

No. 677,019.

Patented June 25, 1901.

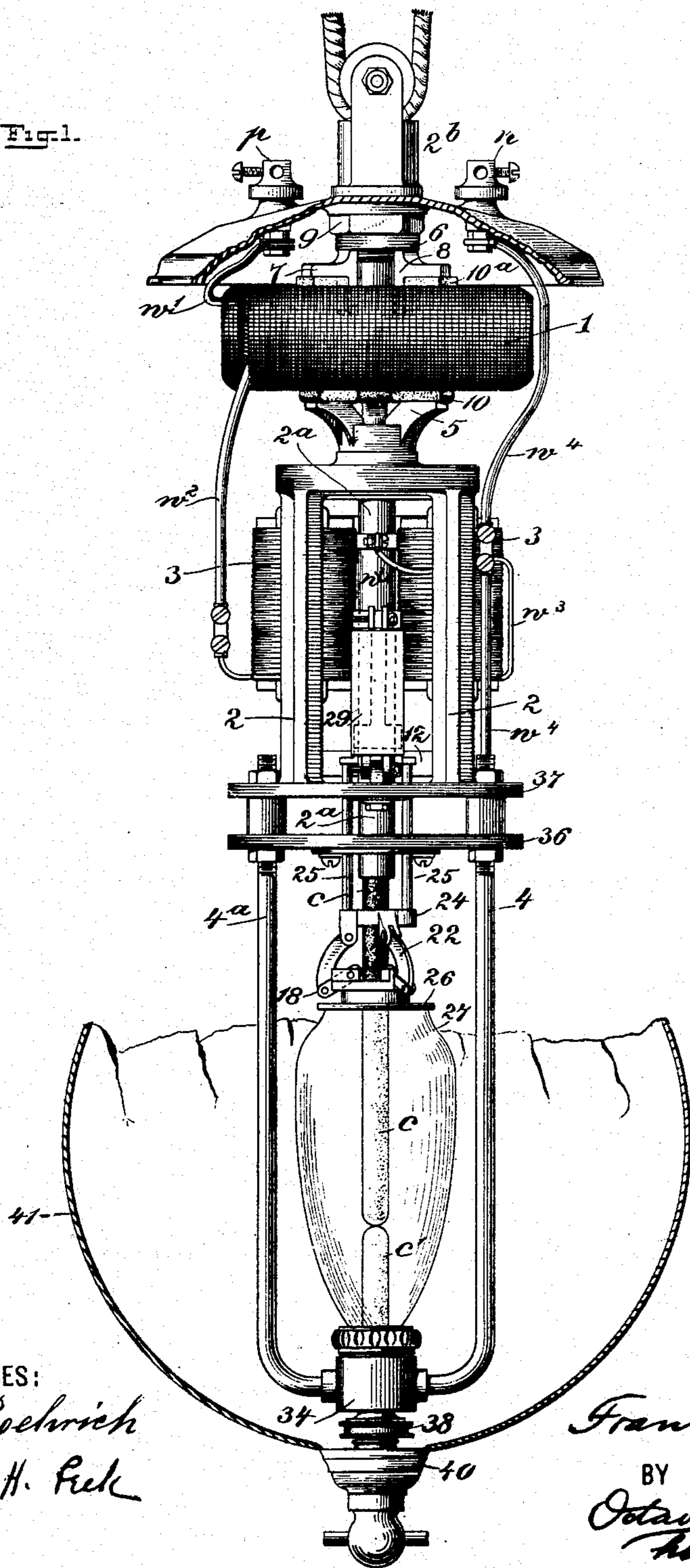
F. M. CONWAY.
ELECTRIC ARC LAMP.

