

F. E. ANDERSEN.
DOOR CHECK AND CLOSER.
APPLICATION FILED MAR. 29, 1909.

969,150.

Patented Sept. 6, 1910.

2 SHEETS—SHEET 1.

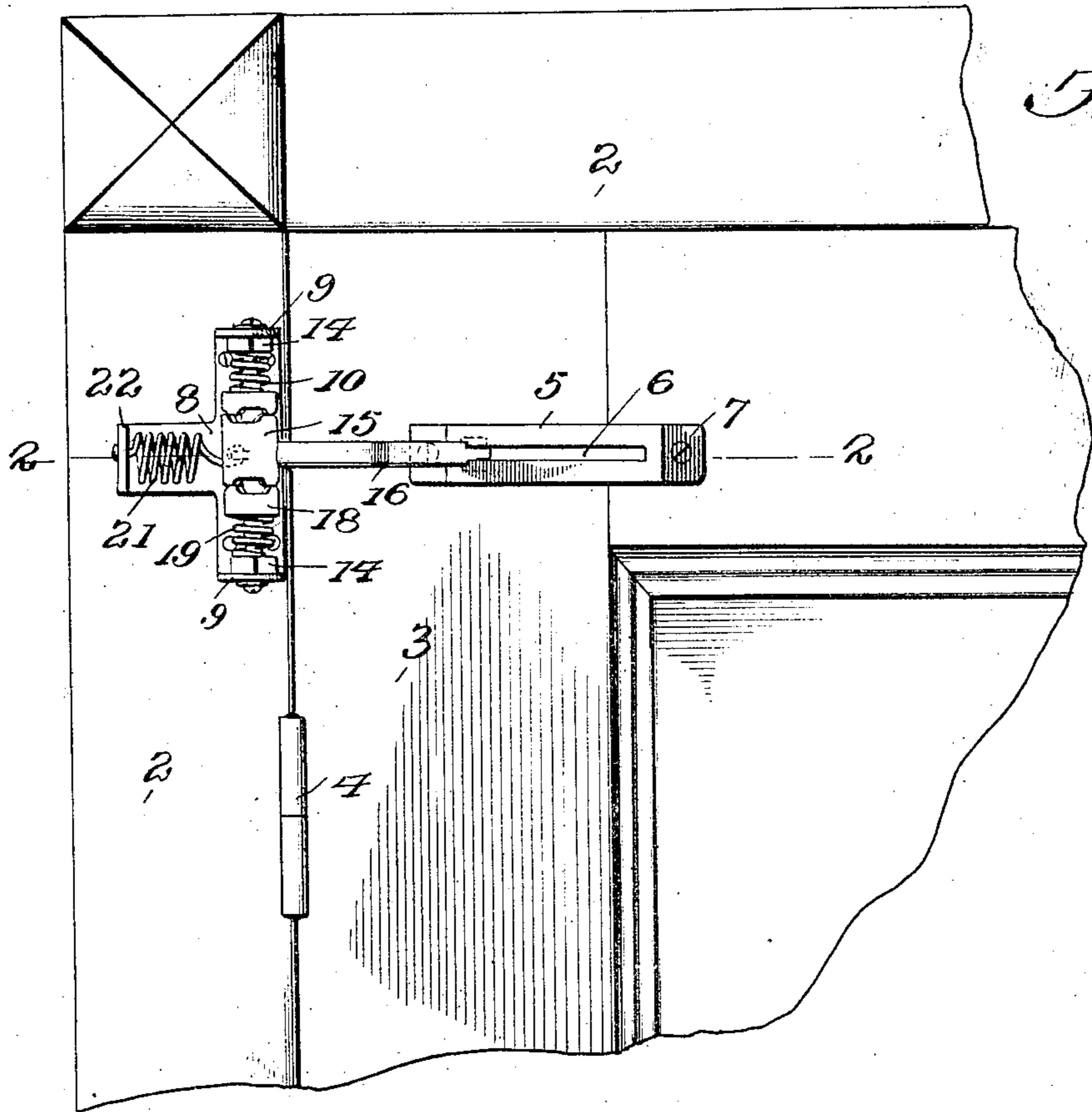


Fig. 1.

