

No. 717,497.

Patented Dec. 30, 1902.

H. CUÉNOD.
ELECTRIC ARC LAMP.

(Application filed July 10, 1902.)

(No Model.)

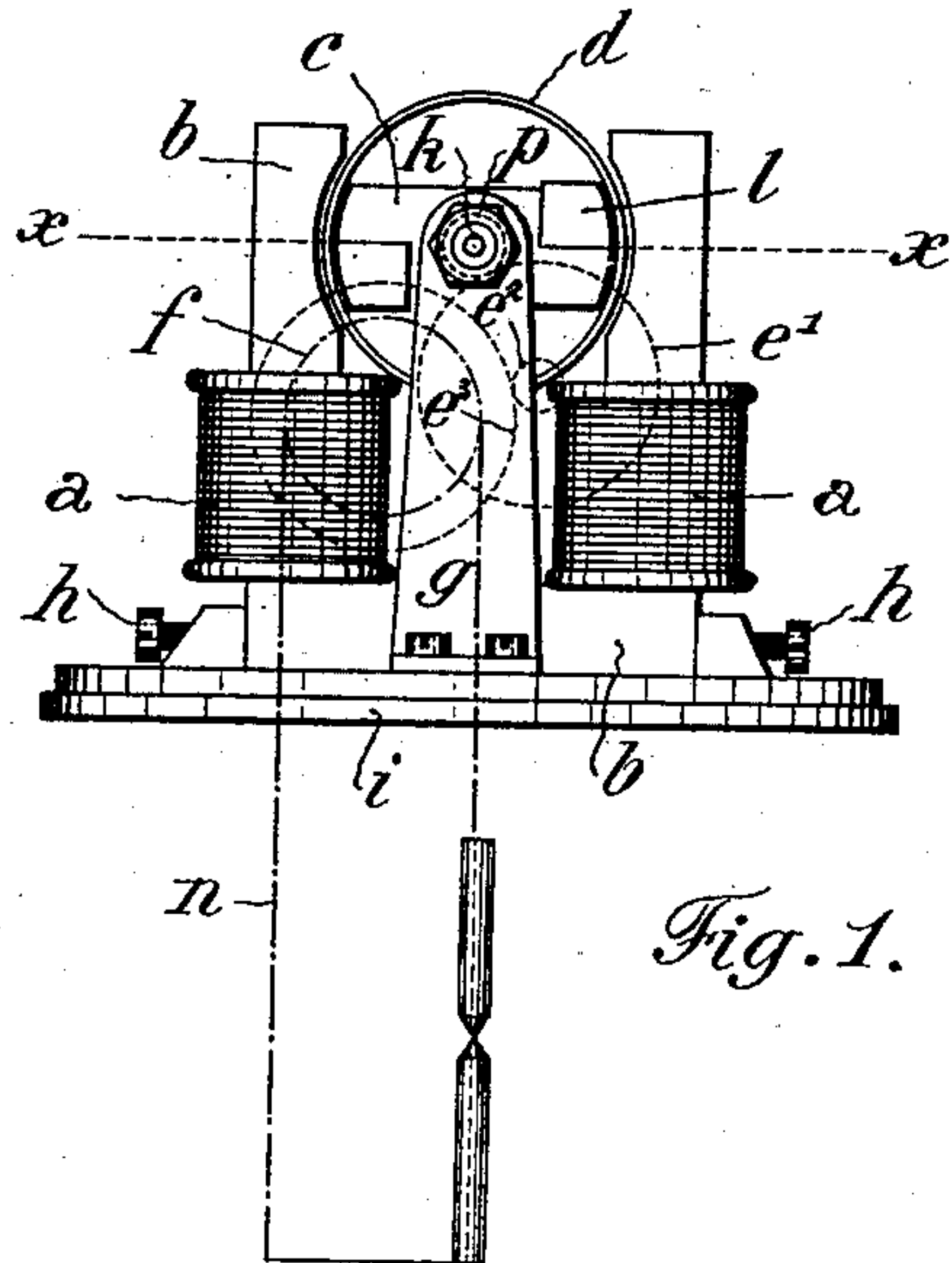


Fig. 1.

