

No. 674,067.

Patented May 14, 1901.

W. H. NORTHALL,
ELECTRIC ARC LAMP.
(Application filed Jan. 18, 1900.)

(No Model.)

2 Sheets—Sheet 1.

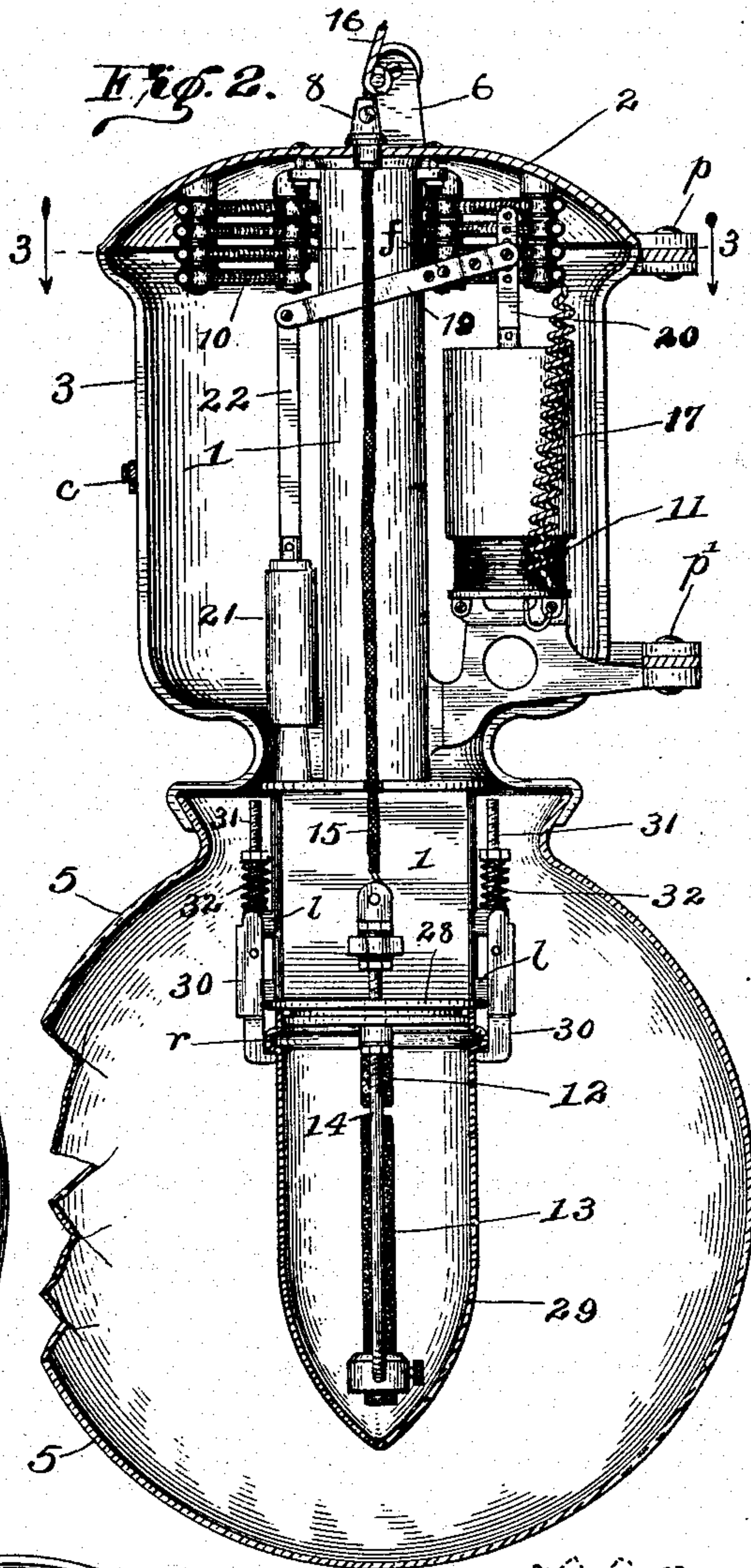
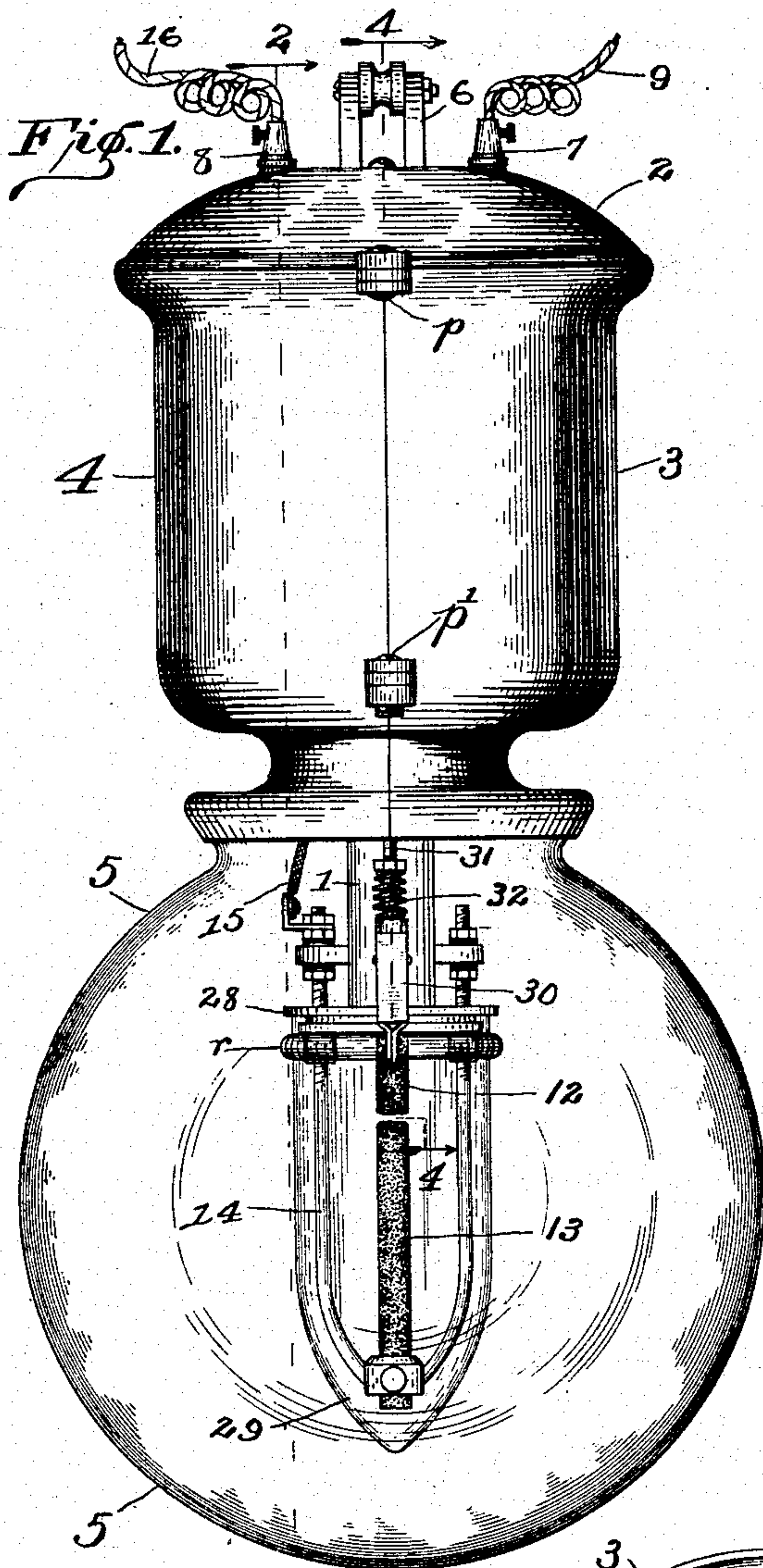
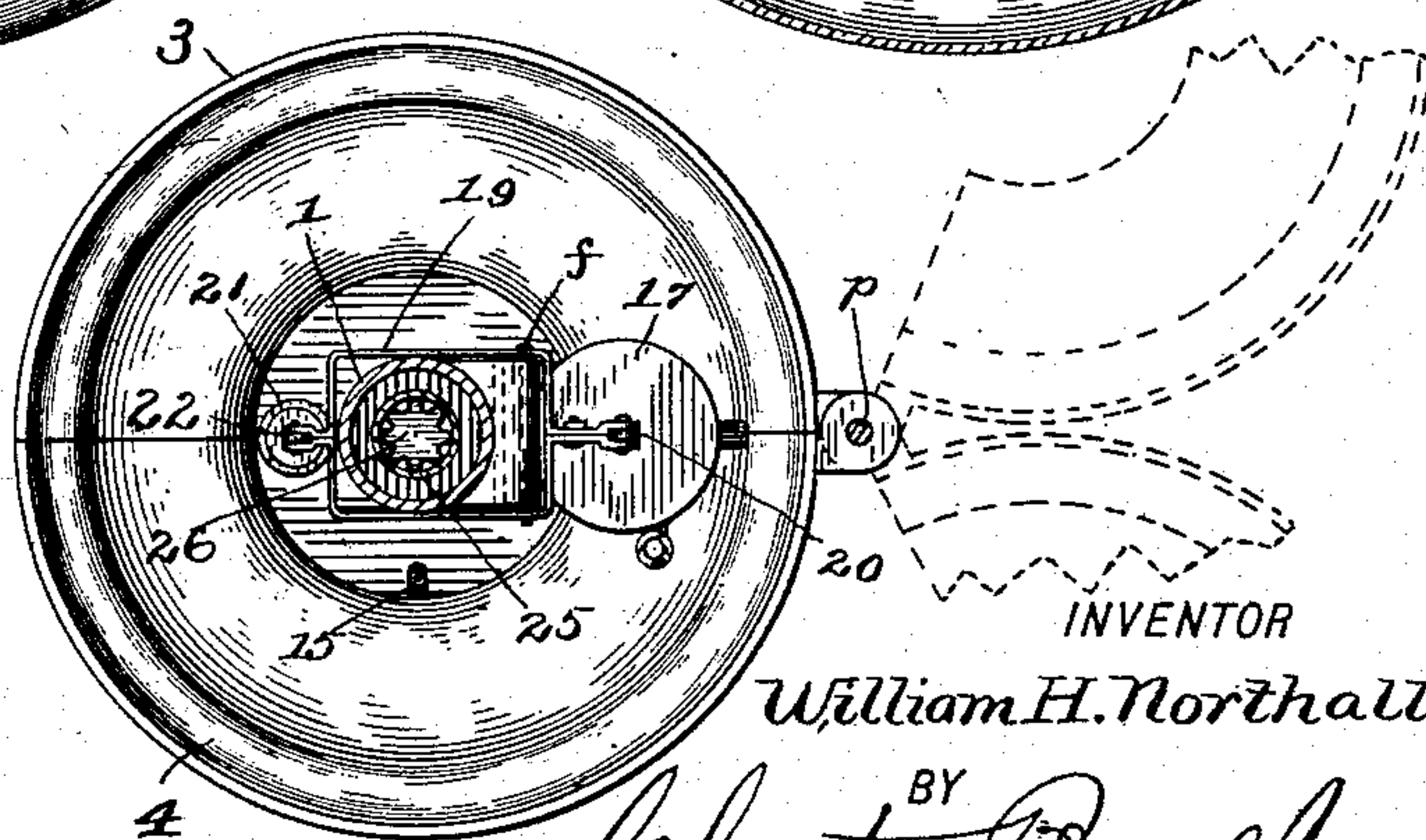


