

No. 760,309.

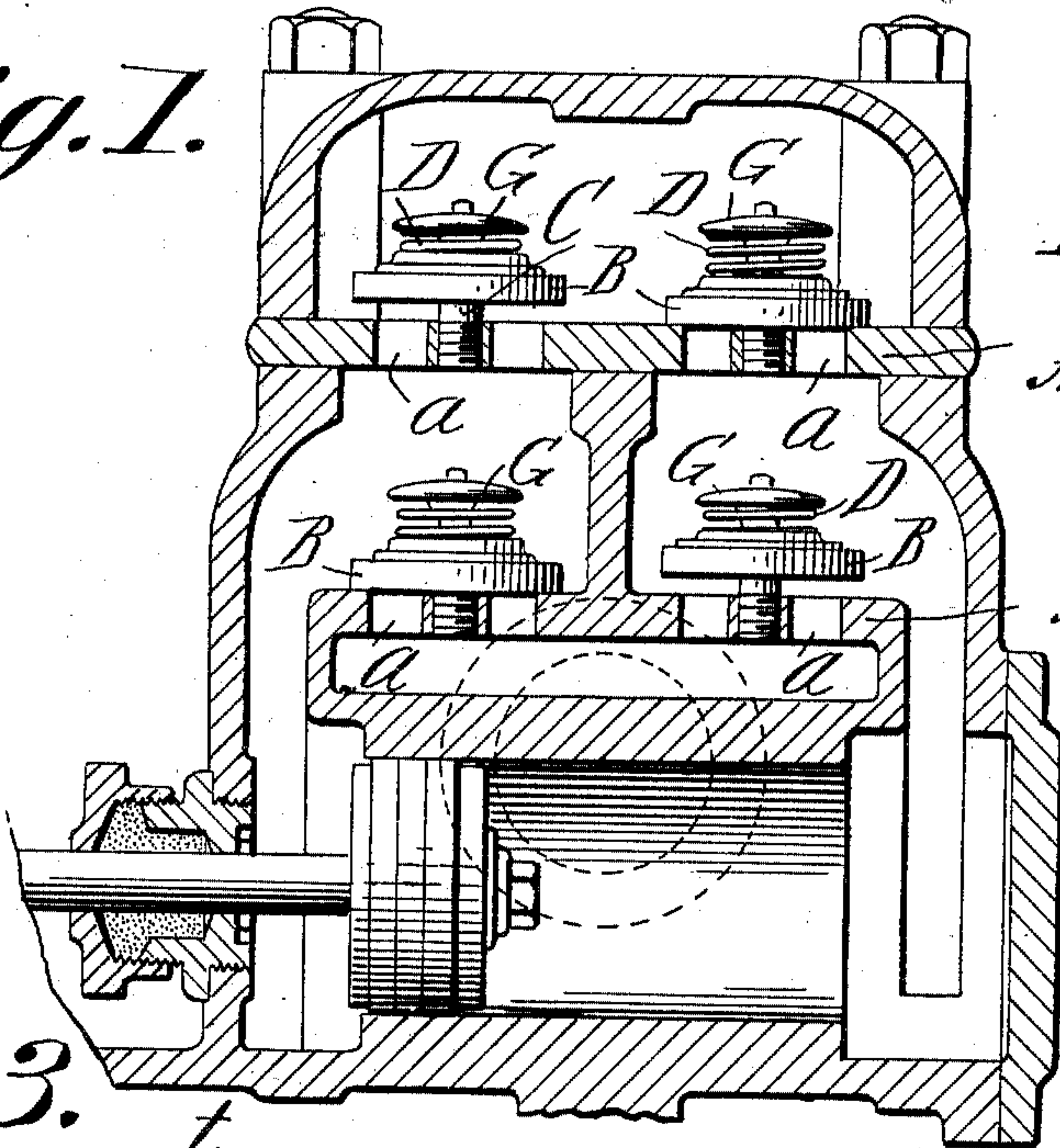
PATENTED MAY 17, 1904.

