

No. 710,229.

Patented Sept. 30, 1902.

E. WIGLE.

MECHANISM FOR OPERATING DOORS.

(Application filed June 25, 1900.)

(No Model.)

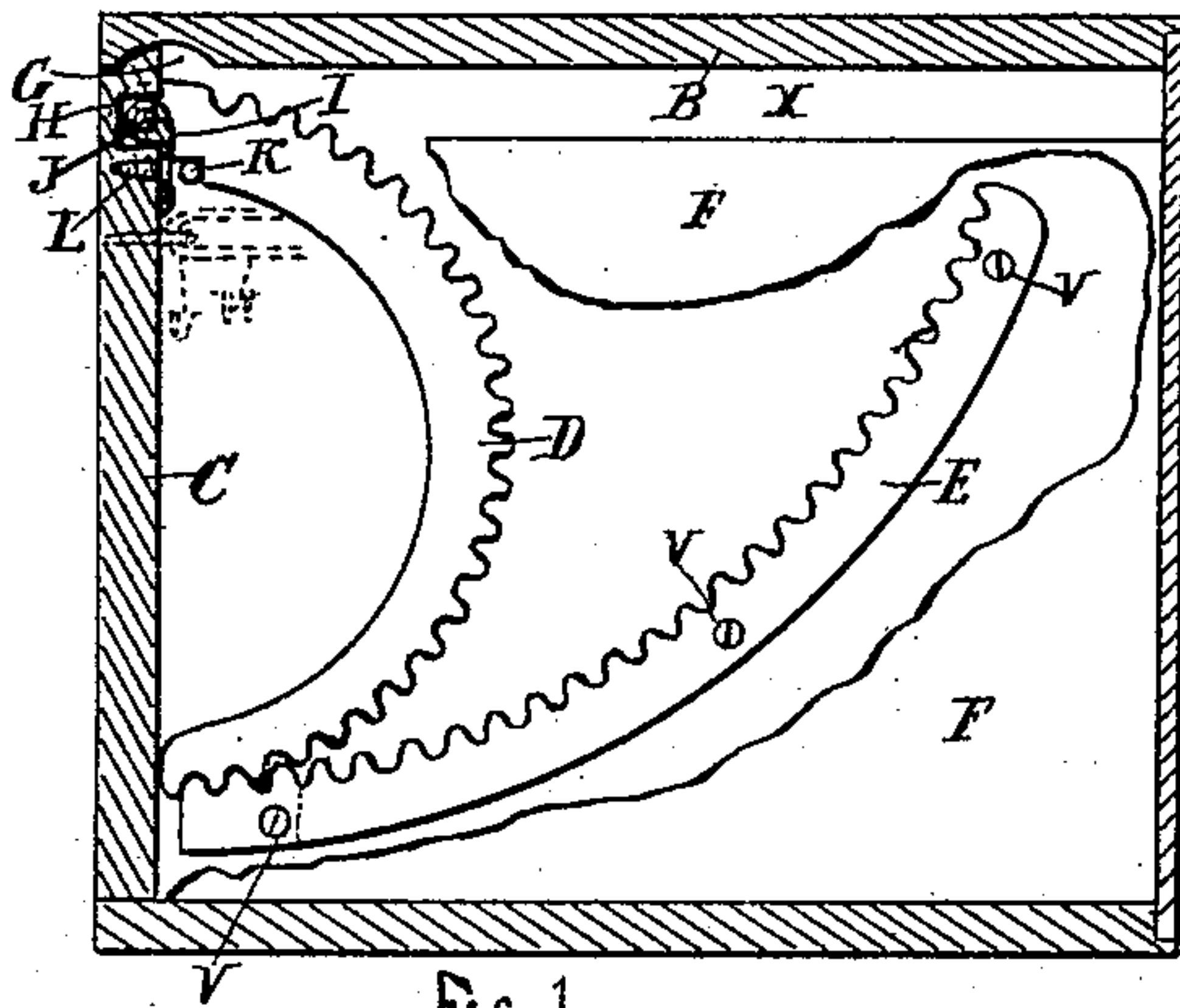


Fig. 1.

