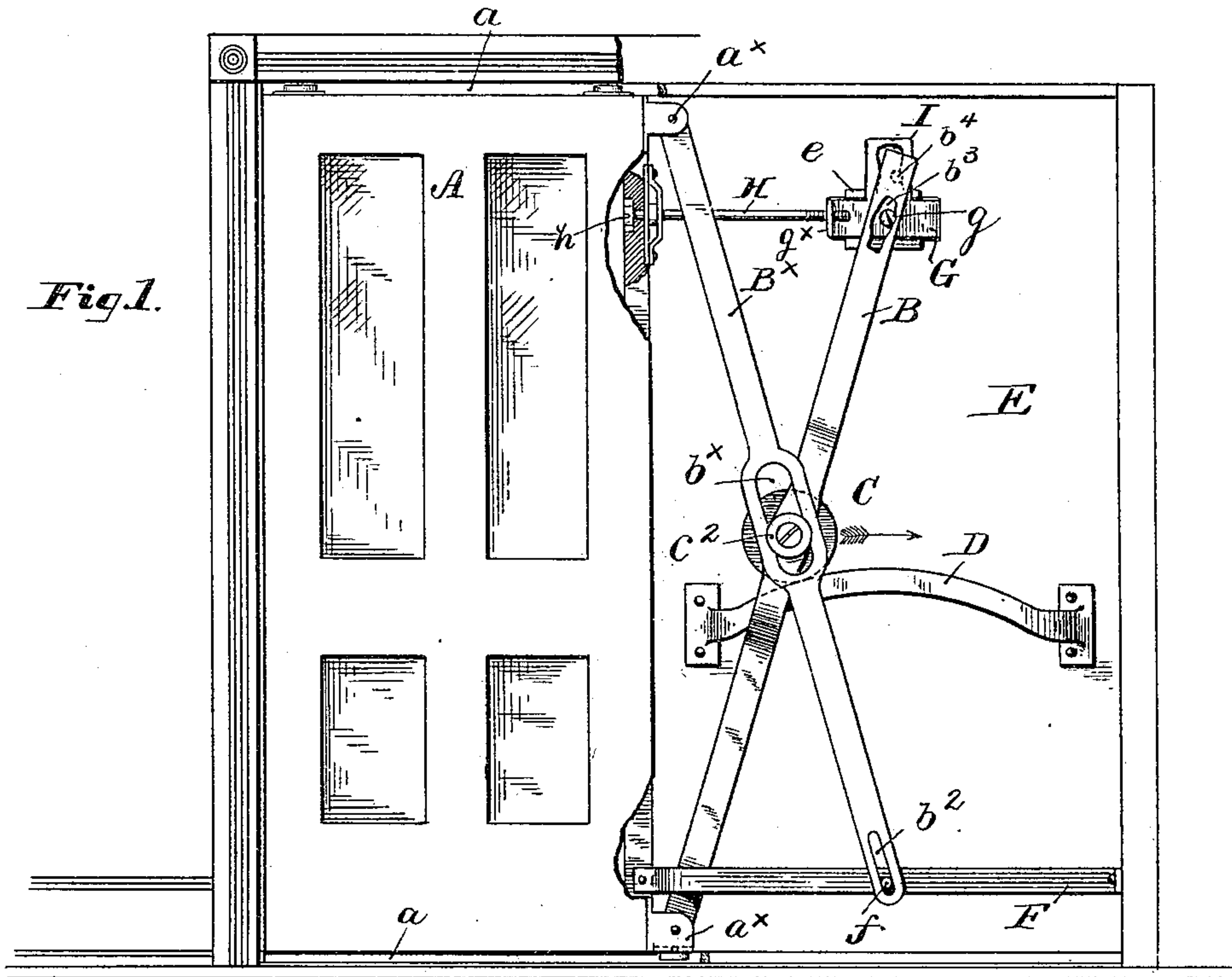
