

No. 654,400.

Patented July 24, 1900.

J. KEENE.
SPRING HINGE.

(Application filed Sept. 18, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

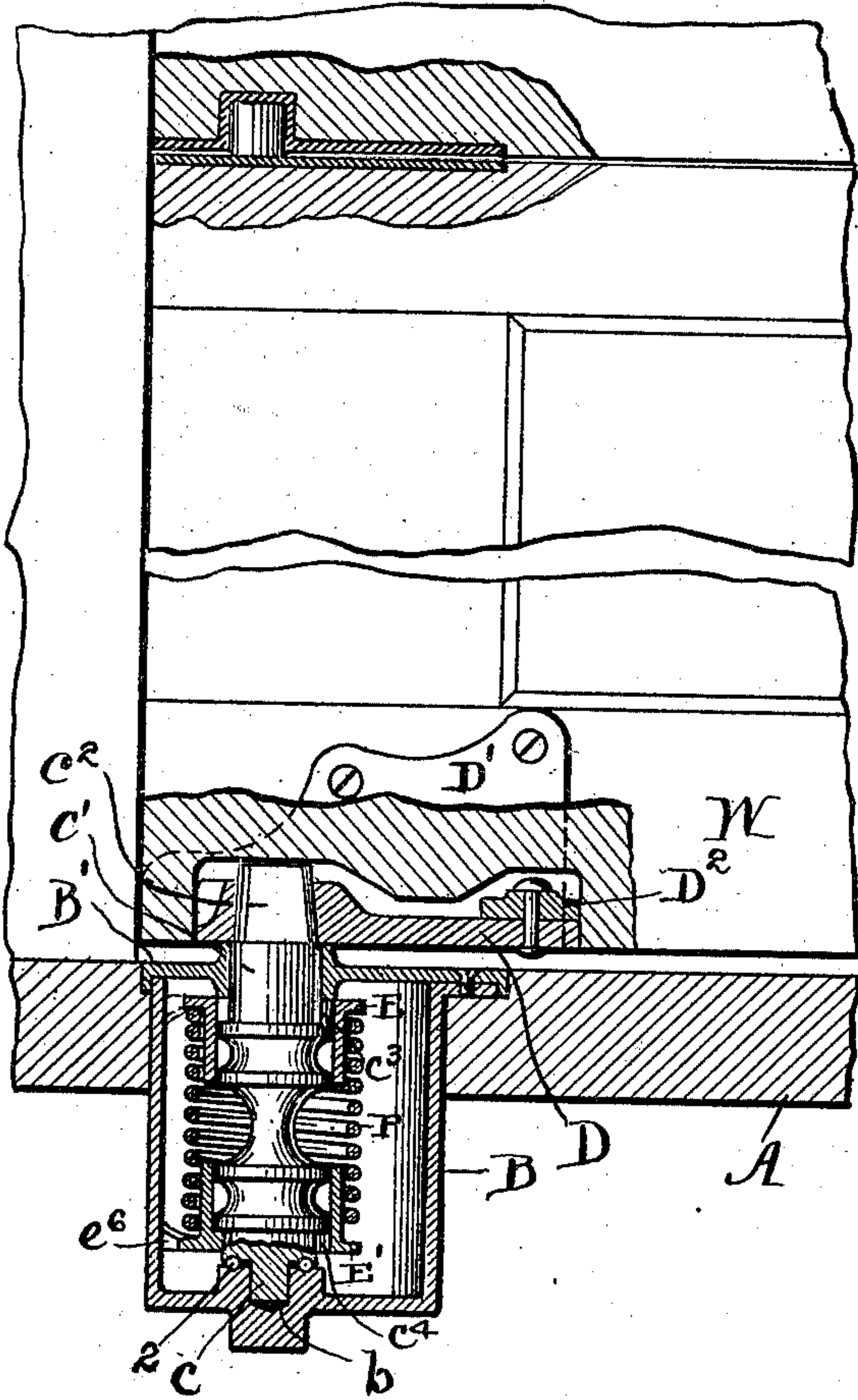


Fig. 2.