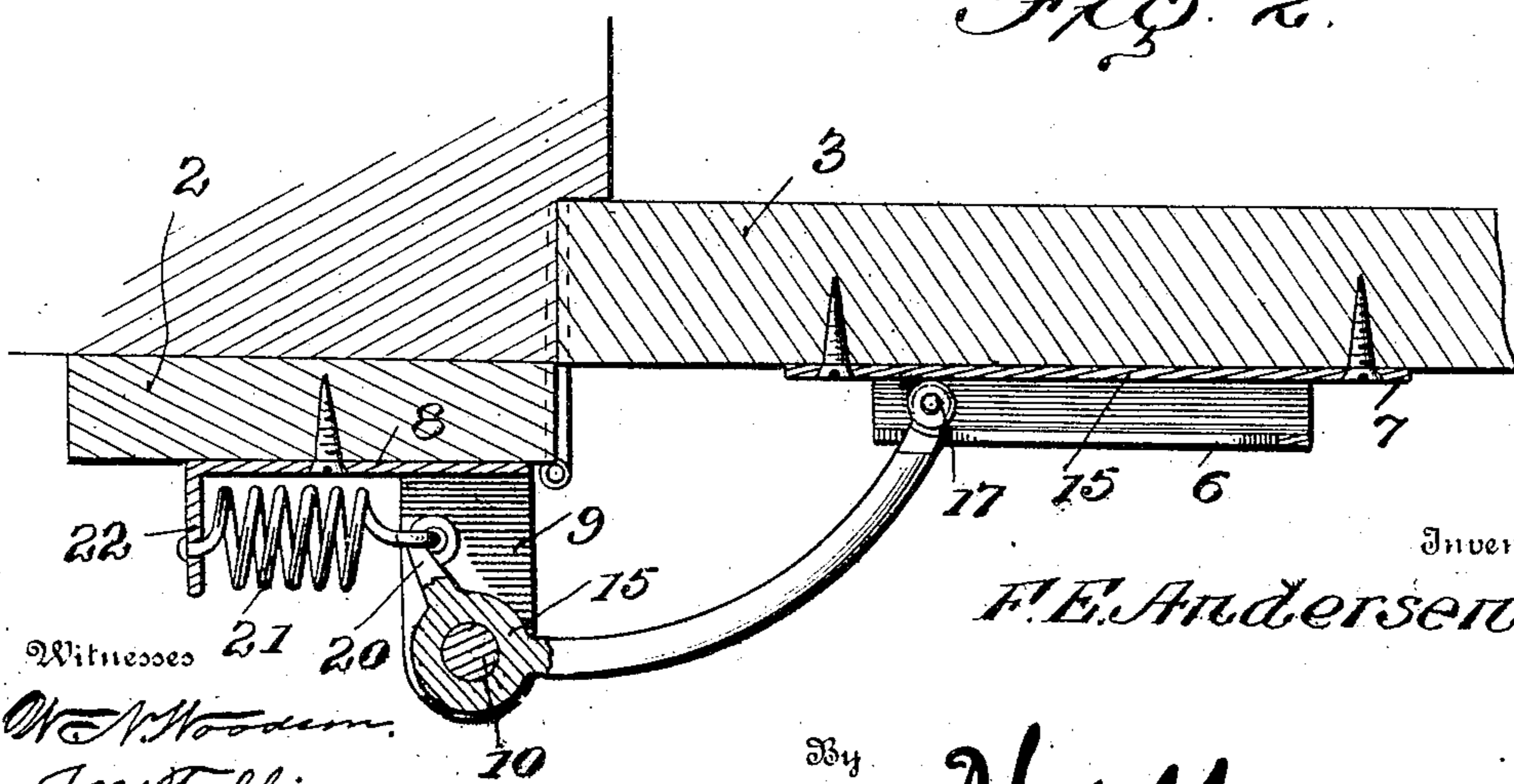


Fig. 2.