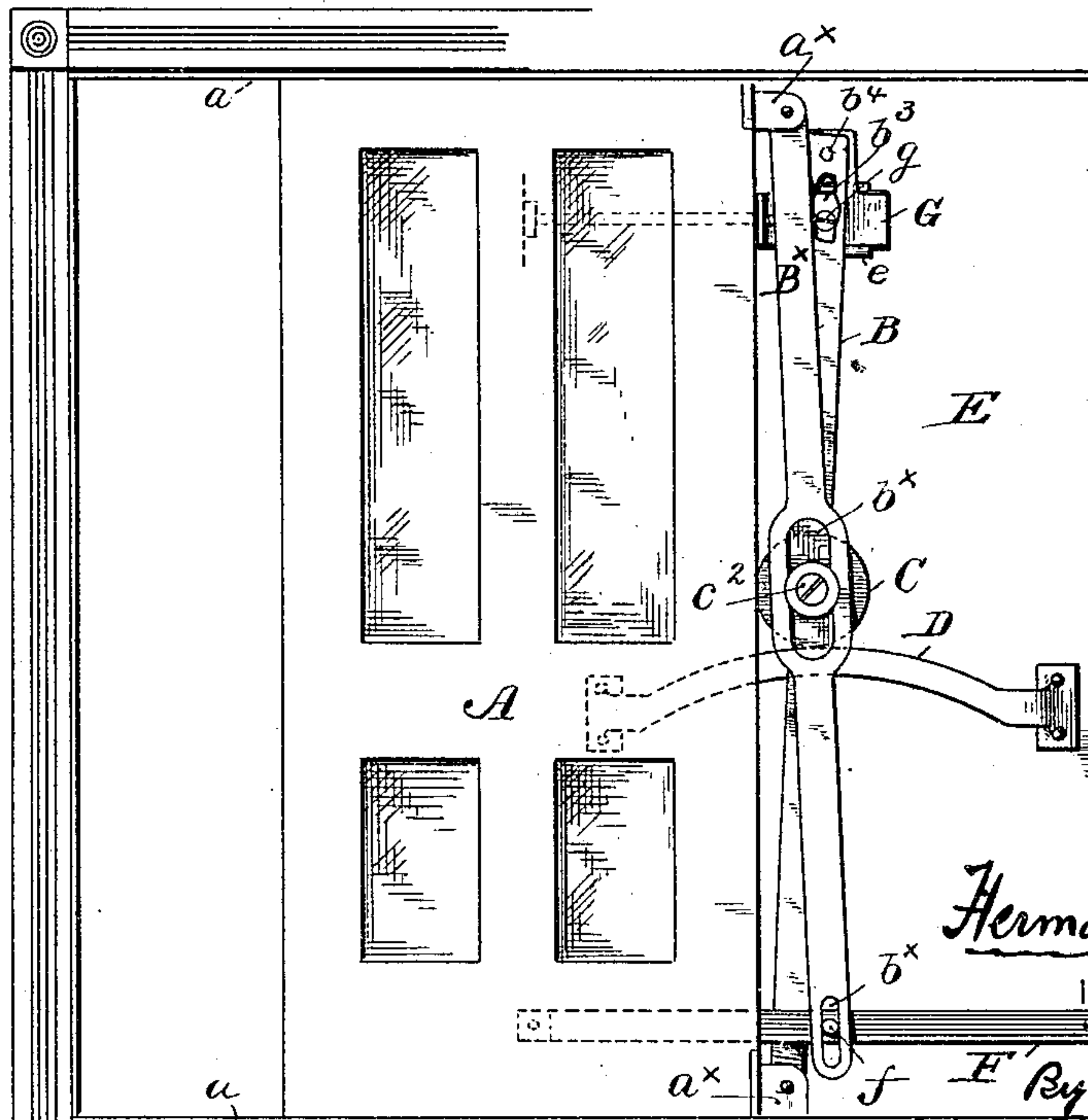