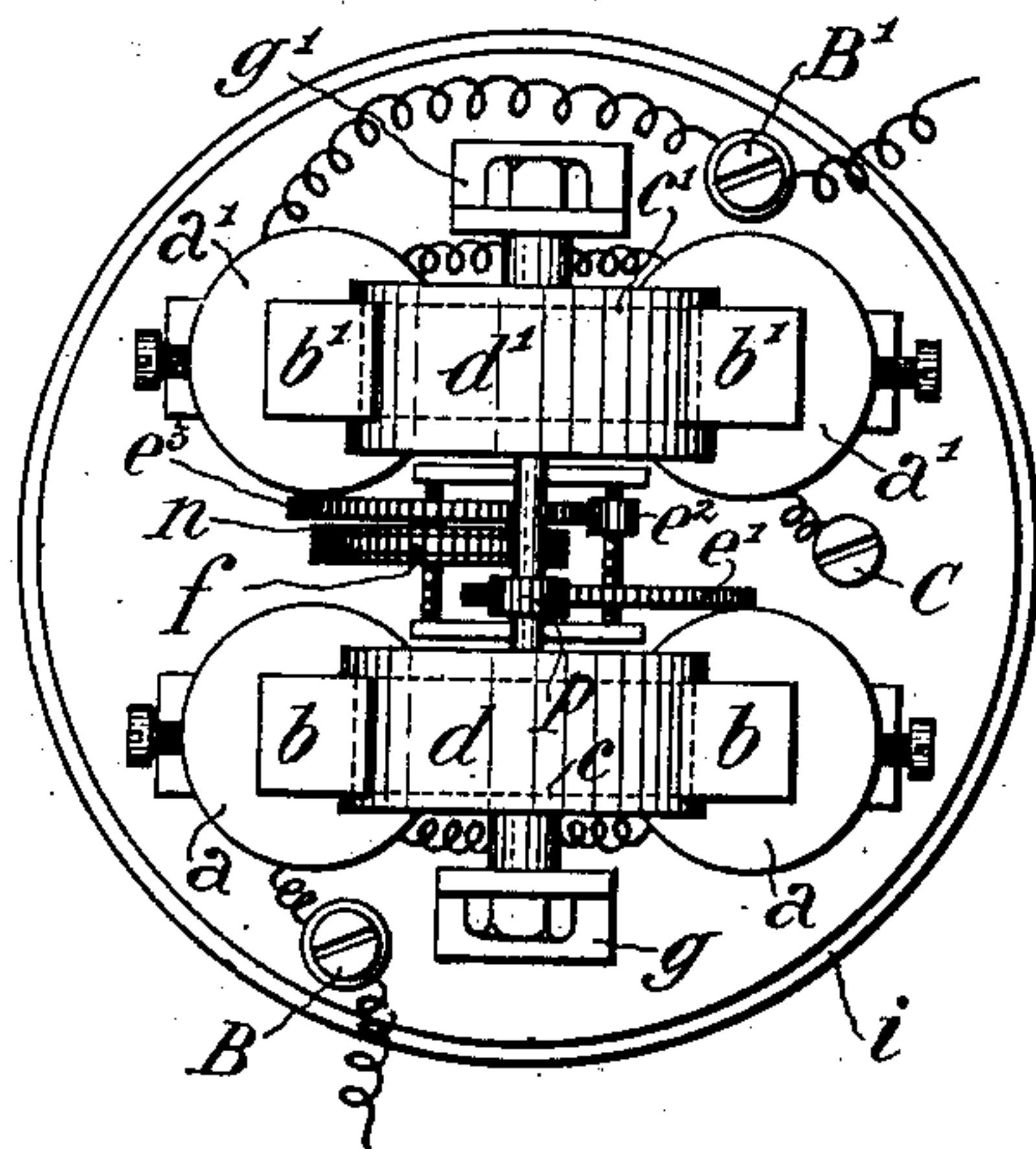


Fig. 2.