(Application filed July 18, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

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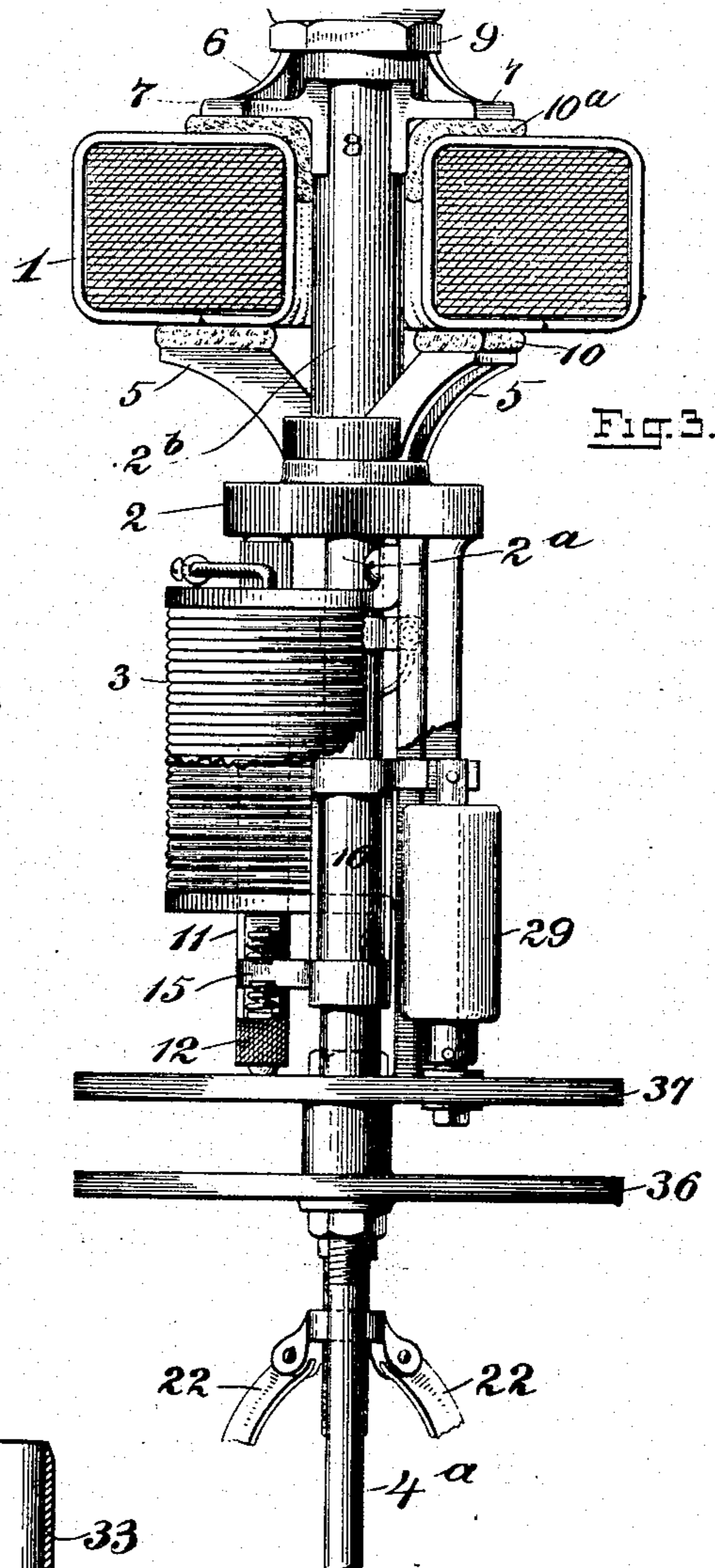
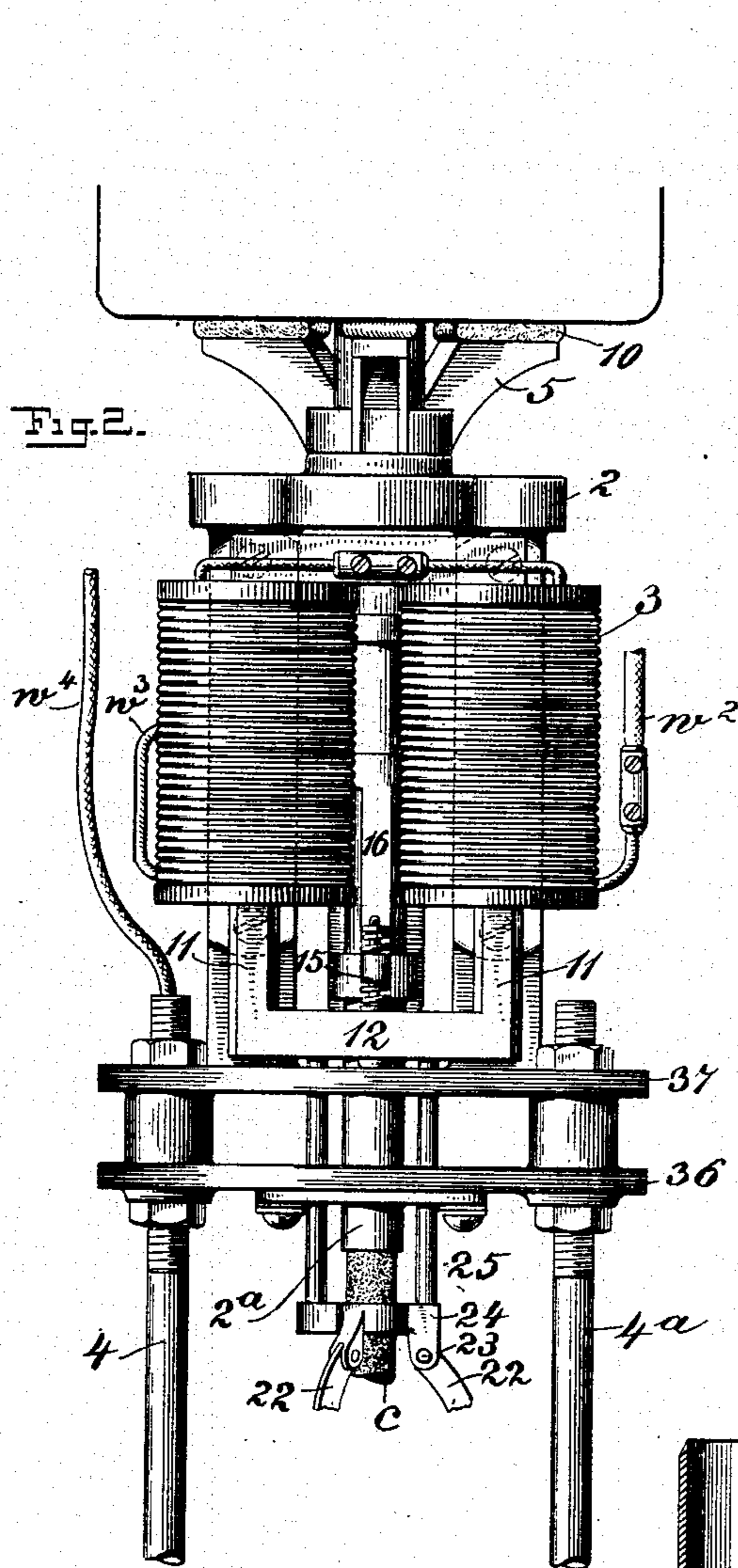
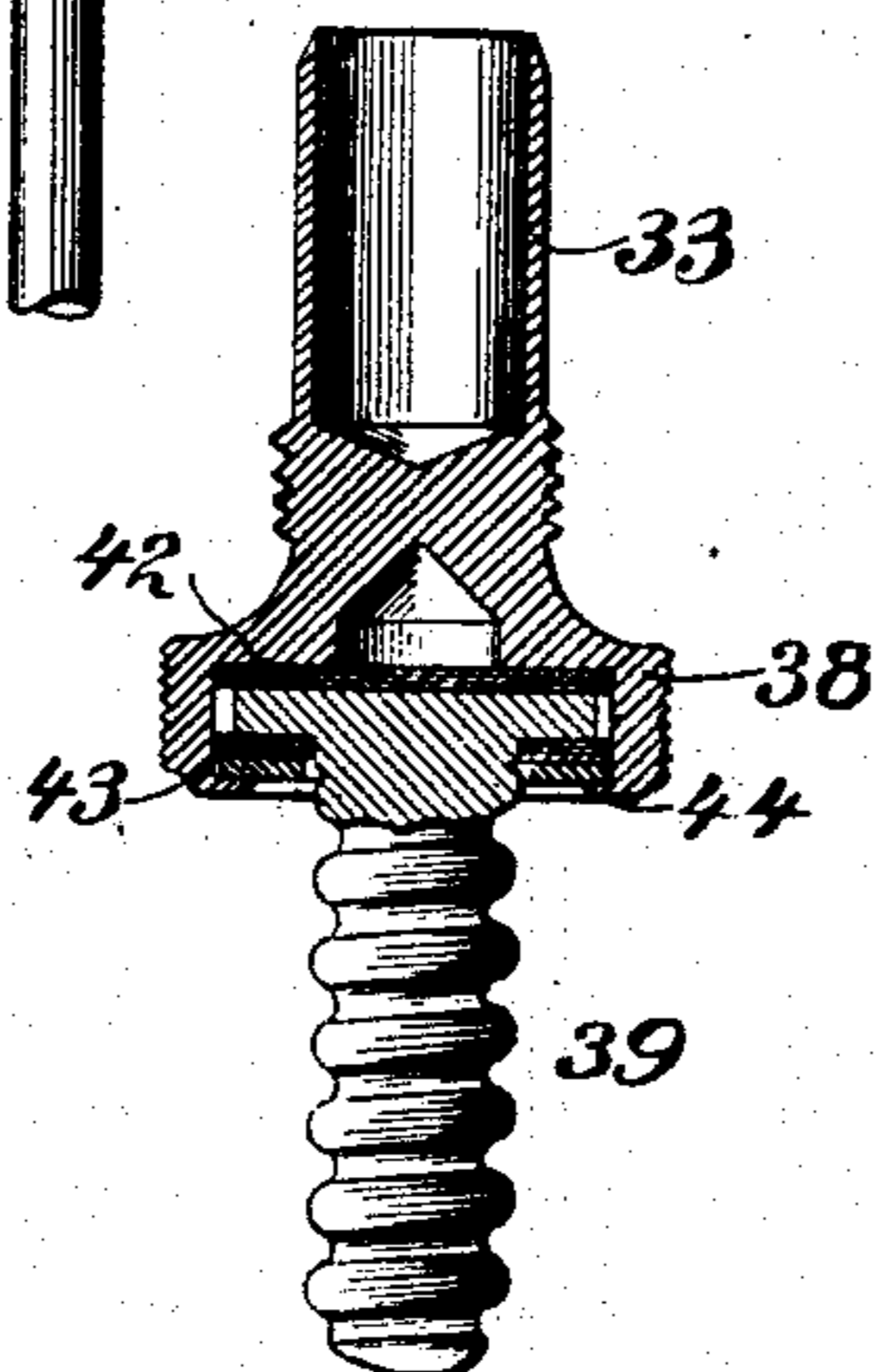