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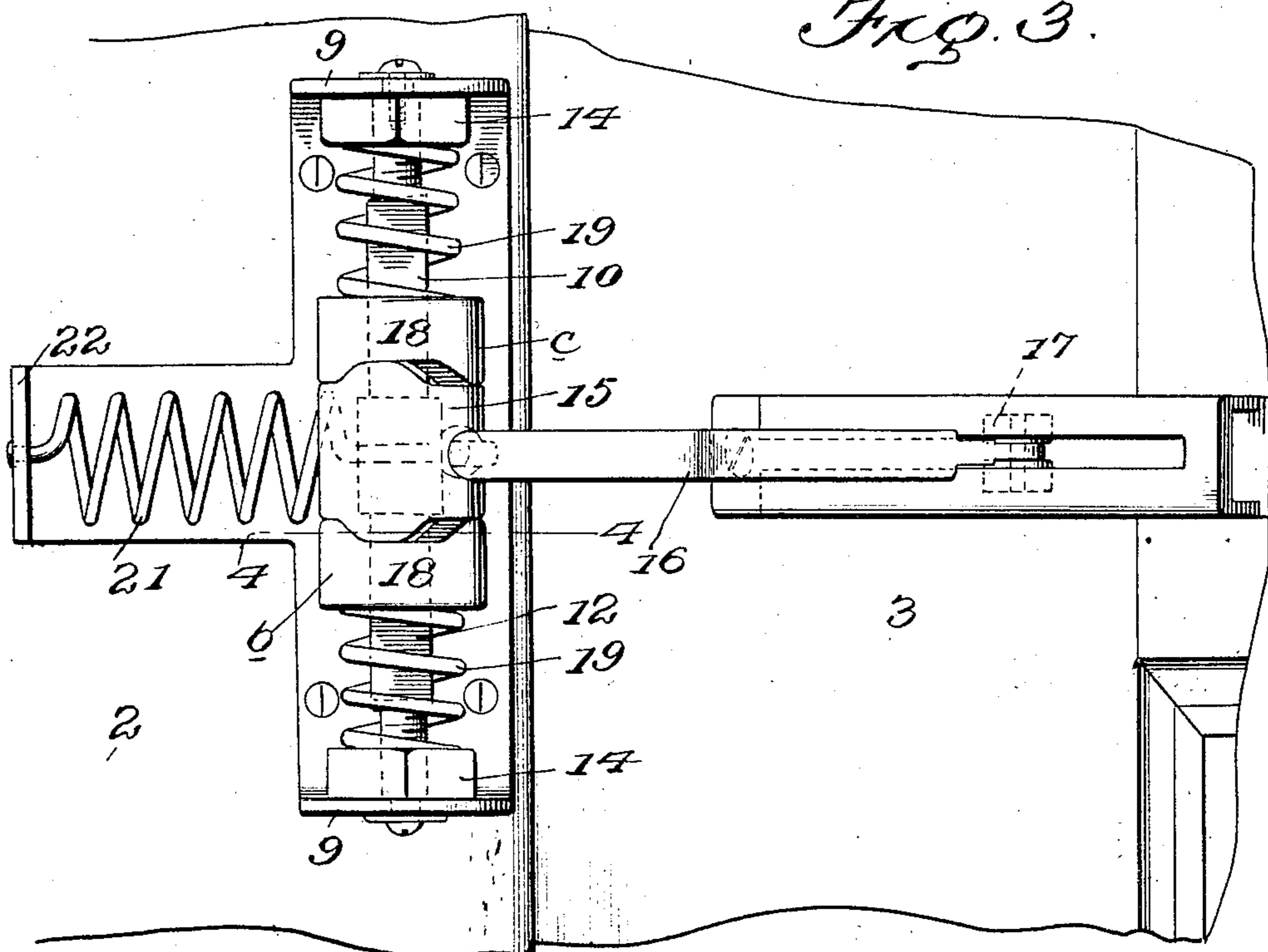


Fig. 4. Fig. 5. Fig. 8.