Fig. 2.



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(No Model.)

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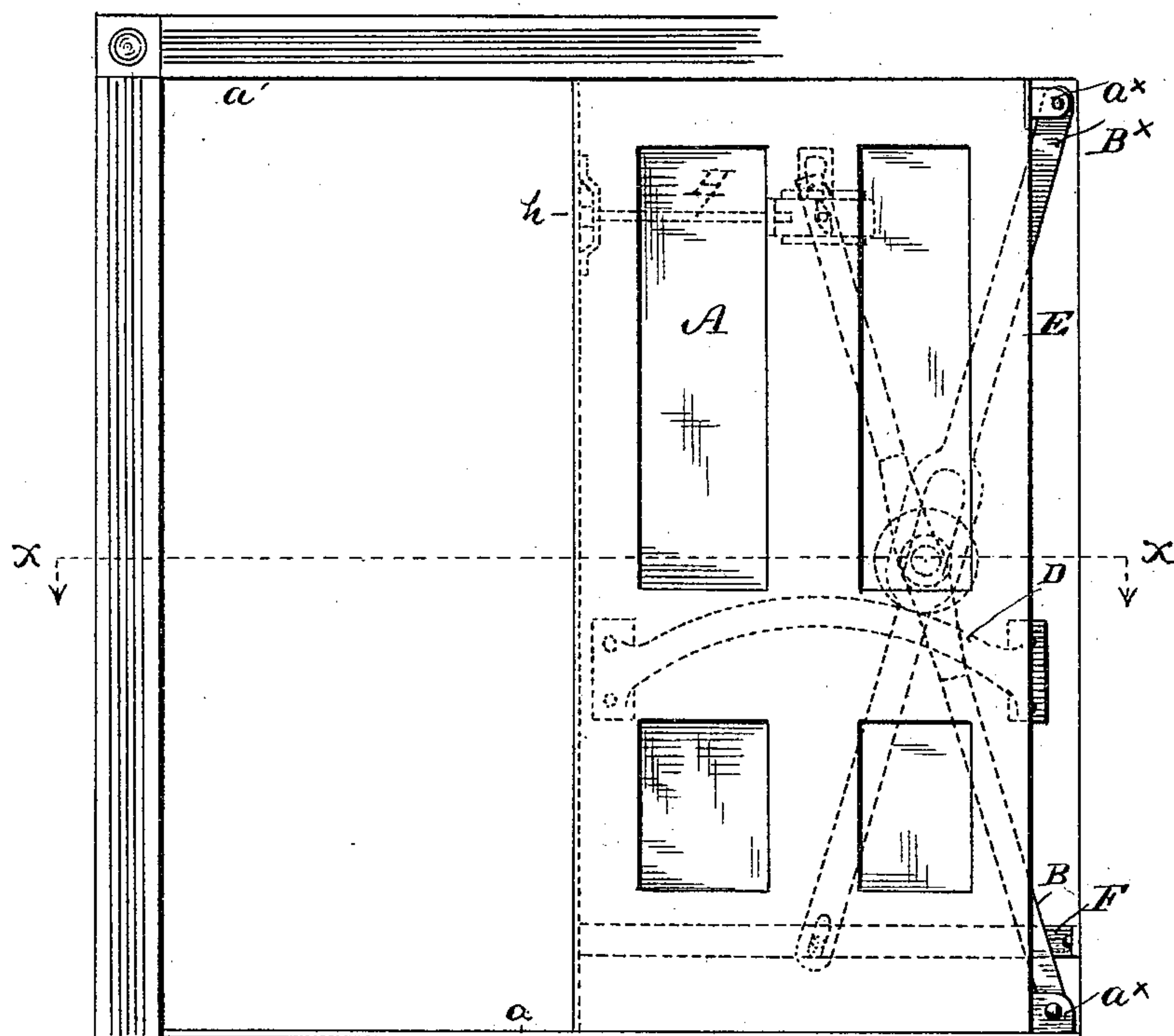
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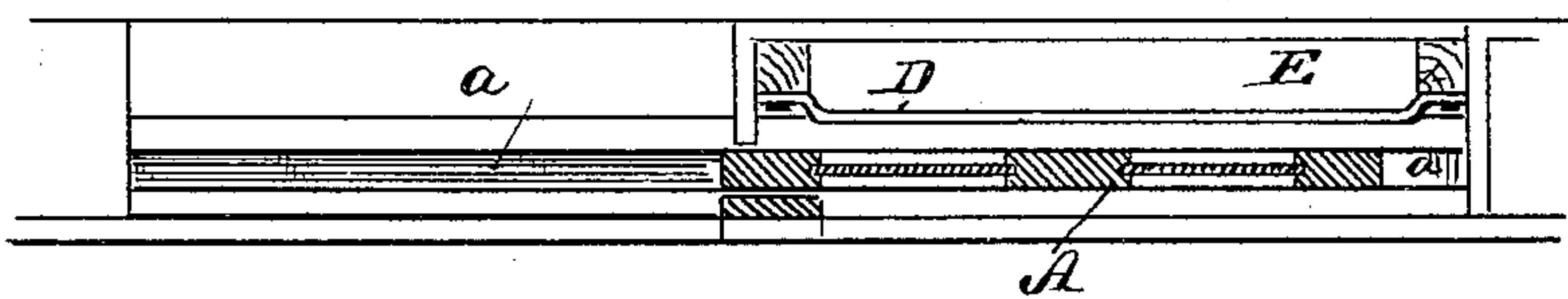
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*Fig. 3.*



