

No. 636,358.

Patented Nov. 7, 1899.

R. SCHEFBAUER.
ELECTRIC ARC LAMP.

(Application filed Aug. 6, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

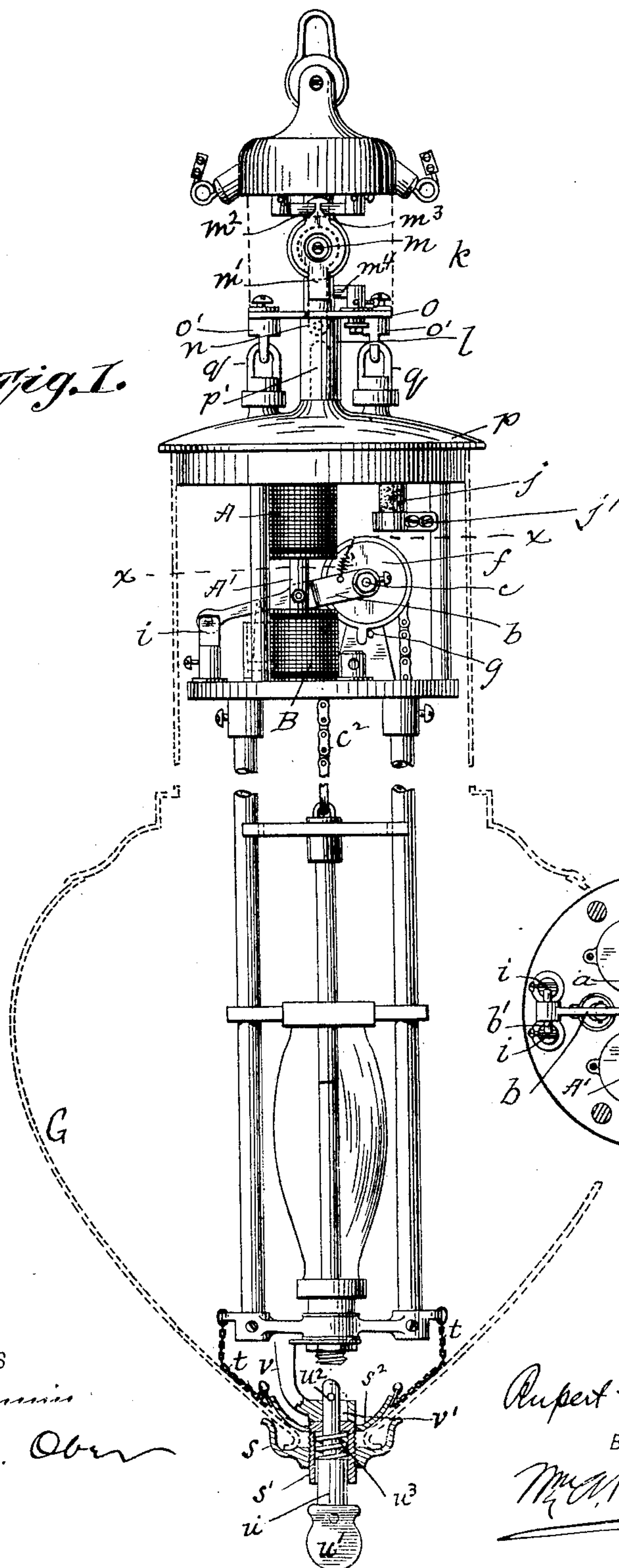
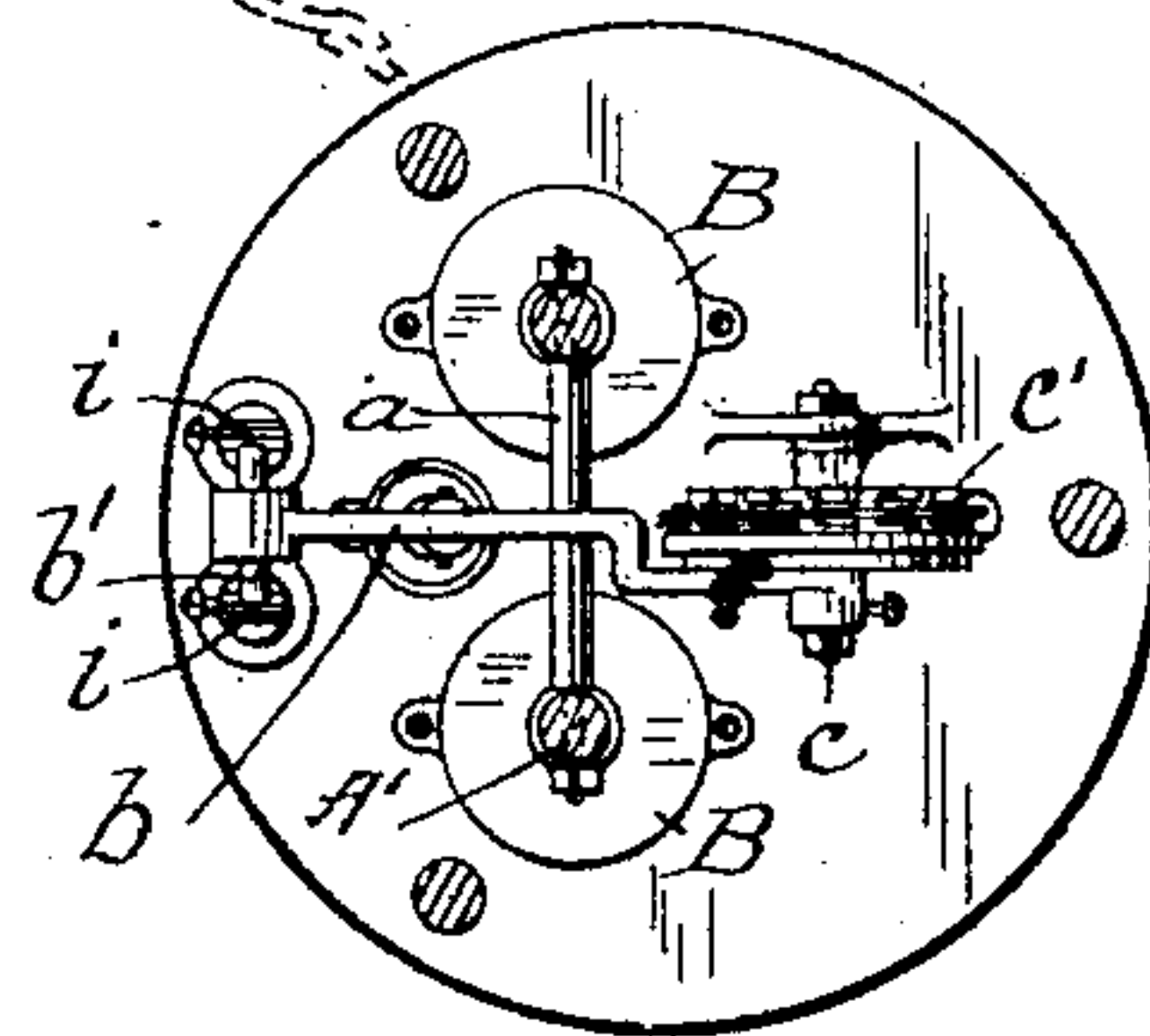


