

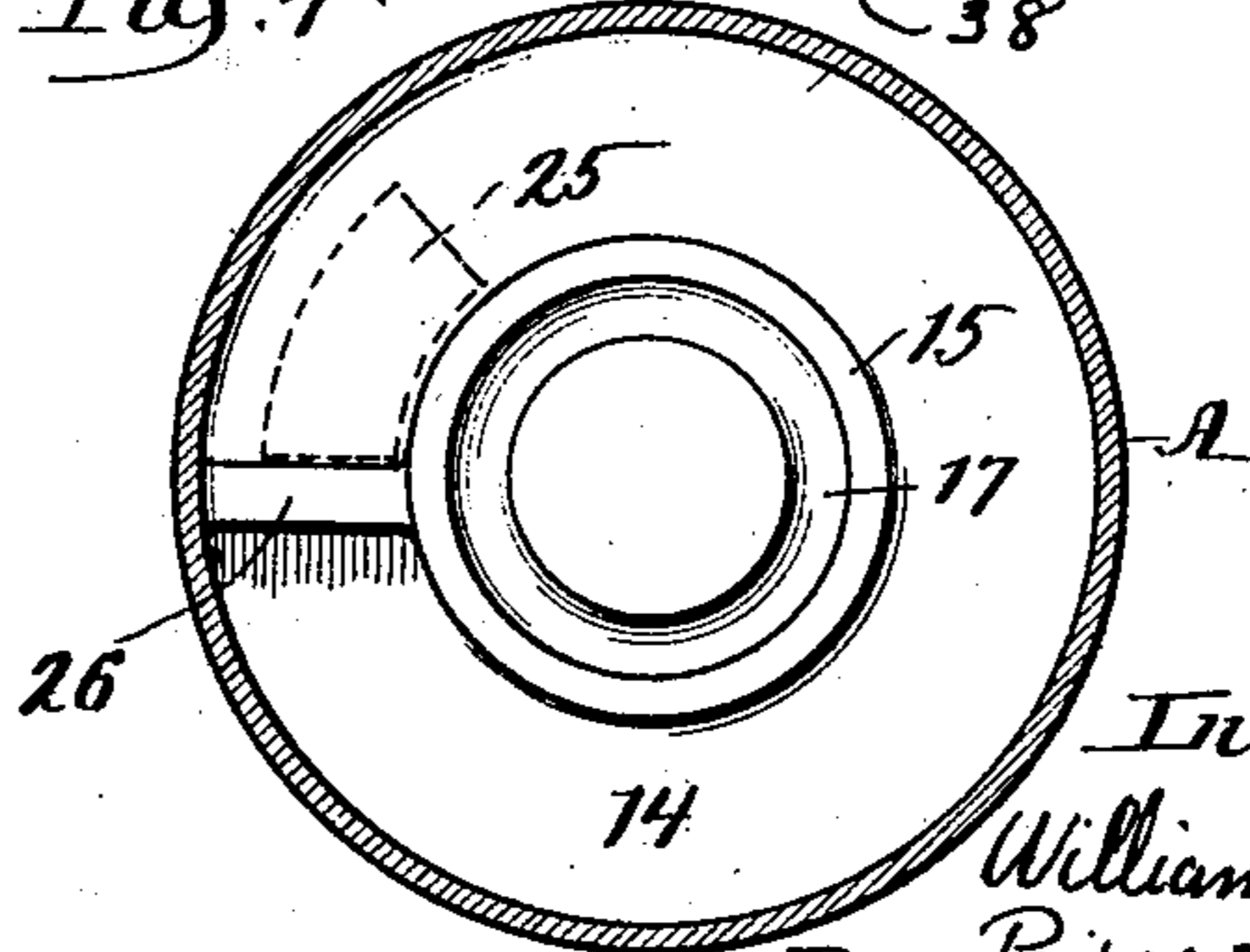