*Fig. 11.*



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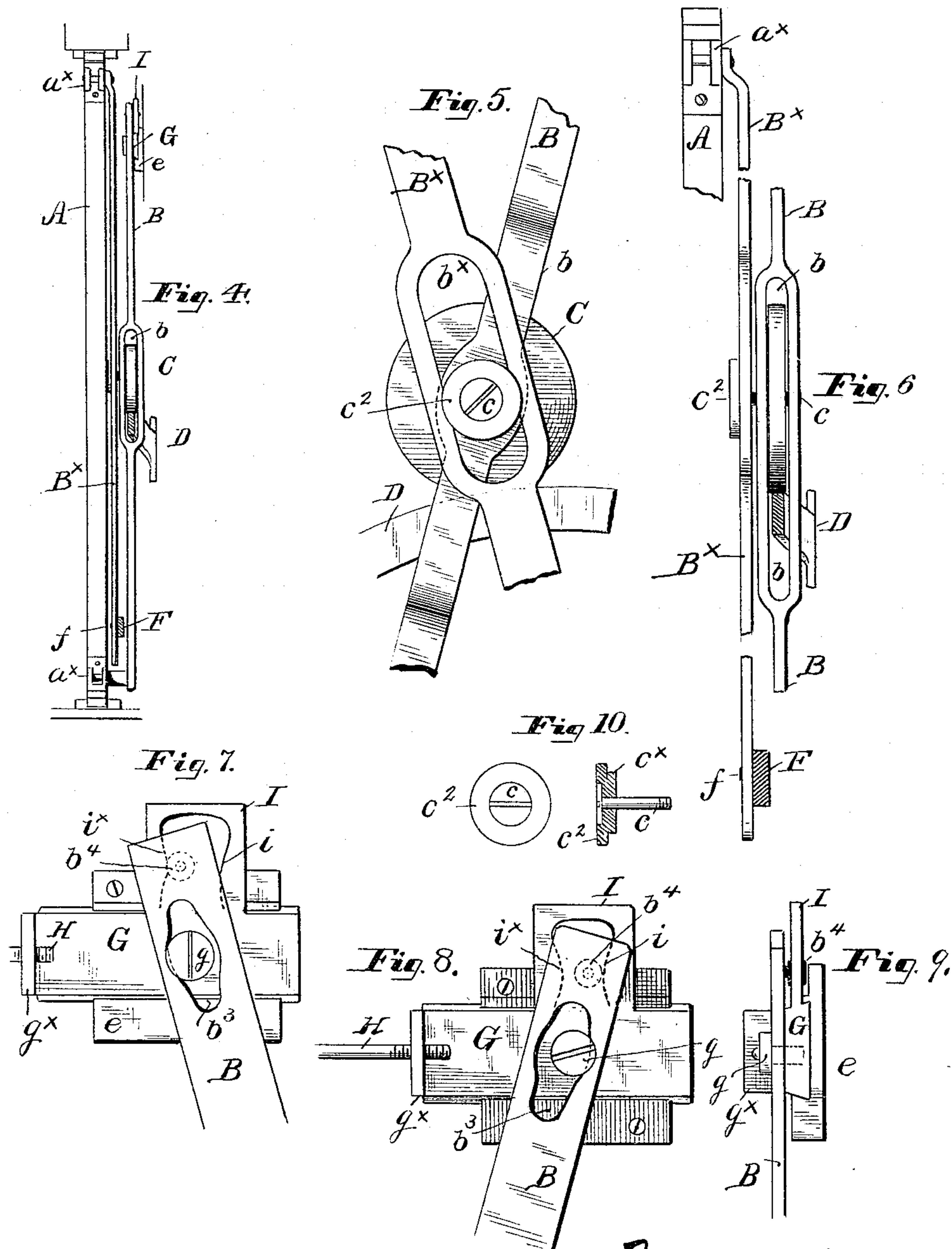
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# UNITED STATES PATENT OFFICE.