A. CHOINIERE.  
PUMP VALVE.

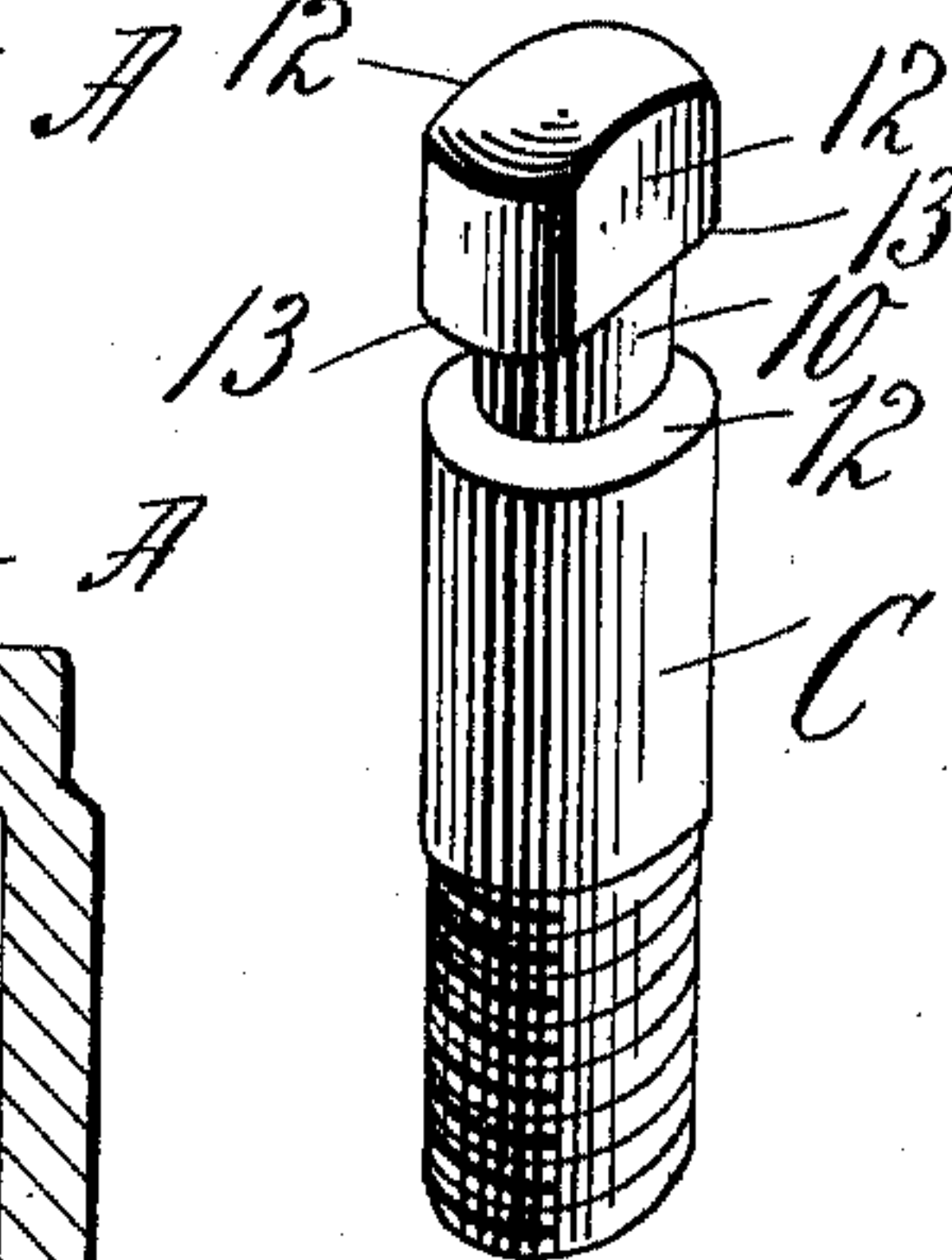
APPLICATION FILED JAN. 30, 1904.

NO MODEL.