Fig. 13.



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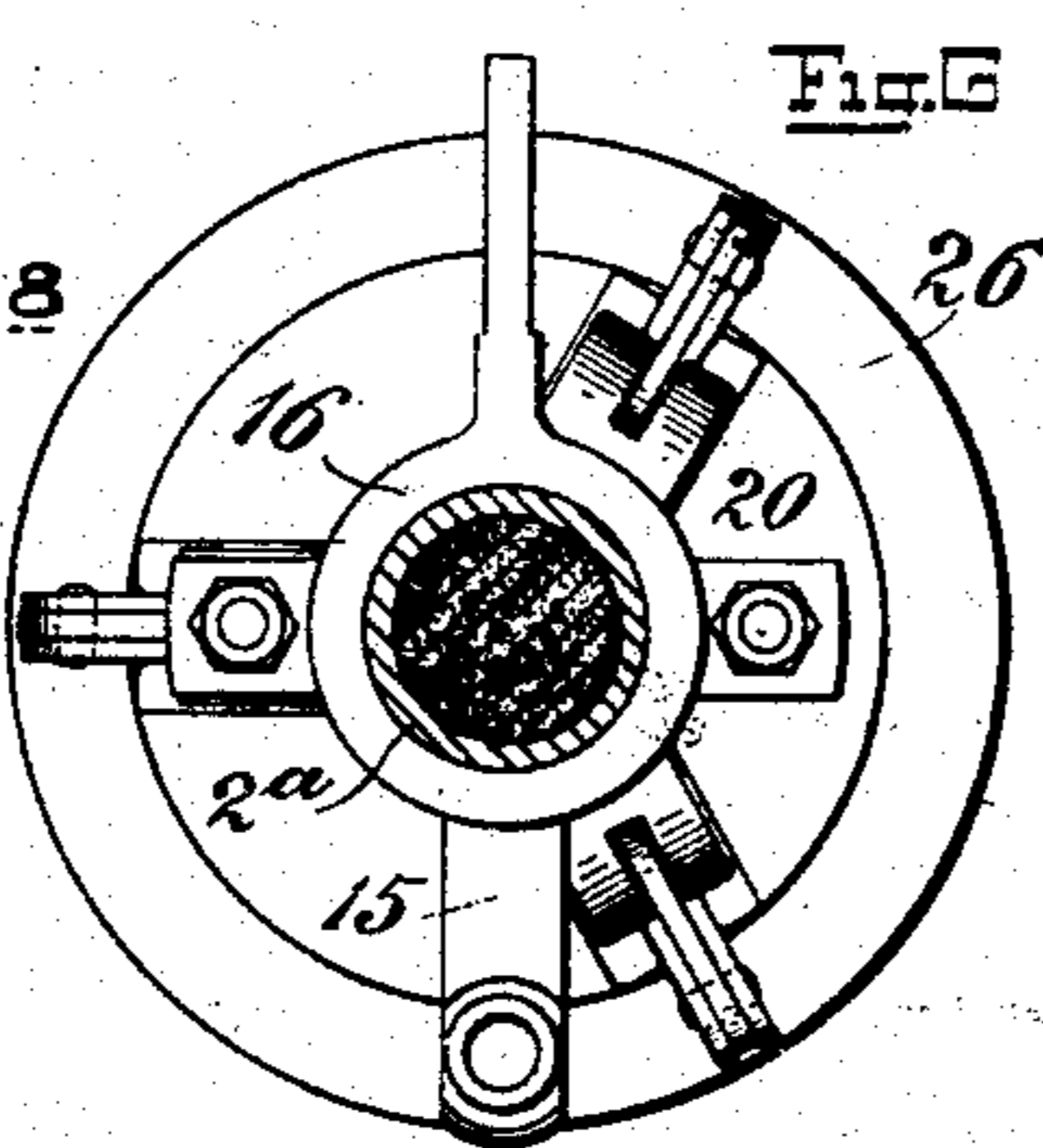