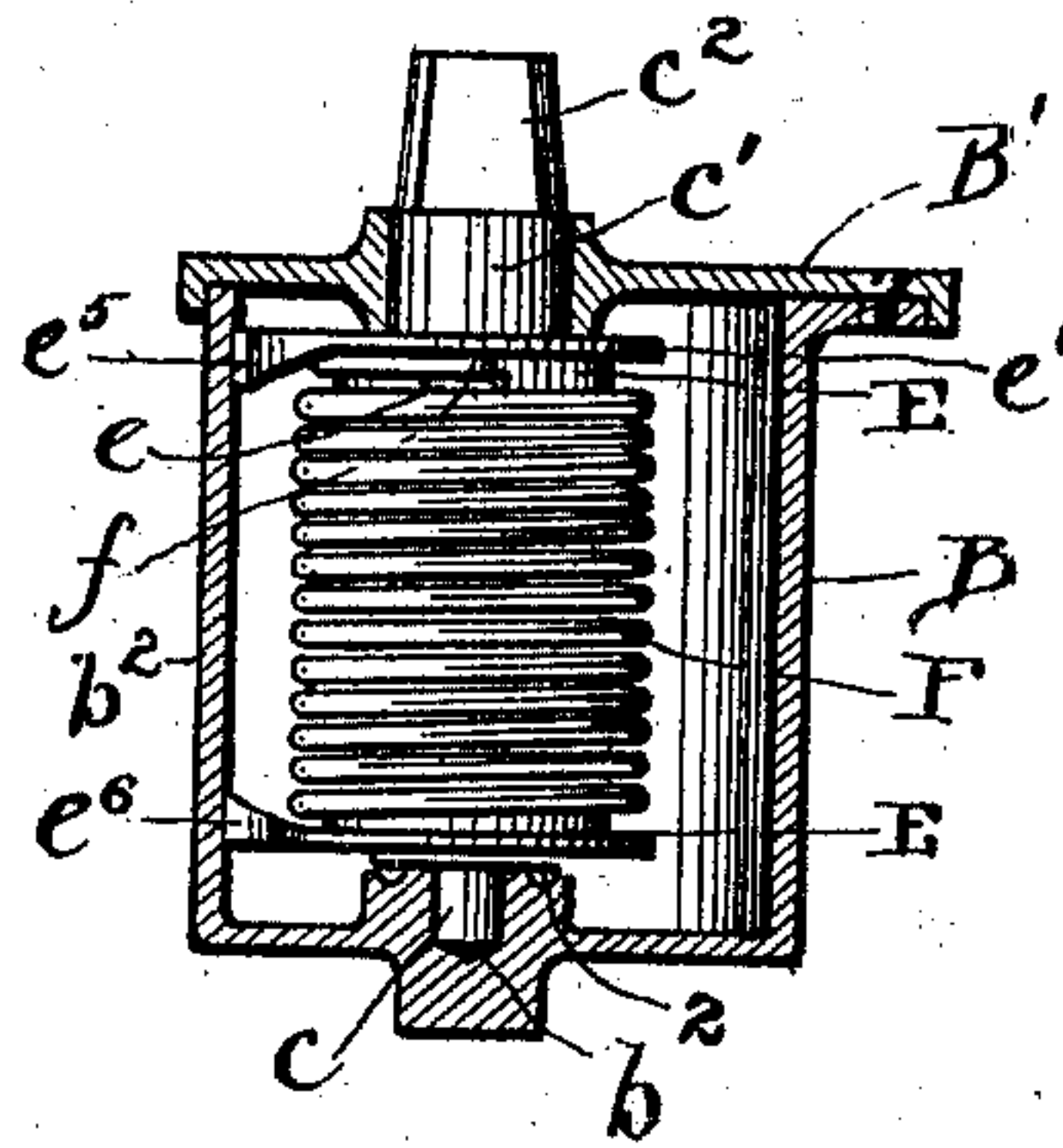


Fig. 3.