Fig. 2.



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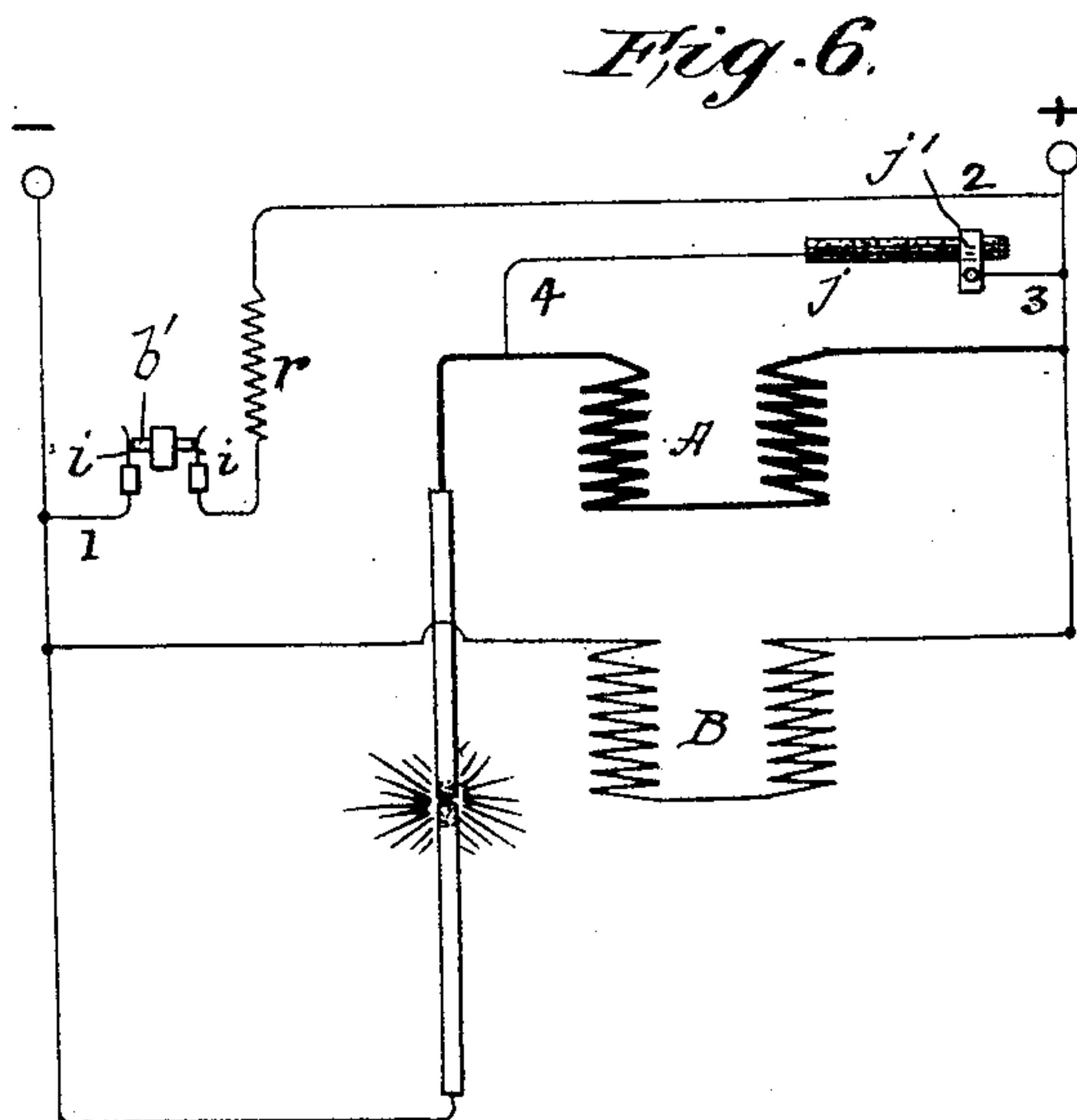
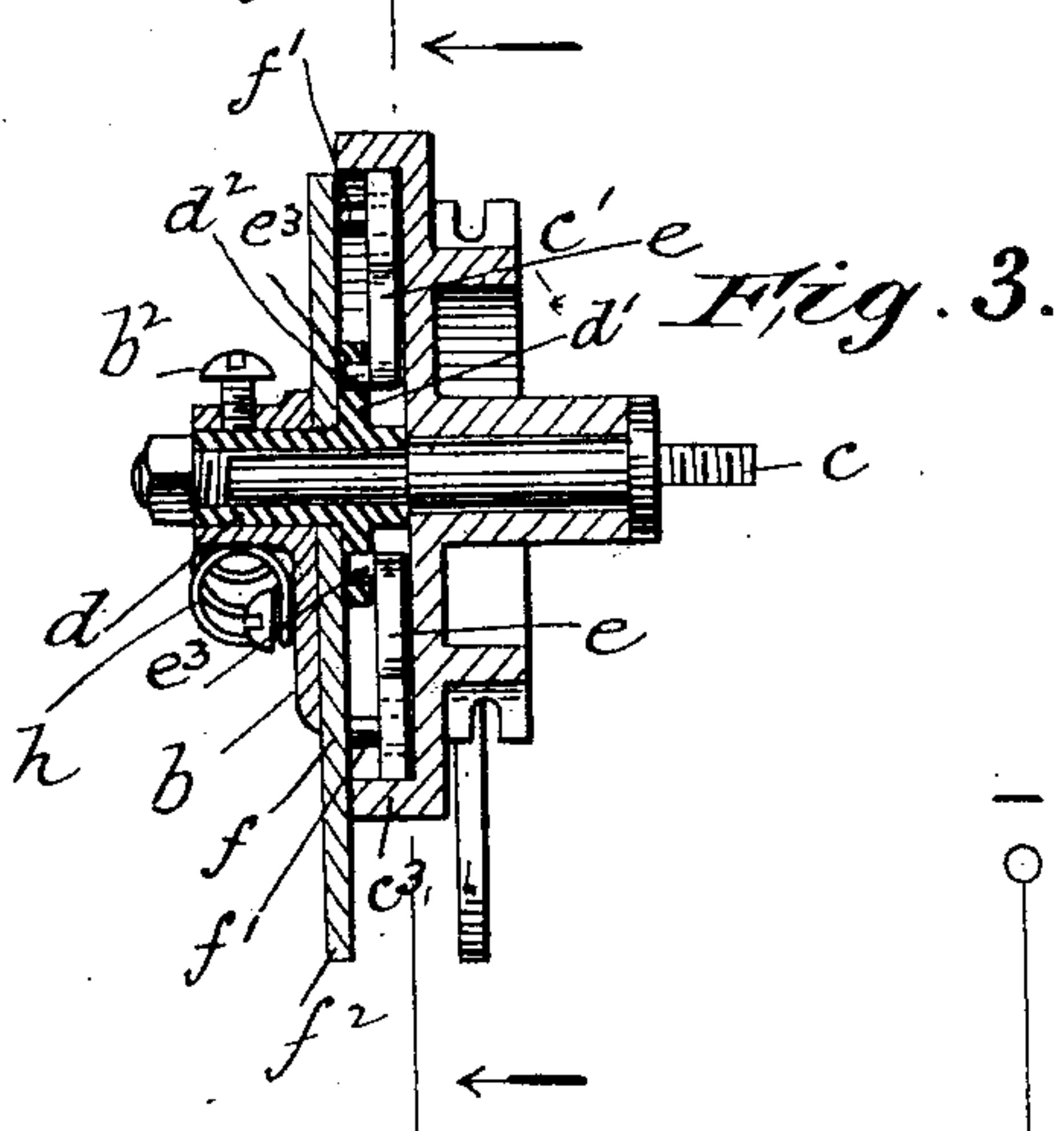