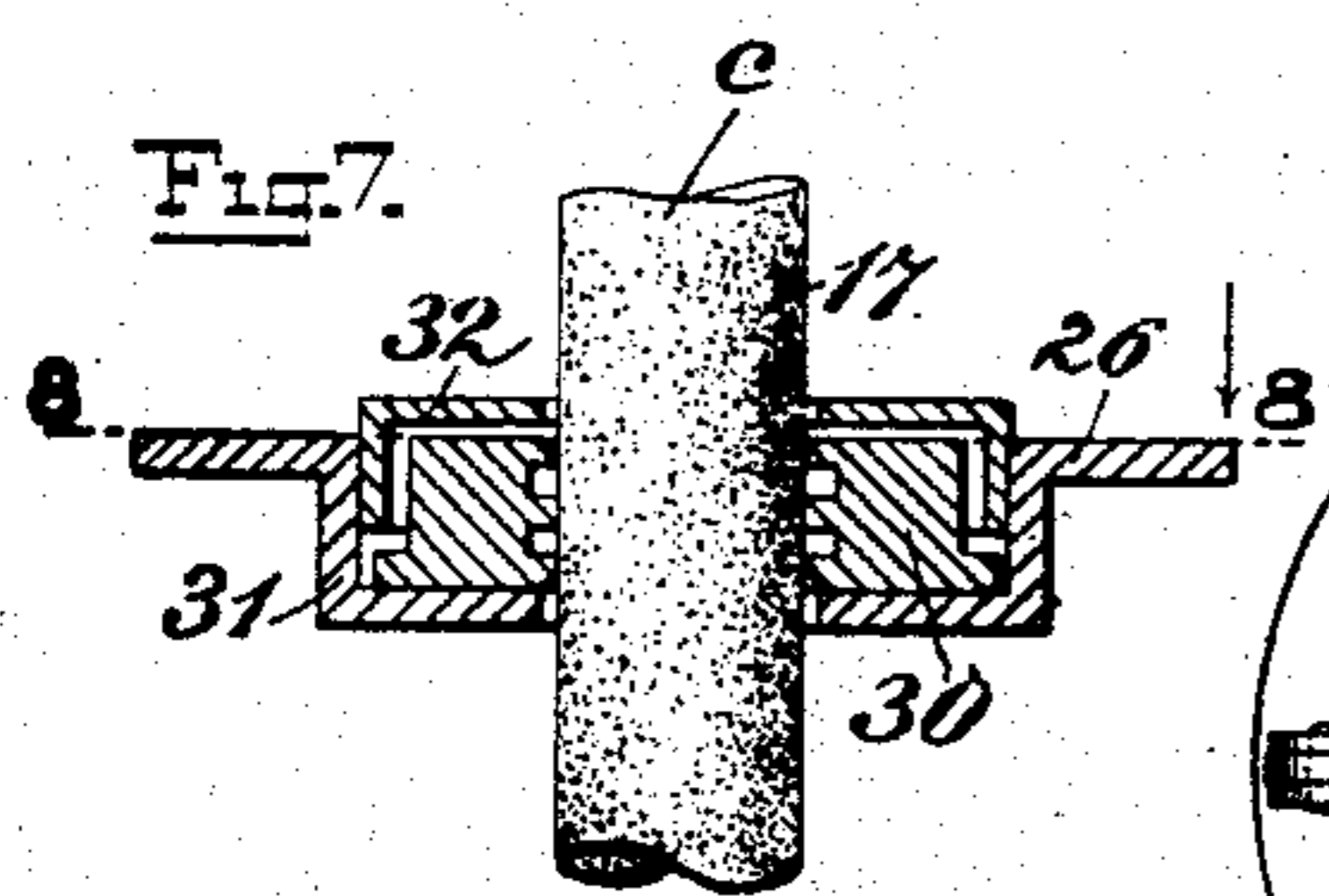
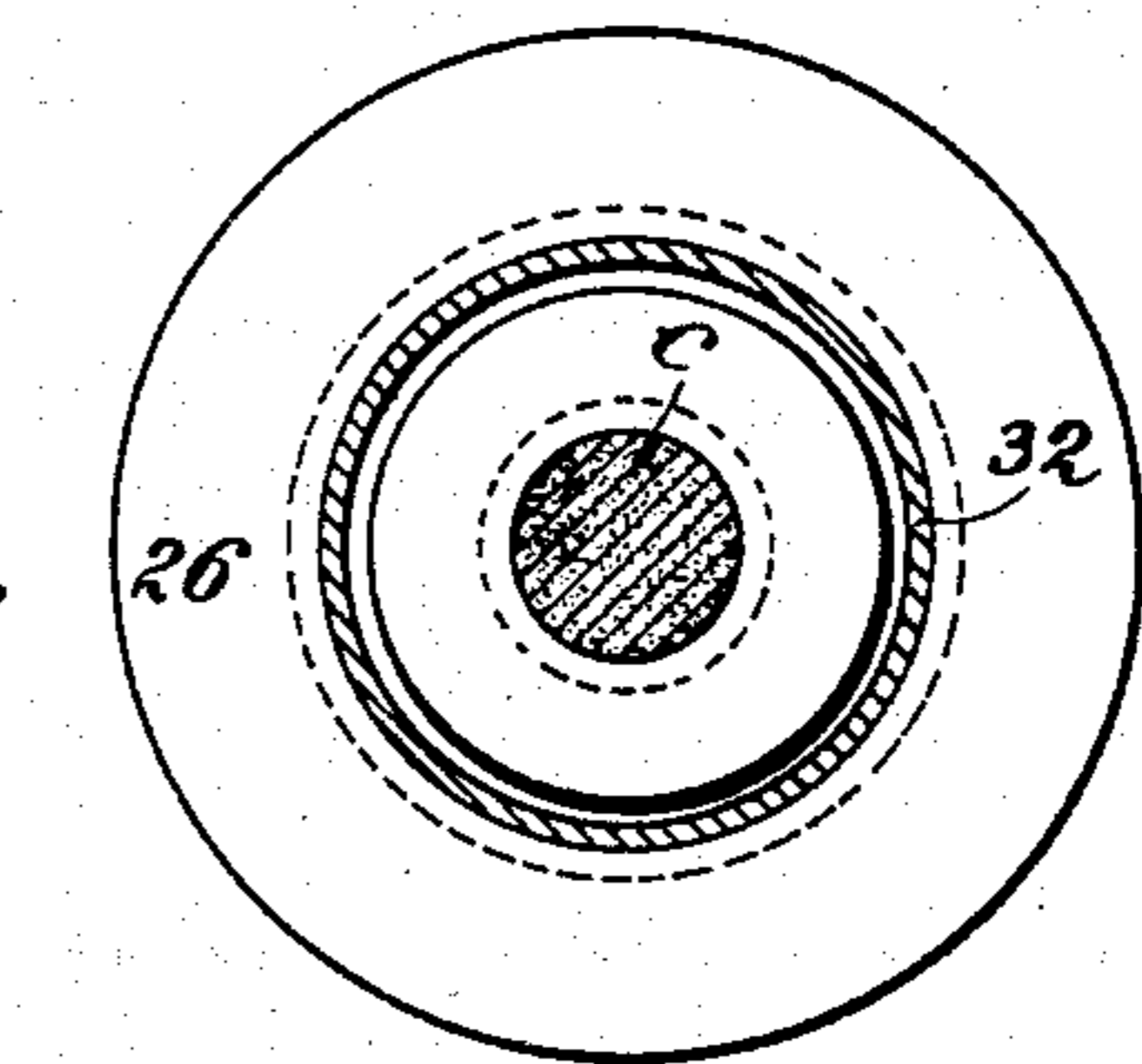
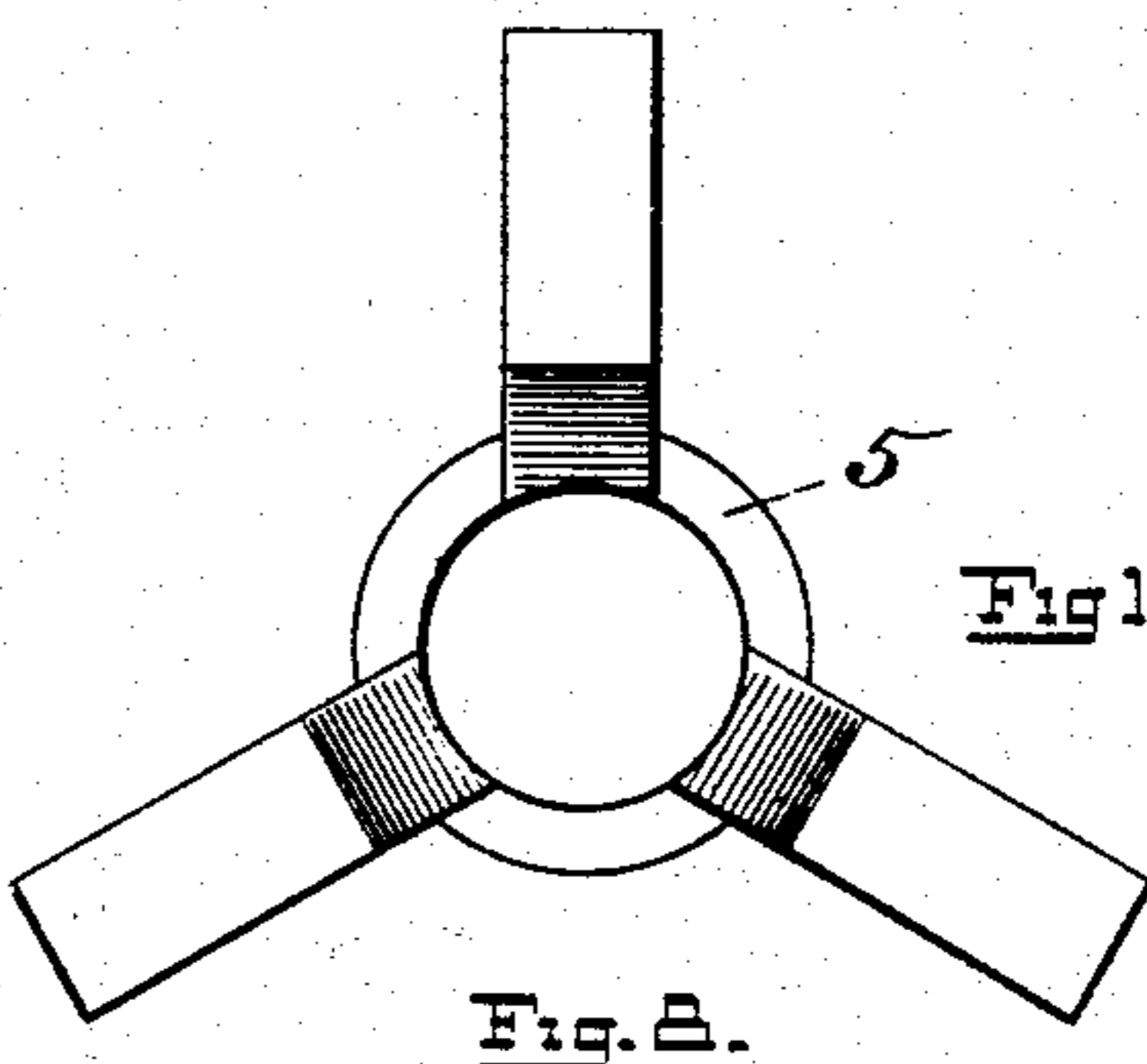