Fig. 3.



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2 Sheets—Sheet 2.

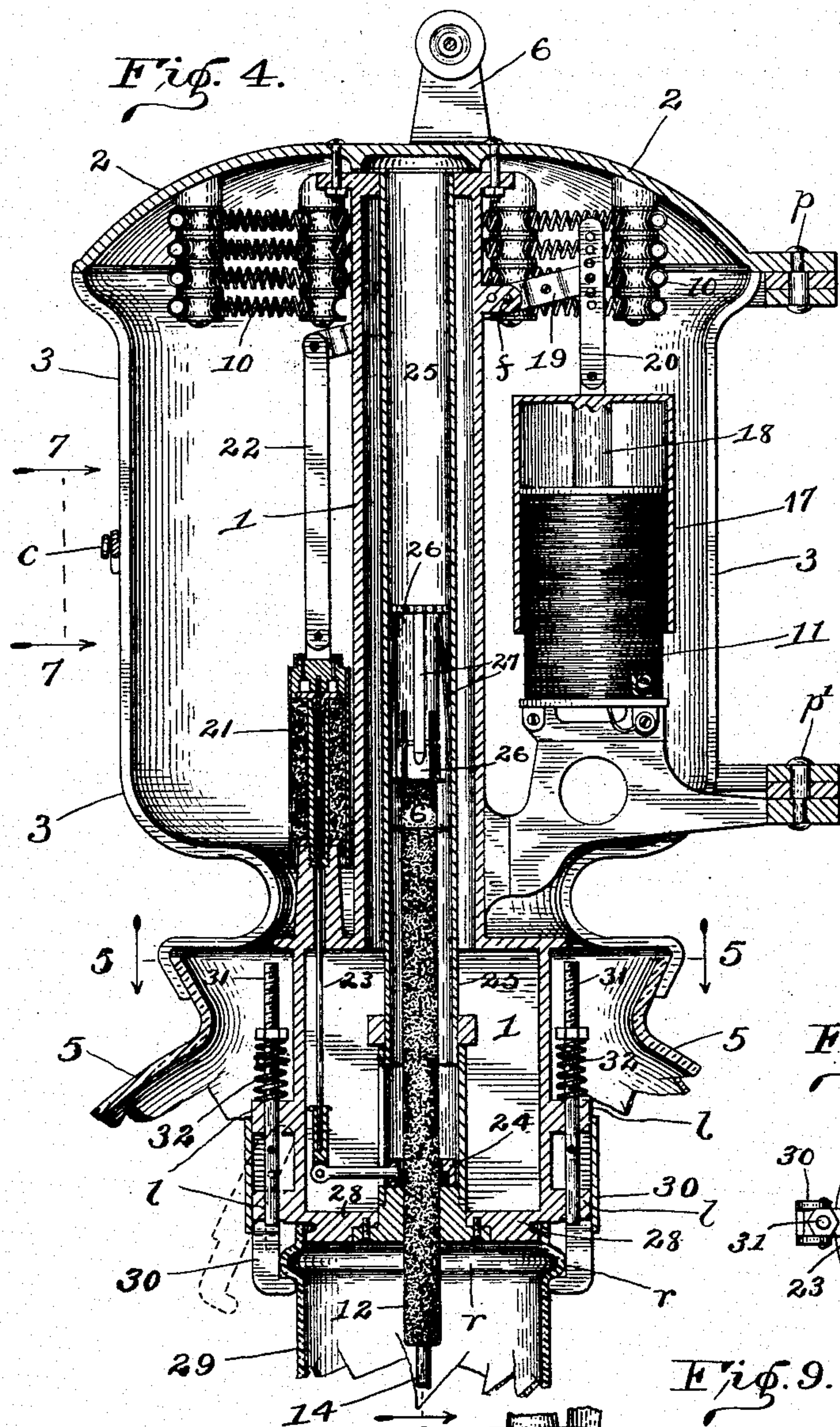


Fig. 7.