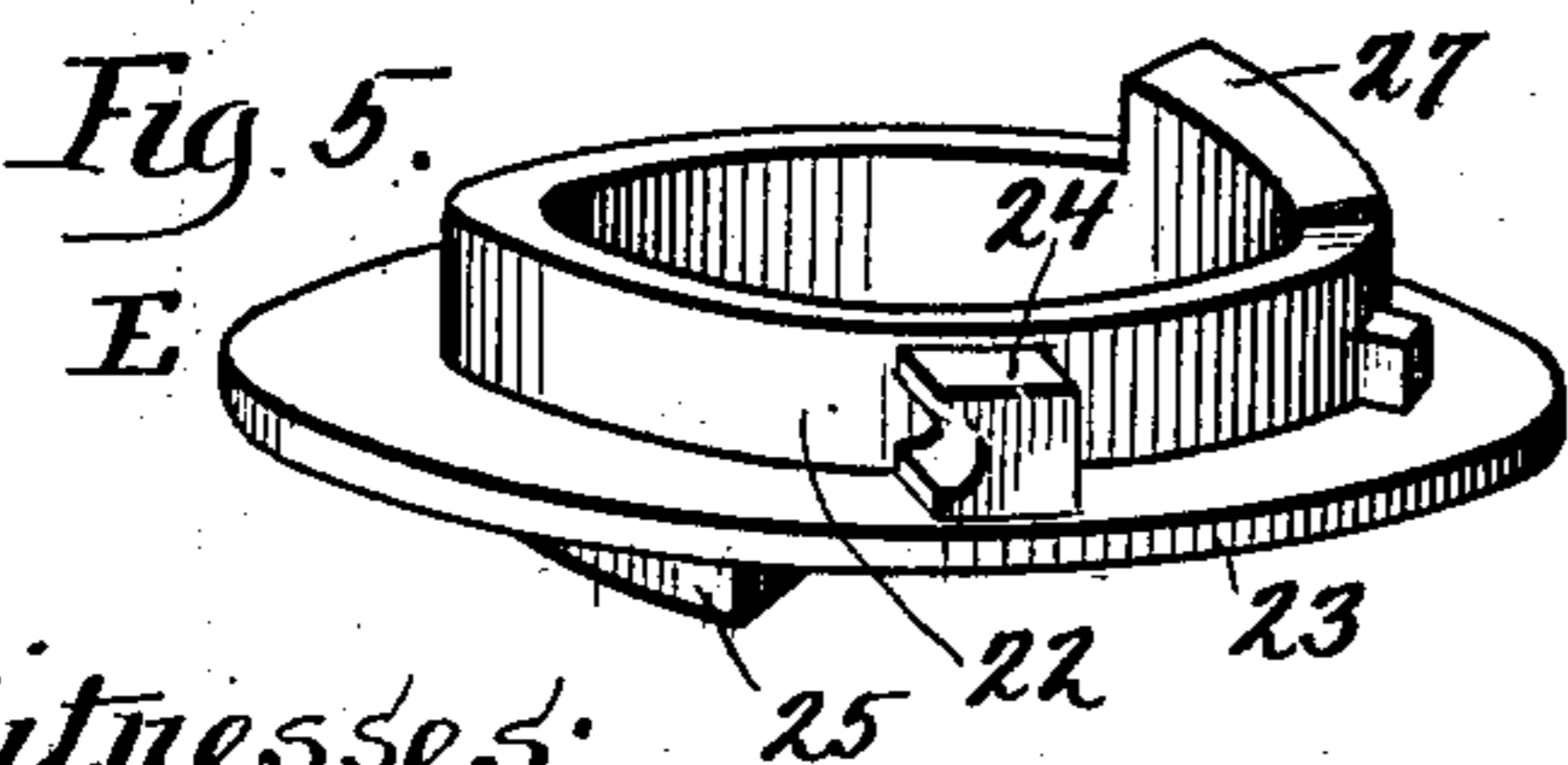
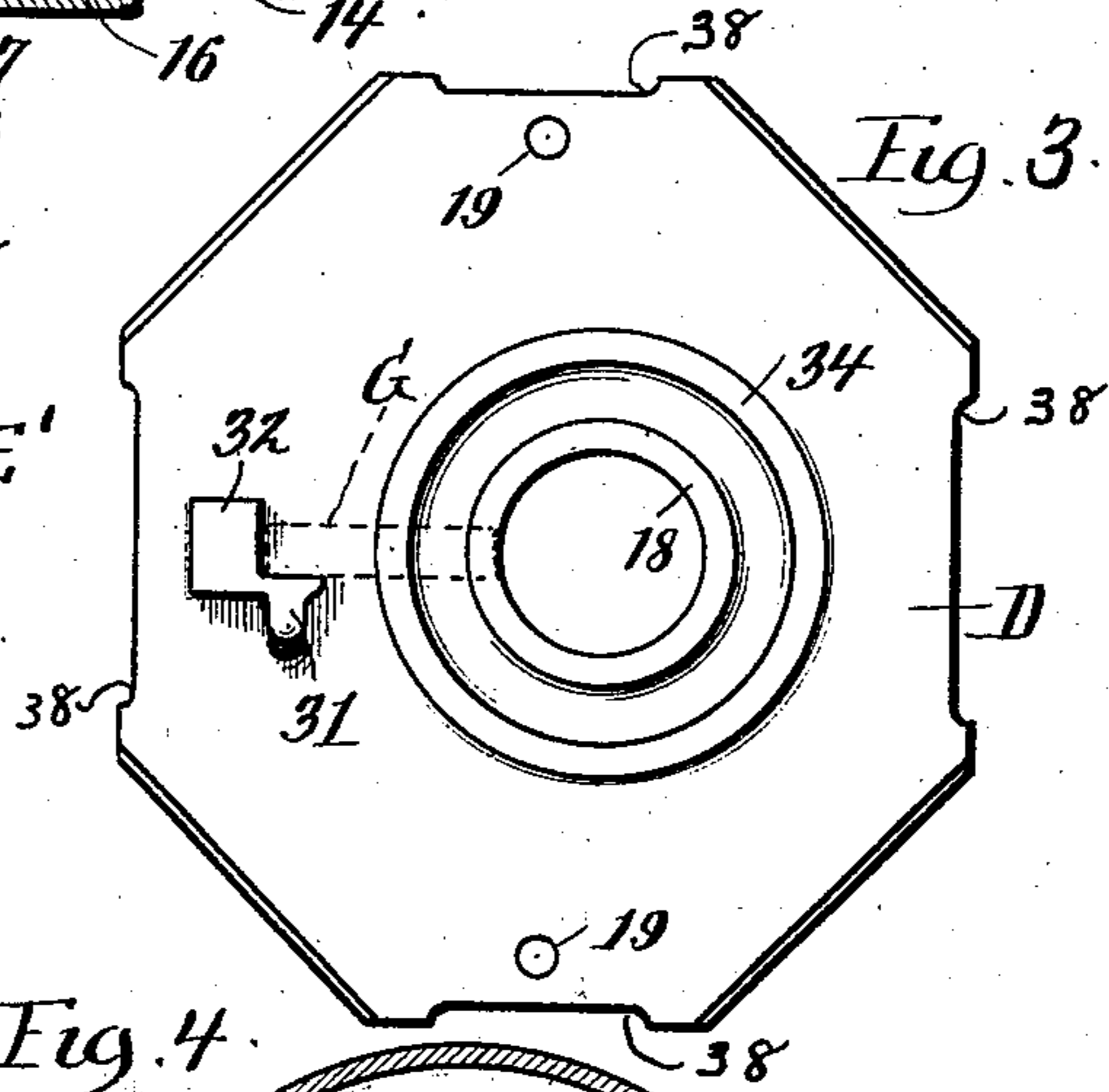