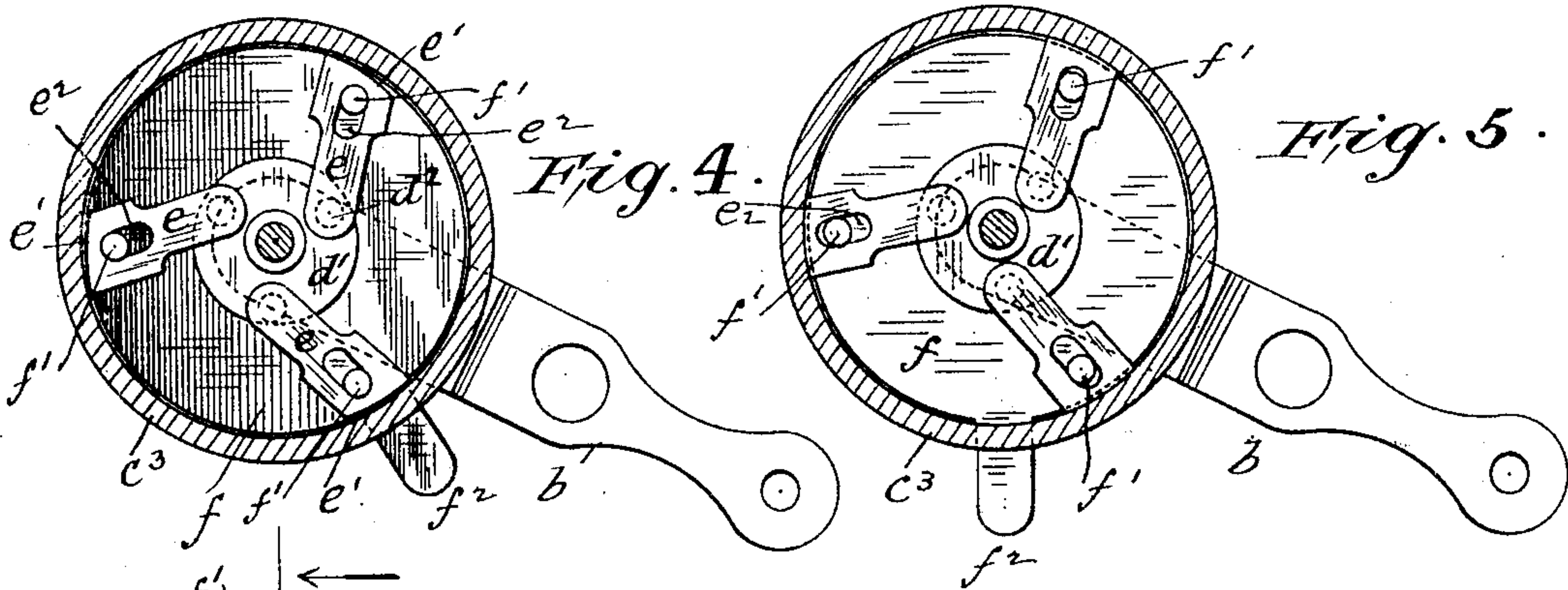
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UNITED STATES PATENT OFFICE.