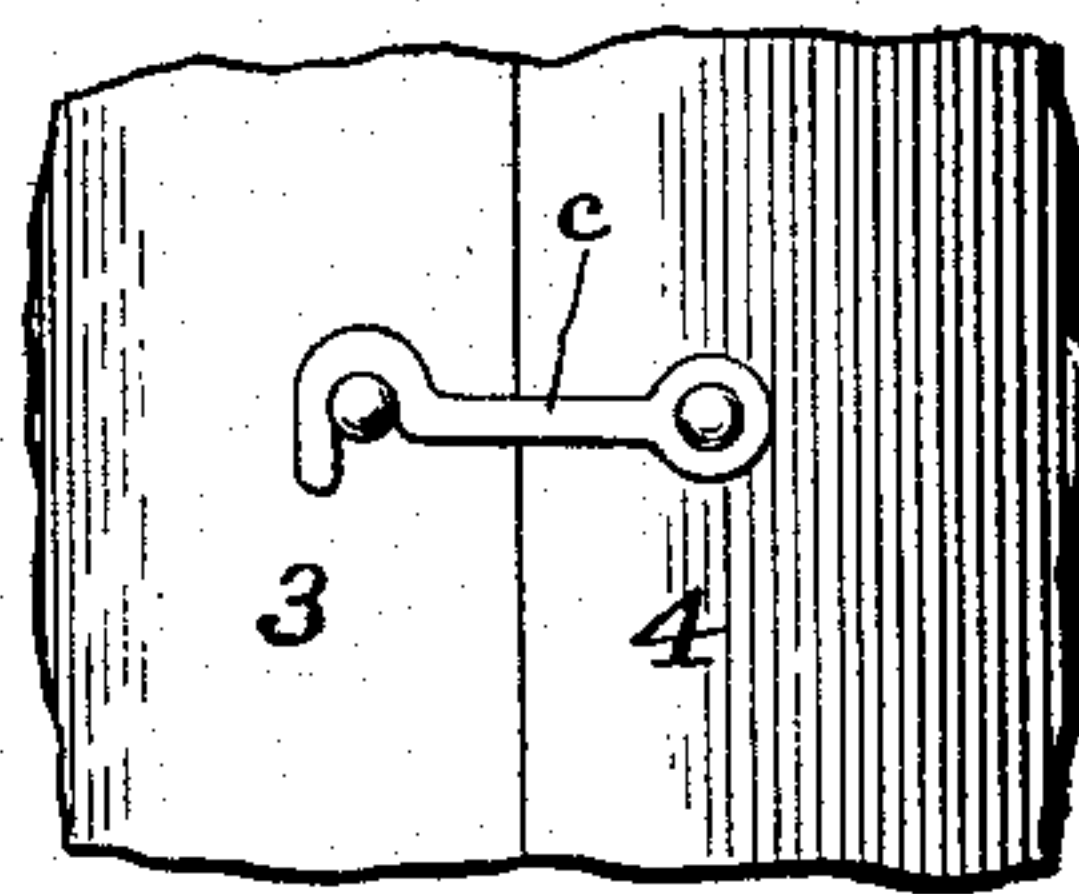


Fig. 6.

