

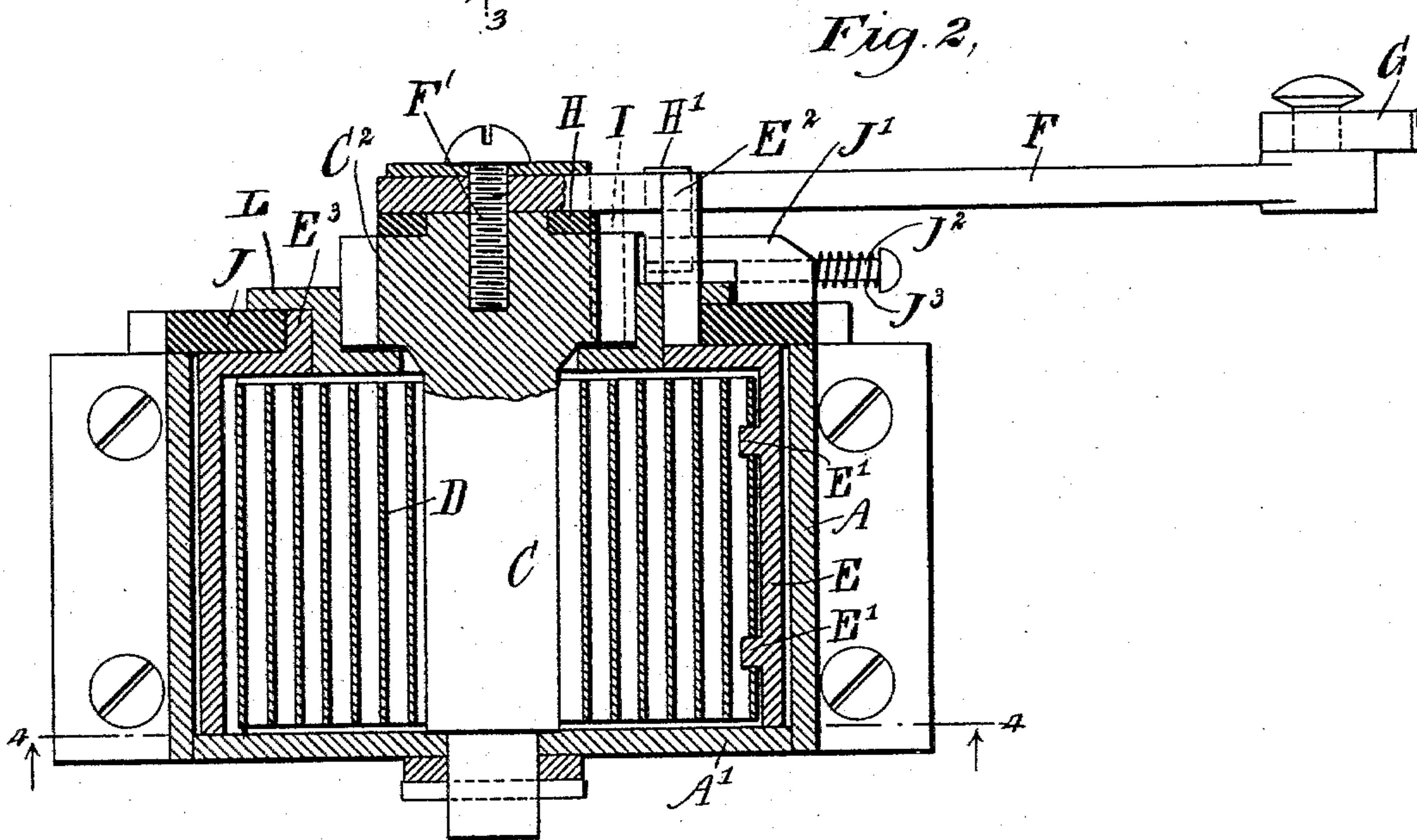
