

No. 647,061.

Patented Apr. 10, 1900.

W. J. WOODCOCK.

POWER HINGE.

(Application filed May 25, 1899.)

(No Model.)

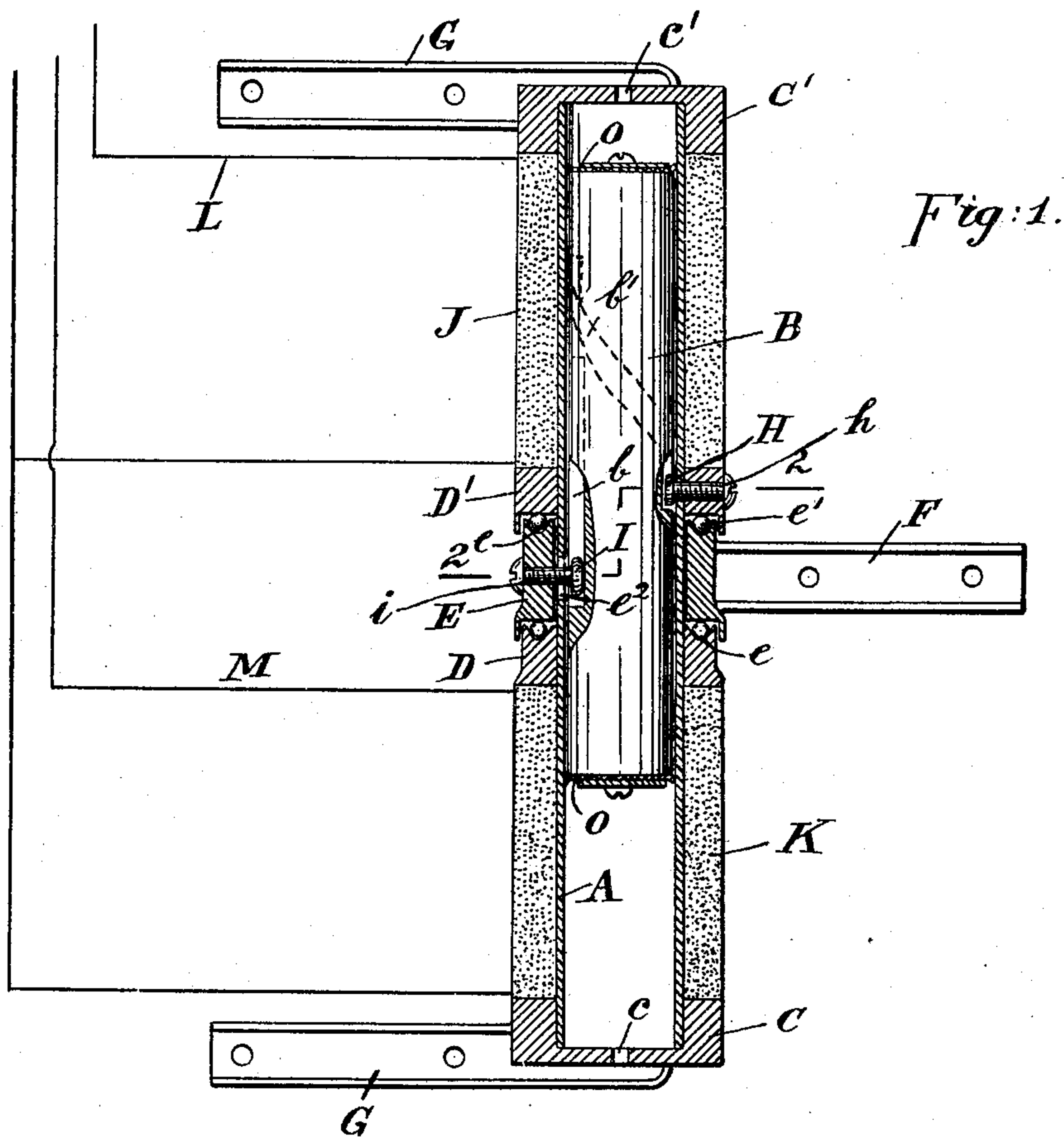


Fig: 1.