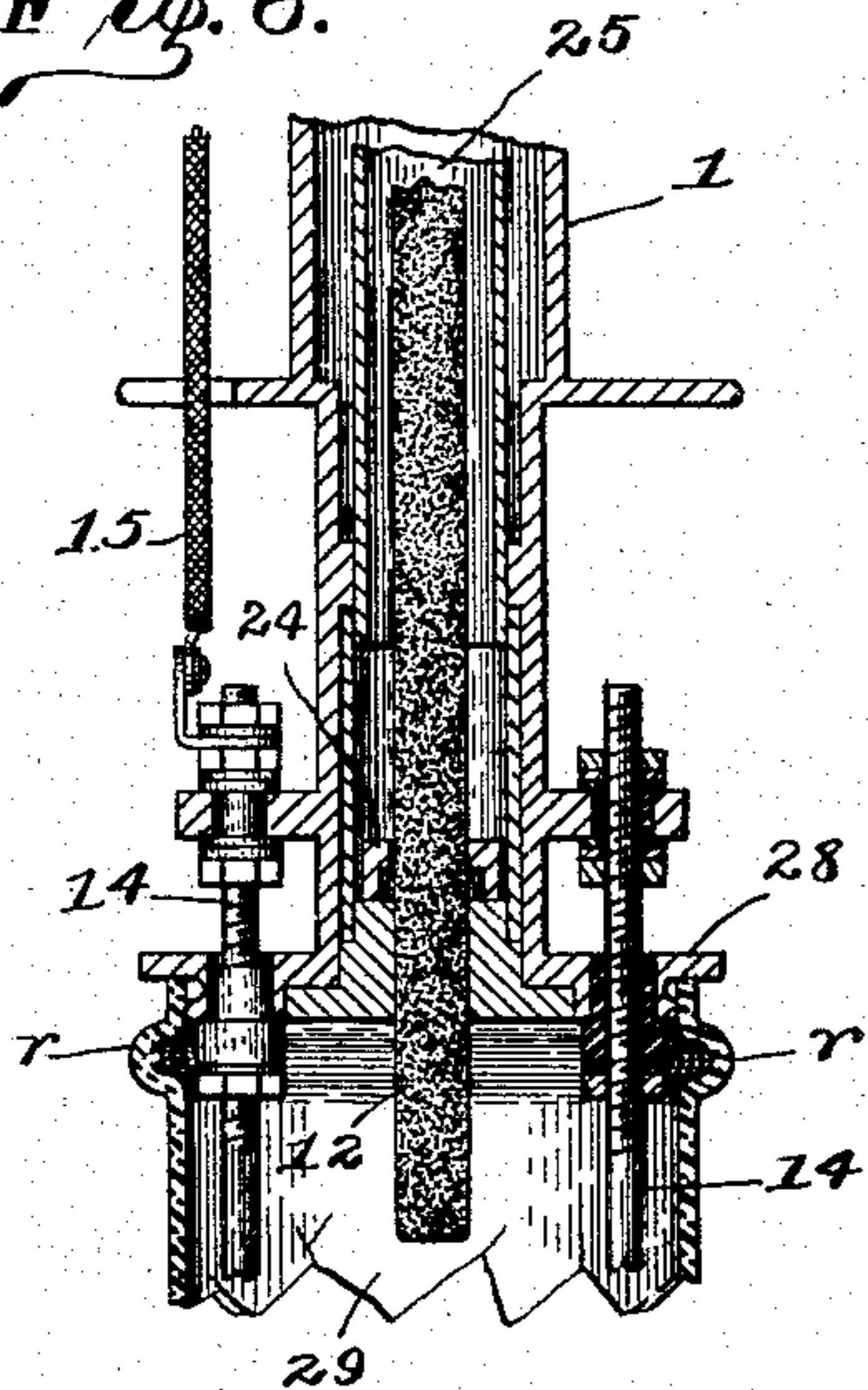


Fig. 5.

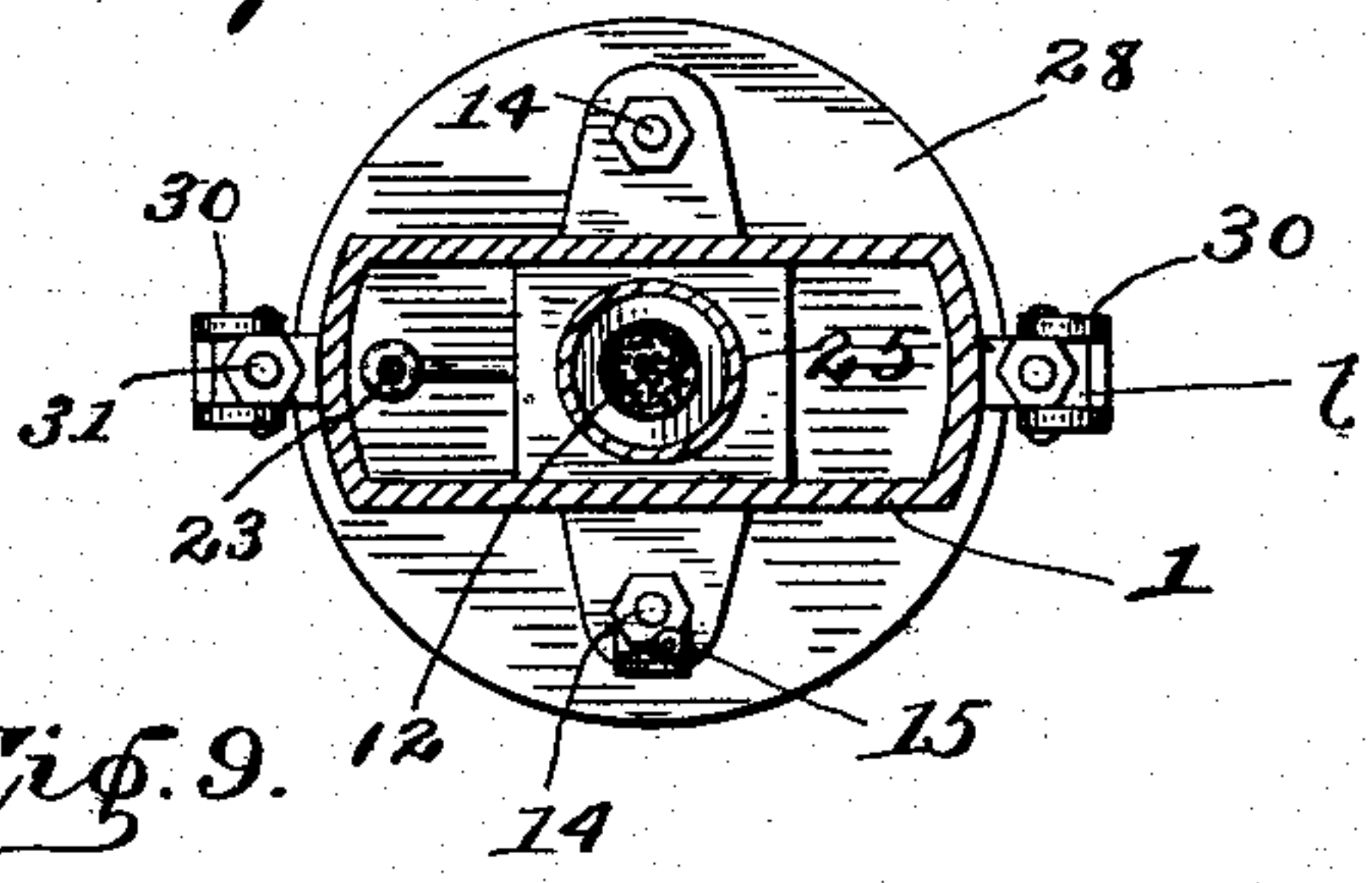


Fig. 9.