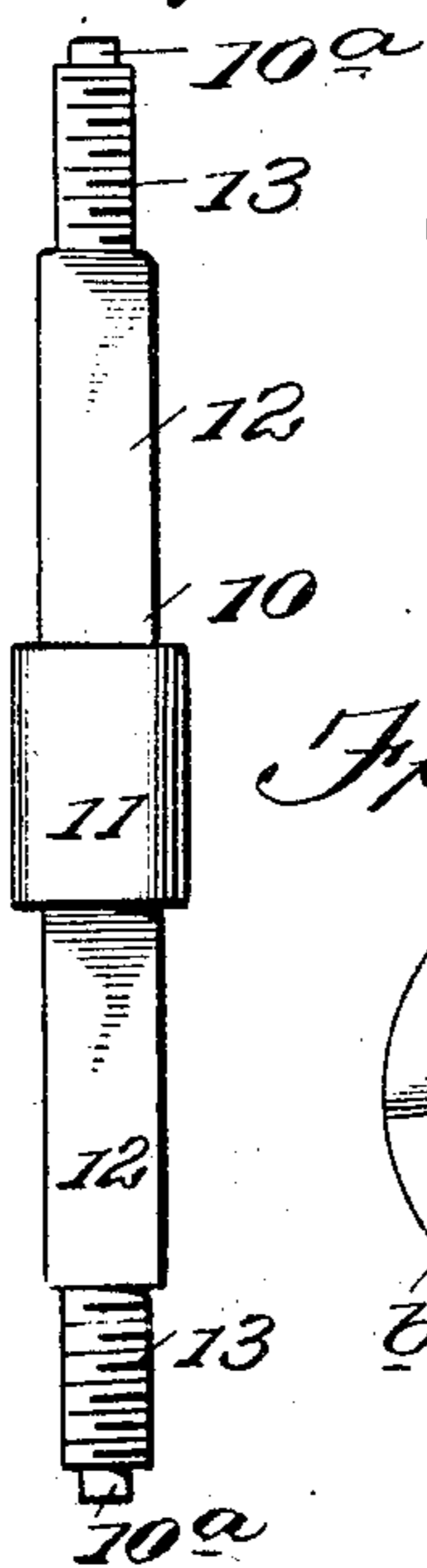
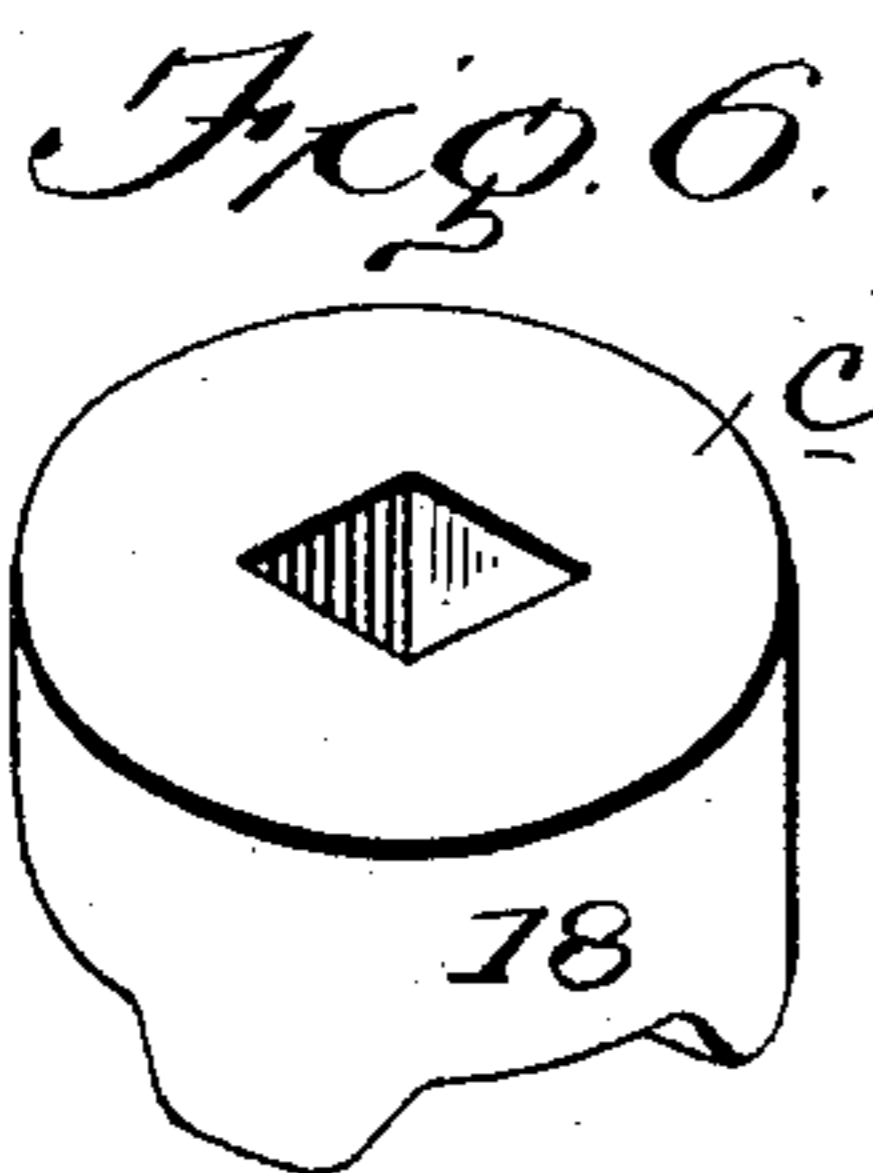