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## HANGER FOR DOORS AND BLINDS.

SPECIFICATION forming part of Letters Patent No. 353,788, dated December 7, 1886.

Application filed May 8, 1886. Serial No. 201,509. (No model.)

*To all whom it may concern:*

Be it known that I, HERMON HINCKLEY, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented an Improvement in Hangers for Doors and Blinds, of which the following is a specification.

This invention relates to a class of devices employed for supporting and occasioning the movement of horizontally traveling or sliding doors and blinds, in which a pair of pivoted levers connected with the door and with the framing within which the door or blind slides sustain and, without the assistance of other supporting devices, permit the movement of said door or blind.

Apparatus embodying a good form of my improvement is represented in the accompanying drawings, and described in this specification, the particular subject-matter claimed as novel being hereinafter definitely specified.

In the drawings, Figs. 1, 2, and 3 are respectively side elevations of a hanger embodying my invention and of a door supported thereby, the side of the casing of the door-recess nearest the eye being supposed removed to exhibit the hanger contrivance, and the door itself in Fig. 1 being closed, in Fig. 2 half-way open, and in Fig. 3 entirely open. Fig. 4 is an edge or end view of Fig. 2, sight being taken from the right-hand side of said figure. Fig. 5 is an enlarged side elevational fragmentary detail exhibiting a portion of the track and the track-roller, hubway in the guide-lever, and bifurcated portion or roller-housing of the roller-lever. Fig. 6 is an edge or end view of the same parts, the track being shown in section. Figs. 7 and 8 are magnified front elevational details of the adjustable cam-way-guide and upper extremity of the roller-lever, representing the parts in Fig. 7 in the position which they occupy when the door is open, and in Fig. 8 in the position which they occupy when the door is closed. Fig. 9 is an edge or end view of the devices represented in Fig. 8, and Fig. 10 a face and a side sectional detail of the axle and its hub and head. Fig. 11 is a sectional view of the devices of Fig. 3, section being supposed in the plane of the dotted line  $x\ x$  on said Fig. 3, sight being taken in the direction of the arrows.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents a horizontally-moving door, blind, or kindred contrivance which has a movement within ways  $a$ . The inner stile of the door is conveniently provided at top and bottom with lugs  $a^x$ , or kindred pivot-connections, to which are respectively pivoted the extremities of a pair of crossed levers, which for convenience of nomenclature I term the "roller-lever" B, it being a supporting brace-bar, and the "guide-lever"  $B^x$ , it being a guiding brace-bar.

In the form of construction represented the roller-lever is to the rear of the guide-lever, and is at or near its center conveniently, but not necessarily, bifurcated or otherwise formed to present a slot, which I term a "roller-slot,"  $b$ , and within which is housed a wheel, pulley, or roller, C, which is adapted to travel upon a convex stationary track, which latter is secured to and slightly projects or bellies out from that farther side or face of the door-recess E which is adjacent to the roller-lever, and the outward projection or belly of which track is such as to cause it to pass through the said roller-slot beneath the roller, which, as stated, rests and travels upon said track. The roller is rigidly housed in or secured to the roller-lever by an axle,  $c$ , which passes through both forks or members of the roller-lever, between which the roller-slot  $b$  is formed, and the said axle is provided at the front of the roller-lever with a hub,  $c^x$ , preferably having a head,  $c^2$ , as shown in Fig. 10.