RUPERT SCHEFBAUER, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE
STERLING ARC LAMP COMPANY, OF NEW YORK.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 636,358, dated November 7, 1899.

Application filed August 6, 1898. Serial No. 687,894. (No model.)

To all whom it may concern:

Be it known that I, RUPERT SCHEFBAUER, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Arc-Lamps, of which the following is a full, clear, and exact description.

This invention relates to electric-arc lamps; and it consists in certain improvements in details relating to arc-regulating mechanism, the cut-out, the regulating resistance, the lamp-switch, the supporting devices, and the globe-holder, all of which will be fully explained with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the entire lamp, the casing being removed and parts being in section. Fig. 1^a is a side elevation of the lamp-switch. Fig. 2 is a plan of the regulating mechanism, taken below the line *x x* of Fig. 1. Fig. 3 is a section through the axis of the clutch; and Figs. 4 and 5 are sections of the clutch, taken at right angles to the axis. Fig. 6 is a diagram of the circuits.

The lamp contains series and shunt magnets, represented by A B, respectively, which act upon movable cores A' A'. A cross-piece *a* connects the cores together and moves with them. This passes through a tripping-lever *b*, pivoted at the axis *c* and at its opposite end provided with a cross-bar *b'*, insulated therefrom and acting as the connecting-piece of a cut-out, as will be hereinafter described. The axis of the lever is also the axis of a combined clutch and pulley forming a part of my invention. The latter device consists of a sprocket-wheel or pulley *c'*, over which passes a chain *c²*, attached at one end to the upper-carbon holder and at the other end to a counterweight running in one of the side rods of the lamp. This sprocket-wheel has formed upon it a rim *c³*, the inner diameter of which forms a bearing-surface for the arms of a clutch, as will be described. The sprocket-wheel and the rim turn loosely on the axis *c*. On the axis beside the sprocket-wheel is a sleeve *d*, having a flange *d'*, provided with three holes *d²*. Between the flange and the side of the pulley are located three clutch-arms *e e e*, the outer end of each having an