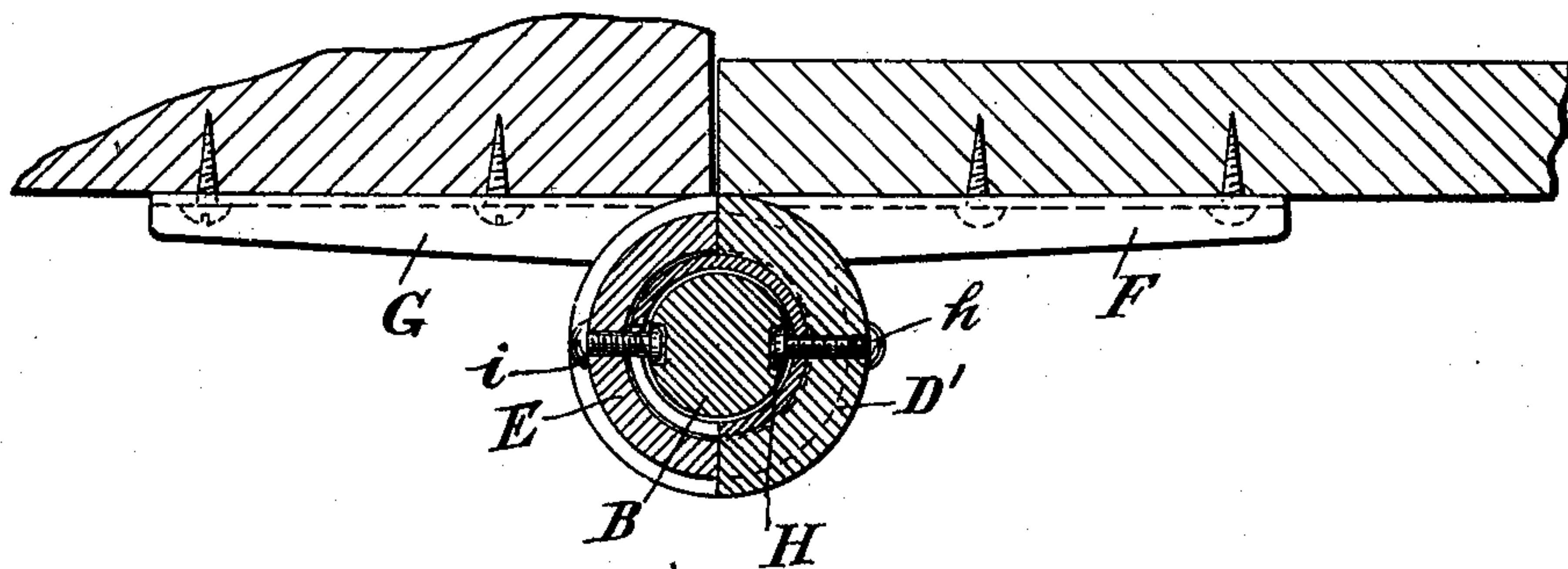


Fig: 2.

WITNESSES

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# UNITED STATES PATENT OFFICE.

WILLARD J. WOODCOCK, OF NEW YORK, N. Y., ASSIGNOR TO RUBEN B. AYRES, OF SAME PLACE.

## POWER-HINGE.

SPECIFICATION forming part of Letters Patent No. 647,061, dated April 10, 1900.

Application filed May 25, 1899. Serial No. 718,261. (No model.)

*To all whom it may concern:*

Be it known that I, WILLARD J. WOODCOCK, a citizen of the United States, residing in the borough of Manhattan, in the city, county, and State of New York, have invented new and useful Improvements in Power-Hinges, of which the following is a specification.

This invention relates to power-hinges for doors, shutters for windows, (such as fire-shutters,) and other like hinged coverings, whereby upon the application of power at said hinges doors or shutters supported thereupon are forced to close or open, according to the direction of the applied power; and it comprises, in brief, a guideway connected to the hinge-post of the door or shutter, a collar or sleeve rotatably mounted about said guideway and secured to the door or shutter, a body within said guideway and capable of a reciprocating movement therein, means preventing said body from other than a reciprocal or shuttle-like movement, a spiral groove in said moving body, and an inward projection upon said collar, whereby upon the shuttle-like movement of the moving body in one direction the door or shutter is caused by its aforesaid connection with the spiral groove to turn in the direction of movement of its projecting member in said slot.

In order that my invention may be fully understood, I have annexed hereto a sheet of drawings, wherein—

Figure 1 is a vertical sectional view of my power-hinge, and Fig. 2 is a cross-sectional view taken on the line 2 2 of Fig. 1.

In said drawings the letter A indicates a cylindrical guideway, and B is an elongated body of material adapted to slide within said guideway, said sliding body having a vertical groove  $b$  and a curved or spiral groove  $b'$  formed therein. The cylinder is covered at each end by suitable means, as by caps  $C$   $C'$ , apertures  $c$   $c'$  being preferably provided in each of said closing end portions for purposes to be referred to hereinafter. Annular collars or seat portions  $D$   $D'$  surround the cylinder A and are secured thereupon with an intervening space between them, and intermediate said seat portions is arranged and located an annular turnable collar E. Grooves  $e$  are provided in the opposed sur-

faces of either of the seat portions  $D$   $D'$  or the collar E or in all of them, and friction-balls  $e'$  are adapted to be contained within said grooves to minimize friction between said opposed surfaces. A bracket F or suitable connection is secured to and extends from the turnable collar E and is adapted to be secured to a door, shutter, or other moving member. Similarly a bracket or brackets or other connection G is secured to and extends from either or both the upper and lower ends of the cylinder A or any suitable part thereof, said bracket or brackets G being adapted to be secured against a rear post or jamb of a door, shutter, or the like, its object being to hold said cylinder or guideway A immovable.

