

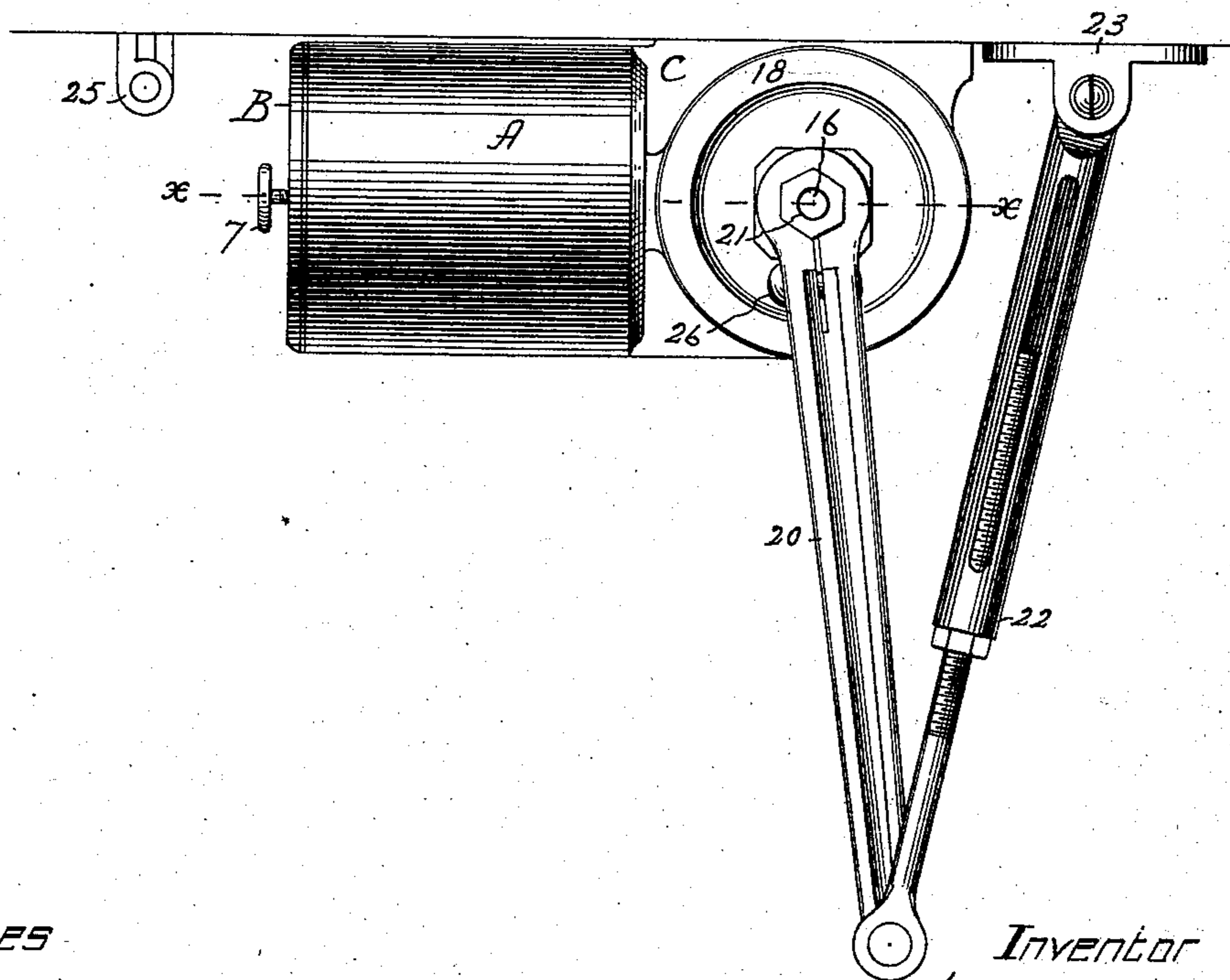