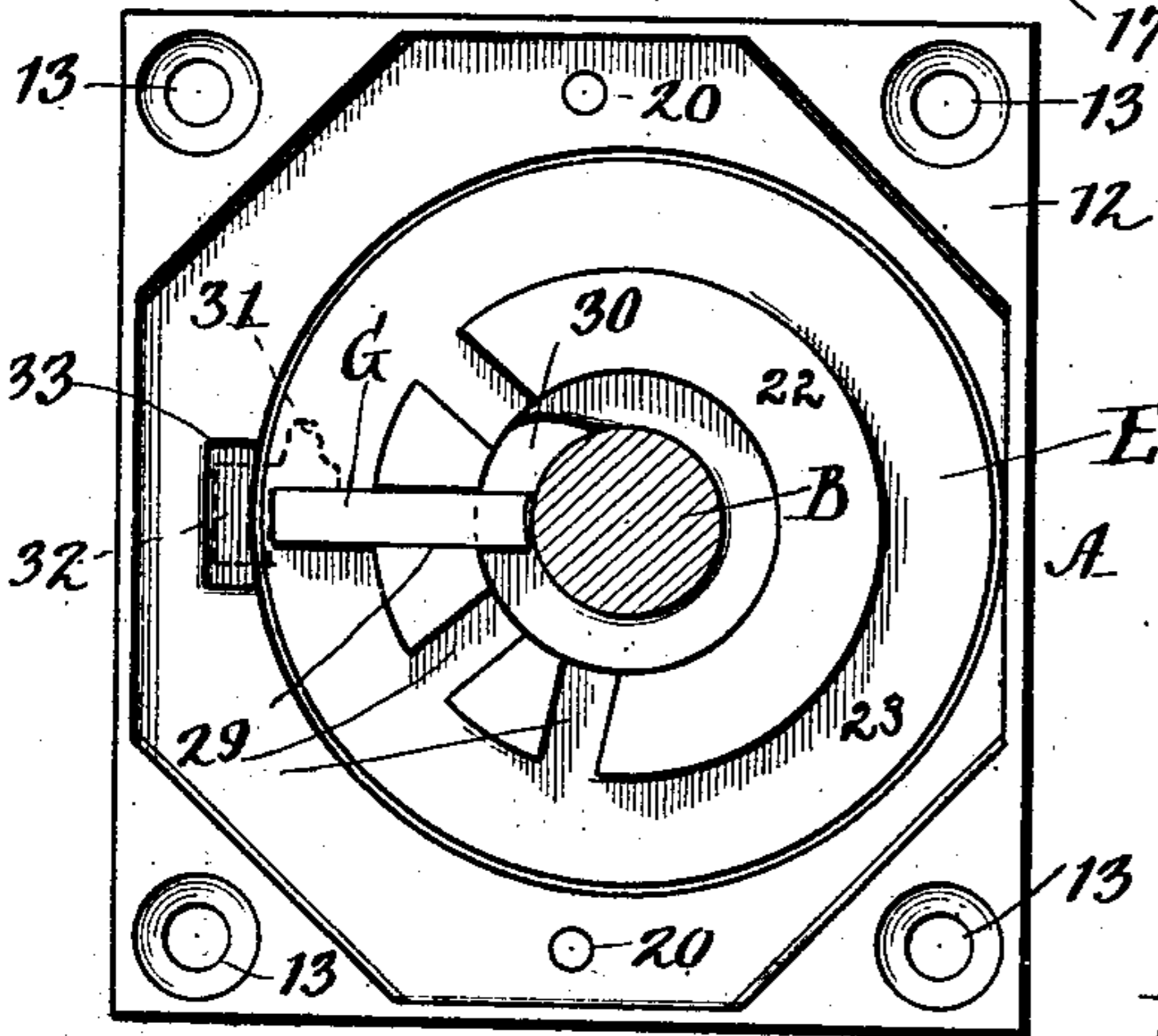