eccentric bearing-surface *e'*, adapted to be thrust against the rim *c³*. Each of these arms carries a pin *e³*, entering one of the holes in the flange of the sleeve, wherein it is free to swing.

f is a circular plate having a central opening, by which it is loosely fitted over the sleeve *d* and up against the flange of said sleeve. This plate is a tripping device for the clutch and for this purpose carries three pins *f'* on its inner face, which extend laterally into short slots *e²* in the outer ends of each of the arms *e*. The plate also carries a finger *f²*, which is adapted to strike a pin *g*, fixed to a suitable part of the lamp-frame, to retard its rotation. Outside of the tripping-plate and fixed upon the sleeve is the lever *b*, which is provided with a hub, through which a set-screw *b²* passes and by which it is locked to the sleeve. A light coiled spring *h* connects the lever and tripping-plate together in such a way that when the lever swings downward the tripping-plate will be rotated with it. The clutch-arms *e* normally stand at an angle to the radius of the clutch. When the lever *b* is lifted, the sleeve *d* is rotated and causes the inner ends of the arms *e* to approach the radii of the clutch, the tripping-plate *f* meanwhile standing still and so causing the outer ends of the clutch-arms to be thrust against the rim *c³*, gripping the latter and causing the entire pulley and clutch to rotate under the action of lever *b*, which is in turn moved by the magnets. The lever *b* is thus lifted either to establish the arc or increase its length, which it does by moving the chain *c²*, which carries the upper carbon. When the action of the magnet allows the lever *b* to swing downward, the clutch and pulley rotate with it, the tripping-plate being pulled by the spring *h*. This continues until the finger *f²* strikes the pin *g*, which holds the plate while the lever moves a short distance farther, thus withdrawing the clutch-arms *e* from contact with the rim *c³* and allowing the weight of the upper carbon and its holder to rotate the sprocket-wheel backward to lower the upper carbon and shorten the arc. It has been found in practice that this clutch is extremely sensitive, there being practically no lost motion whatever.

At the end of lever b , opposite the clutch, I have arranged the lamp cut-out, which is intended to short-circuit the lamp through a small resistance when for any reason the carbon sticks or the resistance of the lamp becomes unduly great. This cut-out is on the principle of the knife-switch, since the moving element, consisting of the cross-bar b' , enters between two spring-plates i i , where it makes a rubbing contact and cleans the surfaces each time it operates. This cut-out is in the circuit 1 2, containing resistance r , as shown in Fig. 6.

As a means for adjusting the lamp or determining how much current shall be taken by the series magnet I use a graphite pencil j in the circuit 3 4, shunting the series coils. The resistance is varied by means of metallic clip j' , surrounding the pencil and adapted to be moved from point to point thereon. This furnishes a very cheap and simple form of regulation and dispenses with springs and adjusting-screws.

Another feature of my invention is the provision of a switch which takes the place of two switches in most other lamps. It has been customary to provide a cut-out switch, which is located on the hanger-board of the lamp, and also a "trim" switch, which is located somewhere on the main frame of the lamp. I have provided a single switch k , which takes the place of both of these, and it is mounted on the supporting device for the lamp.