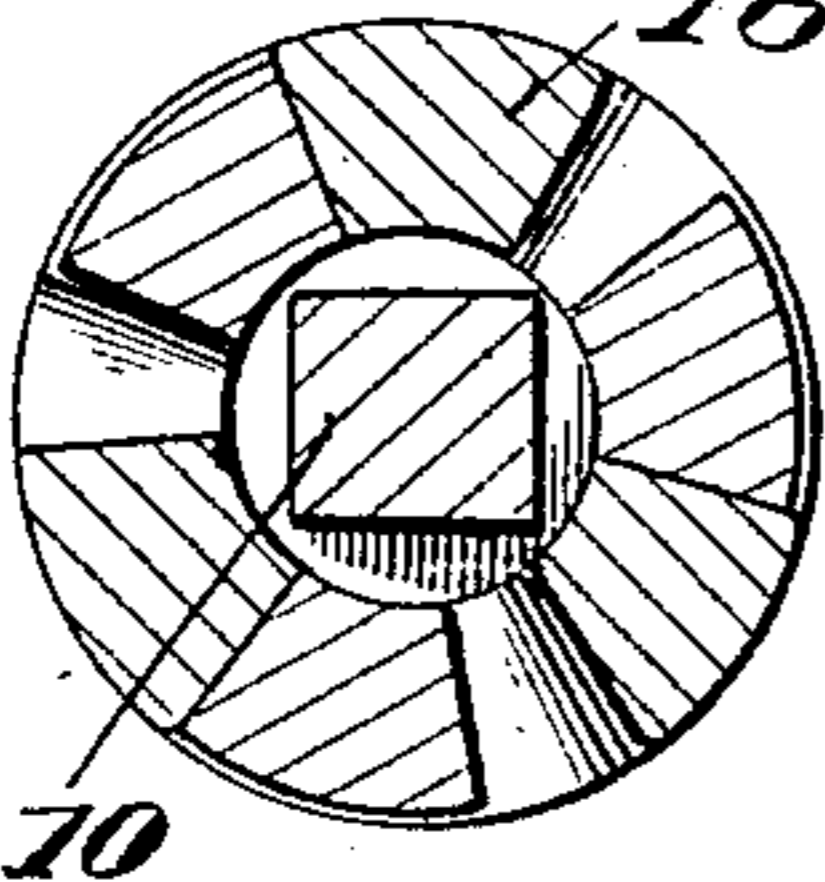