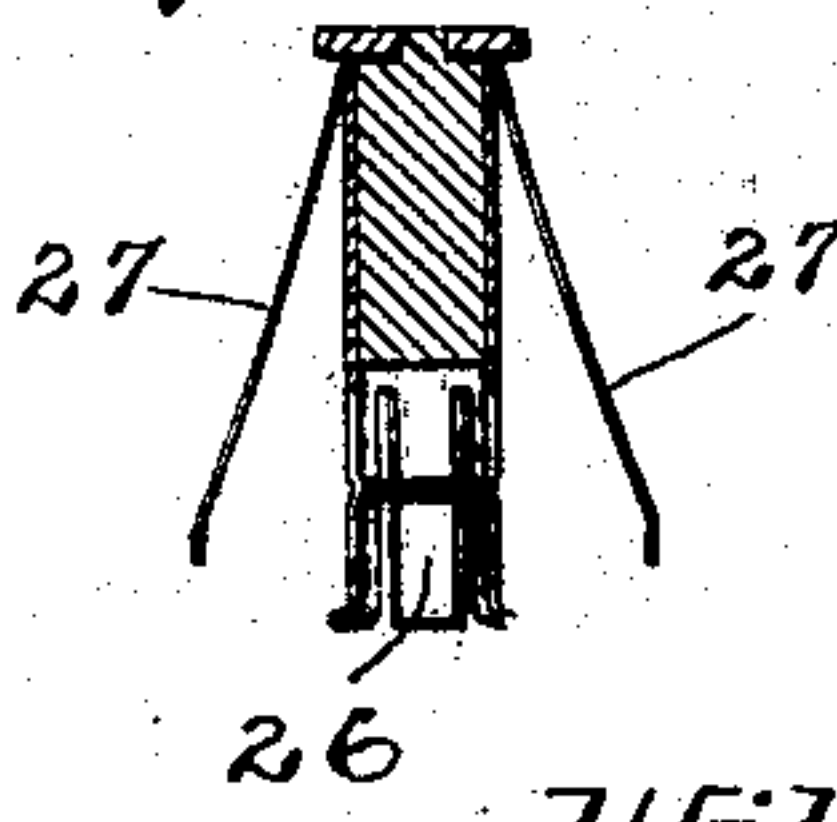
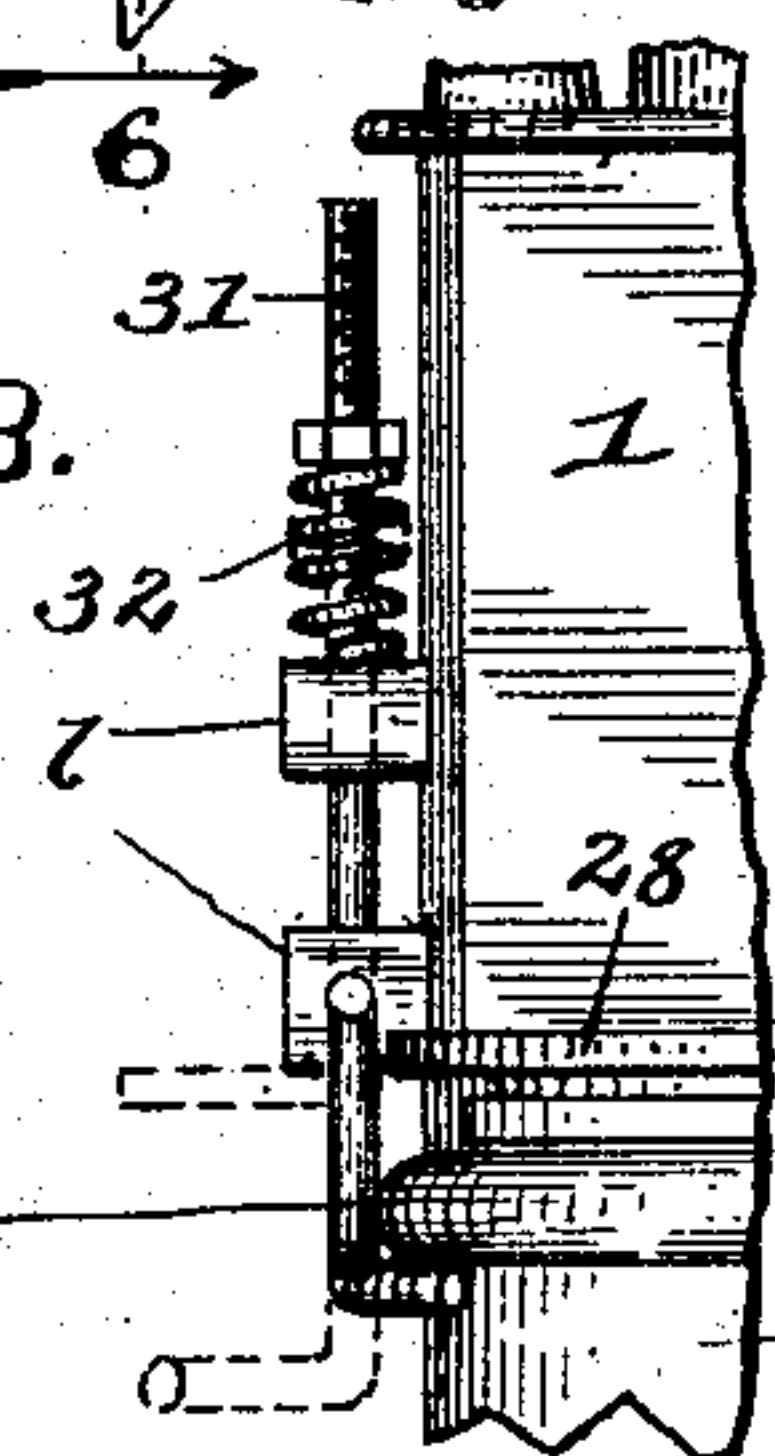