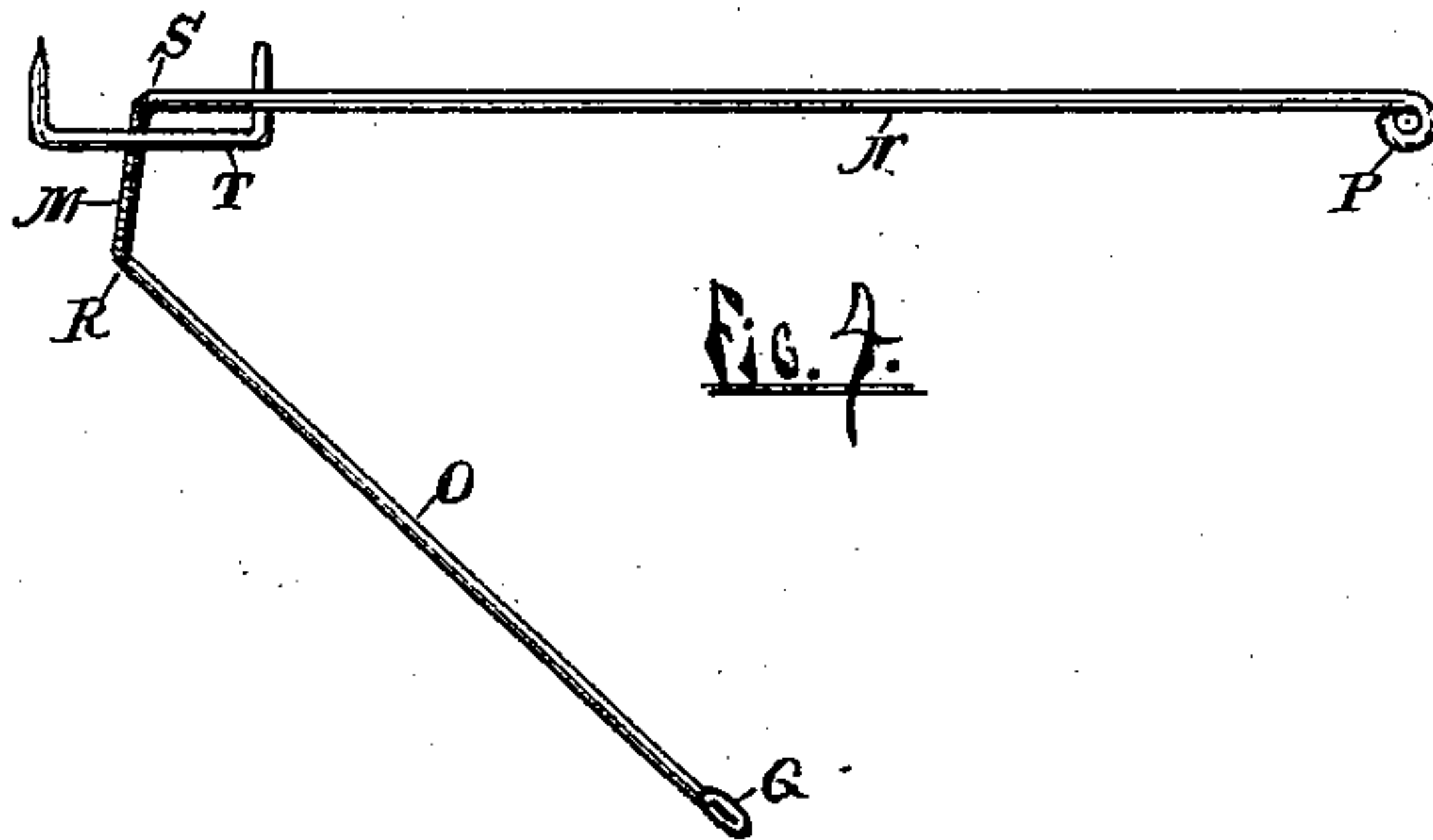


Fig. 7.