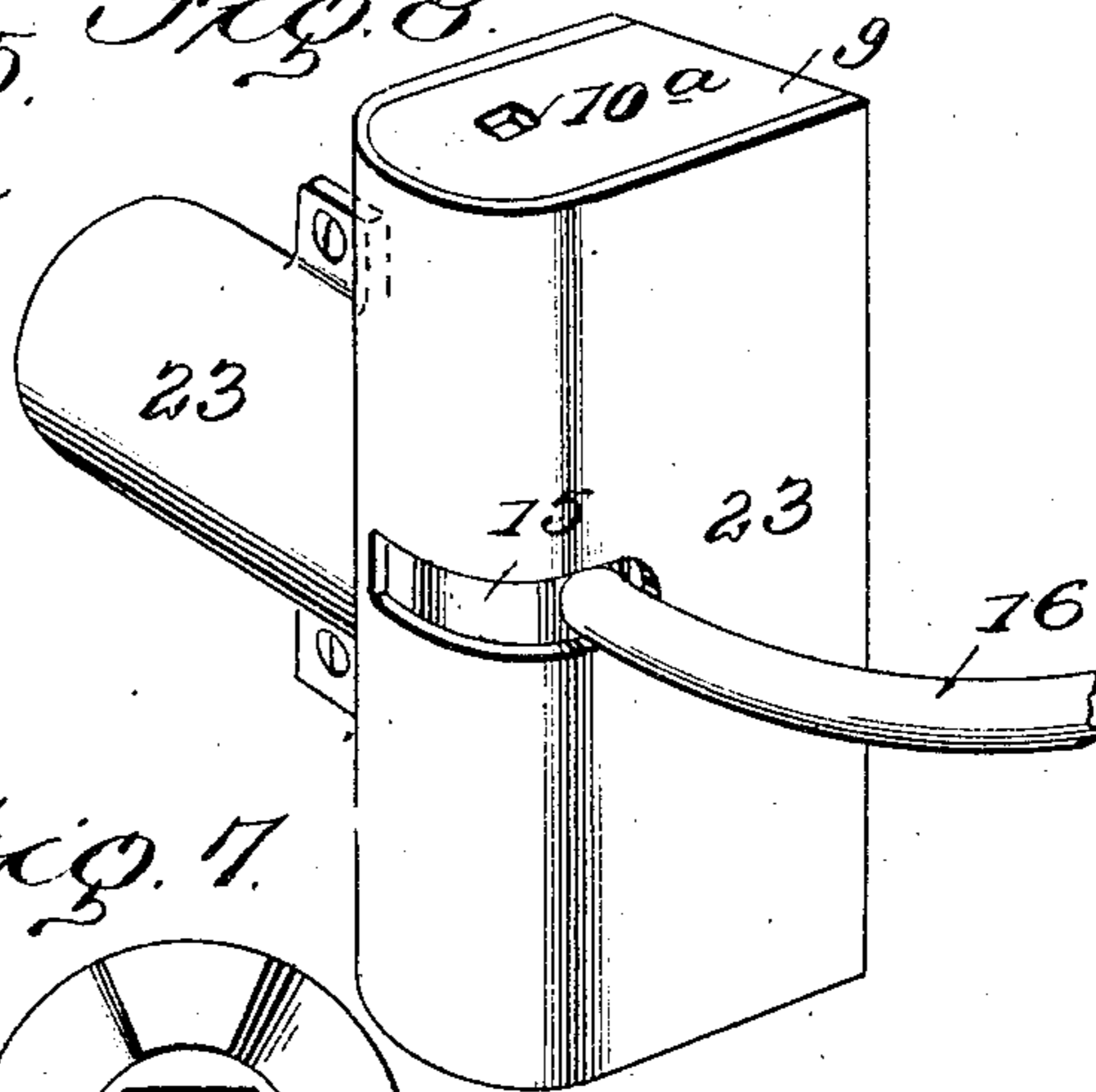
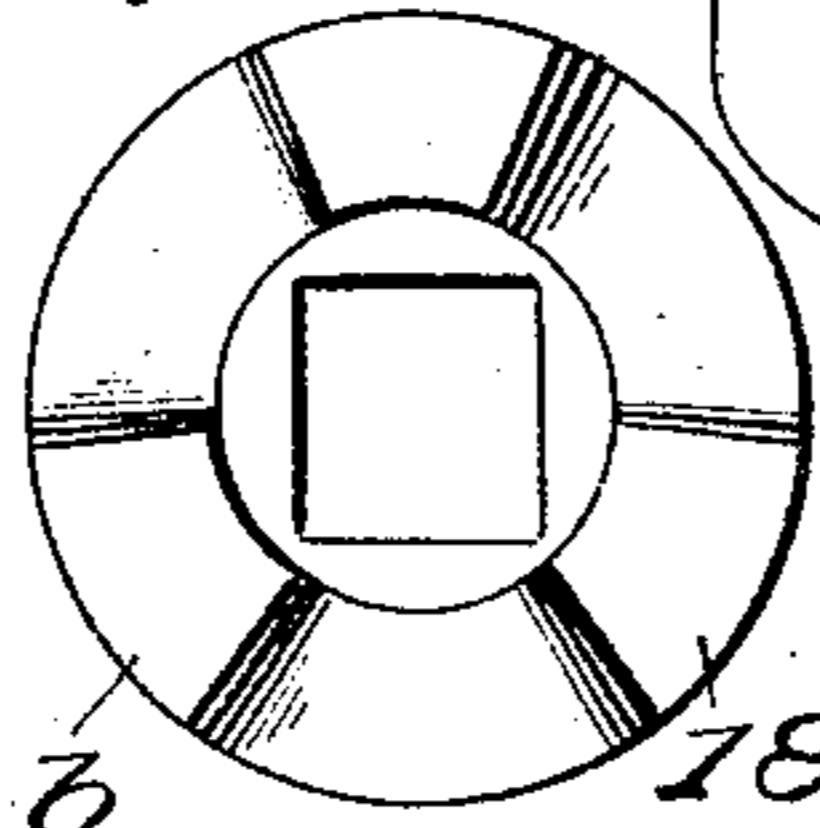