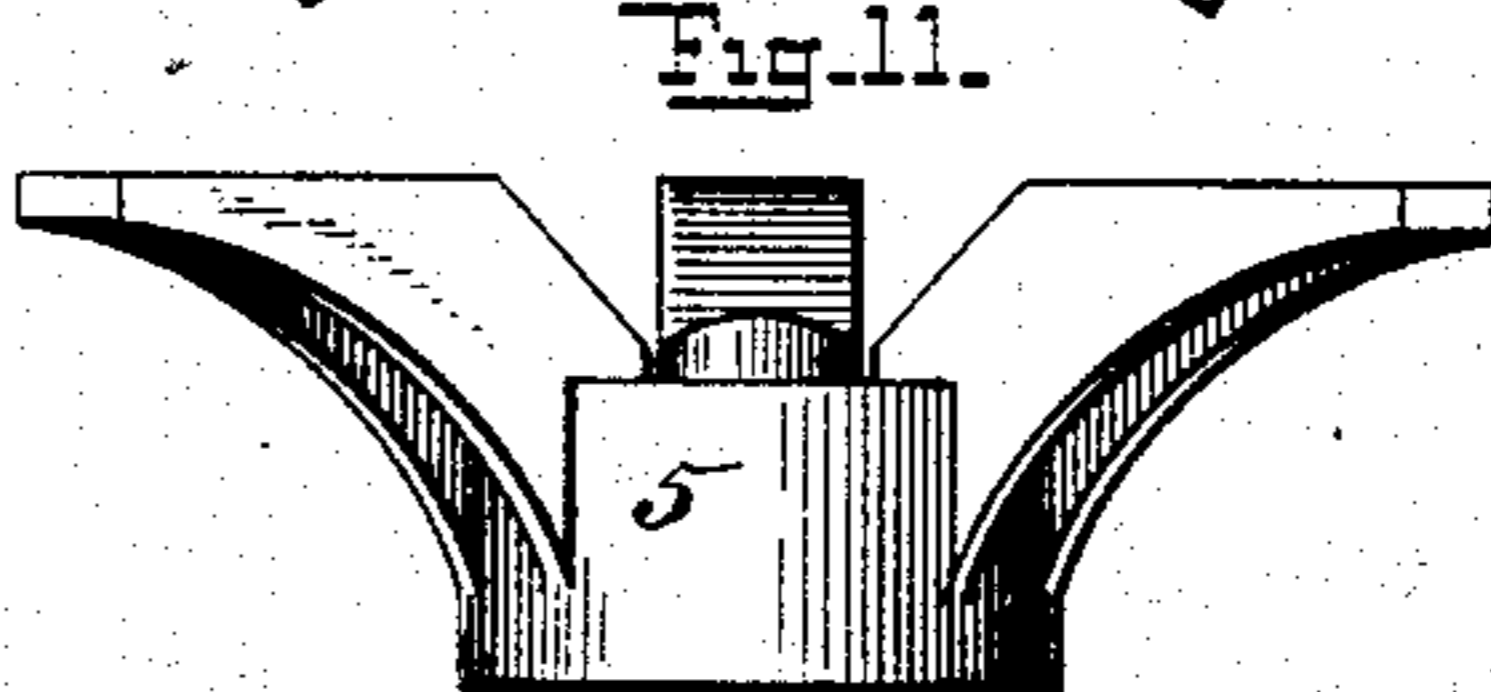
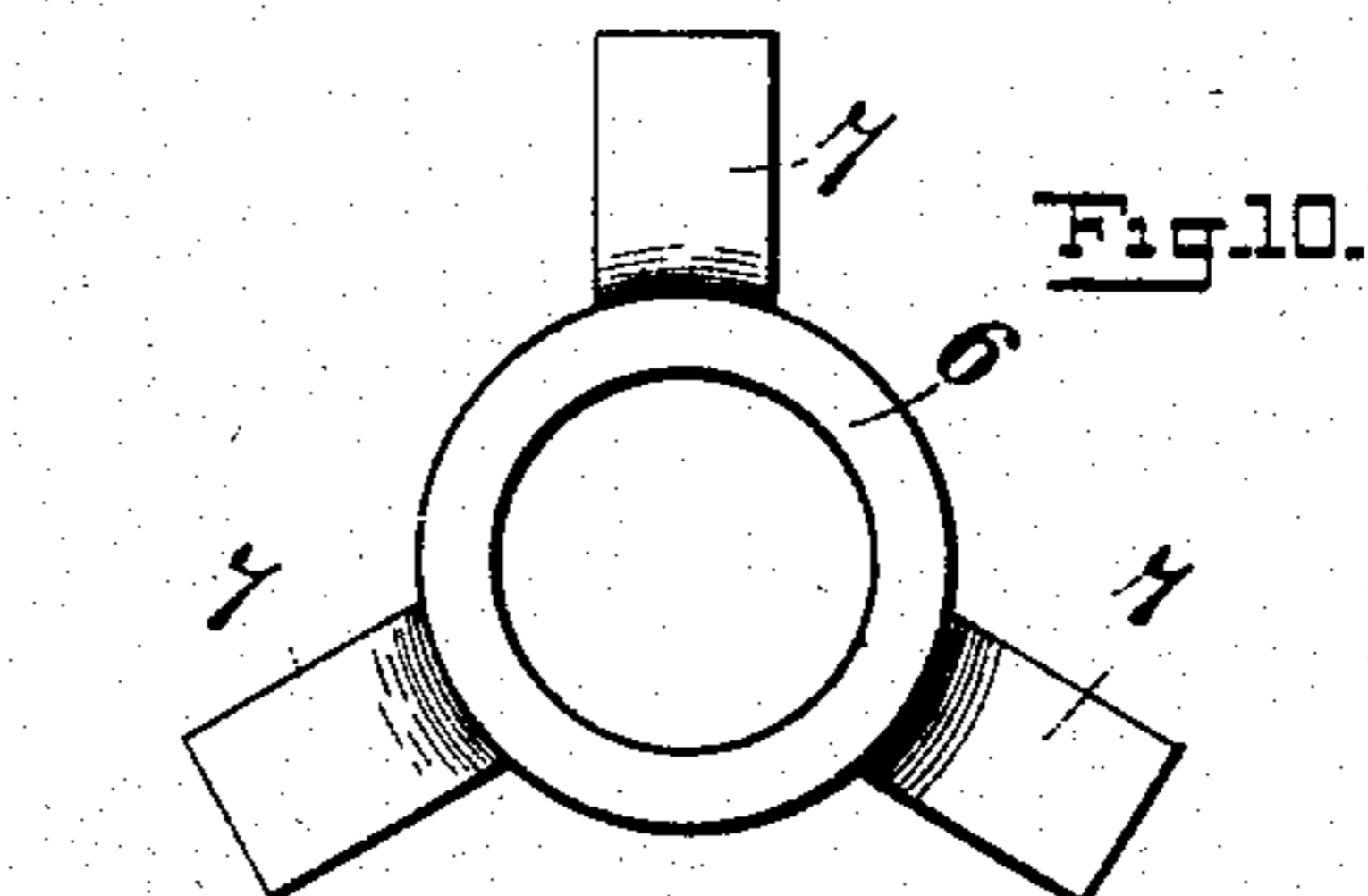
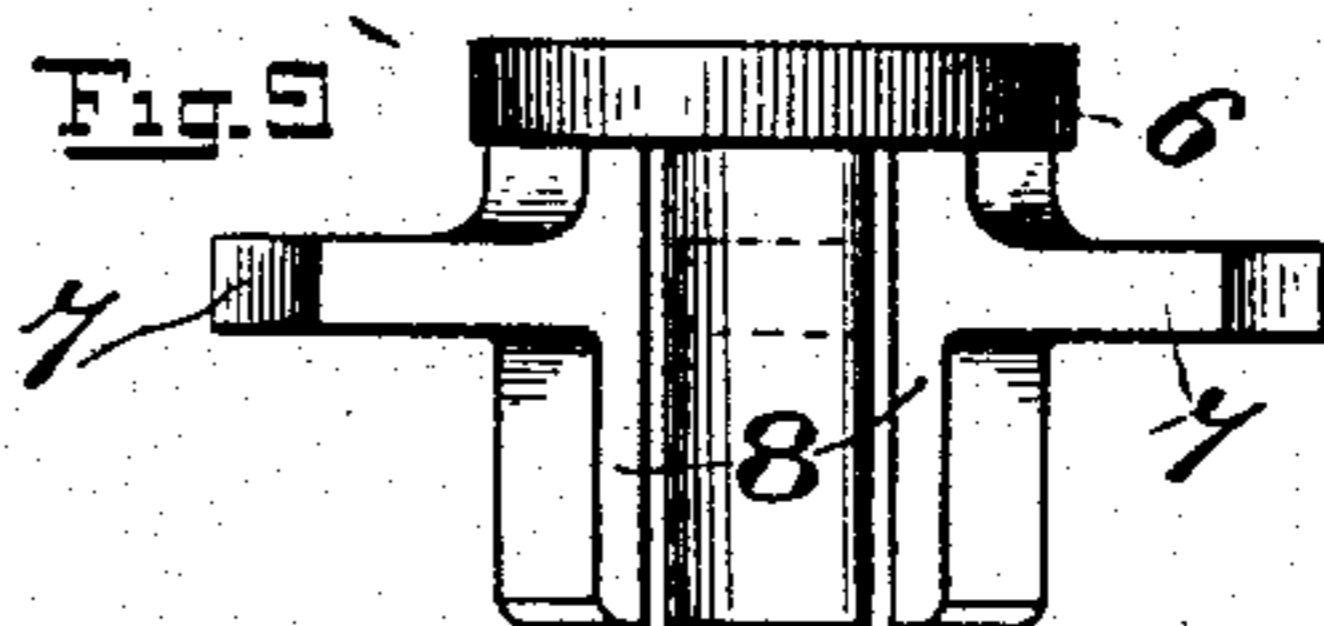