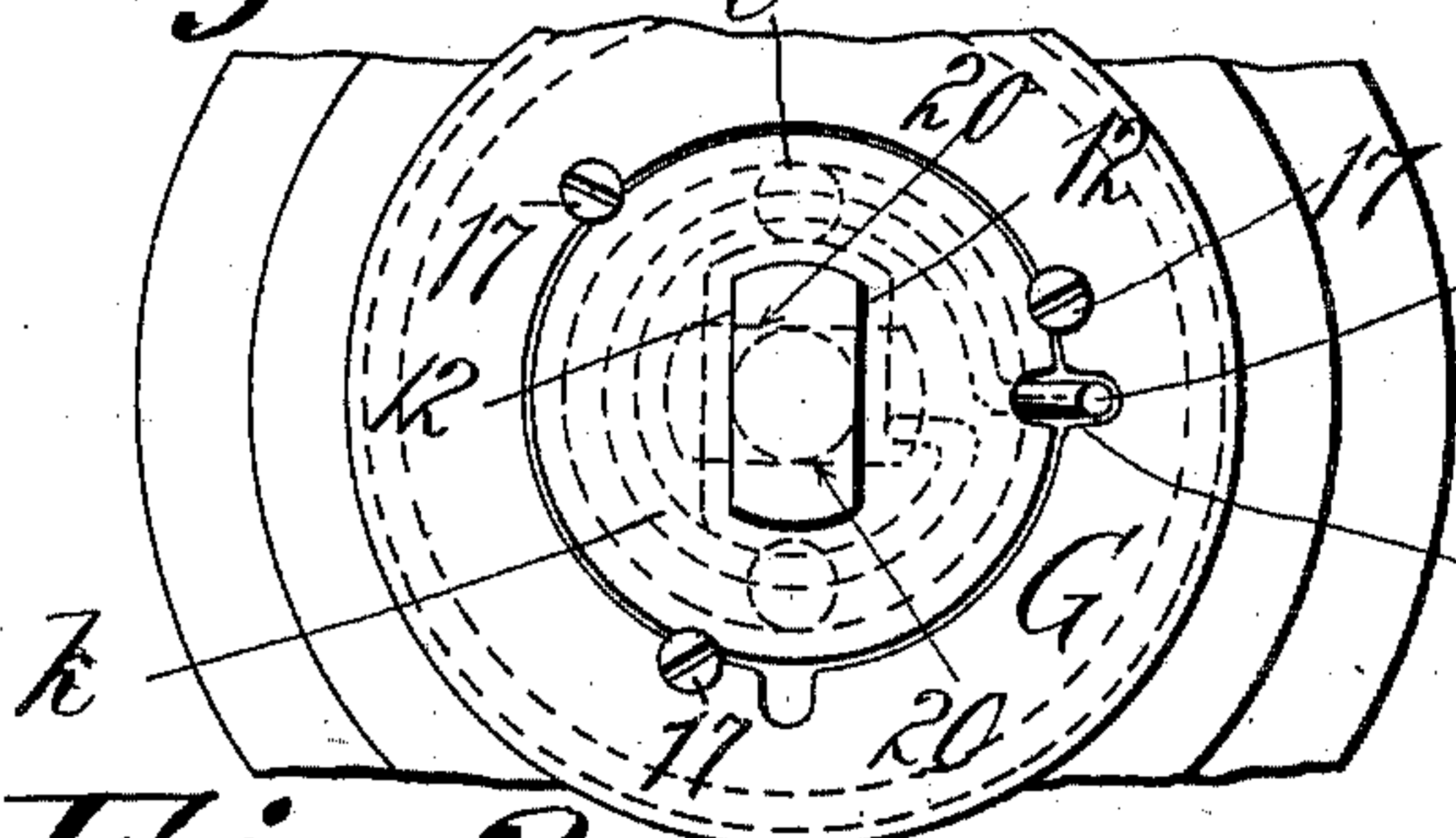
*Fig. 1.*



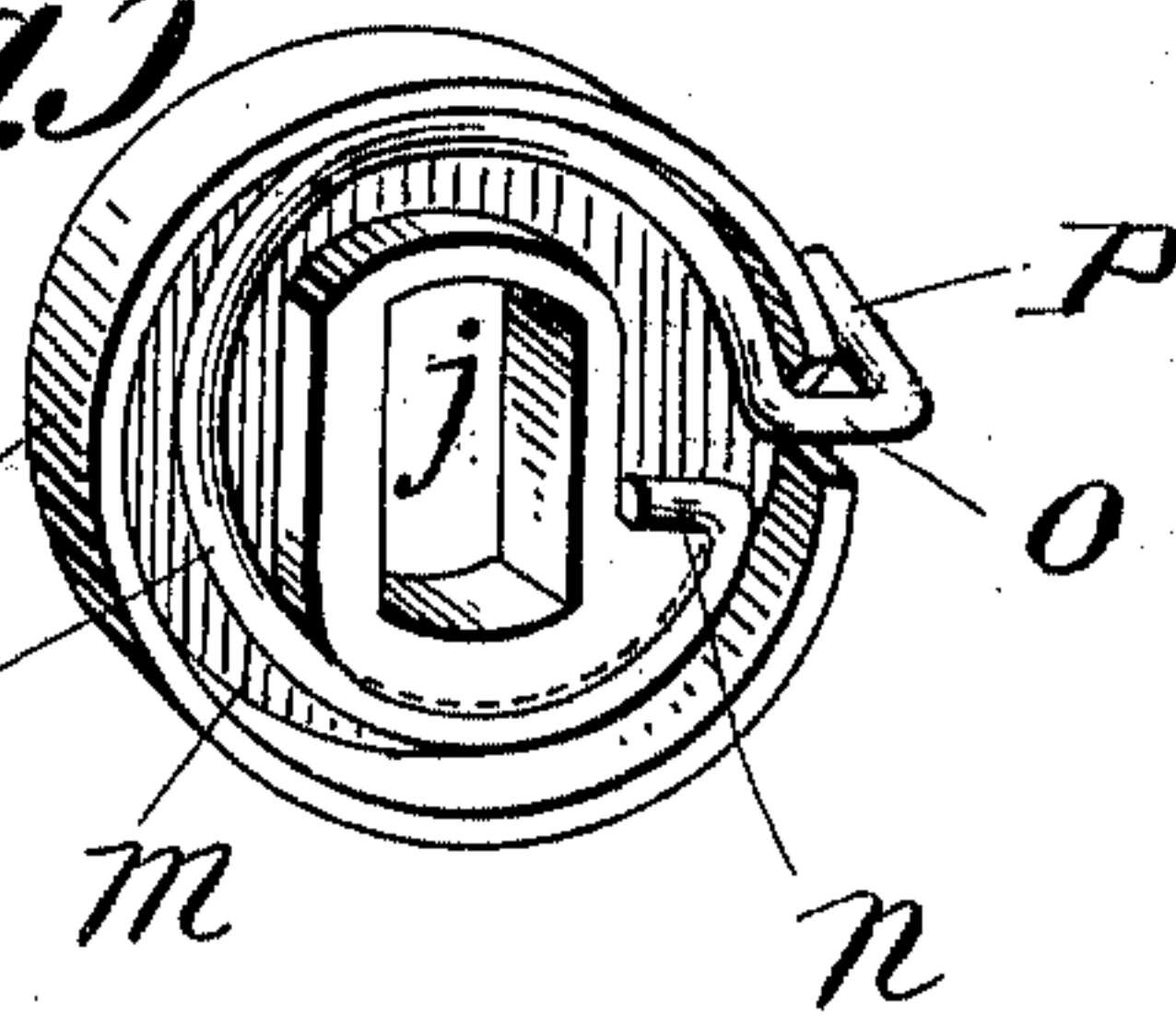
*Fig. 4.*



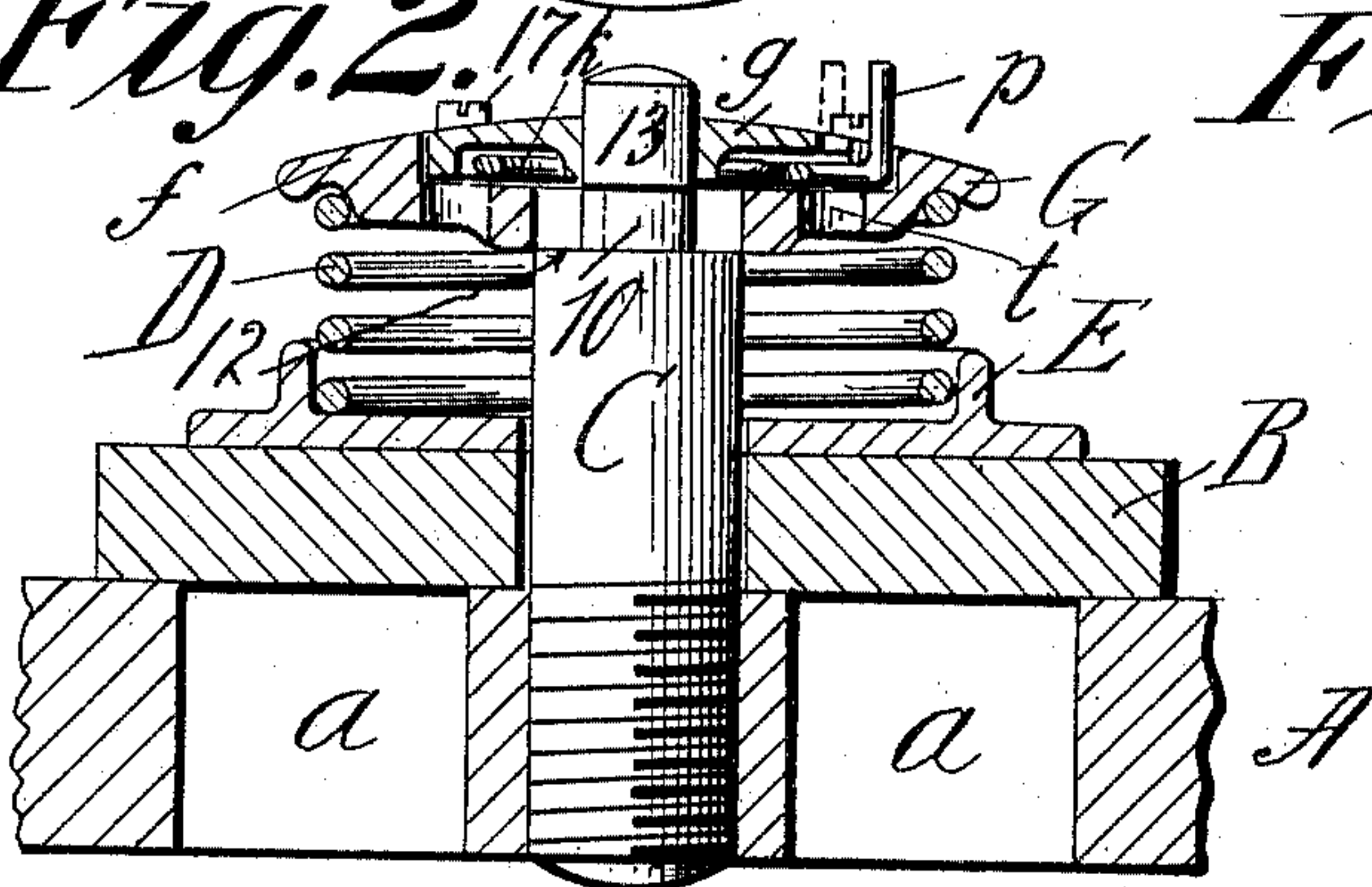
*Fig. 3.*



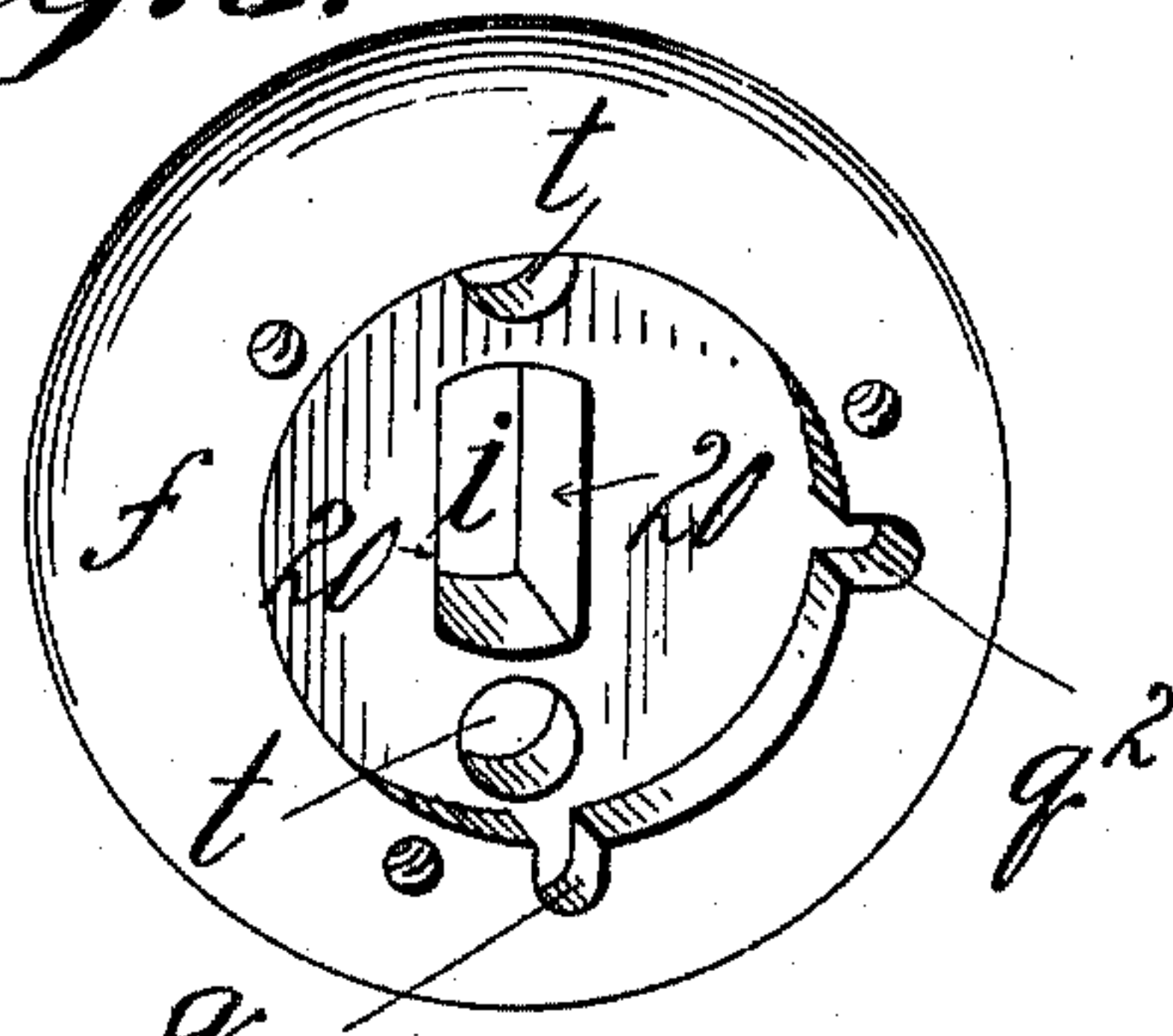
*Fig. 5.*



*Fig. 2.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

ARTHUR CHOINIERE, OF HOLYOKE, MASSACHUSETTS.

## PUMP-VALVE.

SPECIFICATION forming part of Letters Patent No. 760,309, dated May 17, 1904.

Application filed January 30, 1904. Serial No. 191,256. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR CHOINIERE, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Pump-Valves, of which the following is a full, clear, and exact description.

This invention more particularly relates to improvements in valves of the kind in which a disk directly constitutes the valve and which is held against the waterway by a spiral or other appropriate spring, the valve automatically opening under either pressure or suction against the reaction of the spring; and the invention more particularly pertains to novel and readily-detachable means for holding the valve-closing spring in compression relatively to the