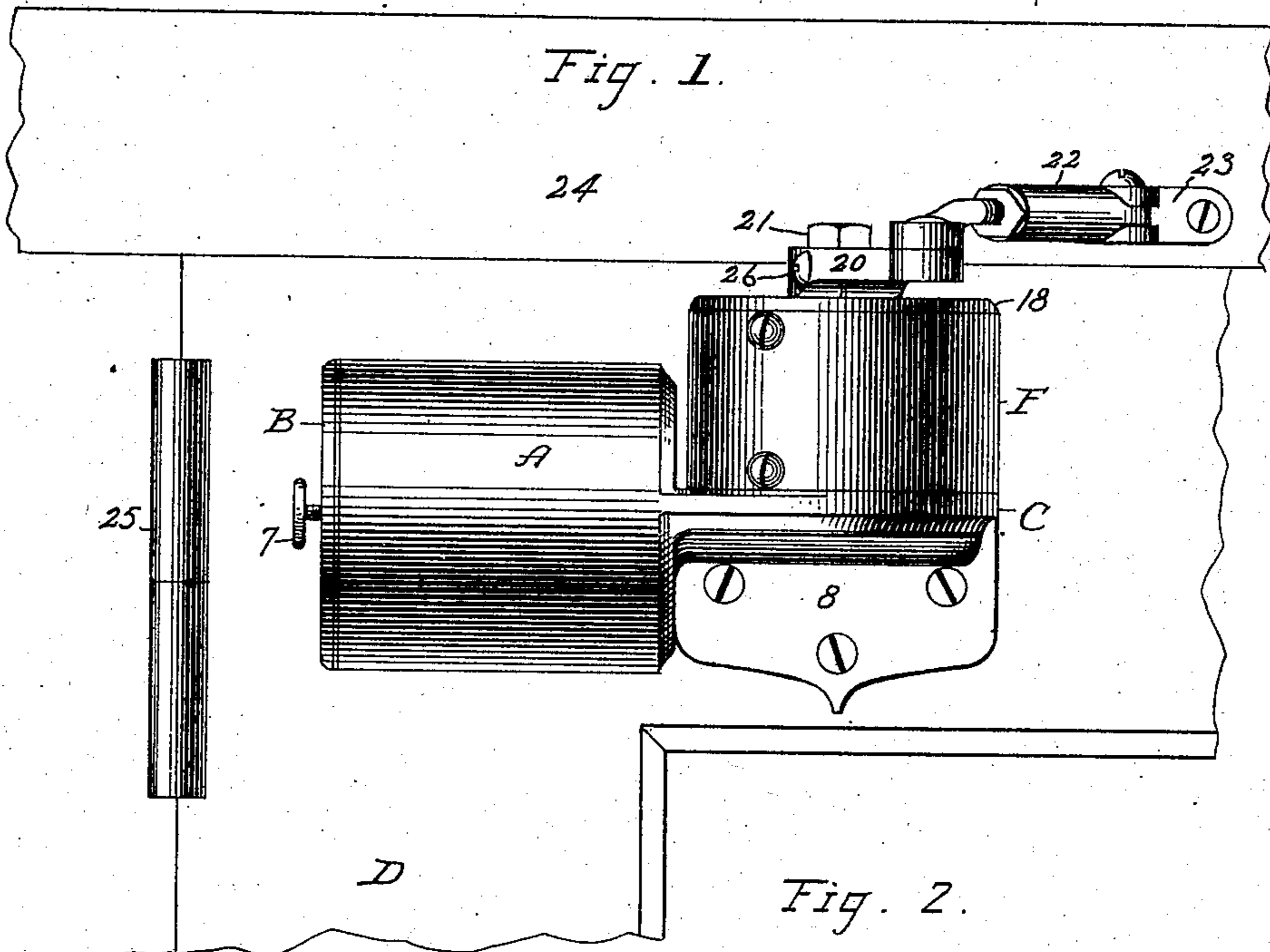
(No Model.)