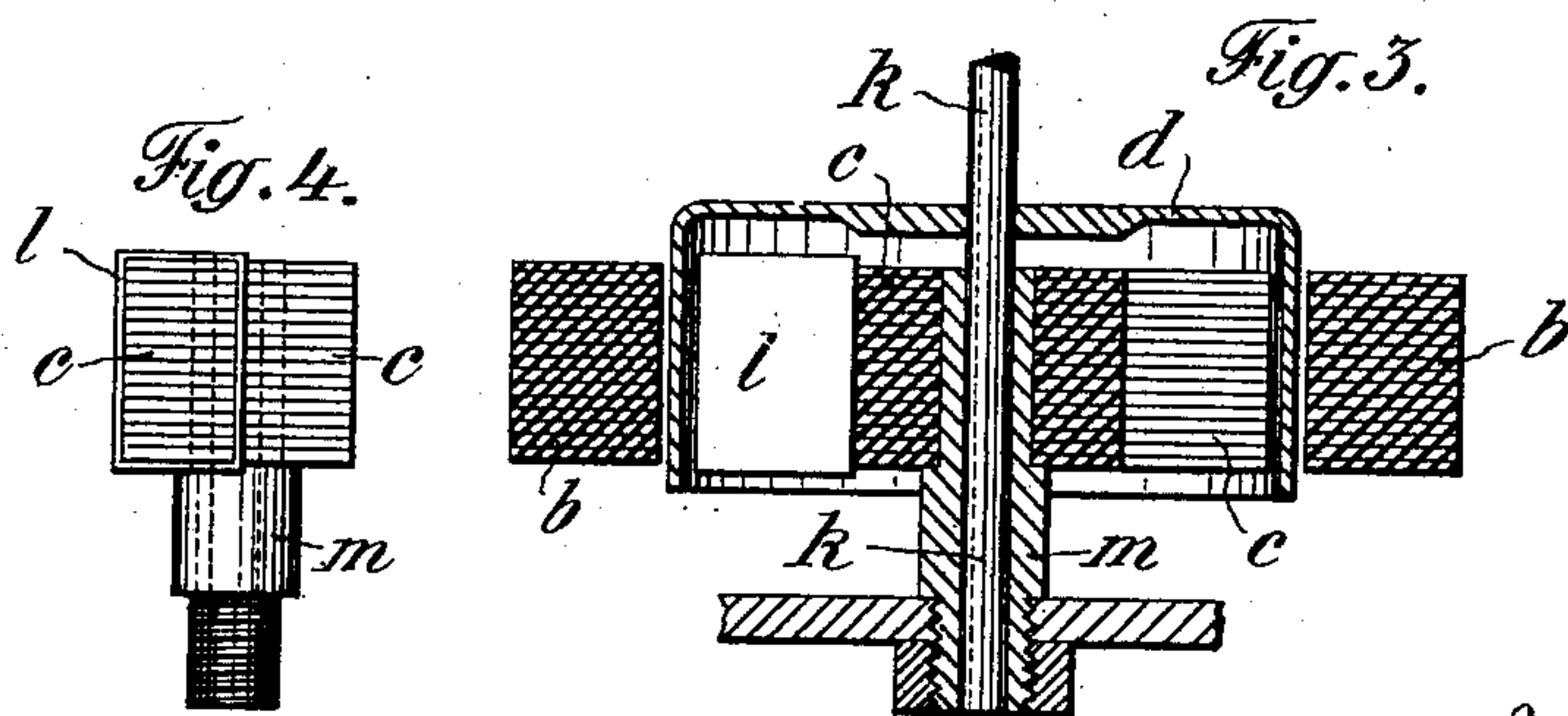


Fig. 3.