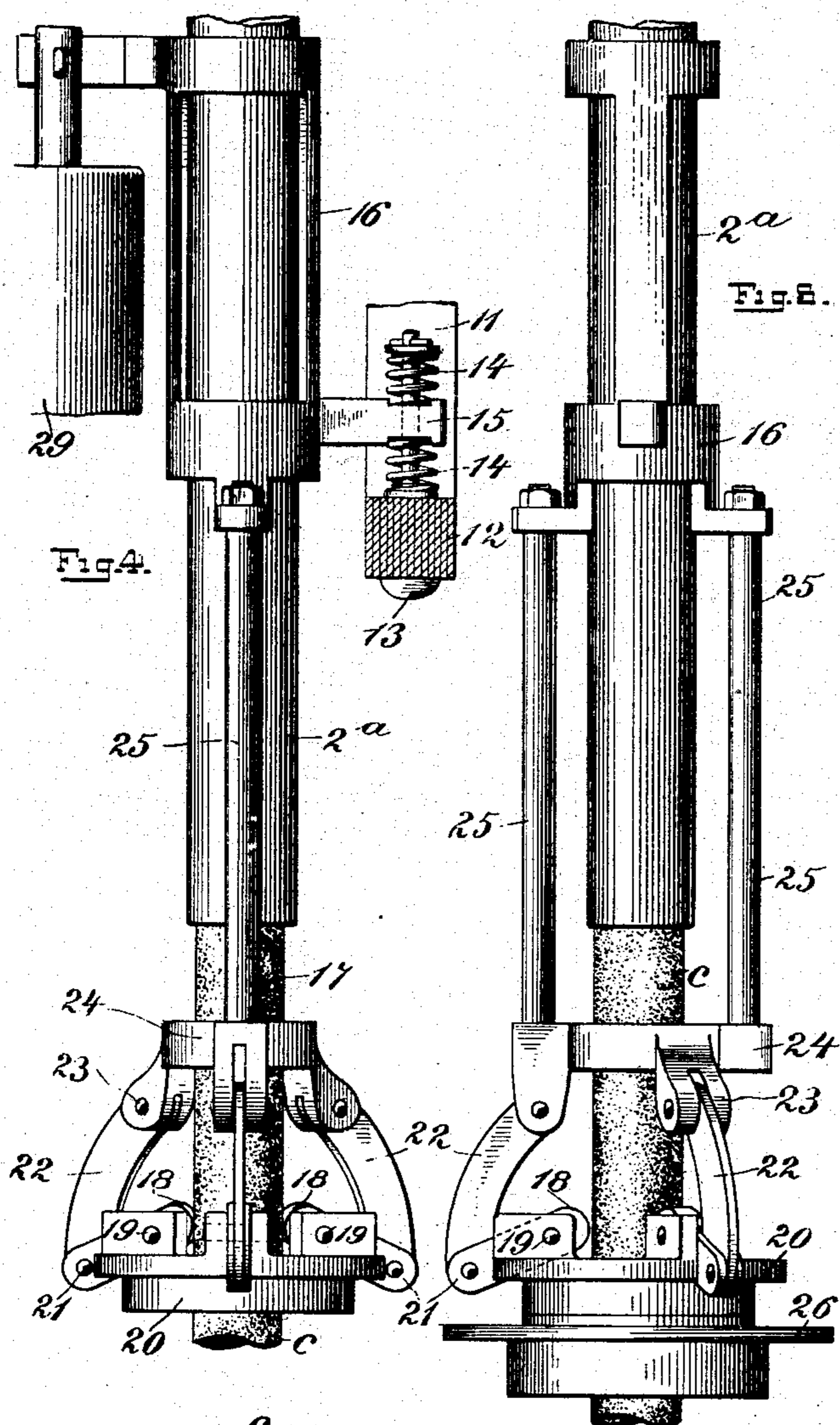
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UNITED STATES PATENT OFFICE.