2 Sheets—Sheet 1.

W. K. HENRY.
DOOR CHECK.

No. 576,965.

Patented Feb. 9, 1897.



WITNESSES

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C. O. Loomis

INVENTOR

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By *James Shepard*
ATTY.

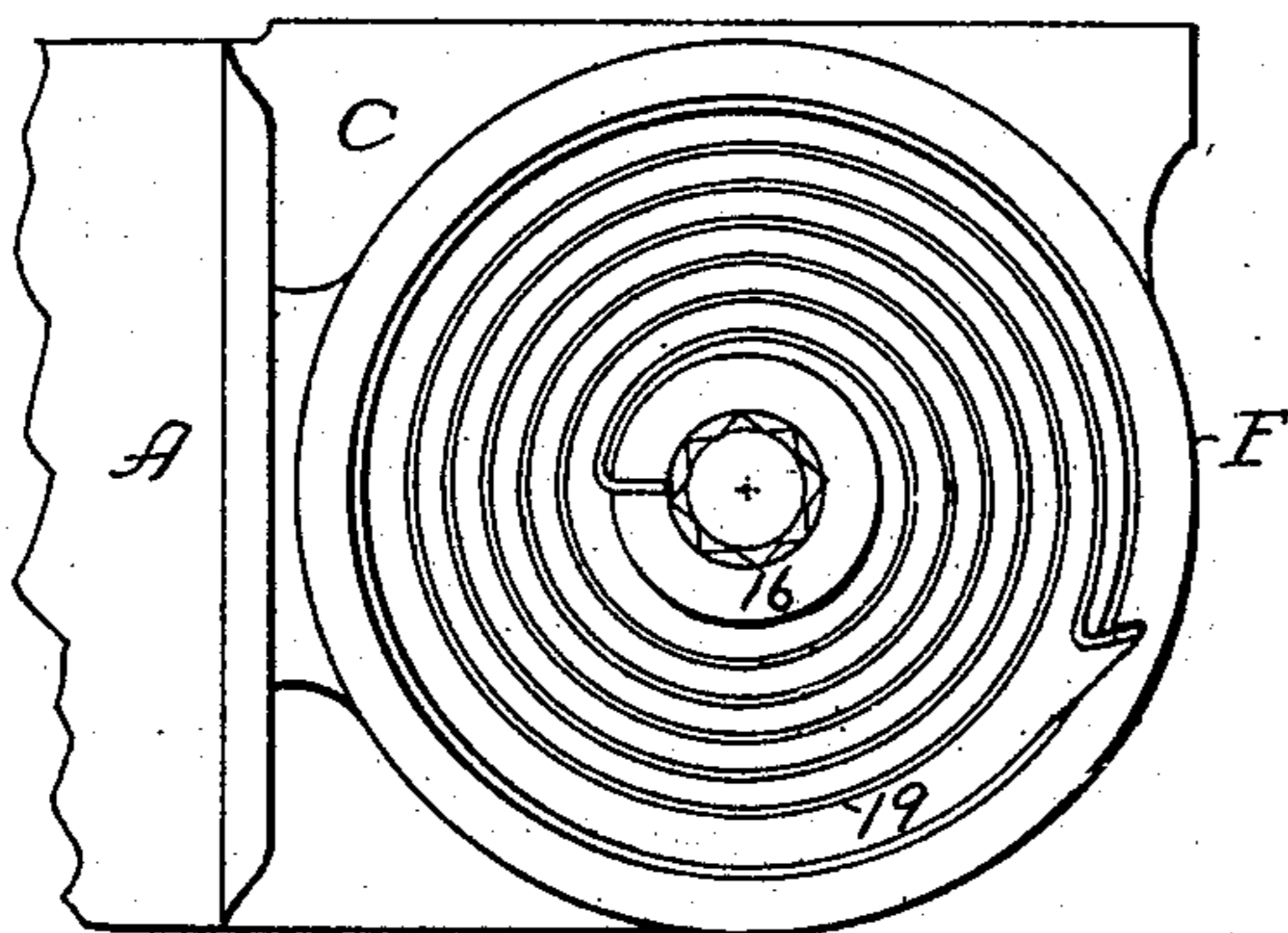
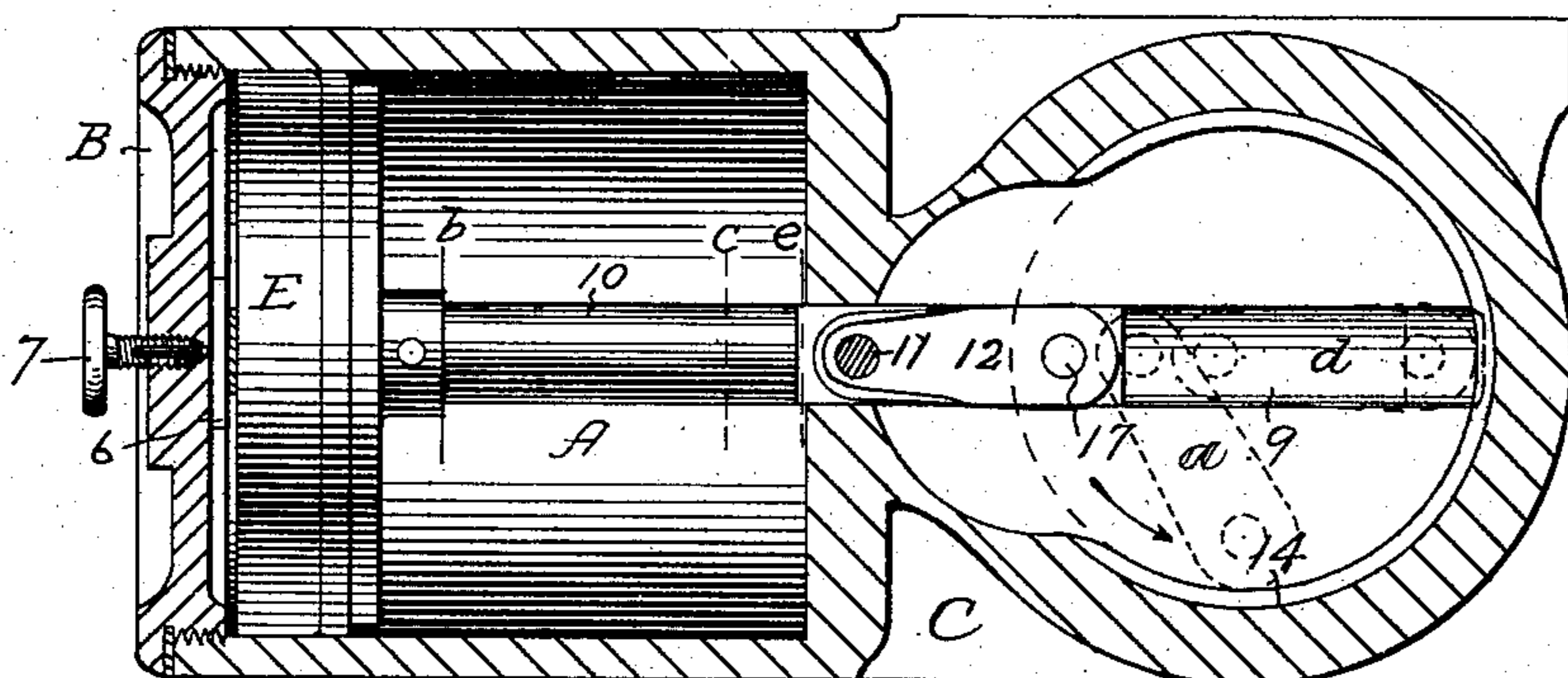
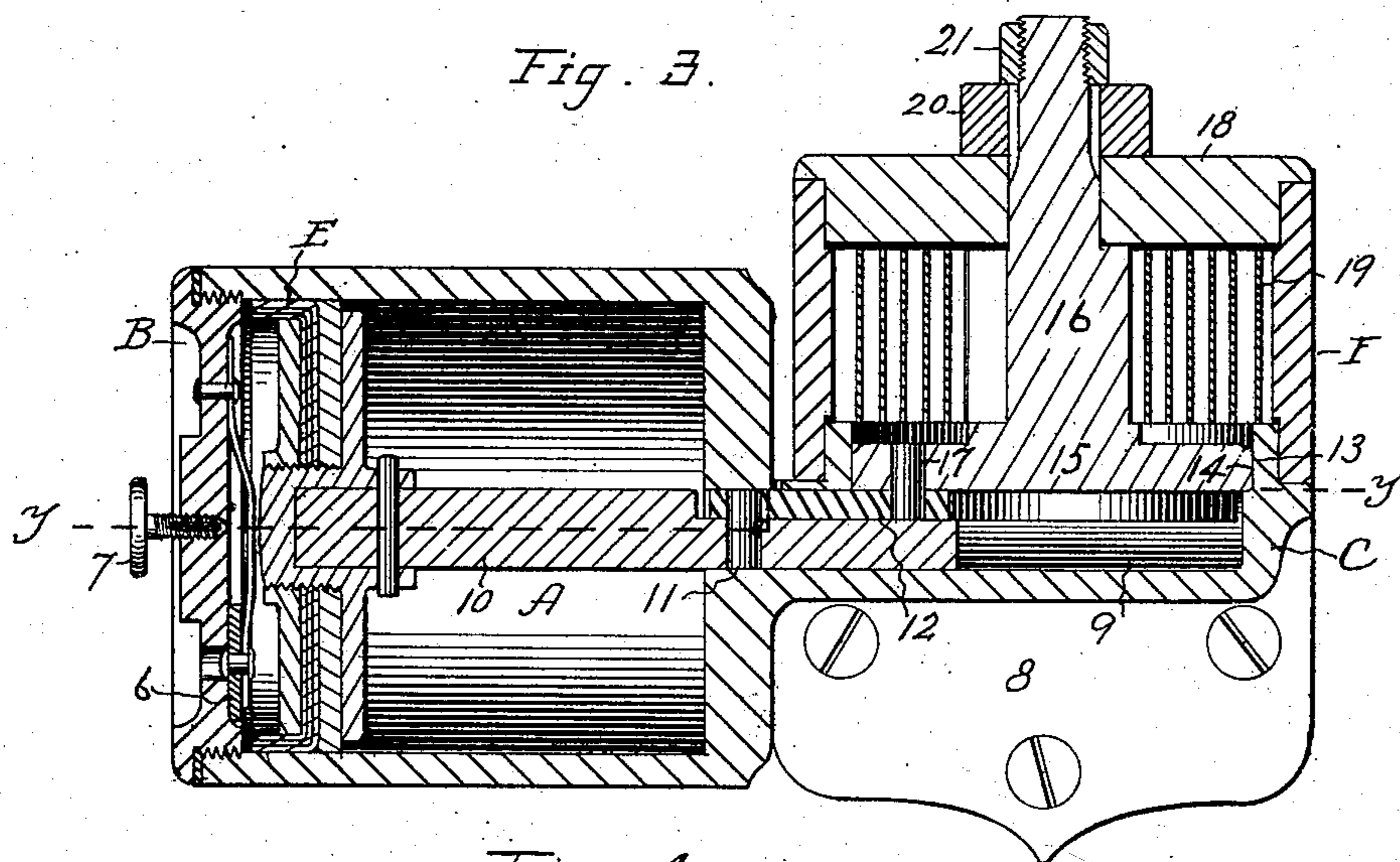
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2 Sheets—Sheet 2.