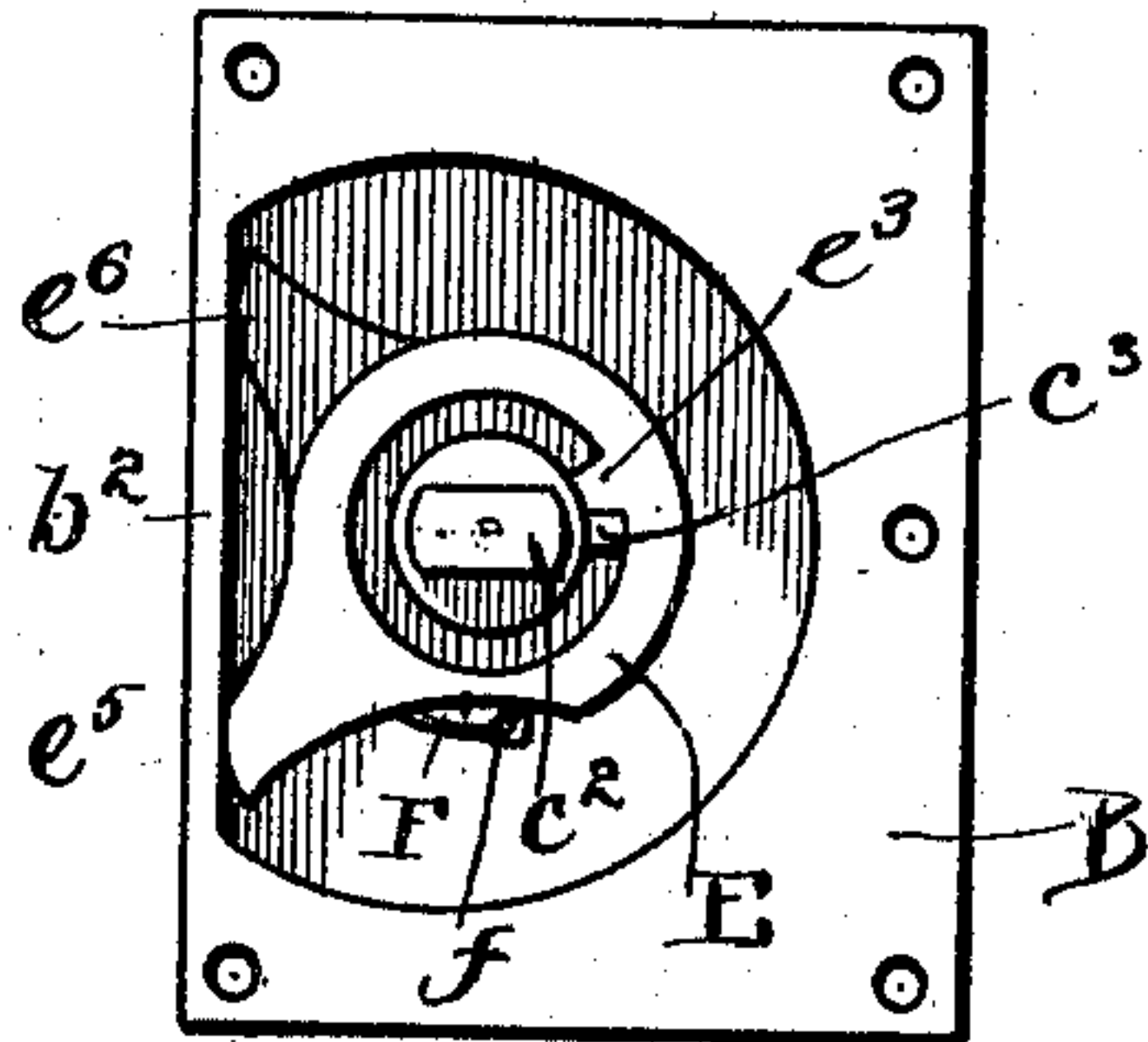


Fig. 6.