FRANK M. CONWAY, OF NEW YORK, N. Y., ASSIGNOR TO THE IMPERIAL
ELECTRIC LAMP COMPANY, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 677,019, dated June 25, 1901.

Application filed July 18, 1898. Serial No. 686,244. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. CONWAY, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Electric-Arc Lamps, of which the following is a specification.

Parts of the invention are applicable alike to constant or direct current lamps and to alternating-current lamps, while some of the improvements relate especially to an alternating-current lamp, as illustrated in the accompanying drawings, in which—

Figure 1 is a front view of the lamp. Fig. 2 is a rear view of portions thereof on a larger scale. Fig. 3 is a side view of the same. Figs. 4 and 5 are respectively a side and a rear view of portions of the automatic feed apparatus on a still larger scale. Fig. 6 is a plan of the same parts represented in Fig. 5, showing the carbon and the central tube of the fixed frame in section. Fig. 7 is a vertical section of the cap of the inclosing globe, showing a self-adjusting guide and packing for the carbon. Fig. 8 is a horizontal section on the line 8, Fig. 7. Figs. 9, 10, 11, and 12 are detail views of a self-centering clamp and support for the annular reactance-coil hereinafter described. Fig. 13 is a vertical section, also on a larger scale, of the socket or support for the fixed carbon and an insulated screw-stud connected therewith for the reception of the outer-globe support.