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DOOR CHECK.

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Witnesses

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Inventor

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UNITED STATES PATENT OFFICE.

WILLIAM K. HENRY, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE
RUSSELL & ERWIN MANUFACTURING COMPANY, OF SAME PLACE.

DOOR-CHECK.

SPECIFICATION forming part of Letters Patent No. 576,965, dated February 9, 1897.

Application filed October 4, 1895. Serial No. 564,678. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. HENRY, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Door-Checks, of which the following is a specification.

My invention relates to improvements in door-checks; and the objects of my improvement are simplicity of construction and convenience and efficiency in operation.

In the accompanying drawings, Figure 1 is a front elevation of my door-check, together with a portion of the door and its casing. Fig. 2 is a plan view of the same. Fig. 3 is a central vertical section on the line *xx* of Fig. 2. Fig. 4 is a horizontal section on the line *yy* of Fig. 3, the link, piston-rod, piston, and vent-valve being shown in plan view. Fig. 5 is a plan view of the spring-chamber with its cap removed.

A designates the cylinder, having a cap B, provided with inlet-valve 6 and vent-valve 7, of any ordinary construction. The end of the cylinder that is opposite the cap B is provided with a piston-rod support C and securing flange or bracket 8, by which the check may be secured in place on the door D. In the middle of the piston-rod support is a longitudinal groove 9, which is preferably semicircular in cross-section and whose axis is coincident with the axis of the piston-rod 10 and piston E, said piston being of any ordinary construction. The piston-rod 10 is flattened or slabbed off at its outer end and provided with a pin 11, to which one end of the link 12 is pivoted. The piston-rod 10 is fitted to and guided within the semicircular groove 9 of the piston-rod support C. The upper side of the piston-rod support is provided with a circular flange 13, Fig. 3, the outside of which receives and holds one end of the reversible spring-barrel F, while the inner wall 14 of said flange forms a bearing for the periphery of the crank-pin disk 15 of the spring-shaft 16. The crank-pin 17 of the crank-pin disk 15 has one end of the piston-rod link 12 pivoted to it. The outer or upper end of the spring-barrel F is provided with a cap 18, within which the upper end of the spring-shaft 16 is journaled. A coiled sheet-

metal spring 19 has its outer end hooked into a slot in the spring-barrel and its inner end into a slot in the spring-shaft in the ordinary manner for this class of springs.

The spring-shaft may be provided with any ordinary devices for connecting it with the door and jamb in such manner as to partially rotate the spring-shaft as the door is opened and closed. I have shown a crank-arm 20, with one end attached to the spring-shaft 16 and secured thereon by the nut 21 and screw 26, while the outer end of said crank-arm is pivoted to one end of the adjustable arm 22, the other end of said adjustable arm being pivoted to the bracket 23, which may be secured to the door-casing 24 over the door D, said door being hinged at 25, all as shown in Figs. 1 and 2. Said crank-arm and its immediate connections are of an ordinary construction, and consequently are not herein claimed. The reversible spring-barrel is also shown and described in my application filed July 8, 1895, Serial No. 555,242, and for that reason is not herein claimed.