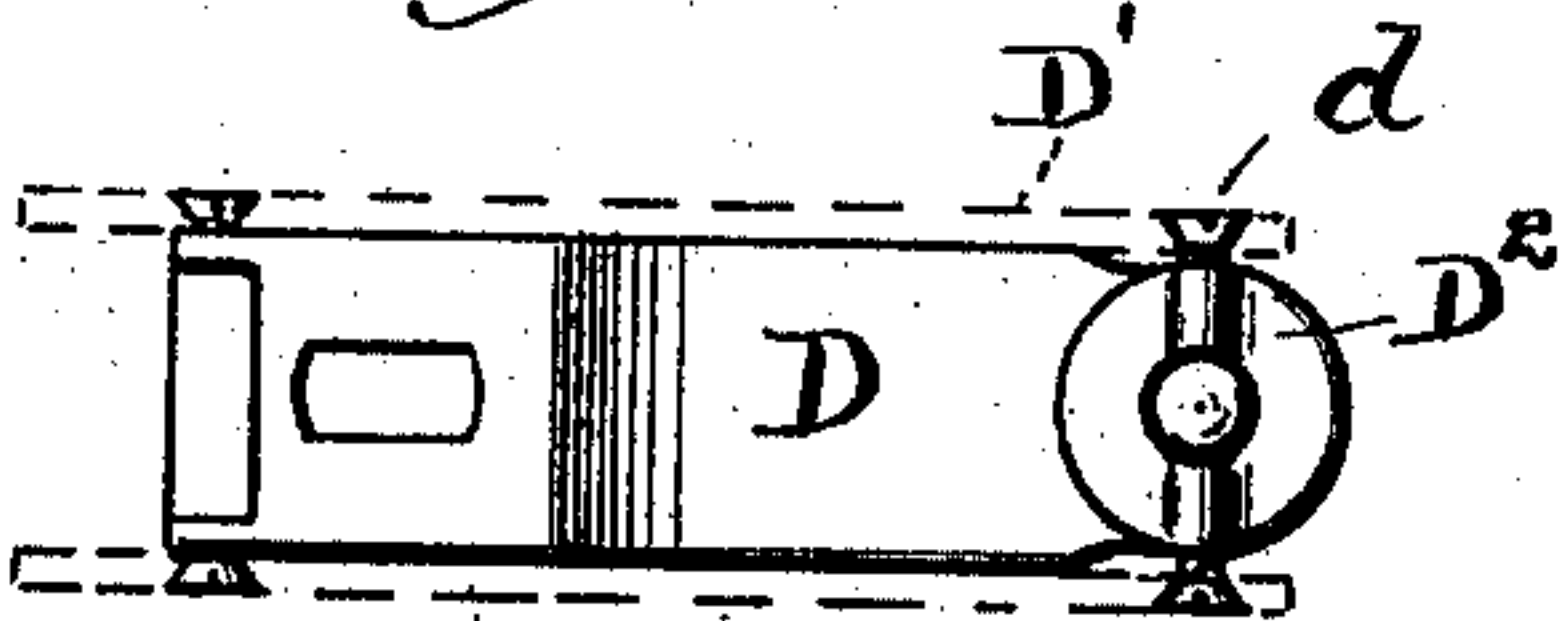


Fig. 4.