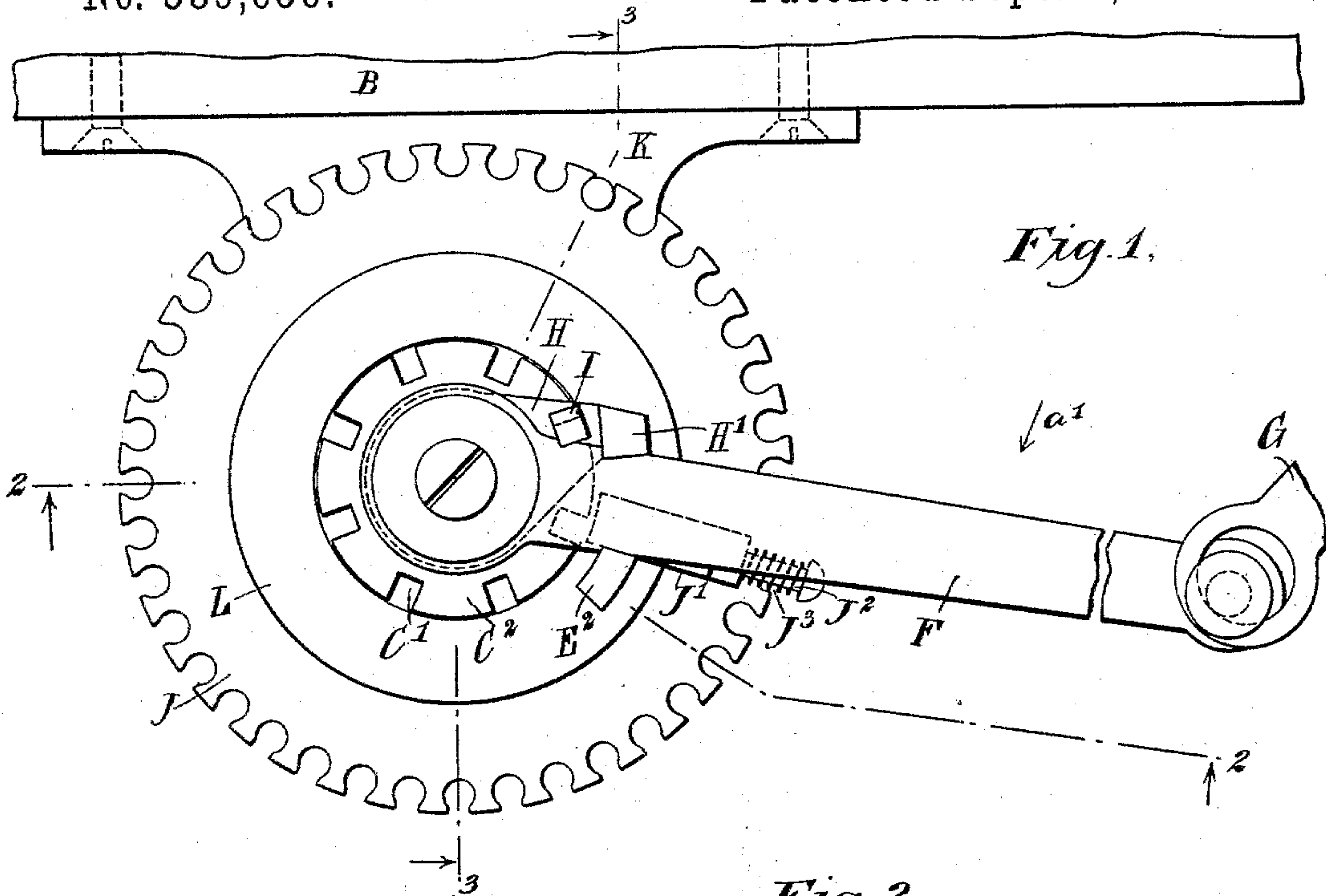
(No Model.)