valve, which means while detachable readily at pleasure is so interlocked with the stem that it may not, owing to any undue circumstances or abnormal conditions, become accidentally detached, whereby it might work injury to the internal pump or other mechanism in which the device is included.

Another object of the invention is to construct the device having the stated efficiency with, furthermore, a degree of compactness, so that the whole valve device, capable of all requisite valve opening and closing operations, will occupy a minimum of space along a line coincident with the axial opening and closing valve motion.

The invention consists in the constructions and combinations of parts, all substantially as hereinafter fully described, and set forth in the claims.

The improved valve device made in accordance with the present invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view through a portion of a double-decked pumping-engine in which a plurality of the present improved spring-closed valves are shown. Fig. 2 is a substantially central vertical sectional view, on a larger scale, through one of the valves and its appurtenances. Fig. 3 is a plan view of Fig. 2. Fig. 4 is a perspective view of the valve-guiding stem. Figs. 5 and 6 are perspective views of the detached portions of the

two-part novel detachable valve-stem head or spring-retainer.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A A represent the partition-walls or decks of a pumping engine or apparatus having the openings *a a* through the portions thereof which constitute the seats for the valves B, which are represented in the form of centrally-apertured plates or disks and understood as being advantageously composed of rubber in any of its elastic or semi-elastic compounds, the apertured valve-seats having concentrically the upstanding posts C, rigidly united by screw-thread engagements or otherwise with the decks A of the pump structure. Each centrally-apertured valve-disk B is overlaid by a cup-like plate E, within which is seated a spiral spring D, held in compression by the detachable spring-retainer G, which is susceptible of being brought to placement about and interlocked with the extremity of the valve-stem and when desired instantaneously removed for the removal or replacement of the valve-closing spring.

I will now describe the spring-retainer and the extremity of the valve-guiding stem C in detail and as the same has been practically employed, it being stated, however, at this time that a latitude of modification and change from these details may be made without departing from the present invention.

The valve-stem, which is of a general cylindrical form and not necessarily very long, has at a short distance within its outer extremity a cylindrical neck 10, which at its lower junction with the valve-stem proper has the base-shoulder 12, and the head or end portion of the valve-stem next outwardly beyond the neck 10 is non-cylindrical—that is, it has flat sides 12 12—making it approximately rectangular, with the shoulders 13 13 overhanging the said necked portion 10.

The spring-retainer G comprises two circular parts or sections *f* and *g*,—one of which is inserted within the other,—and which are rotative the one relative to the other. These sections are held in assemblage by the overlying heads of the screws 17. (Represented in Fig. 3.)