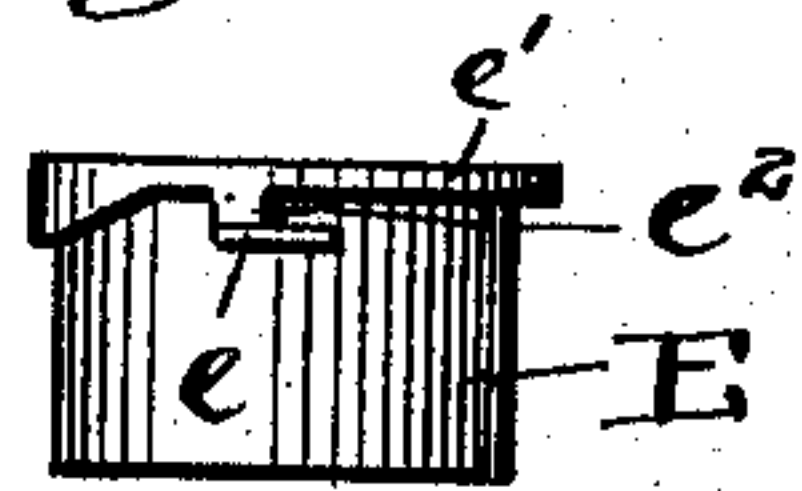
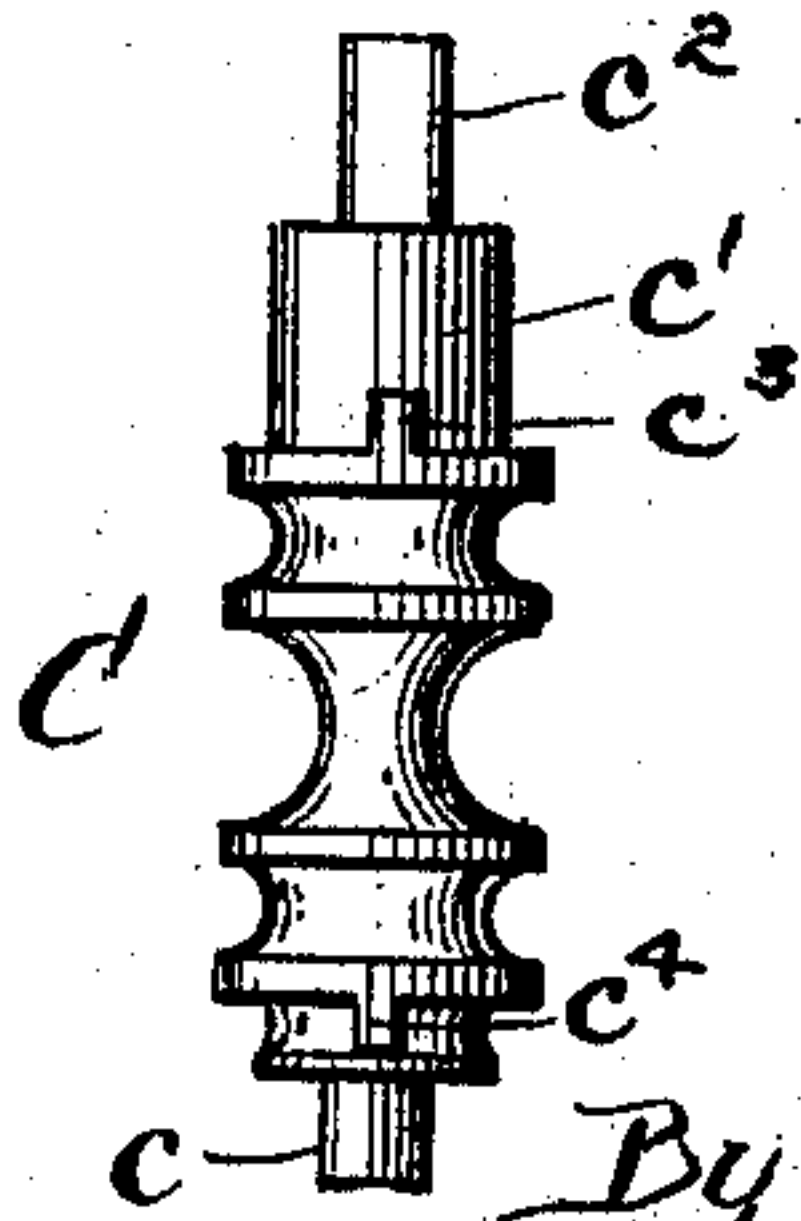


Fig. 5.



Witnesses:
Oliver J. Dennis.
Alberta Adomick

Inventor:
Joseph Keene
y Price & Fisher
his Attorneys:

No. 654,400.

Patented July 24, 1900.