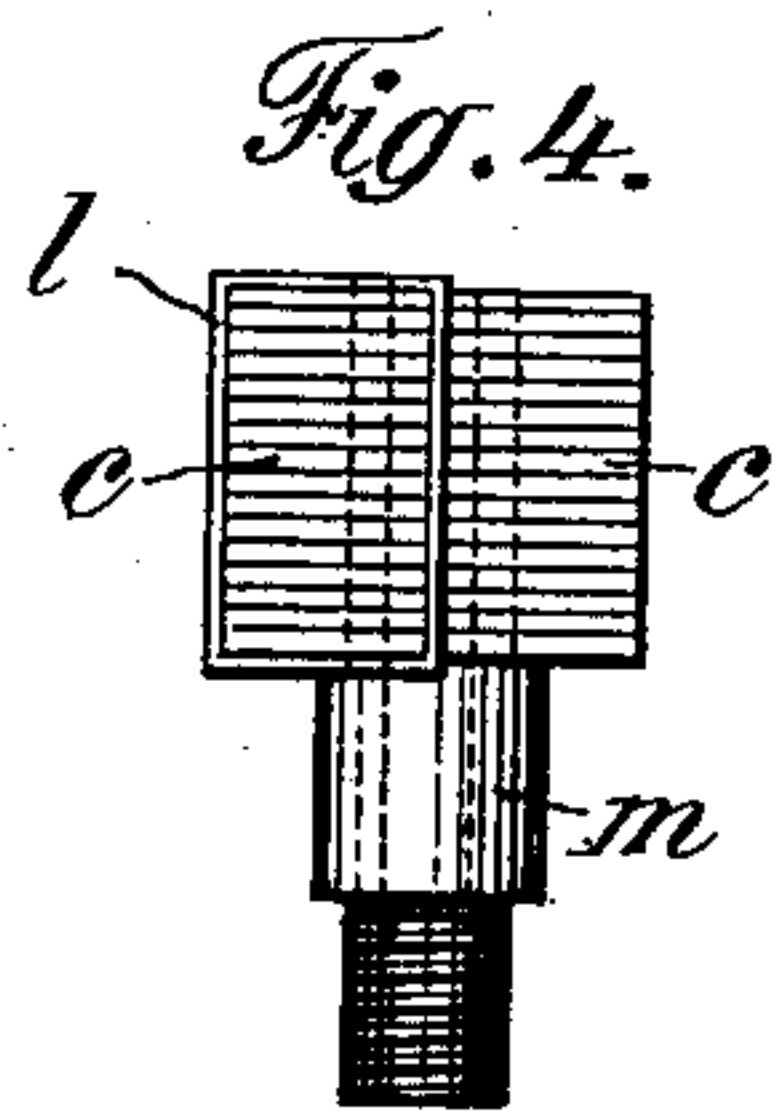


Fig. 4.

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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 717,497, dated December 30, 1902.

Application filed July 10, 1902. Serial No. 114,993. (No model.)

To all whom it may concern:

Be it known that I, HERMANN CUÉNOD, engineer, of Geneva, Switzerland, have invented certain new and useful Improvements in Arc-
5 Lamps, of which the following is a specification.

This invention relates to improvements in arc-lamps.

10 The accompanying drawings show by way of example one form of construction embodying the said invention.

Figure 1 is an elevation of a controlling device of the lamp, the other parts of same being shown schematically. Fig. 2 is a plan of
15 the controlling device. Fig. 3 is a section on the line $x x$ of Fig. 1, and Fig. 4 is a view from left to right of one portion of Fig. 3.

Upon a base i are fixed the electromagnets a and a' by means of suitable screws h , between which the cores $b b'$ of said electromagnets are inserted. Two supports g and g'
20 carry the axis k , upon which are mounted two copper drums or bells $d d'$, rotating in the air-gaps of the cores b and b' . On the axis k there is fixed a pinion p , engaging the toothed wheel e' , the pinion e^2 of which is acting upon the wheel e^3 , the axis of which bears a chain-wheel f . The rotations of the shaft k are
25 therefore transmitted in a slackened condition to the chain-wheel f , upon which passes the endless chain n , the ends of which are connected together in the usual way to sliding supports or holders carrying the carbons. Inside the drums or bells are fixed the cores
30 $c c'$, made of lamellar iron and mounted on sockets m , serving at the same time as supports for the shaft k .

The wires through which passes the current to the lamp are connected to the terminals $B B'$, and the carbons are connected
40 the one to the terminal C , the other to the terminal B' . As shown in Fig. 2, the electromagnet a' is placed in derivation on the carbons, while the electromagnet a is placed in series with them. The sliding carbon-holders
45 are placed in equilibrium in such a way that they remain in the position in which they have been brought.