Both of these spring-retainer sections  $f$  and  $g$  have centrally-elongated apertures  $i$  and  $j$ , which may register with each other and which again by a partial turning of the one section  
 5 relatively to the other may have their long dimensions angular to each other.

The thickness of the centrally rabbeted and apertured portion of the wider and lower section  $G$  of the retainer and against which the  
 10 upper end of the compressed spiral spring bears with an upward stress is about equal to the height of the neck 10, or, in other words, the distance between the base-shoulder 12 and the opposite overhanging shoulders 13 13.

15 In applying the retainer at the extremity of the valve-stem and interlocking it therewith the two parts  $f$  and  $g$  are adjusted so that the elongated apertures  $i$  and  $j$  register with each other, whereupon, of course, the two-  
 20 part device may be slipped onto the stem over the slab-sided head thereof, the section  $f$  encircling the neck, while the upper section  $g$  remains about and has practically a tenon-and-mortise and non-rotatable engagement with  
 25 the valve-stem head. Now by turning the section  $f$  a quarter-way around the boundaries 20 20 of the elongated aperture  $i$  will be brought under the shoulders 13 13, and all, whereby as will be apparent from the above  
 30 explanations, the interlocked two-part retainer will not be permitted to have an endwise movement of displacement from off the valve-stem nor by reason of the engagement between the section  $g$  and slab-sided valve-stem head any  
 35 rotation, except as such rotative movement is wilfully accomplished by an intelligently-applied manipulation.

In order to insure additional security to the locking of the parts, a lock or detent is provided as between the sections  $g$  and  $f$  of the  
 40 retainer, the same, as shown, consisting of a spring  $k$ , coiled within a recess  $m$  in the section  $g$  and anchored against rotational shifting, as indicated at  $n$ , such spring having an  
 45 outwardly-extended portion  $o$  and an upwardly-extending finger  $p$  and adapted for a snap-catch engagement in a notch  $q$  in the section  $f$ . A second notch  $q^2$ , ninety degrees removed from the one,  $q$ , enables, when the one  
 50 section is rotatively moved relatively to the other, such movement to be limited for the registration of the two apertures  $i$  and  $j$ , so that the retainer as a whole may be easily slipped upwardly off from the top of the valve-  
 55 stem or brought to placement or replacement thereupon.

By making the portion  $f$  of the spring-retainer rabbeted or cup-shaped, as indicated in Figs. 2 and 6, a partially-inclosed space for  
 60 occupancy is afforded for the secondary section  $g$  of the retainer, compactness of the parts are insured, the walls of the circular rabbet serve as means for constraining the one part for its rotational shifting movement on  
 65 the other about the common axis, and ample

strength is afforded to the sectionally-formed retainer.

Inasmuch as water, more or less dirty at times, is searching through and around the valve device and as more or less sediment  
 70 may be carried into the cavity or upwardly-opening chamber in the cup-shaped part  $f$ , one or more holes  $t$  are formed through the base of the cavity, so that any water entering into such cavity may carry or wash the  
 75 dirt or sediment downwardly through said openings  $t$  and leave the retainer internally free and clear for the proper relative movements of its parts and detent or locking-spring. 80

The spring-retainers have heretofore been proposed which were engaged at the extremity of the valve-guiding stem, and more or less dependence was had upon the valve-closing  
 85 spring for keeping the retainer in its proper place, and inasmuch as it is of comparatively frequent occurrence for the valve-guiding springs to become broken or inoperative the retainer was subject to the water-pressures in  
 90 various directions thereon, having the tendency to dislodge it from the stem, whereupon it would roam uncontrolled in the pump-chamber, leaving the valve also subject to disengagement from its guiding-stem and generally working injury to the apparatus; but, as  
 95 apparent, the part  $g$  in the example of the device here illustrated is effectually interlocked at and with the extremity of the stem, so that it can have no rotative movement and  
 100 so, consequently, that it can under no condition have any undesired axial movement in either direction. 100

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is— 105

1. In a valve device, in combination, a valve, a stem, having a neck and an adjacent non-cylindrical shouldered portion, a valve-closing spring, and a spring-retainer comprising portions rotatively movable one relatively to the  
 110 other, having non-cylindrical apertures, arranged for coincidence and for non-registry, and coöperative with the necked and shouldered portions of the valve-stem for the purpose set forth. 115