2 Sheets—Sheet 1.

J. M. HENTON.  
DOOR SPRING.

No. 589,656.

Patented Sept. 7, 1897.



WITNESSES:

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Thos. G. Hooper

INVENTOR

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BY

Munn & Co.

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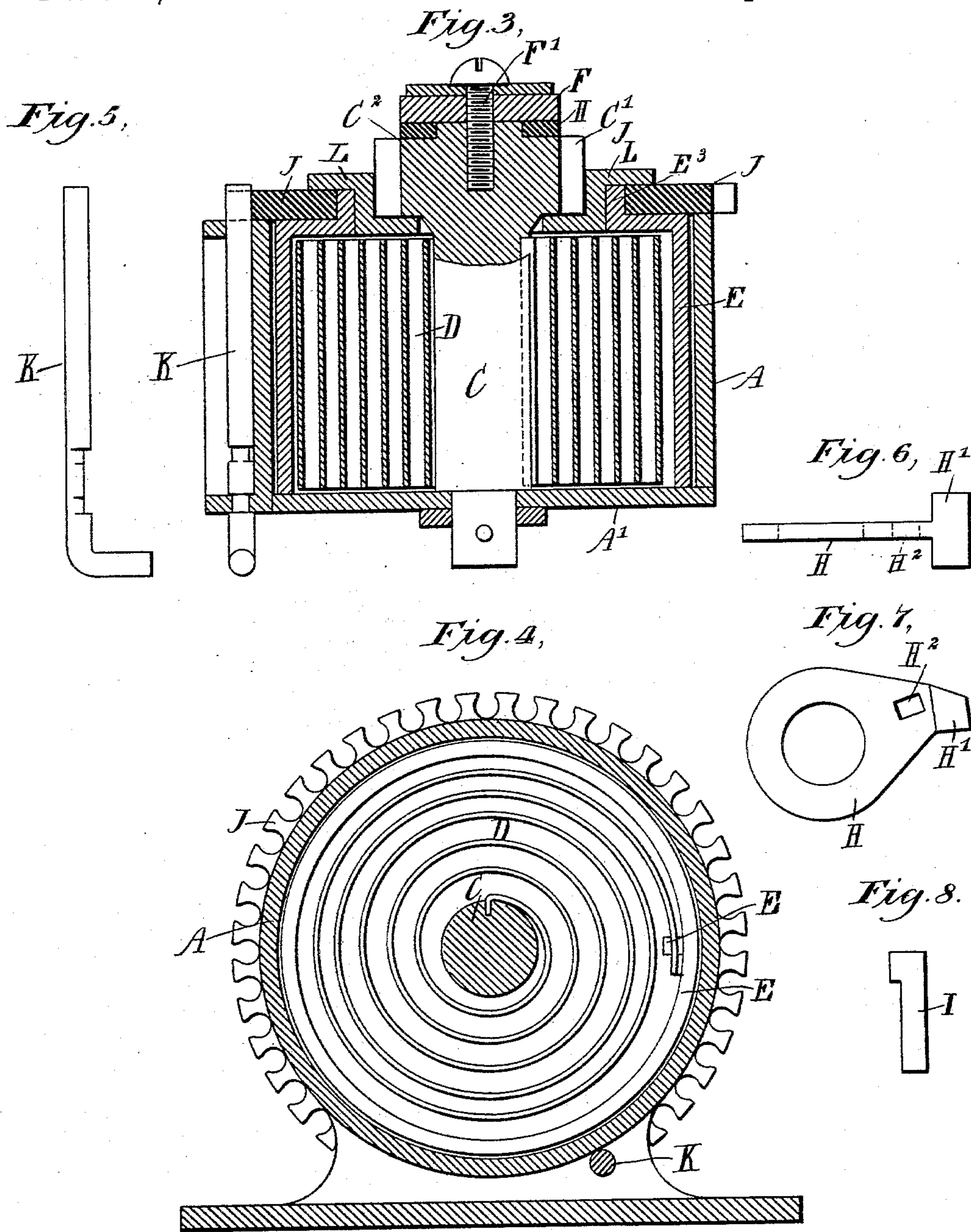
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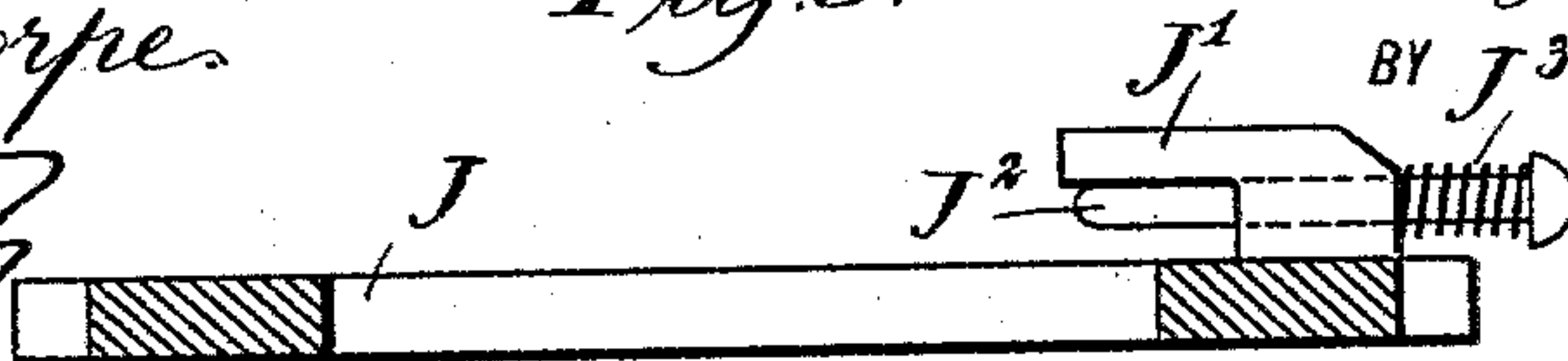
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WITNESSES:

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Fig. 9.



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# UNITED STATES PATENT OFFICE.

JOHN M. HENTON, OF LEAD, SOUTH DAKOTA.

## DOOR-SPRING.

SPECIFICATION forming part of Letters Patent No. 589,656, dated September 7, 1897.

Application filed April 6, 1896. Serial No. 586,391. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN M. HENTON, of Lead, in the county of Lawrence and State of South Dakota, have invented a new and Improved Door-Spring, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved door-spring designed for facilitating the flexible retention of a pivotally-moving body or device, as a door, at any desired angle in its movement around its pivotal center, the device being simple and durable in construction, arranged to permit right and left action, the change from one to the other being automatic and instantaneous, variable angle of action, conveniently regulating the tension of the spring, and rendering the latter inactive whenever desired.

The invention will be fully described hereinafter and the features of novelty pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement as applied to a door. Fig. 2 is a sectional side elevation of the same on the line 2 2' of Fig. 1. Fig. 3 is a transverse section of the same on the line 3 3 in Fig. 1. Fig. 4 is an inverted sectional plan view of the same on the line 4 4 of Fig. 2. Fig. 5 is a sectional side elevation of the key. Fig. 6 is a side elevation of the ratchet locking-arm. Fig. 7 is a plan view of the same. Fig. 8 is a side elevation of the pin for locking the locking-arm for the head, and Fig. 9 is a sectional side elevation of the ratchet-wheel.

The improved door-spring is provided with a main casing A, having flanges for securing the said casing to a door or other device, the bottom A' of the casing being removable for conveniently inserting the parts contained in the casing. In the bottom A' of the casing A is journaled the lower reduced end of a crank-shaft C, on which is secured the inner end of a coil-spring D, fastened at its outer end to inwardly-projecting lugs E', formed on a spring barrel or casing E, containing said spring D, mounted to rotate loosely within the main casing A.

At the upper end of the crank-shaft C is mounted to turn on a screw F' a crank-arm F, pivotally connected by a link G with a link-foot attached to the door-casing or other suitable part adjacent to the door. The crank-arm F engages at one side a projection H', formed on the free end of an arm H, mounted to turn loosely on the upper reduced end of the crank-shaft C directly under the pivotal end of the crank-arm F.