Fig. 7.



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UNITED STATES PATENT OFFICE.

FREDERICK E. ANDERSEN, OF RED WING, MINNESOTA.

DOOR CHECK AND CLOSER.

969,150.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed March 29, 1909. Serial No. 486,439.

To all whom it may concern:

Be it known that I, FREDERICK E. ANDERSEN, citizen of the United States, residing at Red Wing, in the county of Goodhue and State of Minnesota, have invented certain new and useful Improvements in Door Checks and Closers, of which the following is a specification.

My invention relates to door checks and closers and particularly to a door closer which while resisting the opening of the door, yet permits the door to be relatively easily operated during the first part of the movement of the door, resiliently checks the opening of the door during the last part of its movement, permits the easy closing of the door during the first part of its closing movement, but checks the speed of the closing door as it approaches the door frame.

The invention consists, generally speaking, in a cam sleeve mounted to rotate, and having an arm extending out and engaging with the face of the door, the cam sleeve having upper and lower ends co-acting with a pair of spring-pressed, nonrotatable cams, the rotatable cam being in engagement therewith, and a spring which is placed under tension when the door is opened and which acts, in consequence, to close the door.

For a full understanding of the invention and the merits thereof, and to acquire a knowledge of the details of construction, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a side elevation of a portion of a door and door frame showing my invention applied; Fig. 2 is an enlarged cross-section on lines 2—2 of Fig. 1; Fig. 3 is a face view of the door check applied; Fig. 4 is a section on the line 4—4 of Fig. 3; Fig. 5 is a side elevation of the shaft bolt; Fig. 6 is a perspective of the upper cam member; Fig. 7 is a top view of the under cam member; and, Fig. 8 is a perspective view of the check inclosed within its casing.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, 2 designates a door frame of any ordinary construction, and 3 a door therefor, hinged as usual at 4. Upon the outer face of the door is attached a guide 5 having spaced inwardly extending

flanges 6. The inner face of the guide 5 forms a track upon which the outer end of the arm, to be hereafter described, moves. The guide 5 is attached to the face of the door in any suitable manner, as by the lugs 7 through which pass screws or bolts.

Attached to the door frame, is a supporting plate 8 having at its inner end the outwardly extending flanges 9.

10 designates a shaft supported between the flanges 9 and having square ends 10^a which fit in square openings in the flanges 9 so that the shaft is held therein from rotation. The middle portion of the shaft is circular in section, as at 11. On both sides of the circular or cylindrical middle section of the shaft, are the square sections 12, and between the ends of the square sections 12 and the square terminals 10^a, the shaft is round in cross section and is threaded as at 13 for engagement with nuts 14. Surrounding the middle portion 11 of the shaft, is a sleeve 15 having its ends cut away to form alternating projecting and depressed portions. Projecting from the sleeve is an inwardly curved arm 16 which at its free end is provided with opposed rollers 17. The arm is narrowed at its extremity so as to fit within the slot of the guide on the door, and the rollers 17 mounted on said reduced portion are adapted to run upon the inside face of the guide.

Mounted on either side of the central cam sleeve and fitting the square portions 12 of the shaft, are the cams 18, the inner ends of these cams being cut away into alternate projections and depressions so as to fit the projections and depressions of the cam sleeve 15. These cams 18 are shiftable longitudinally along the shaft, but are held in yielding engagement with the sleeve 15 by opposed coil springs 19 which, at one end, bear against the cams 18 and at the other end bear against the nuts 14. It will be obvious that by turning the nuts 14, the springs will be pressed with greater force against the cams 18 and will force these cams into more or less strong engagement with the cam sleeve 15. The cam sleeve 15 is provided with a hook 20 extending radially from the sleeve, and this hook is engaged by one end of a coiled contractile spring 21. The other end of the spring 21 is engaged by the upwardly bent end 22 of a right angular extension of the base plate.

It will be obvious, now, that upon opening the door, the cam sleeve 15 will be rotated upon the shaft, and the spring 21 will be extended and will act against the opening of the door, and when the door is free, will act to close it. If it were not for the cams 18, the spring 21 would close the door immediately it was released, and the door would close with a slam. It is to prevent this that I provide the sleeve 15 with the opposed cam-like ends, and provide the opposed longitudinally shiftable spring-pressed cams 18. These are so arranged with regard to the cam sleeve 15 and the cam faces thereof, that, when the door is being closed, the projecting portions of the cam faces on the ends of the cam 15, will ride against the projecting portions of the inner end of the cams 18, thus forcing the cams 18 apart against the force of the springs that force them inward. Hence, as the door nears its closing movement, the opposed cams will be forced outward and as the tension on the springs 19 is increased, the door will be retarded. These springs, however, are not of sufficient strength to entirely counteract the action of the spring 21 and hence the spring 21 will close the door, but the springs 19 will, through the protuberances on the cams, act to impede such closure and will permit the cams to only gradually yield, thus allowing the door to close gently. It will be seen that on a reverse movement of the door, that is, an opening movement, the alternate depressions and projections of the cam faces on the cams 15 and 18 will act in the same manner, and as it reaches the extremity of its opening movement, the projecting cam faces on the cam sleeve 15 will engage with the projections on the cams 18 and will force them outward against the force of the springs, as before described. It will be seen from the drawings that the space between any two of the projections on the inner ends of the cams 18, is greater in width than the face of any projection on the cam 15, and hence that there will be a certain movement of the cam sleeve relative to the cams 18, during which time the cams 18 are not forced apart and that the springs actuating these cams are not under much tension. During the first part of the opening movement of the door, the springs 19 will be relaxing in their tension, and as a consequence, the movement will be comparatively easy. During the middle portion of movement of the door, the springs 19 will be under but slight tension, but during the last part of the movement, either in opening or closing, the springs will be compressed and will act to check the door, as before described.

While I may embody my invention in a number of different forms, I prefer to provide the base with an inclosing casing 23

which will surround the springs 21 and 19 and the cams, this casing being of course slotted for the projection of the cam sleeve arm.