2. In a valve device, in combination, a valve, a stem having adjacent portions of different cross-sectional contours, a valve-closing spring, and a spring-retainer comprising portions, one of which is rotatively movable relatively to the other, and both having apertures  
 120 therein arranged when in registry to permit placement on and removal from the stem, and when one of the parts is turned to prevent displacement of the retainer from the stem. 125

3. The combination with the valve, a valve-spring, and stem having at its extremity a neck and a non-cylindrical head with shoulders above and below the neck, of a spring-retainer comprising relatively rotative parts having  
 130



apertures which in registry permit the placement of the retainer in position about the head and necked portions of the stem, and upon the turning of the parts insure an interlocking of one of the retainer members between the shoulders of the stem, preventing movement of the retainer axially relatively to the stem.

4. The combination with the valve-spring and stem constructed with a two-shouldered portion and an intermediate and separating neck, of a spring-retainer comprising relatively rotative parts, both apertured, one arranged to engage and be non-rotatable relatively to the shoulder-constituting part of the stem, and the other permitted, by its aperture to be turned about the stem-neck and by its aperture boundaries to acquire all engagement under the outer stem-shoulder.

5. In a device of the character described, a stem and detachable spring-retainer: the stem being shouldered within its outer end, and the retainer being composed of relatively rotative parts, one thereof having a non-rotatable engagement with the portion of the stem above the shoulder, and the other being capable by a partial rotation thereof, to have an engagement under the shoulder for preventing displacement of the retainer along the length of the stem.

6. In a device of the character described, a stem and detachable spring-retainer: the stem being shouldered below its outer end, and the retainer being composed of relatively rotative parts, one thereof having a non-rotatable engagement with the portion of the stem above the shoulder and the other being capable, by a partial rotation thereof, to have an engagement under the shoulder for preventing displacement of the retainer along the length of the stem, and a detent for detachably locking said portions of the retainer against rotative movement, the one relatively to the other.

7. The combination with the valve-spring and stem constructed with an inner shoulder, an outer non-cylindrical shoulder-constituting portion, and an intermediate and separating cylindrical neck, of a spring-retainer comprising relatively rotative superimposed parts, both having non-cylindrical apertures, one arranged to engage and be non-rotatable relatively to the shoulder-constituting part of the stem, and the other permitted, by its aperture, to be turned about the stem-neck and by its aperture boundaries to acquire an engagement under the outer shoulder.

8. In a valve device, in combination, a valve, a stem, having at its extremity, a neck, and next outwardly therebeyond, a flat-sided portion, the bases of which constitute shoulders, a valve-closing spring, and a spring-retainer

comprising portions rotatively movable, in different planes, one relatively to the other, having rectangular apertures arranged for coincidence and for non-registry, and coöperative with the necked and flat-sided shoulder-constituting portions of the valve-stem as described.

9. In a valve device, in combination, a valve, a stem, having, at its extremity, a neck, and next outwardly therebeyond a flat-sided part, the base portions thereof constituting shoulders overlying the neck portion, a valve-closing spring, and a spring-retainer comprising a rabbeted circular part and a secondary part nested on the rabbeted part and the one rotatively movable relatively to the other, and both having elongated apertures arranged for coincidence and for non-registry, and adapted to engage with and under the necked and flat-sided shoulder-constituting portions of the valve-stem.

10. In a valve device, in combination, a valve, a stem, having, near its end, a neck, with a shoulder or seat next inwardly therefrom, and having a flat-sided part, next outwardly therebeyond, the base portions of which constitute shoulders overlying the neck portion, a valve-closing spring, and a spring-retainer comprising a rabbeted circular part and a secondary part nested in the rabbeted part, and the one rotatively movable relatively to the other, both having elongated apertures arranged for coincidence and for non-registry, and adapted to engage with respectively the outer stem portion, and also between the inner and outer shoulders of the stem, substantially as described.

11. In a valve device, in combination, a valve, a stem, having at its extremity, a neck, and next outwardly therebeyond a flat-sided part, the base portions thereof constituting shoulders overlying the neck portion, a valve-closing spring, and a spring-retainer comprising a rabbeted circular part and a secondary part nested in the rabbeted part, the one rotatively movable relatively to the other, and both having elongated apertures arranged for coincidence and for non-registry, and adapted to engage with and under the necked and flat-sided shoulder-constituting portions of the valve-stem, and a locking device mounted on the one adapted to detachably engage the other, of said spring-retainer parts, for the purposes set forth.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

ARTHUR CHOINIERE.

Witnesses:

OLIVER N. MORIN,  
WM. S. BELLOWS.