The guide-lever is centrally slotted to form what I call a "hubway,"  $b^x$ , which is of such width as to closely embrace but not bind upon the hub of the axle, and the lateral edges of which are overlapped by the head of said hub, so that the said guide-lever is maintained against and steadied in its movement with respect to the roller-lever by said hub.

The lower extremity of the guide-lever is provided with a slot, which I term the "pin-slot,"  $b^2$ , through which enters and within which plays, so to speak, a fixed pin,  $f$ , or roller, laterally projecting conveniently from a transverse framing-bar, F, secured within the door-recess in, for instance, the manner represented in Fig. 1.



It is manifest that one end of each of the crossing levers being pivotally secured to the door the lower end of the guide-lever, while capable of longitudinal thrust, being rigidly held against lateral movement or movement end for end of the framing-bar, the roller-lever being provided with a roller which travels and bears upon a fixed track, and the guide-lever and roller-lever being stayed with respect to each other by the engagement of the hub on the axle of the roller-lever with the hubway on the guide lever, the door, provided the upper end of the roller-lever be suitably controlled against lateral, yet permitted to assume longitudinal, movement, will be in effect suspended through the roller upon the track, while the movement of said door and of the levers with respect to each other in any possible position will be definitely controlled. In order then to control the upper end of the roller-lever, the latter is provided with an elliptic slot,  $b^3$ , through which passes a stay-pin,  $g$ , rigid with respect to and projecting from the front face of an adjustable slide,  $G$ , which is preferably flaring upon its edges and secured within a dovetailed way,  $e$ , fixed against that inner face of the door-recess against which the track is mounted.

The slide  $G$  is horizontally adjustable by the swiveled adjusting-rod  $H$ , which threads through a bearing,  $g^x$ , on the slide, and the head  $h$  of which, Fig. 1, is controllable for the rotation of the rod and lateral adjustment of the slide, from the outside edge strip of the casing inclosing the door-recess, or that chamber thereof within which the crossed levers of the door are mounted and operated.

From the slide  $G$  is erected, or integral with it is, a guide,  $I$ , which has two opposite camways,  $i$   $i^x$ , formed in it, against which a guide-roller,  $b^4$ , secured to the rear face of the upper end of the roller-lever, respectively travels.

The adjustable slide and its stay-pin and camway-guide together, in the play of parts, cooperate with the elliptic slot in and the guide-roller projecting from the upper end of the roller-lever to stay and control, limit and adjust the movement of said upper end of said roller-lever.

In the operation of the device, the door being closed, or in the position represented in Fig. 1, the roller rests upon the left-hand end of the track or that nearest the door the levers are crossed, as shown, and the door is suspended or supported upon the levers, the weight being borne by the roller upon the track. In this position of parts the right-hand side of the elliptic slot  $b^3$  bears against the stay-pin  $g$ , while the guide-roller  $b^4$  bears against the right-hand camway  $i$  of the guide. When the door has been half-way opened, as shown in Fig. 2, the roller will have been caused to travel to the highest part of the convex track, at the same time the hubway  $b^x$  of the guide-lever will have traveled down, so to speak, upon the hub of the roller-axle, the pin-slot  $b^2$  will have traveled down upon the fixed pin  $f$ , the ellip-

tic slot  $b^3$  in the roller-lever will have traveled up against the stay-pin  $g$ , and the guide-roller  $b^4$  will have traveled up to the top of the guide  $I$ . When the door has been entirely opened, the levers will have reversed themselves, as shown in Fig. 3, the fixed pin  $f$  will occupy the same position with respect to the pin-slot  $b^2$  that it did when the door was closed, the stay-pin  $g$  will bear upon the opposite or left-hand side of the elliptic slot  $b^3$ , while the guide-roller  $b^4$  will bear upon the camway  $i^x$ , as shown in Fig. 7. In closing the door the entire action will be simply reversed.

Throughout the above operation and varying disposition of the parts it will be obvious that the slide  $G$  and its stay-pin  $g$  and camway guide  $I$ , in engagement, respectively, with the elliptic slot  $b^3$  and the guide-roller  $b^4$ , will serve together to maintain the level or horizontal position of the door, and that by a lateral adjustment of the slide the door can be exactly adjusted and maintained in exact adjustment. The weight of the door and hanger upon either side of the convex track serves to retain the door either securely closed or securely opened.