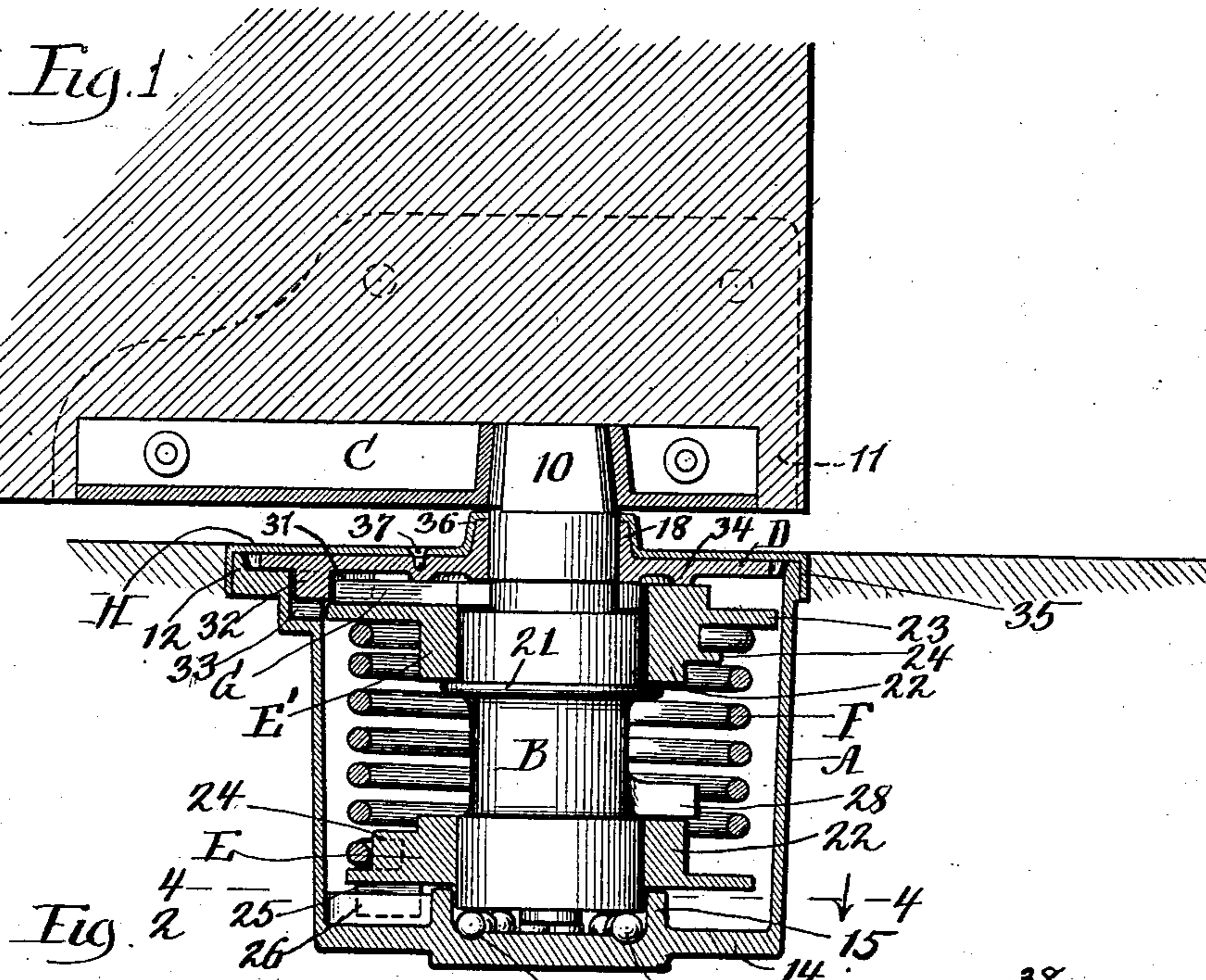
No. 720,254.