I do not wish to be limited to the specific manner of forming the base of the device, or attaching the spring 21, as it will be obvious that the base may be changed in many ways and that the attachment of the spring may be modified without in any way departing from the principle of my invention.

Having thus described the invention, what is claimed as new is:—

1. In a door check and closer, the combination with a base plate adapted to be attached to a door frame and a supporting member thereon, of relatively stationary and rotatable contact members mounted on the supporting member, and provided with co-acting cam faces, means for resiliently urging one of said contact members against the other contact member, an arm on the rotatable member adapted to engage the face of a door, and a spring resisting the rotation of the rotatable member in one direction and by its reaction causing the rotation of said member in the reverse direction to close the door.

2. A door check and closer comprising, in combination, a base, a fixed shaft mounted therein, a rotatable sleeve on said shaft having an arm engaging with a door, said sleeve having opposed cam faces on the ends thereof, of opposed longitudinally yielding contact members engaging with said cam faces, springs for forcing said contact members into engagement with the sleeve, means for regulating the tension of said springs and means for yieldingly resisting the opening of the door and acting to close it.

3. In a door check and closer, the combination with a base, a fixed shaft mounted therein, a rotatable sleeve on said shaft and having an arm projecting therefrom and engaged with a door, said sleeve having opposed cam faces on its ends, of opposed longitudinally yielding contact members surrounding the shaft and having cam faces formed on their inner ends adapted to engage with the cam faces of the sleeve, springs for forcing said contact members into engagement with the sleeve, nuts on the shaft for regulating the tension of the springs and means for yieldingly resisting the opening of the door and acting to close it.

4. In a door check, a base plate, a transverse shaft mounted on the base plate, a rotatable member having a cam face on the end thereof and mounted on said shaft, an arm projecting from the member and engaged with a door, a contractile spring fast at one end to said base and at its other end engaged with said rotatable member and acting to resist the rotation thereof in one

direction and by its reaction causing the rotation of said member in a reverse direction, a nonrotatable contact member mounted upon said shaft and engaged against the cam-faced end of the rotatable member, and a spring forcing the said nonrotatable contact member into engagement with the rotatable member.

5. In a door check, the combination with a base having outwardly turned ends, a fixed shaft mounted in the base and screw-threaded at its ends, and a rotatable sleeve mounted on the middle of said shaft and having cam faces on its ends, of an arm projecting from the sleeve adapted to engage at its other end with a door, opposed contact members longitudinally movable on the shaft and having inner cam faces adapted to engage with the cam faces of the sleeve, springs surrounding the shaft and forcing said contact members inward against the ends of the rotatable member, and nuts on the screw-threaded portions of the shaft and bearing against the ends of said springs for regulating the tension thereof.

6. In a door check and closer, the combination with a base having outwardly turned ends, a shaft fixedly mounted in the base and having screw-threaded terminal portions, and a rotatable sleeve surrounding the middle of the shaft and having cam faces at its ends, of an arm projecting from the sleeve and adapted to be engaged at its end with a door, contact members longitudinally movable on the shaft and having cam faces engaged with the cam faced ends of the sleeve, springs surrounding the shaft and forcing the contact members inward, nuts on the screw-threaded portions of the shaft for adjusting the tension of the springs, and a contractile spring fast at one end and at the other engaged with said sleeve to prevent its rotation in one direction, but

by its reaction causing the rotation of said sleeve in the reverse direction.

7. In a door check and closer, the combination with a base having outwardly turned ends, a shaft fixed in the ends of said base against rotation, a sleeve rotatably mounted on the middle of the shaft and having cam faced ends, an arm projecting from the sleeve, its free end adapted to engage a door, of contact members mounted on the shaft constructed to engage with the cam faced ends of the sleeve, springs for forcing the contact members into said engagement, and a contractile spring connected at one end to said base and at the opposite end with said sleeve to resist its rotation in one direction, but by its reaction causing the rotation of said sleeve in the reverse direction.

8. In a door check and closer, the combination with a base, a rotatable member mounted on the base and having opposed cam projections and depressions on its ends, yielding contact members located at either end of the sleeve, having cam projections and depressions on their inner ends engaging with the cam faces of the rotatable member, and means for urging the contact members against the cam faces of the rotatable member, of an arm on the rotatable member adapted to engage with the face of a door, and a spring resisting the rotation of said sleeve in one direction, but by its reaction causing the rotation of said sleeve in the reverse direction, the cam projections on the rotatable member being narrower than the corresponding depressions on the contact members.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK E. ANDERSEN. [L. S.]

Witnesses:

H. P. McINTIRE,
JENE McINTIRE.