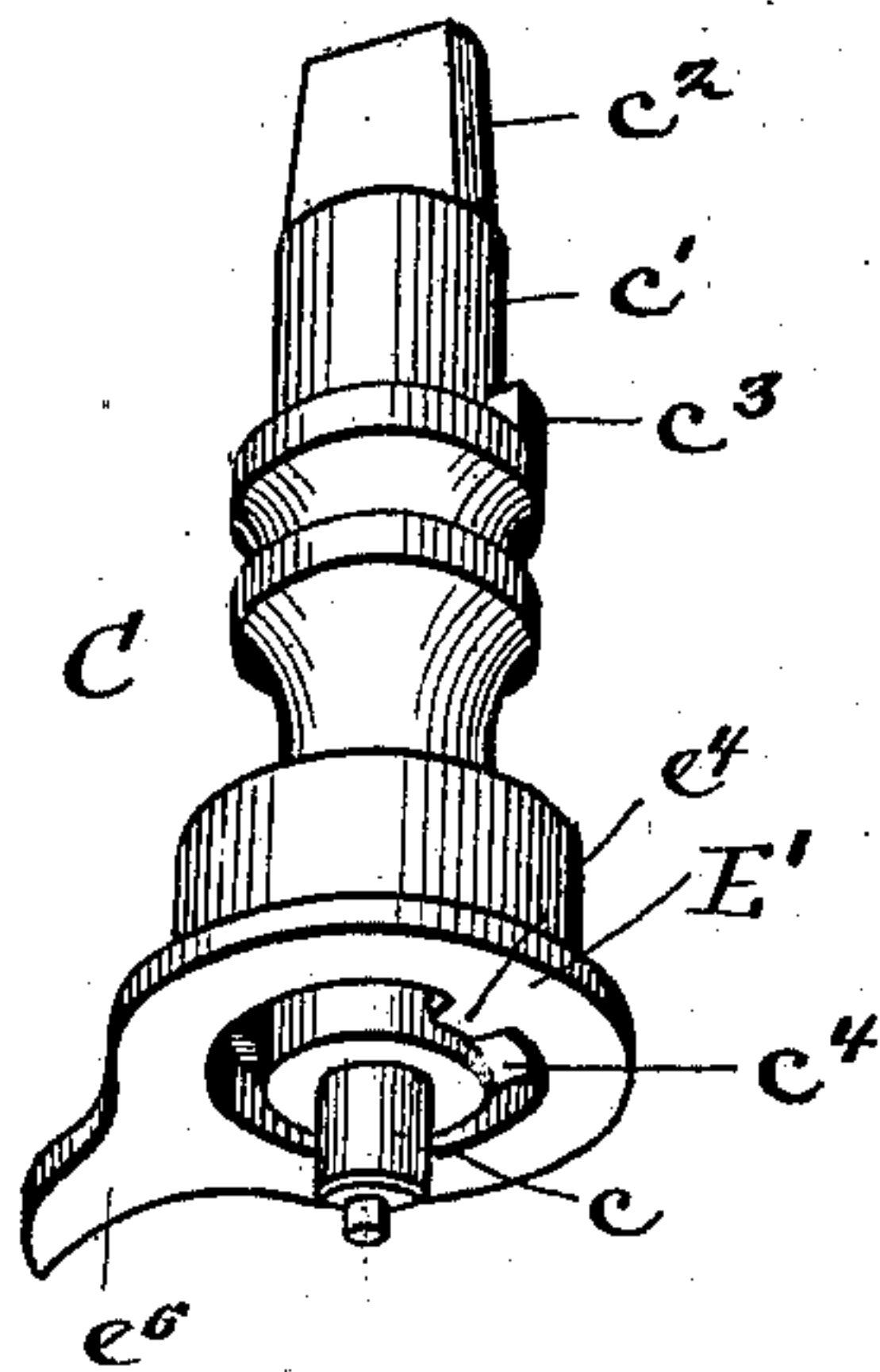
J. KEENE.
SPRING HINGE.

(Application filed Sept. 18, 1899.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 7.



Witnesses:
Fred Gerlach
Alberta Adamick

Inventor:
Joseph Keene
By *Prin Fisher*
his Attorneys.

UNITED STATES PATENT OFFICE.

JOSEPH KEENE, OF CHICAGO, ILLINOIS.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 654,400, dated July 24, 1900.

Application filed September 18, 1899. Serial No. 730,938. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH KEENE, a resident of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Spring-Hinges, of which the following is a full, clear, and exact description.

This invention has for its object to provide an improved construction of spring-hinge of that type whereby the door or gate to which the hinge is connected after being opened in either direction is automatically returned to its normally-closed position.

The invention consists in the features of improvement hereinafter described, illustrated in the accompanying drawings, and particularly defined in the claims at the end of this specification.

Figure 1 is a view in central vertical section through a double-acting spring-hinge embodying my invention, this view showing also a part of the door and of the threshold and jamb. Fig. 2 is a detail view showing the support or casing for the spring-hinge in vertical section, but showing the remaining parts in elevation. Fig. 3 is a plan view of the part shown in Fig. 2. Fig. 4 is a detail view in elevation of one of the pintle-sleeves. Fig. 5 is a detail view in elevation of the pintle. Fig. 6 is a detail plan view of the hanger-plate for engaging the lower edge of the door. Fig. 7 is a detail perspective view from the lower end of the spindle and of the lower sleeve thereon.