Such being a description of the construction and operation of my device, it is obvious that it is to be contradistinguished from certain well-known devices of a kindred character, in which crossing-levers are employed; but one of which, however, is attached to the door, the other being attached to a post or other member of the framing or casing, in which, also, the levers are connected by a fixed pivot-pin passing through both, which pin, as the weight of the door is placed upon it, forms in effect a shear-joint, the tendency being to cut out the pin, elongate the hole, and allow the door to sag, in which, again, as the door is moved, its weight is carried away from the line of support, so as to cause great strain at the points of attachment to the door and post, in which, moreover, no means of adjustment are provided, and in which, finally, the levers do not completely pass each other and become exactly transposed in relative position, but, on the contrary, are vertical when the door is closed, the whole travel being in one direction from the vertical, and the cross-strain, when the door is heavy, being thereby greatly increased.

The advantages of my device are apparent. The hub-provided axle of the roller being supported at both ends, the weight comes upon the center of the axle, thereby avoiding shear. The curved track, moreover, maintains the weight and relieves the strain, the hanger as an entirety being equally strong at all points of travel. The door can be readily hung, and the hanger, when once applied, can be readily and easily adjusted. The levers being vertical when the door is half-open, the travel is in both directions from the center, the result being that the inclination of the levers at a given point in the travel is slight and the cross-strain proportionately less, so that the levers,



although made very light, will carry a considerable weight.

It is obvious that the camway-guide may, if desired, be placed below instead of above the roller-lever being pivoted to the top edge of the door and the guide-lever to the bottom edge; or that it may be connected with the guide-lever instead of with the roller-lever. The roller-lever, operating in connection with the camway-guide, may also, if desired, be pivoted to the upper edge of the door and the guide-lever to the lower, in which case the action of the parts would be reversed, and it would be necessary to invert the track.

The foregoing and other modifications may be obviously resorted to without departure from the invention.

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

1. The combination, in a hanger for a horizontally-moving door or blind, of a pair of levers crossing each other and having a sliding connection at or near their centers, each pivotally secured at one of its extremities to the door, and at its opposite extremity free to move in or with respect to a suitable guide, a roller connected with one of the levers at or near the central portion of said lever, and a fixed track upon which said roller travels, substantially as set forth.

2. The combination of a horizontally-moving door, a lever pivoted to the door at one extremity moving under the control of an adjustable bearing at the other extremity and provided with a carrying-wheel, a fixed track upon which said carrying wheel or roller travels, a second lever, likewise pivoted to the door, crossing the lever first mentioned and moving under the control of a bearing at the other extremity, and a slide-connection between the two levers, substantially as set forth.

3. The combination of the door, the roller-

provided lever pivoted to the door at one extremity and provided with an elliptic slot and with a guide-roller at the other extremity, a track upon which the roller of said lever travels, an adjustable slide or bearing provided with a camway for the guide-roller and with a suitable pin for the elliptic slot of the roller-lever, a guide-lever crossing the roller-lever, pivoted to the door at one extremity, having a traveling or sliding bearing at the other extremity, and centrally slotted to admit a hub or kindred device connected with the roller-lever, substantially as and for the purpose set forth.

4. As a device for adjusting the set of a horizontally-moving door, the horizontally-adjustable camway or guide, the stay-pin, in combination with the roller-lever provided with the elliptic slot and with the guide-roller, substantially as and for the purposes set forth.

5. The combination of a roller-lever, a roller applied to said lever, an axle for said roller, a hub beyond said roller-lever, a guide-lever crossing said roller-lever and slotted to admit said hub, a door pivoted to corresponding extremities of the said two levers, and traveling bearings with which corresponding opposite extremities of the said levers are connected, substantially as and for the purposes set forth.

6. In combination, the sliding door, the crossing levers connected with the door, and also connected with traveling bearings, substantially as specified, the roller carried by one of the levers, and a convex track upon which the roller travels, substantially as and for the purposes set forth.

In testimony whereof I have hereunto signed my name this 29th day of April, A. D. 1886.

HERMON HINCKLEY.

In presence of—

G. C. KLINE,

H. D. ACHENBACH.