Fig. 8.



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WILLIAM H. NORTHALL, OF ELWOOD, INDIANA, ASSIGNOR TO THE LEA MANUFACTURING COMPANY, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 674,067, dated May 14, 1901.

Application filed January 18, 1900. Serial No. 1,909. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. NORTHALL, a citizen of the United States, residing at Elwood, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

My invention relates to that variety of electric-arc lamps wherein the arc is formed within a substantially air-tight inclosure; and it consists in various details of construction and arrangements of parts whereby a simple, inexpensive, and highly-efficient lamp of said variety is produced.

A lamp embodying my said invention will first be fully described and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of a lamp of the character in question embodying my improvements; Fig. 2, an elevation of the interior thereof, the casing or globes being cut away or cut in half, as seen from the point indicated by the dotted line 2 2 in Fig. 1; Fig. 3, a horizontal sectional view as seen from the dotted line 3 3 in Fig. 2, showing the interior of the lamp below the resistance-coils in top plan; Fig. 4, a central sectional view of the principal portions of the lamp, on a somewhat-enlarged scale, as seen from the dotted line 4 4 in Fig. 1; Fig. 5, a horizontal sectional view as seen from the dotted line 5 5 in Fig. 4; Fig. 6, a detail sectional view on the dotted line 6 6 in Fig. 4; Fig. 7, a detail elevation as seen from the dotted line 7 7 alongside Fig. 4, showing the catch by which the inclosing casing is secured together; Fig. 8, a detail view of an alternative construction of one of the catches for clamping and holding the inside globe, and Fig. 9 a detail sectional view of the upper-carbon holder.

I will first describe the frame of my improved lamp, the main portion of which is a tubular casting 1, within and upon which the other portions of the lamp are secured. Upon the upper end of this casting is placed a cap 2, which is there rigidly and strongly secured in place. Hinged to this cap and to a suitable projection on the tubular casting 1 are

the casing halves or sides 3 and 4. These are carried by hinged pivots *p p'* and when closed are held to position and against each other by a suitable catch *c*. The lower edges of the sides 3 4 constitute a clamping-flange by means of which the outside globe 5 is held in place. To remove this globe it is only necessary to unlatch the casing halves or sides and swing them apart, (see dotted lines in Fig. 3,) when the globe can readily be taken out. This forms an extremely simple and expeditious means whereby the globes to the lamp may be removed for cleaning, renewal, or replacement. The whole structure is carried from any suitable support from which a connecting wire or cord may be run to and pass through the loop structure 6, formed on or connected to the cap 2. This structure, as best shown in Fig. 1, is preferably composed of two ears with a sheave or roller secured between them; but obviously it may be of any suitable construction or arrangement. The binding-posts 7 and 8 are also secured to the cap 2, preferably one on each side of the attaching device 6. To one of these is connected the incoming line-wire 9, and, as usually arranged, the current passes from this through resistance-coils 10, thence through the solenoid 11, and thence (by way of the frame part 1) to the upper carbon 12, thence to the lower carbon 13 and its frame, thence by way of the wire 15 to the other binding-post and out over the outgoing line-wire 16. I have thus briefly described the general structure of the lamp and the ordinary course of the current before proceeding to describe the details.

The solenoid 11 differs from ordinary solenoids in being provided with an external shell 17, as well as an ordinary core 18, by means of which it is given increased power. Above the solenoid is a branched lever 19, mounted by means of a fulcrum-pin *f* on a suitable bearing or projection on the central frame-piece 1. One end of this lever is connected to the core and shell 17 18 of the solenoid by means of a link 20, and the other end is connected to a dash-pot 21 by means of a link 22. The lamp is adjusted for different voltages by shifting the fulcrum-pin *f* from one to another of two or more holes provided therefor in the branched lever 19. The link 22 is also

a part of the lifting-clutch mechanism, as substantially a continuation thereof, 23, extends inside or alongside of the dash-pot to the clutch 24, by which the upper carbon 12 is from time to time lifted in the operation of the lamp. The advantage of this arrangement is that there is no other and uncovered opening needed in the frame or casing for the passage of the clutch-lifting rod, and this opening being well covered by the dash-pot the result is that the air is more perfectly excluded from the chamber containing the arc than would otherwise be the case. If it is preferred to run the rod 23 down outside the dash-pot, the opening in the frame should be in the form of a stuffing-box. The clutch itself works in an ordinary and well-known manner, and its operation is well understood by those skilled in the art.