PATENTED FEB. 10, 1903.

W. J. KEENE.
SPRING HINGE.

APPLICATION FILED MAR. 17, 1902.

NO MODEL.



Witnesses:
Fred C. Laack
Alberta Adamick

Inventor
William J. Keene
By *Peirce & Fisher*
his Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM J. KEENE, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO SPRING BUTT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION.

SPRING-HINGE.

SPECIFICATION forming part of Letters Patent No. 720,254, dated February 10, 1903.

Application filed March 17, 1902. Serial No. 98,468. (No model.)

To all whom it may concern:

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

The improvement relates to that type of spring-hinges for doors and the like called "double-acting"—i. e., which are arranged to automatically close the door after it has been swung open in either direction.

The invention seeks to provide a strong simple construction and in which the tension of the spring may be easily and conveniently adjusted without necessitating the use of special tools; and it consists in features of improvement hereinafter described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a central vertical section of the improved spring-hinge as applied to a door or gate. Fig. 2 is a plan view of the hinge-casing and contained parts with the top plate and dust-cap removed and with the spindle shown in section. Fig. 3 is an inverted plan view of the top plate. Fig. 4 is a section on line 4-4 of Fig. 1 looking toward the bottom of the casing. Fig. 5 is a perspective view of the lower collar or sleeve.