50 The cores $c c'$ are intended to close the magnetic currents of the electromagnets, and there is only left between their ends and the face

of the drums a very small air-gap necessary to insure the free rotation of the drum. The said cores $c c'$ are, moreover, made of lamellar iron and provided with a longitudinal
55 split on a portion of their length, as shown in Figs. 3 and 4, and one-half of each of such split ends of the cores c and c' is surrounded by a copper band or frame l , soldered in short
60 circuit.

The lamp works in the following manner: The current arriving at the terminals flows through the electromagnet a and magnetizes the core b . The lines of force are crossing
65 both sides of the drum d and close the field through the piece c . This flow produces in the drum strong Foucault's currents, which act upon said drum and tend to cause the same to rotate in the opposite sense of that
70 of the lines of force. If the piece c is placed so as to directly close the field, the strain effected on the drum will tend to deform it without causing its rotation. According as
75 the said piece c will be displaced in one sense or the other the lines of force will cause the rotation of the drum in one direction or in the opposite one. The strain will increase with the displacement of said piece c to a
80 maximum corresponding to a certain position of the same. The field is then not completely closed, and a portion of the line of force is lost without producing any useful effect. This is avoided by the addition of the
85 short-circuited copper band or frame l . The Foucault's currents which pass through the said band or frame l are, because of the hysteresis of the iron and of the interposition of the drums in the air-gap, not exactly in
90 phase with those of the drum, and they act upon them on one hand and on the other hand upon the lines of force, tending to deviate the same and to close the magnetic circuit through the free portion of the piece c .
95 The lines of force will therefore already cross the drum obliquely without being necessary to displace the piece c , and the rotation of the drum will be caused in much better conditions, according to the field being stronger. It is obvious that the displacement will be the
100 most convenient proceeding for an exact controlling. Supposing the sliding supports of the carbons to be placed in equilibrium, the

carbons being separated from each other, the current will pass through the magnet a' in derivation and will cause the rotation of the drum d' and by means of the gears e and the chain-wheel f the reapproachment of the carbons. As soon as the said carbons are put into contact the electromagnet a is crossed by the whole current passing through said carbons and exerts upon the drum d a strain in a sense opposite to that of the electromagnet a' , thereby causing the carbons to be disjoined until the equilibrium of both systems takes place again. In proportion as the carbons wear out the resistance of the arc increases and the series magnet a weakens, while the power of magnet a' increases. The difference of potential having augmented, the equilibrium of the systems is broken and the drum d' rejoins the carbons until the equilibrium is reestablished, the movable set remaining in place. The controlling of the length of the arc is very easily obtained by the displacement of the pieces c and c' respectively to each other, so as to diminish or to increase the power of one of the systems and to displace the point of equilibrium. The energy of the system is sufficient so that the friction of the sliding carbon-holders in their grooves will have very little influence on the controlling.

I claim—

1. An arc-lamp characterized by the combination of two metallic drums with two electromagnets the branches of which surround the drums, and two iron cores maintained inside the drums and having their ends suitably slotted and provided with a metallic band or frame soldered in short circuit around

one portion of the said slotted end of the core, substantially as shown and described.

2. In an arc-lamp, the combination, of two metallic drums, an axis for the same and supports for the axis, two electromagnets with branches surrounding the metallic drums, two iron cores inside said drums, the ends of said cores being slotted, and a metallic band soldered in short circuit around one portion of the slotted end of each core, substantially as specified.

3. In an arc-lamp, the combination of two metallic drums, an axis for the same and supports for the axis, two electromagnets with branches surrounding the metallic drums, two iron cores arranged inside the drums in such manner as to control the lamp by the displacement of the said cores around the axis, substantially as specified.

4. In an arc-lamp, the combination with the carbons and carbon-holders, of two metallic drums, an axis for the same and supports for the axis, two electromagnets the branches of which surround the drums, one of said magnets being in series with the carbons and the other magnet in derivation on the carbons, and said magnets acting oppositely so as to form a differential device, substantially as specified.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

HERMANN CUÉNOD.

Witnesses:

E. IMER-SCHNEIDER,
L. H. MUNIER.