Extending inwardly from the cylinder or guideway and lying in the path of the spiral groove  $b'$  in the body B is a projection H, here shown in the form of a small roller, which is pivoted at the end of a pin or screw portion  $h$ , secured in the annular collar  $D'$ . Extending inwardly from the turnable collar E, through a slot  $e^2$  in the cylinder or guideway A, is a projection I, which lies within the slot  $b$  in the body B, said projection being here shown and preferably as a small roller extending from a pin or screw portion  $i$ , which is secured in said collar E. Now we shall see that the body B is capable of a vertical reciprocating or shuttle-like movement within the cylinder or guideway A, bounded by the length of the slot  $b$ , and by reason of the lateral confines of said slot and their engagement with the roller I said body in its vertical traverse imparts a turning movement to an object, as a door or shutter, held by the connection-piece F, because roller H, being rotatably but otherwise rigidly held within the guideway A, as seen, and being in engagement with the spiral groove  $b'$ , causes the turnable collar E, bearing the door or shutter connection F, to make a corresponding turn in agreement with the convolution of the spiral groove  $b'$ .

The spiral groove  $b'$  terminates at both ends in a straight or vertical groove  $b^2$ , and since the roller H is seated in either one or the other of said straight-groove portions  $b^2$  when the door or shutter is either fully open or tightly closed it follows that said door or shutter is locked by reason of said straight groove in



such open or closed position, holding said door or shutter against movement otherwise than by actuation of the shuttle-like body B. In other words, the door or shutter cannot be released from its open or closed position without actuating the body B with the power means provided.

To operate the device, it is apparent that power must be applied to the body B to move it in either direction. One means of moving said device may be electrical power, for which purpose I have shown electric coils J K, having wire connections L M, and in which case the body B serves as a core and is moved in either direction, according to the application of the current.

In the operation of the device the body B when moved by the application of force in either direction, the guideway A being closed except for the small apertures *cc'*, provides a cushion for itself by air compression within the guideway or cylinder A in the direction of its movement. The air, which is compressed, however, gradually escapes through either of the vents *cc'* and in this manner regulates the degree of action and prevents the door or shutter from being thrown open or closed with too much force.

As is quite evident I am not limited to the use of electricity as the form of power with which to operate my device, for I may use compressed air, water, steam, or other elastic element under compression. In such cases I provide a packing at either end of the body B, as indicated at O, said packing transforming said body B into a piston-head. The cylinder A being rendered air-tight and suitable pipe connections being introduced at both the apertures *cc'*, we shall see that any elastic element may be introduced through said apertures to force the piston-head B either upwardly or downwardly, as may be required to perform its work. Thus the form of power required is immaterial, and my invention comprises a device for automatically moving doors, shutters, and the like either singly or in series.

The details herein given of my invention are susceptible of various modifications, and I do not wish to be restricted to the particulars herein referred to; but

I desire to claim, broadly, as follows:

1. A power device for operating doors or shutters, comprising a guideway connected to a rigid support, a turnable sleeve about said guideway having means of connection with a door or shutter, a body arranged to move shuttlewise along the guideway, a groove in said body in its line of movement, and a connection with the door or shutter to work

therein, a curved groove having lock ends in said body, and a lug with stationary relation to the guideway, engaged with said curved groove, together with means of applying power to move said shuttle-like body in the required direction.

2. A power device for operating doors or shutters comprising a cylindrical guideway connected to a rigid support, a shuttle-like body entirely contained within said guideway and arranged to move reciprocally and spirally therein, said shuttle-like body having connection with a door or shutter to actuate it; means of applying power to move said shuttle-like body in either direction, and means in the cylindrical guideway to form a vented air-cushion for the shuttle-like body in its movement.

3. A power device for operating doors or shutters, comprising a guideway connected to a rigid support, a shuttle-like body within said guideway, a collar rotatably mounted between ball-bearings about said guideway, a connection between said collar and the shuttle-like body, means upon the latter to impart a turning movement to the former, and a connection between said collar and a door or shutter.

4. A power device for operating doors or shutters, comprising a cylinder connected to a rigid support, a shuttle-like body contained within said cylinder, and arranged to move reciprocally in spiral manner therein, and means of introducing pressure within the cylinder at either end of the shuttle-like body to move the latter; also a connection between said shuttle-like body and a swinging door, whereby the movement of the shuttle-like body in one direction causes the door to close, and the movement of the shuttle-like body in the other direction causes the door to open.

5. In a power device for operating doors or shutters, a guideway connected to a rigid support, and a shuttle-like body in engagement with a door or shutter and arranged to move reciprocally within said guideway, said shuttle-like body having a spiral groove about it terminating in straight grooves at either end, the latter forming locks; together with a lug extending inwardly from the guideway and engaging with said spiral and straight grooves, and power means for moving the shuttle-like body in either direction.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLARD J. WOODCOCK.

Witnesses:

CHARLES J. HOEHNLE,  
L. T. SULLIVAN.