The hinge casing or support A, which is let into the floor, as indicated in Fig. 1, carries a spindle B, having an upper flattened end 10, which fits within a correspondingly-shaped socket in a socket-piece C. The latter is let into the lower edge of the door near the jamb and held securely in place between the side plates 11. The upper edge of the door is provided with a pivot-hinge in the usual manner, so that it may swing to and fro in either direction.

The casing A is preferably cylindrical and provided at its upper edge with a flange 12, preferably rectangular and having countersunk holes 13 at its corners for the screws, by which the casing is held firmly in position. The central portion of the bottom 14 of casing A is depressed and surrounded by a short annular flange 15, forming a cup, within which spindle B is stepped. Preferably the lower

end of the spindle rests upon a row of balls 16, running in an annular raceway 17 at the bottom of the cup-shaped portion.

The upper cylindrical portion of the spindle B is journaled in a bearing 18 in a top or cover plate D, which fits within a recess or rabbet formed in flange 12 of the casing and is held in place by screw-bolts passing through holes 19 and 20 in the top plate and flange. The top plate D is cut away at the corners opposite the screw-holes 13, as shown, and the recess in flange 12 similarly shaped, so that the plate may be removed without disturbing the screws which secure the casing in place.

Spring-supporting collars or sleeves E and E' are journaled on enlarged portions of the spindle B near the upper and lower ends of the casing. The lower collar E is positioned just above the flange 15 on the bottom of the casing and the upper collar E' rests upon a shoulder 21 upon the spindle. Each sleeve or collar comprises a central boss 22 and a horizontally-disposed flange 23 and is provided with a notched lug 24 to receive the inwardly-turned ends of the coiled spring F. The lower collar E has a stop-lug 25 on its lower face normally engaging a fixed radial rib or stop 26 on the bottom of casing A (see Fig. 5) and has a lug 27 on its upper end normally engaged by a lateral projection or lug 28 on spindle B.

The upper end of the central boss 22 of the upper sleeve or collar E' is provided above the flange 23 with a series of radial grooves or channels 29, which are preferably open-sided, as shown, and rectangular in cross-section. The spindle B has a reduced portion and a stop-lug 30 opposite the inner ends of channels 29, and spring F is held under tension by a locking-pin G, preferably of rectangular cross-section, placed in one of the channels, with the inner projecting end of which the stop-lug 30 of the spindle normally engages. A fixed stop or lug 31, depending from the lower side of the cover, normally engages the side of the outer end of the locking-pin G. This stop-lug is preferably provided with a portion 32, which extends beyond the end of the pin and within a recess 33, formed in the upper edge of the casing A,

so that the stop-lug 31 is supported by the body of the casing and the pin held against endwise displacement. An annular projection or boss 34 upon the under side of top plate D serves to hold locking-pin G securely in place.

The dust-cap H is arranged flush with the floor and has a depending flange 35, fitting about the flange 12 of casing A, and an annular boss 36, fitting about the bearing 18 of top plate D. The dust-cap is held in place upon the top plate by a stud-screw 37.

The spindle B and collars or sleeves E E' are spring-held in central position to hold the door or gate closed by the engagement of lug 25 with fixed stop 26 at the bottom and by the engagement of locking and stop pin G with the fixed stop 31 at the top.

The edge of top plate D and of the rabbet or recess in top flange 12 are correspondingly beveled, as indicated, so that as the top plate is forced into position lug 31 is forced against pin G, taking up any lost motion between the parts, and the door is spring-held securely in central position.

It will be observed that stops and lugs on the spindle and sleeves interlock in one way only and that the arrangement is such that as the door or gate is swung in one direction the upper sleeve E' will be held stationary by the locking-pin G and fixed stop 31, while the lower sleeve E will be rotated against the tension of spring F by the engagement of spindle-lug 28 with sleeve-lug 27, thus placing the spring under tension, so that it will automatically swing the door to closed position as soon as the latter is released. When the door is swung in the opposite direction, sleeve E is held stationary by lug 25 and fixed stop 26 and sleeve E' turned to place the spring F under tension by the engagement of lug 30 with locking-pin G.