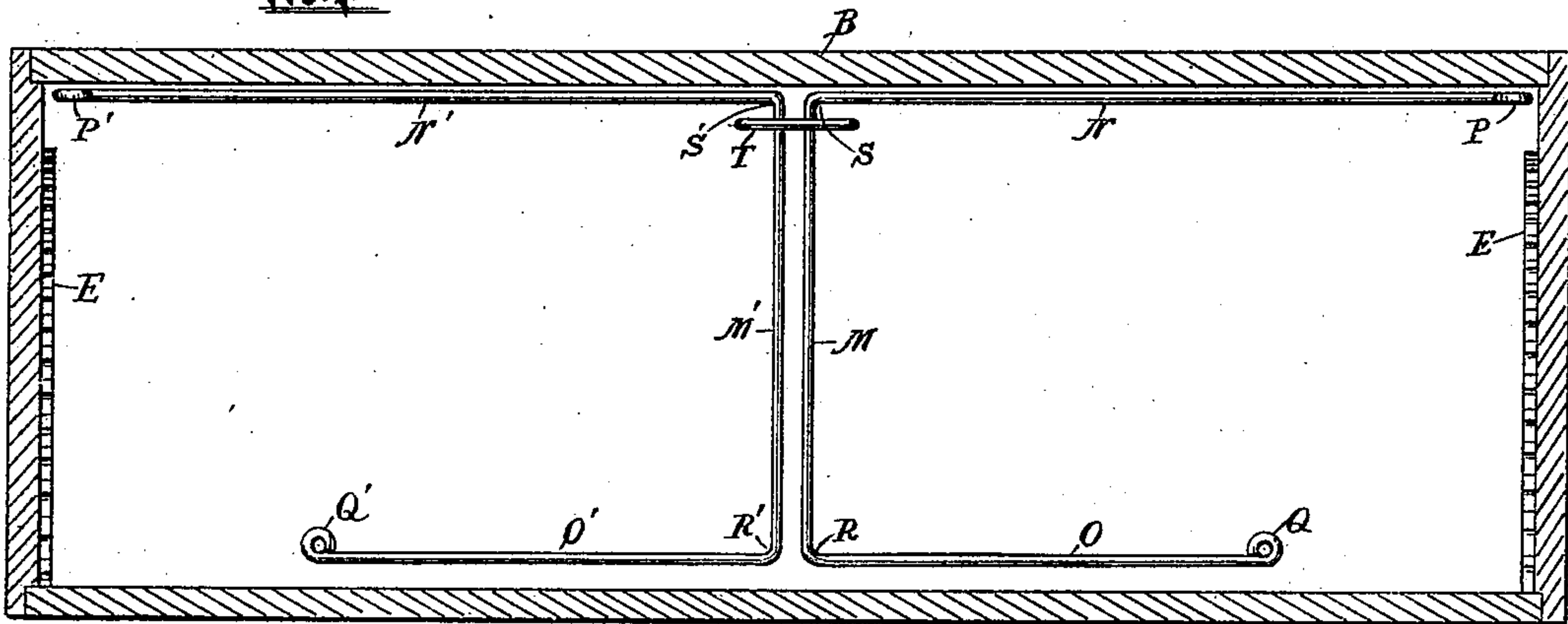


Fig. 2.