The arm H is formed with an aperture H<sup>2</sup> for the passage of a pin I, adapted to engage one of a series of peripheral recesses C', formed on the head C<sup>2</sup> of the crank-shaft C, to lock said arm H to said shaft. The side of the crank-arm F opposite the one engaging the lug H' abuts against an upwardly-extending arm E<sup>2</sup>, projecting from an annular flange E<sup>3</sup>, formed in the top of the spring barrel or casing E, so that when the arm F is moved in the direction of the arrow a' the spring-barrel E is turned to wind up the spring D. The annular flange E<sup>3</sup> forms a bearing for a ratchet-wheel J, extending on the top of the casing A and adapted to be engaged by the upper end of a key K, fitted to slide vertically in suitable bearings in the casing A, as is plainly illustrated in Figs. 1 and 3, said key being shown in detail in Fig. 5 and adapted to be moved in or out of engagement with the ratchet-wheel J by the operator.

The arm E<sup>2</sup>, previously mentioned and forming an integral part of the spring-barrel E, is adapted to rest against a stop J', forming an integral part of the ratchet-wheel J, the latter being adapted to be locked to the head C<sup>2</sup> of the crank-shaft C by a pin J<sup>2</sup>, normally held in an outermost position by a spring J<sup>3</sup>, said pin being fitted to slide radially in a suitable bearing in the stop J'. Now when the outer end of the pin J<sup>2</sup> is pressed by the operator it moves inwardly to engage one of the recesses C' in the head C<sup>2</sup>. This pin is used for giving any desired tension to the spring D, which is done in the following manner:

When the casing A is attached to the door and the key K engages the ratchet-wheel J, then the crank-arm F is moved against the projection H' of the arm H to move the arm H as far as desired, and then the pin J<sup>2</sup> is pressed inwardly by the operator to engage



one of the recesses  $C'$  in the head  $C^2$ . The crank-arm  $F$  is then moved in the opposite direction until it engages or abuts against the arm  $E^2$ , and the pin  $I$  is withdrawn from the arm  $H$ , and the latter is moved forward until it encounters the crank-arm  $F$ . Said pin  $I$  is then again inserted in the aperture  $H^2$  to engage one of the recesses  $C'$  in the head  $C^2$ . This operation is repeated until the desired degree of tension is given to the spring  $D$ , it being understood that by moving the crank-arm  $F$  in the manner described a winding up of the spring is accomplished by the crank-shaft  $C$ .

The fixed tension of the spring  $D$  remains constant at all times, thus giving a constant but yielding pressure through the arms  $E^2$  and  $H$  on the crank-arm  $F$  to force it to and retain it at the angle at which the stop  $J'$  may be fixed.

It will be seen that by the arrangement described the arm  $E^2$  and the arm  $H$  force the crank-arm  $F$  in opposite directions by an action and reaction which are always equal, as the pressure comes from the opposite ends of the same coil-spring.

In order to set the device, the operator first removes the key  $K$ , then swings the door to the desired place, (whether closed or wide open or at any intermediate point,) and then the key is again inserted to lock the ratchet-wheel  $J$  in place. The spring is now in action to return the door to that point.

If it is desired that the door should be free from the action of the spring, then the operator simply moves the key  $K$  downward to disengage the latter from the ratchet-wheel  $J$ , as then the several parts move in unison upon opening and closing the door—that is, upon swinging the crank-arm  $F$  forward or backward.

It is understood that when the device is in action the moving of the door carries the crank-arm  $F$  forward against the arm  $E^2$ , while the lug  $H'$  on the opposite side of the crank-arm is held in place by the stop  $J'$ , forming an integral part of the locking ratchet-wheel  $J$ . The movement of the arm  $F$  against the arm  $E^2$  causes a turning of the casing  $E$  to wind up the spring as the inner end is held rigid on the now fixed crank-shaft  $C$ . When the door is released, the tension of the spring causes a return movement of the door until the crank-arm abuts against the lug  $H'$ .