The tension of spring F may be easily adjusted without the aid of special tools. After the dust-cap H is removed top plate D can easily be removed without taking out the heavy fastening-screws at the corners. To facilitate the removal of the top plate, its edges are cut away, as at 38, so that a screw-driver or other convenient tool may be inserted between the edge of the plate and the edge of the rabbet or recess in flange 12. Then by engaging one of the rectangular grooves 29 with a screw-driver or any handy rigid piece the sleeve E' may be turned to bring any desired one of the grooves or channels 29 into line with the edge of lug 30 and the locking-pin easily placed in position. This work is greatly facilitated by having open-sided channels or grooves for the locking-pin and by the arrangement in which the two parts to be interlocked are exposed to view. In prior constructions at least one of these has been hidden, or the holes for the pin in one part, which must be brought to accurate alinement with corresponding holes in the other part, are hidden, so that the ad-

justment is not easily effected and is rendered particularly difficult to a workman not thoroughly familiar with the structure of the hinge.

With the structure shown the parts to be connected are all exposed at the upper part of the casing and are conveniently accessible and the manner of adjustment apparent at once to any workman and can be effected with any convenient tool at hand, thus avoiding the necessity of special tools, which are seldom at hand and easily misplaced or lost.

Another advantage incident to the present structure is that, although the locking-pin G is very easily removed from position after taking off cover-plate D, it is normally locked in place and cannot work loose or out of position.

Except when removed for effecting the adjustment the closing top plate is always in position, effectually excluding shavings, dirt, &c., from the interior of the casing, thus obviating one objection to prior forms, in which openings are provided through which the adjustment may be effected. Moreover, by having locking-pin G also act as a stop-pin for engaging a fixed stop the necessity is avoided of providing two sleeves or collars at the upper end of the spring in order to effect the adjustment.

It is obvious that changes may be made in the details of construction.

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

1. In spring-hinges, the combination with a casing or support, of a spindle adapted to engage a swinging door or gate and journaled in said support, a spring arranged to actuate said spindle in opposite directions, a tension-regulating collar for said spring connected to its upper end, a locking-pin for said collar, a series of open-sided grooves or seats for said pin, said pin being freely and vertically removable through the open sides of said grooves or seats, and a vertically-removable top plate normally closing the open sides of said grooves or seats to prevent the displacement of said pin.

2. In spring-hinges, the combination with a casing or support, of a spindle arranged to engage a swinging door or gate and journaled in said support, a spring arranged to actuate said spindle in opposite directions, a tension-regulating collar for said spring connected to its upper end and journaled on said spindle, a locking-pin for connecting said spindle and collar, a series of horizontal radial seats for said pin on said collar at its upper end and a lug upon the upper end of said spindle engaging the side of said pin.

3. In spring-hinges, the combination with a casing or support, of a spindle arranged to engage a swinging door or gate, a spring arranged to actuate said spindle in opposite directions, a tension-regulating collar for said spring connected to its upper end and jour-

naled on said spindle, a locking-pin for connecting said spindle and sleeve, a series of horizontal, radial seats for said pin formed on said collar at its upper end, a lug upon the upper end of said spindle engaging the side of said pin and an abutment opposite the end of said pin to prevent its endwise displacement.

4. In spring-hinges, the combination with a casing or support, of a spindle arranged to engage a swinging door or gate and journaled in said support, a spring arranged to actuate said spindle in opposite directions, a tension-regulating collar for said spring connected to its upper end and journaled on said spindle, a locking-pin for connecting said spindle and sleeve, a series of horizontal, open-sided radial seats for said pin formed on said collar at its upper end, a lug upon the upper end of said spindle engaging the side of said pin and a top plate having an annular abutment engaging the upper face of said pin to prevent its displacement.

5. In spring-hinges, the combination with a casing or support, of a spindle arranged to engage a swinging door or gate and journaled in said support, a spring arranged to actuate said spindle in opposite directions, a tension-regulating collar for said spring connected to its upper end and journaled on said spindle, a locking-pin for said collar, a series of horizontal, radial, open-sided grooves or seats for said pin formed upon the upper face of said collar, a lug on said spindle opposite the inner end of said grooves or seats for engaging said pin and means for preventing the displacement of said pin through the open sides of said grooves or seats.