In describing the drawings I have used the terms "front" and "rear" merely for the purpose of distinction and not to indicate that one face is more the front of the lamp than the other.

In an alternating-current lamp I employ a reactance-coil 1 of annular form surrounding the central hanger 2^b of the frame 2 and connected at one pole by a wire *w*¹ with a binding-post *p* and at the other pole by wire *w*² with one pole of the solenoid 3, from the other pole of which a conducting-wire *w*³ passes to the fixed central tube 2^a of the frame in which the moving carbon *c* works. From the support of the fixed carbon *c* a conducting-wire *w*⁴ is carried up through the tubular hanger 4 and to the other binding-post *n*. The annular reactance-coil 1 rests in horizontal po-

sition upon a bracket 5, constructed with radial arms, preferably three in number, supported on the central hanger 2^b of the frame. This horizontal annular reactance-coil is secured in position by a cap-frame 6, having radial arms 7, which bear on the coil, and a central hub 8 for centering it, above which is a clamp-nut 9, engaging with a screw-thread on the exterior of the central frame-hanger 2^b. Insulating and heat-resisting pads or packings 10 and 10^a of asbestos are interposed between the coil 1 and the bracket 5 and cap 6, respectively. The supporting-bracket 5 is shown in elevation and plan, respectively, in Figs. 11 and 12. The cap-frame 6 is shown in elevation and plan, respectively, in Figs. 9 and 10. This mode of supporting and clamping the annular reactance-coil is of great utility in dispensing with the necessity of perforating the coil with screw-bolts or the like for securing it in position.

The solenoid 3 is preferably formed of a pair of vertical coils located on one side of the suspension-tube 2^a, having tubular cores and receiving the vertical arms 11 of an armature 12, of U form, made up of a cluster of iron plates and connected by a rod 13 and cushion-springs 14, with an arm 15 projecting from the vertically-sliding frame 16, from which the upper movable carbon *c* is suspended by means of a clutch of peculiar construction, the said carbon extending and working in customary manner in the central suspension-tube 2^a.

My improved clutch, which regulates automatically the feed of the movable carbon, is constructed with three radial lever-jaws 18, gripping the carbon *c* inwardly or with radial pressure, said jaws being mounted by fulcrum-pins 19 in a ring 20, and the outer ends of the said radial levers 18 being connected by pivots 21 to links 22, which are attached by pivots 23 to an upper ring 24, connected by suspension-rods 25 to the sliding frame 16. When the lamp is not in operation and the solenoid "dead," the clutch and its frame rest by gravity upon the stationary ring 26, forming the cap or cover of the protecting-globe 27, the weight of the sliding frame 16 and the attachments 25 24 22 upon the outer ends of the radial levers 18 depressing the

outer ends of the said levers, so as to lift their inner ends away from the carbon *c* and allow this to drop upon the fixed carbon *c'*; but as soon as the solenoid is excited the electromagnetism raising the armature 12 in customary manner lifts the clutch-levers 18 by their outer ends, causing their inner ends to grip the carbon *c* tightly, raising it from contact with the lower carbon *c'*, when the distance of the arc is regulated in the usual way under automatic control of the current. The construction of the clutch with three radially-moving clutching-points renders it self-centering on the round carbon, and thus adapts it to clutch the carbon automatically and more effectively than a clutch with only two or more than three clutching-points. The cushion-springs 14 prevent any sudden movement being imparted to the adjustable carbon by the movement of the armature, and on the opposite side of the frame from the armature connection is a dash-pot 29 to regulate and prevent too sudden ascent of the frame in a customary manner. The carbon *c* where it passes through the annular plate 26 is surrounded by a packing 30, Fig. 7, having free play horizontally in all directions within a cup 31, formed in the plate 26, the central aperture therein through which the carbon passes being made of somewhat larger diameter than the carbon, as shown in Fig. 7. The packing 30 is covered by a flanged cap 32 of larger internal diameter than the packing 30 and having a central aperture of larger diameter than the carbon *c*, so as to leave the carbon *c* and its packing 30 free to move slightly in any horizontal direction, as already stated, thus providing a self-adjusting supporting-cap for the inclosing globe.

The lower fixed carbon *c'* is mounted in a socket 33, Fig. 13, screwed into the center of the coupling 34, which is connected by the tubular hangers 4 4^a to the plates 36 37, secured to the frame 2. The head 38 of the screw-socket 33 has the inverted-cup form shown in Fig. 13 for the reception of the head of the suspension-screw 39, on which is screwed the support 40 for the external globe 41. In order to insulate the external-globe support 40 from the screw-socket 33 38,

through which the current passes from the fixed carbon *c'*, I employ insulating-packing 42 above the head of the suspension-screw 39 and the annular insulating-packing 43 below the head supported by a washer 44, which is fixed in position by turning in the bottom flange of the cup-formed head 38, as represented in Fig. 13.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination of the annular reactance-coil 1, central hanger 2^b, armed supporting-bracket 5, centering-cap 6, clamp-nut 9 and suitable packing 10, 10^a, substantially as and for the purpose set forth.

2. The lower-carbon-supporter socket 33 constructed with a cup-shaped head 38 in combination with the suspension-screw 39 and support 40 for the external globe 41 and insulating-packings 42, 43, preventing conduction between said carbon-socket 33 and suspension-screw 39, substantially as explained.

3. In an electric-arc lamp, the combination of a central lamp-hanger, a solenoid fixed to said central lamp-hanger and having vertically-movable cores, a sliding frame 16 moved vertically by said cores, toggle-clutch levers 18, 22, supported at the lower end of said frame 16, a floating fulcrum-ring 20 in which the clutch members 18 of the toggle-clutch levers are fulcrumed at points near the movable carbon of the lamp, and a fixed arresting-ring 26 supported from the lamp-hanger; substantially as and for the purposes set forth.

4. In an electric-arc lamp the combination of a central lamp-hanger, a bracket 5 projecting outwardly and upwardly from said lamp-hanger a reactance-coil 1 of annular form surrounding the central lamp-hanger and resting upon the bracket 5 and a clamping-cap 6 having threaded connection with the central lamp-hanger and bearing against the reactance-coil to hold it upon its supporting-bracket; substantially as herein set forth.

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Witnesses:

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