If the device is applied to act in an opposite direction, then the movement above described is reversed, as the device can be readily applied to a right-handed or left-handed door without any change, alteration, or adjustment of the parts other than the change of the angle of action made by the key  $K$ , for the action of the spring comes from the opposite ends through the respective arms. It makes no difference which way the spring is operated, right or left, the effective action is the same—namely, to turn the crank-arm  $F$  to that angle at which the stop  $J'$  is locked,

as determined by the particular ratchet in the ratchet-wheel  $J$  which the key  $K$  may engage, and the effect may be to open a door, if attached to a door, instead of to close it.

A washer  $L$ , made  $Z$  shape in cross-section, is interposed between the head  $C^2$  and the spring-casing flange  $E^3$  and extends with its upper arm over the ratchet-wheel  $J$  to hold the latter in place on top of the casings  $A$  and  $E$ , as will be readily understood by reference to Figs. 2 and 3.

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

1. A spring for doors and the like, comprising a casing, a spring mounted therein, a pivoted arm adapted to be connected with a door, means for adjusting the arm to hold the door in the position desired, and means between the arm and spring, whereby the opposite ends of the spring will exert a constant pressure on opposite sides of the said arm, substantially as and for the purpose set forth.

2. A spring for doors and the like, comprising a casing, a shaft journaled therein, a barrel mounted to rotate in the casing, a spring connected to the barrel and shaft respectively, an arm loosely mounted on the shaft independently of the barrel, and means for moving the shaft and barrel respectively in opposite directions from said arm, substantially as described.

3. A check for doors and the like, comprising a casing, a shaft journaled therein, a barrel mounted to turn within the casing, a spring connected to the shaft and to the barrel respectively, a crank-arm loosely mounted on the shaft and adapted for connection with the door, and arms or projections connected to move the shaft and barrel respectively and extending into the path of the said crank-arm on opposite sides thereof, so that the crank-arm is between said projections, substantially as described.

4. A spring for doors and the like, comprising a casing, a shaft journaled therein, a barrel mounted to turn within the casing, a spring connected to the shaft and to the barrel respectively, a crank-arm loosely mounted on the shaft and adapted for connection with the door, another arm likewise mounted to turn on the shaft but normally rigidly connected thereto, a locking device for connecting the shaft and said second arm in different positions, said arm extending into the path of the crank-arm and normally engaging the same at one side, and a projection from the spring-barrel engaging the opposite side of the crank-arm, as and for the purpose set forth.

5. A spring for doors and the like, comprising a casing, a shaft journaled in the casing, a barrel mounted in the casing, a spring connected to the shaft and barrel respectively, a crank-arm loosely mounted and adapted for connection with a door, a wheel loosely mounted on the casing and provided with a stop, arms or projections connected to move the



shaft and barrel respectively and extending into the path of travel of the crank-arm on opposite sides thereof, the said arms or projections being also arranged to engage the stop on the said wheel, and means for locking the said loosely-mounted wheel in different positions, substantially as described.

6. A spring for doors and the like, comprising a casing a shaft journaled therein, a barrel mounted to turn within the casing, a spring connected to the shaft and to the barrel respectively, a crank-arm loosely mounted on the shaft and adapted for connection with the door, a ratchet-wheel loosely mounted on the casing and provided with a stop, arms or projections connected to move the shaft or barrel respectively and extending into the path of travel of the said crank-arm on opposite sides thereof so that the crank-arm is between the said projections, the said arms or projections being also arranged to engage the stop on the ratchet-wheel, and a key arranged

to engage the ratchet-wheel to hold it stationary, substantially as described.

7. A device of the class described, comprising a main casing, a spring-barrel mounted to revolve therein, a shaft carrying a crank-arm and provided with a recessed head, a coil-spring in said barrel and connected at one end to the barrel and at its other end to said shaft, a ratchet-wheel adapted to be locked in place on said casing and carrying a stop, and adapted to be engaged at one side by an arm of said spring-barrel and at its other side by a lug on an arm adapted to be locked in said recessed head, said lug and barrel-arm being adapted to be engaged at opposite sides of the crank-arm, and a key for locking and unlocking said ratchet-wheel to and from said casing, as set forth.

JOHN M. HENTON.

Witnesses:

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J. P. HYMES.