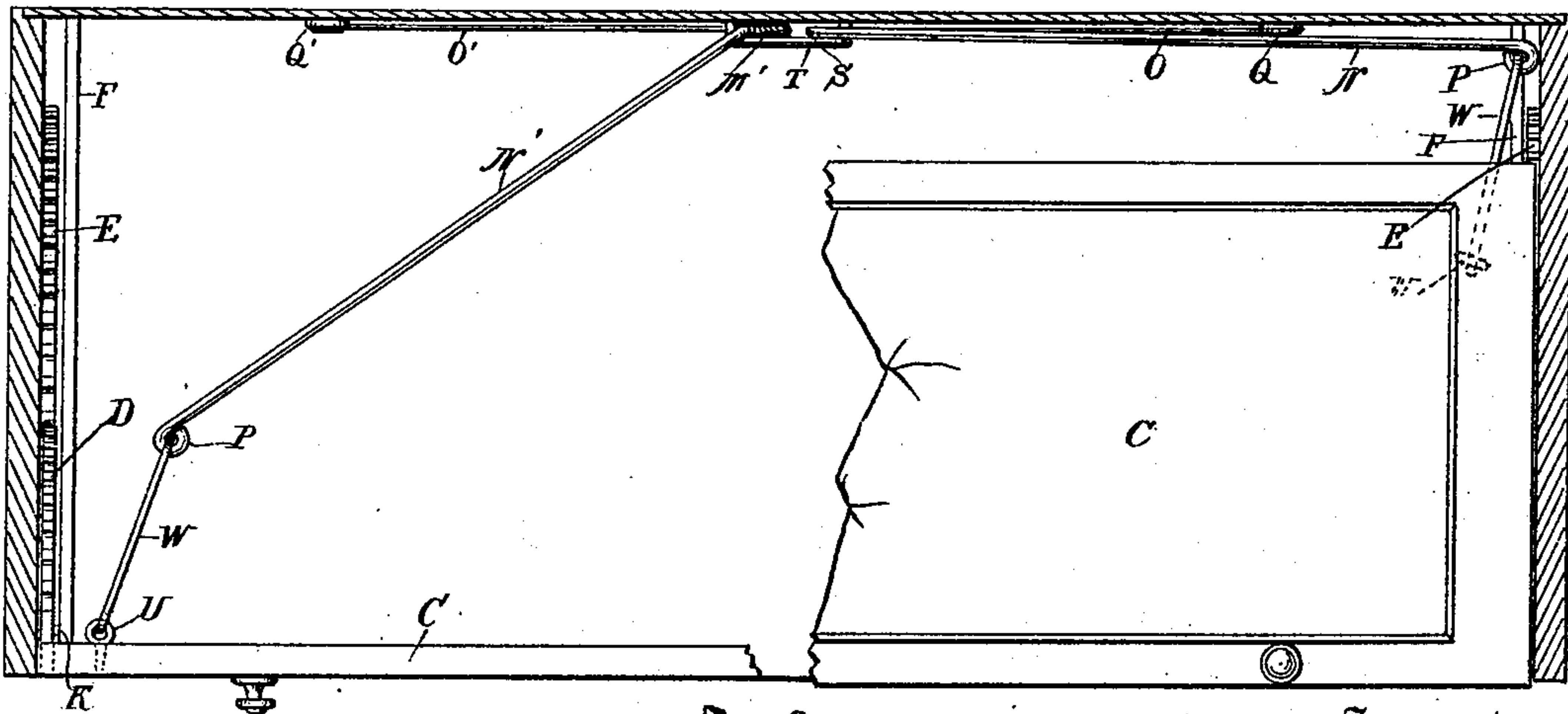


Fig. 3.

Witnesses

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# UNITED STATES PATENT OFFICE.

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## MECHANISM FOR OPERATING DOORS.

SPECIFICATION forming part of Letters Patent No. 710,229, dated September 30, 1902.

Application filed June 25, 1900. Serial No. 21,456. (No model.)

*To all whom it may concern:*

Be it known that I, ELI WIGLE, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Mechanism for Operating Doors and other Analogous Portions of Furniture; and I do hereby declare the following to be a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in mechanisms for operating the doors and other analogous parts of furniture in which the door or front is pivotally supported at the upper side and adapted to turn on the same to a horizontal position and move back under the top of the case, the front of which case is closed by the door when the door is turned down to a vertical position; and its objects are to provide the same with novel means for supporting the pivots of the door and carrying the same inward in a horizontal plane, to provide novel means for equalizing the movement at the respective ends of the door to prevent binding of the same, to provide novel means of aiding the inward movement of the pivots and door, to simplify and cheapen the construction, and to provide the device with various new and useful features hereinafter more fully described, and particularly pointed out in the claims.

My invention consists, essentially, in providing segmental rockers at each end of the case, said rockers having pivots at one end supporting the door, ways traversed by said rockers, said rockers and ways being so formed that the pivots are carried horizontally as the rockers traverse the ways, a rod rigidly connecting the rockers, whereby the same move equally and simultaneously, a spring to pull the door inward, and means for preventing the rockers from slipping on the ways, as will more fully appear by reference to the accompanying drawings, in which—

Figure 1 is an elevation of the inside of one end of a section of a bookcase embodying my invention and with parts in section and broken away to show the construction; Fig. 2, a longitudinal vertical section showing the back of the section in elevation; Fig. 3, a plan view of the case with parts broken away and

portions of the door in two different positions, and Fig. 4 a detail of the spring.

Like letters refer to like parts in all of the figures.

A represents the end of the case; B, the top of the same; C, the door, and F a partition near each end of the case to keep the contents of the case out of the mechanism. At each end of the case is a suitable curved rocker D, having its upper or rear end pivotally connected to the upper part of the door C and supporting the same. This rocker at its lower or front end engages and is supported by a track or way E and traverses the same as the rocker turns backward at the top. To prevent the rockers D from slipping on the ways E, I prefer to provide each with intermeshing cogs or teeth, as shown; but other well-known means may be provided without departing from my invention. So, also, the curvature of the rocker and ways and attachment of the rockers to the front may be varied without deviating from my invention. To equalize the movement of the front, at each end I provide a rod J, journaled on the door C and extending across the top of the same, to the respective ends of which rod the rockers D are rigidly attached. This rod prevents the rockers from turning unequally and carries the rod back and forth horizontally and equally at each end. Any form of rocker and track that will carry the rod horizontally in the space X in the top of the case and above the partitions F will serve, and such form may be varied considerably without departing from my invention. To stop the outward movement of the top of the door and to support the lower part of the same in a horizontal position, pins or studs K are provided and fixed on the ends of the case in proper position to engage the shoulders on the rockers when the door is closed and to engage and support the door when the same is open.