In providing for a perfect sliding contact by which the electrical connection between the upper carbon and the frame is maintained I place within the hollow main frame-piece 1 a tube 25, having a smooth interior surface and preferably formed of brass, which is permanently and amply secured therein both mechanically and electrically. Upon the upper end of the upper carbon 12 I place a clamping-cap composed, essentially, of a split-sided tube 26, the fingers of which embrace the carbon, the remainder of said tube being filled with a solid body of metal and surrounding which are several spring-fingers 27, which spread out and bear constantly and equally upon the inner surface of the tube 25.

As shown, the upper portion of the central main frame-piece 1 is preferably substantially cylindrical in form and provided with suitable projections upon which to mount the adjacent parts. The lower portion is preferably enlarged considerably in one direction in order to provide a chamber of sufficient size to contain the clutch mechanism comfortably. The lower end of this main frame portion is substantially a disk 28, against which the top of the inner globe 29 rests and which forms the upper wall of the chamber of which said globe forms the remainder. The globe and the disk being nicely fitted together, as shown in the drawings, and there being no other perforation leading into the inclosure except that through which the rod operating the clutch passes, (which is itself inclosed within the dash-pot,) it will be seen that when the parts are properly fitted together little if any air can enter said chamber.

The globe 29 is held against the plate 28 by means of latches 30, pivoted to vertically-movable rods 31, which are normally held upwardly by means of springs 32. As best shown in Fig. 4, these latches are formed to engage with lugs 7 on the main frame part 1 when they are in position for holding the globe, but are enabled to escape from said lugs when pulled downwardly, so that the springs 32 are

compressed and in that position can be swung outwardly, as indicated by the dotted lines, so that the globe 29 can be removed. An alternative construction of these latches is shown in Fig. 8, in which the vertical movement of the device is the same, but in which a projection on the side of the latch escapes from a slot when the latch is pulled downwardly, so that it may be partially revolved in its bearings instead of being swung outwardly on a pivot. The result in each case is the same, as the engaging jaw is by the movement described removed from contact with the rib *r* at the upper end of the globe, which rib, as will be readily seen, is the means for engagement with either form of latch. Said rib also provides a means whereby a circumferential cavity or chamber is formed around the upper end of the globe, which experiment has shown to be desirable in lamps of this character, as it has a tendency to arrest and hold any small amount of air which may accidentally enter the globe and prevent it from descending to the point where the carbons are in contact, and thus exercising its effect upon the combustion there going on.

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

1. The combination, in an electric-arc lamp, of a central tubular frame part upon which the mechanism of the lamp is mounted, a cap portion secured to the upper end of said tubular frame part, and hinged portions adapted to form sides and with the said cap to inclose and cover the lamp mechanism, substantially as shown and described.

2. The combination, in an electric-arc lamp, of a central frame portion, a cap portion thereon, and hinged portions forming sides to the lower casing, said hinged side portions having flanges at the lower end constituting a globe-holder and provided with a suitable catch whereby they are held together when closed, substantially as and for the purposes set forth.

3. The combination, in an electric-arc lamp, of the hollow main central frame portion extending to the top of the lamp, the cap and side portions of the casing attached thereto supported on the top of said hollow central frame portion, a guide-tube for the carbon-holder mounted within said hollow frame portion and supported from its top, a clutch mechanism within a chamber at the lower end of said hollow frame portion, a globe fitted against the lower end of the central frame, means whereby said globe is held in place, an electric controlling device, a dash-pot, a lever connected at one end to the moving portion of the electric controlling device and at the other end to said dash-pot, a clutch-rod running from the dash-pot mechanism down through the shell of the frame to within the chamber and attached at its lower end to the clutch

mechanism, the opening in said shell being arranged to exclude the passage of air, substantially as and for the purposes set forth.

4. The combination in an electric-arc lamp, 5 of the frame, the globe 29 seated closely onto said frame, and provided with a circumferential rib, and latches pivoted to vertical spring-mounted rods carried on the frame and adapted to engage with said rib, substantially 10 as set forth.

5. In a device using a glass globe, the combination of a supporting-body, a lug on said body drilled to receive a rod, a rod adapted to move longitudinally in said hole and engaging with the globe so as to support the 15 same, a spring tending to lift said rod and a handle adapted to revolve the rod around its axis and throw it out of engagement with the globe, substantially as set forth.

20 6. In an arc-lamp the combination with the frame thereof, of a current-contact, carbon-guide and cut-out, composed of a flat circular part, a cylindrical solid piece, a cylindrical

tube fitting and surrounding said solid piece and extending beyond it, one or more slots in 25 said tube extending beyond the end of the solid piece and one or more spring-fingers supported from the end carrying the circular piece and adapted so as to be free to spring 30 laterally outward, substantially as described.

7. In a globe-carrying device the combination with a flanged globe, of a main supporting-body, one or more lugs supported by said body and projecting under the flange of the 35 globe, a pivoted catch with the part arranged to project under and support the flange of the globe, and adapted to revolve upward around the fulcrum until it clears the edge of the globe, substantially as described.

In witness whereof I have hereunto set my 40 hand and seal, at Indianapolis, Indiana, this 7th day of December, A. D. 1899.

WILLIAM H. NORTALL. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.