A designates the threshold of the door, and within a suitable opening formed in the threshold is placed the casing or support B of my improved spring-hinge, this casing being closed at the upper end by a top plate or cover B'. At the base of the support or casing B is formed a seat *b*, in which is stepped the lower end *c* of the pintle C. Around the reduced lower end *c* of the pintle C is formed an annular groove to receive bearing-balls 2, that rest in a corresponding annular groove formed in the top of the seat *b*. The circular upper part *c'* of the pintle C extends through a bearing-hole in the top plate B', and the extreme upper end *c''* of the pintle C is formed of polygonal shape to enter a corresponding seat formed in the hanger-plate D, that is attached to the lower edge of the door, as clearly shown

in Fig. 1 of the drawings. Around the pintle C are set the upper and lower sleeves E and E', these sleeves being arranged to engage and hold, respectively, the upper and lower ends of the coil-spring F, whereby the return of the door W to the normally-closed position is effected.

By reference more particularly to Figs. 2 and 4 of the drawings it will be seen that each of the spring-holding sleeves E and E' is formed upon its periphery with a lug *e*, between which lug and the peripheral flange *e'* will be inserted the adjacent bent end *f* of the coiled spring F. The bent end of the coil-spring F is retained in position not merely by the lug *e* and flange *e'*, but also by its bearing against the metal *e''*, adjacent the flange *e'*. (See Fig. 4.) The lug *e* enters between the terminal coils of the spring, and the purpose of this arrangement is to enable the end of the spring to be interlocked with the corresponding sleeve before the sleeve is slipped to its final position upon the pintle, as will hereinafter more fully appear.

The pintle C is provided with the stop-lugs *c''* and *c'''*, these lugs preferably projecting from the reduced portions of the pintle opposite the outer ends of the sleeves E and E', engaging corresponding offsets *e''* and *e'''*, that project radially inward from the outer ends of the sleeves E and E'. The coil-spring F when in position will be under tension, and the spring will be placed in position and under tension in the following manner before the pintle is inserted into the inclosing casing or support B, viz: One of the sleeves E will be slipped over the corresponding end of the pintle C until the offset *e''* of this sleeve bears against the adjacent enlarged part of the pintle and against the stop *c''* thereof. One end of the coil-spring F will then be inserted into the seat formed by the lug *e*, the flange *e'*, and the raised part *e''*. The other sleeve E' will then be slipped over the opposite end of the pintle, and the coil-spring F will be drawn out (by the separation of the coils) so that its bent end *f* may be inserted in the seat adjacent the lug *e* of the sleeve, the lug *e* entering the space between the outer coils of the spring. The sleeve E will at such times be opposite the round bearing portion

c' of the pintle, and the sleeve will then be turned so as to give the desired tension to the coil-spring, after which the sleeve E' will be moved inward toward the sleeve E until the offset e^4 of the sleeve bears against the raised portion of the pintle and bears against the lug c^4 , that projects from the pintle at such point. The resiliency of the spring will now tend to turn the sleeves E and E' in opposite directions and will hold their respective offsets e^3 and e^4 in bearing against the corresponding lugs c^3 and c^4 of the pintle C . The sleeves E and E' are formed, respectively, with the radial extensions e^5 and e^6 , these extensions projecting in opposite direction when the sleeves are in position upon the pintle. When the pintle C , with the sleeves and spring thereon, is placed in position within the support or casing B , the extensions e^5 and e^6 of the sleeves will bear against the wall b^2 of the casing. This wall b^2 of the casing is flattened more or less, so as to engage the extensions e^5 and e^6 of the sleeves E and E' and form a bearing to prevent the revolution of these extensions in one direction. After the pintle and its connected parts have been inserted in the support or casing B the cover B' will be slipped over the end of the pintle and will be connected to the top flange of the casing by suitable screws, as shown. When the upper end of the pintle c^2 has been engaged by the hanger-plate D , attached to the lower edge of the door in manner to be hereinafter described, it will be found that the spring F and parts connected therewith will serve to hold the door in normally-closed position and return it to such position after it has been opened in either direction. When the door is opened, for example, toward the left—*i. e.*, away from the person viewing the drawing—the pintle C will be turned in the direction of the arrow shown by full lines in Fig. 3, and at such time the lug c^3 at the upper end of the pintle will engage the offset e^3 of the corresponding sleeve E , and the pintle will thus turn the sleeve E in the direction of the arrow shown in Fig. 3 and will draw the corresponding end of the coil-spring F with it. The opposite end of the coil-spring F will be held stationary because of its engagement by the lower sleeve E' , that is held against rotation in the direction of the arrow, Fig. 3, by reason of the bearing of the extension e^6 against the wall b^2 of the support or casing B . Hence it will be seen that as the door is thus opened toward the left the tension of the spring F will be increased, and when the door is released the force of the spring will return it to normally-closed position. It will be understood, of course, that when the door W is opened in opposite direction—*i. e.*, toward the right—the lug c^4 at the lower end of the pintle C will engage with the corresponding lug on the lower sleeve E' and will thus turn the lower end of the coil-spring, while the upper end of this spring is held against movement by the bearing of the extension e^5 of the up-