l is a post in which a shaft m has its bearing at right angles thereto. Each end of the shaft carries a suitable insulated cross-arm m' , adapted to make contact above with one or both of two contact-pieces m^2 m^3 and below with a contact-piece m^4 . An operating-lever n is shown in dotted lines on the end of shaft m , which projects downward through the floor-plate o to be easily reached. When the handle is in a vertical position, as shown, the lamp is short-circuited, the current passing from m^2 through m' to m^3 ; but when the handle is thrown to the right the lamp is in circuit, the current then passing from m^2 through m' to m^4 . The post l projects below the bottom plate o and has an axial passage in its lower end and on each side of the post, and depending from the plate o are two hooks o' , reversed in position with respect to each other. The casing around the lamp mechanism is cylindrical, and its top plate p is provided at the center with a pin p' , adapted to enter the passage in the lower end of post l . On each side of this pin are arranged two eyes q . The hooks o' , with the eyes q and pin l , are the supporting devices for the lamp, the hooks carrying the current to and from the lamp, and are operated in the following manner:

To remove the lamp, it is slightly lifted and then twisted. This frees the eyes q from the hooks o' , after which the lamp is lowered to withdraw the pin p' . In hanging up the lamp

the pin p' is first adjusted to the opening in the post, which then becomes a guide, and when the lamp has been elevated sufficiently to allow the eyes to enter the hooks it is twisted to effect engagement and left seated in the hooks. I am aware that reversed hooks and eyes have been used as supporting or fastening devices; but, so far as I know, the center guide-pin in combination therewith is new. An additional function of this arrangement is that when the lamp is in operation there can be no arcing at the hooks due to the swinging of the lamp, because the center pin holds them steady.

Referring now to the means for supporting the outer globe of the lamp, it will be seen that the globe G rests in a cup or pan s , screw-threaded upon the hollow hub s' . The flange of the globe is confined by a disk or cross-head s^2 , also screwing onto the hub, but located inside of the globe. Two chains t are attached to the disk at opposite points and to the lower ends of the side rods of the lamp for the purpose of supporting the globe when it is lowered from its normal position. Through the hub s' a stem u passes, and this is provided with a knob u' on its lower end and with a short stud u^2 projecting from it at right angles at its upper end. A spring u^3 , located inside of the hub and surrounding the stem, presses at one end against the stem and at the other end against the hub. The upper end of the stem is adapted to pass through an eye in the bracket v , projecting downward from the lower-carbon holder. This eye has a vertical groove v' , permitting the lug u^2 to pass. When the end of the stem has been thus passed through the eye, it is given a short turn to lock it in place. When thus adjusted, it will be seen that the tendency of the spring is to lift the globe and hold it tightly against the hood or casing of the lamp. With this device the operation of trimming the lamp is very simple, the globe being lowered by simply turning the stem so as to allow it to become disengaged from the bracket v and allowing the globe to lower until it is supported by the chains. The inner globe and carbon are then easily accessible.

Having described my invention, I claim—

1. In an arc-lamp, the combination of the feed-controlling magnets, a pivoted lever moved thereby, a pulley over which the carbon-carrying chain or cord passes, and a clutch consisting of a plurality of pivoted arms arranged around a center and adapted to be thrown toward the radii by the movement of the pivoted lever, an annular gripping-surface against which said arms are thrust when moved, said gripping-surface being connected with said pulley, a tripping-plate to which the arms are also pivoted and a yielding connection between the lever and tripping-plate, substantially as described.

2. In an arc-lamp, the clutch consisting of the pulley provided with the rim c^3 in combination with the arms s , the sleeve d , to which the

arms are pivoted, the tripping-plate *f*, to which the arms are also pivoted, the swinging lever *b* connected to the sleeve, a yielding connection between the lever and tripping-plate and
5 a detent for the tripping-plate substantially as described.

3. In an arc-lamp, a double-pole switch consisting of two metallic bars *m'* hung at their middle points on the extremities of a rock-
10 shaft, a crank-handle on said shaft, two contacts which one end of said arms is adapted to bridge to short-circuit the lamp, and a third

contact adapted to be engaged by the other end of said arms simultaneously with engagement with one of the other two contacts, to
15 let current into the lamp, substantially as described.

In witness whereof I subscribe my signature in presence of two witnesses.

RUPERT SCHEFBAUER.

Witnesses:

WM. A. ROSENBAUM,
GEO. S. KENNEDY.