6. In spring-hinges, the combination with a casing or support, of a spindle arranged to engage a swinging door or gate and journaled in said support, a spring coiled about said spindle and arranged to actuate the same in opposite directions, a tension-regulating collar for said spring connected at its upper end and journaled on said spindle, a locking-pin rectangular in cross-section for said collar, a series of correspondingly-shaped radial, open-sided grooves or seats for said pin formed upon the upper face of said collar, a lug on said spindle opposite the inner ends of said grooves or seats for engaging the inner end of said pin and a closing top plate having a bearing for the upper end of said spindle, an annular abutment for engaging the upper face of said pin to prevent its displacement and a fixed stop arranged to engage the outer end of said pin.

7. In spring-hinges, the combination with a casing or support, a spindle arranged to engage a swinging door or gate and journaled in said support, a spring coiled about said spindle and arranged to actuate the same in opposite directions, a tension-regulating collar for said spring connected to its upper end and journaled on said spindle, a locking-pin for connecting said spindle and collar, hori-

zontal radial seats upon the upper end of said collar for said pin, a lug upon said spindle engaging the side of said pin and a fixed stop engaging the side of said pin near its outer projecting end.

8. In spring-hinges, the combination with a casing or support, of a spindle arranged to engage a swinging door or gate and journaled in said support, a spring coiled about said spindle and arranged to actuate the same in opposite directions, a tension-regulating collar for said spring connected at its upper end and journaled on said spindle, a locking-pin for connecting said collar and spindle, a series of horizontal, radial, seats formed at the upper end of said collar for said pin, a lug upon the upper end of said spindle for engaging the side of said pin, a closing top plate having a bearing for the upper end of said spindle and a depending, fixed lug upon the under side of said top plate for engaging the side of said pin near its outer projecting end.

9. In spring-hinges, the combination with a casing or support, of a spindle arranged to engage a swinging door or gate and journaled in said support, a spring coiled about said spindle and arranged to actuate the same in opposite directions, a tension-regulating collar for said spring connected at its upper end and journaled on said spindle, a locking-pin for connecting said collar and spindle, a series of horizontal, radial seats formed at the upper end of said collar for said pin, a lug upon the upper end of said spindle for engaging the side of said pin, a closing top plate having a bearing for the upper end of said spindle, a depending fixed lug upon the under face of said top plate for engaging the side of said pin, said lug having an extension, and a recess formed in said casing for receiving said extension.

10. In spring-hinges, the combination with a casing, of a spindle arranged to engage a swinging door or gate and journaled in said casing, a spring coiled about said spindle and arranged to actuate the same in opposite directions, a tension-regulating collar for said spring connected to its upper end and journaled on said spindle, a locking-pin for connecting said collar and spindle, a series of horizontal, radial seats for said pin formed in the upper end of said collar, a lug upon the upper end of said spindle for engaging the side of said pin, a closing top plate having a depending fixed lug upon the under face of said top plate for engaging the outer end of said pin and a rabbet or seat for said top plate formed in said casing, the edges of said top plate and of said rabbet or seat being inwardly inclined.

11. In spring-hinges, the combination with a cylindrical casing having a top horizontal flange provided with screw-holes for fastening-screws, of a spindle arranged to engage a swinging door or gate and journaled in said casing, a spring coiled about said spindle and

arranged to actuate the same in opposite directions, a tension-regulating collar for said spring connected to its upper end and journaled on said spindle, a locking-pin for connecting said collar and spindle, a series of
5 horizontal radial grooves or seats for said pin formed in the upper end of said collar, a lug upon said spindle for engaging the side of said pin, a top plate having a fixed stop for
10 engaging the outer end of said pin and a rab-

bet or recess formed in the flange of said casing for said top plate, said rabbet or recess and said top plate being cut away opposite said screw-holes, whereby the top plate may be removed without removing the fastening- 15 screws.

WILLIAM J. KEENE.

Witnesses:

ALBERTA ADAMICK,
HARRY L. CLAPP.