G is a recess in the top of the case to receive the upper edge of the door when closed.

H is a groove in the door to receive the rod J, and I a bearing for the rod projecting downward on the door and secured by a screw L.

To automatically draw the door into the case, springs are provided, which are attached to the back of the case at one end and to the door at the other end, each spring being at-



tached at the lower end Q to the back of the case and extended horizontally to near the middle of the back, as at O, and thence upward, as at M, and thence outward to near the ends of the case, as at N, and provided at the free end with an eye P, connected by a suitable link U to the door, below the pivot of the same. Two such springs are provided, one for each end of the front.

From the foregoing description the operation of my device is obvious and needs no further explanation.

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

1. The combination of a case, a door adapted to turn from vertical to horizontal, rockers pivotally attached to the door, and ways traversed by the rockers, whereby the upper side of the door is carried horizontally inward within the case when the door is opened, substantially as described.

2. The combination of a case, a door, rockers pivoted to the door at their upper ends, ways traversed by the rockers and stop-pins to support the door when open and to stop the front of the door when the door is closed, substantially as described.

3. The combination of a case, a door, rockers having convex sides and pivotally attached to the door and having teeth on their convex sides, and curved ways having concave sides and attached to the case and having teeth on their concave sides engaging the teeth in the rockers, whereby the door is carried horizontally inward in a right line, substantially as described.

4. The combination of a case, a door, toothed ways attached to the ends of the case, a rod journaled on the door, and toothed rockers fixed on the respective ends of the rod and engaging the ways attached to the case, substantially as described.

5. The combination of a case, a door, toothed ways attached to the case, a rod journaled on the door, toothed rockers attached to the rod, and engaging the ways attached to the case, and stop-pins to engage the rockers on the door, substantially as described.

6. In combination with a case and a door adapted to turn to a horizontal plane and run back into the same, a spring having one end attached to the back of the case, and extending horizontally, and thence vertically, and thence again horizontally, a link connecting the free end of the spring and the upper part of the door, and a staple engaging the vertical portion of the spring, substantially as described.

7. The combination of a case, a door, toothed ways fixed on the ends of the case, toothed rockers pivotally connected at their upper ends to the door and engaging the ways on the case, and springs attached to the back of the case near the bottom thereof, and thence extended vertically, and thence horizontally, in opposite directions, and links pivotally

connecting the free ends of the springs with the upper part of the door, substantially as described.

8. The combination of a case, a door, toothed ways attached to the ends of the case, a rod journaled on the door, toothed rockers rigidly attached to the respective ends of the rod and engaging the ways on the case, stop-pins in the case to engage the rockers on the door, springs attached to the back of the case near the bottom thereof and extending vertically and thence horizontally, a staple slidably engaging the vertical portions of the springs, and links connecting the free end of the springs with the upper part of the door, substantially as described.

9. In a bookcase, the combination of a suitable section made up of end pieces with suitable top and bottom; a door to the front side of the same and hinge-rod secured to the upper back side of said door; plates rigidly secured to said rod and at right angles thereto extending within the ends of said section to serve as guides to the door and suitable guides for the plates to guide them back within the section when the door is swung to the horizontal position; and means for withdrawing the door automatically within the section, for the purpose specified.

10. In a bookcase, the combination of a suitable section made up of end pieces with suitable top and bottom; a door to the front side of the same and hinge-rod secured to the upper back side of said door; plates rigidly secured to said rod and at right angles thereto extending within the ends of said section to serve as guides to the door and suitable guides for the plates to guide them back within the section when the door is swung to the horizontal position, for the purpose specified.

11. In a bookcase, the combination of a suitable section made up of end pieces with suitable top and bottom; a door to the front side of the same; hinge-rod secured to the upper back side of said door; plates rigidly secured to said rod and at right angles thereto extending within the ends of said section to serve as guides to the door, for the purpose specified.

12. In a bookcase having two ends and a suitable top and bottom, a sliding door at the front of the case, a rod attached to said door, and links rigidly attached to said rod and extending at right angles thereto within the case to form guides when the door is pushed into the case.

13. In a bookcase having two ends and a suitable top and bottom, a slidable door at the front of the case, a rod connected thereto, a pair of links rigidly secured together by said rod, said links having supports and being adapted to move longitudinally as the door is slid into and moved out of the case.

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Witnesses:

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