When mounted as shown in Figs. 1 and 2, opening the door will pull the outer end of the crank-arm 20 to revolve the spring-shaft in the direction indicated by the dart in Fig. 4 and wind up the spring. The parts should be so adjusted that when the door is closed the piston will be near the outer end of the cylinder and the piston-rod pin, crank-pin 17, and link 12 in longitudinal alinement, as shown in Figs. 3 and 4. The movement of the spring-shaft also pulls the piston toward the inner end of the cylinder. At a quarter-revolution of the spring-shaft the pins and link will be in the position indicated by the broken lines at *a* in Fig. 4, while the end of the piston-hub will have been moved from the line *b* to the line *c*, Fig. 4, and in the next quarter of a revolution the pins and link will be in the position shown by broken lines at *d*, Fig. 4, and the end of the piston-hub will be at the line *e*, Fig. 4, because the construction shown involves the movement of the crank-pin away from the axis of the piston-rod during the first quarter-revolution and toward the axis of the piston-rod during the second quarter-revolution. Upon the release of the door the spring will return the door

and the moving parts of the check to their normal position, the piston and cylinder acting to check the door. By an examination of Fig. 4 it will be seen that the first quarter
5 of a revolution of the crank-pin 17 about the axis of the spring-shaft in closing the door moves the piston about one-quarter as far as does the last quarter of a revolution, so that the door may move rapidly at first, while the
10 piston moves slowly, but at the last quarter the piston moves much faster, so as to effectually check the door as it nears the jamb.

In order to reverse the check for a different-handed door, the reversible spring-barrel
15 and its spring are turned over end for end and the parts properly mounted on said door. As the door is opened the parts operate the same as before, only the spring-shaft is turned in the opposite direction from that indicated
20 by the dart in Fig. 4, the crank-pin and link connection with the piston-rod and piston giving precisely the same movement to the piston for each half-revolution of the spring-shaft, no matter which direction the shaft
25 may be rotated from the position shown in Figs. 3 and 4.

By the employment of the grooved piston-rod support I provide a simple and efficient guide for the extreme end of the piston-rod,
30 so that it operates easily without any liability of being bent or sprung. By the employment of a crank-pin disk supported in a peripheral bearing I not only firmly support the shaft closely to the plane of the link, but I
35 bring the parts into a very compact form.

I do not wish to limit myself to the details of construction shown, but desire to use known substitutes for all parts that are older than my invention and to make such changes in
40 any part or parts as are within the scope of my invention.

I claim as my invention—

1. The combination of a cylinder, a plate-like piston-rod support at one end of said cylinder
45 and having an open groove with its cen-

tral longitudinal line in the same plane as the axis of said cylinder, a piston and piston-rod fitted to said cylinder and open groove, a crank-shaft and crank-pin connected to said piston-rod, mounted at right angles to and
50 in the same plane as the axis of the cylinder and piston-rod, and devices for operatively connecting said parts with a door and its casing, substantially as described and for the purpose specified.

2. The combination of a cylinder and piston, a piston-rod in the same plane as the axis of said cylinder, a piston-rod support having an open groove in the path of said piston-rod
60 which is fitted thereto, a crank-shaft arranged at right angles to the piston-rod and centrally with reference to the groove of said piston-rod support, a crank-pin carried by said crank-shaft, a link connecting said crank-shaft and
65 piston-rod and operating devices, the same being arranged for moving the crank-pin and link to one side of the groove in said piston-rod support for a right-handed door and to the opposite side for a left-handed door, substantially as described and for the purpose
70 specified.

3. The combination of a piston and piston-rod, a cylinder having the grooved piston-rod support extending across the end of said cylinder, a spring-barrel secured to said support
75 at one end of said cylinder, a spring and spring-shaft within said barrel, a crank-pin disk having a peripheral bearing extending across one end of said cylinder and adjacent to said piston-rod support, a link connecting
80 the crank-pin of said disk with the piston-rod and devices for operatively connecting said parts with a door and its casing, substantially as described and for the purpose specified.

WM. K. HENRY.

Witnesses:

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M. S. WIARD.