per sleeve E against the wall b^2 of the support or casing B .

I am aware that various forms of double-acting spring-hinges have been heretofore devised for use at the thresholds of doors; but I believe my present invention possesses features of superiority, notably in the following particulars, viz: It will be observed that the ends of the coil-spring F engage the spring-holding sleeves at points substantially in the horizontal plane of the offsets whereby the sleeves interlock with the lugs of the pintle C . This arrangement is particularly advantageous, because when the pintle is turned by the swinging of the door the strain from the pintle to the end of the coil-spring is in substantially a direct line radially of the sleeve. Hence all tendency to cant or twist the sleeve out of vertical plane is avoided and a uniform bearing of the sleeve upon the pintle is maintained, which would not be the case if the end of the coil-spring were connected, for example, to the upper end of the sleeve, while the interlocking of the pintle and the sleeve occurred at the lower end of the sleeve. It will also be seen that by forming the sleeves with the lugs e the ends of the coil-spring may be bent inward—that is to say, toward the center of the coils—and the ends of the spring may be interlocked with the sleeves, while the spring is drawn out to permit it to be placed under tension, it being understood that the initial tension must be given to the spring by turning one of the sleeves before such sleeve is finally moved to its working position upon the pintle. This provision of lugs or seats to receive the inwardly-turned ends of the coil-spring is also advantageous because it permits the spring to have its ends turn inwardly—which in practice is a far cheaper manner of bending the ends of a heavy wire than to bend them at right angles to the coil of the spring.

By reference more particularly to Figs. 1 and 3 of the drawings it will be observed that inasmuch as the arms e^5 and e^6 bear against the flattened portion of the casing the pintle C can be turned in either direction considerably more than a half-circle. This is important because it insures that if the door be swung violently open in either direction its movement will be arrested not by the hinge, but by the contact of the door with the jamb. Hence all strain upon the hinge from the violent movement of the door is avoided.

In order to hold the door W in position and to permit a slight adjustment of the hanger-plate D , I provide at each side of the hanger-plate D a face-plate D' , adapted to be attached by screws to the corresponding side of the door adjacent its lower edge. The hanger-plate D is pivotally connected to a swivel-block D^2 , at opposite points of which block are formed screw-threaded seats to receive the screws d , that pass through the side plates D' . Hence it will be seen that after the plates D' have been fastened in position upon the door the hanger-plate D may be drawn by

one or the other of the screws *d* toward one face or the other of the door, and in this way the door can be hung in exact central position.

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

1. A spring-hinge comprising the combination with a suitable casing or support, of a pintle journaled therein and provided with the upper and lower lugs, two sleeves loosely encircling said pintle and said lugs, and provided with inwardly-projecting offsets at their outer ends to engage said lugs, a coil-spring encircling the pintle and having its ends connected to the outer portions of said sleeves at points in substantially the horizontal plane of the sleeve-offsets and suitable means whereby each of said sleeves is held

against movement in one direction while it is free to be moved in the opposite direction. 20

2. A spring-hinge comprising the combination with a suitable casing or support having a flattened wall, of a pintle journaled therein and provided with upper and lower lugs, two sleeves loosely encircling said pintle and provided with inwardly-extending offsets to engage said lugs and provided also with oppositely-disposed extensions that bear against the flattened face of the casing, and a coil-spring having its opposite ends connected to said pintle-sleeves. 25 30

JOSEPH KEENE.

Witnesses:

ALBERTA ADAMICK,
GEO. P. FISHER, Jr.