

(No Model.)

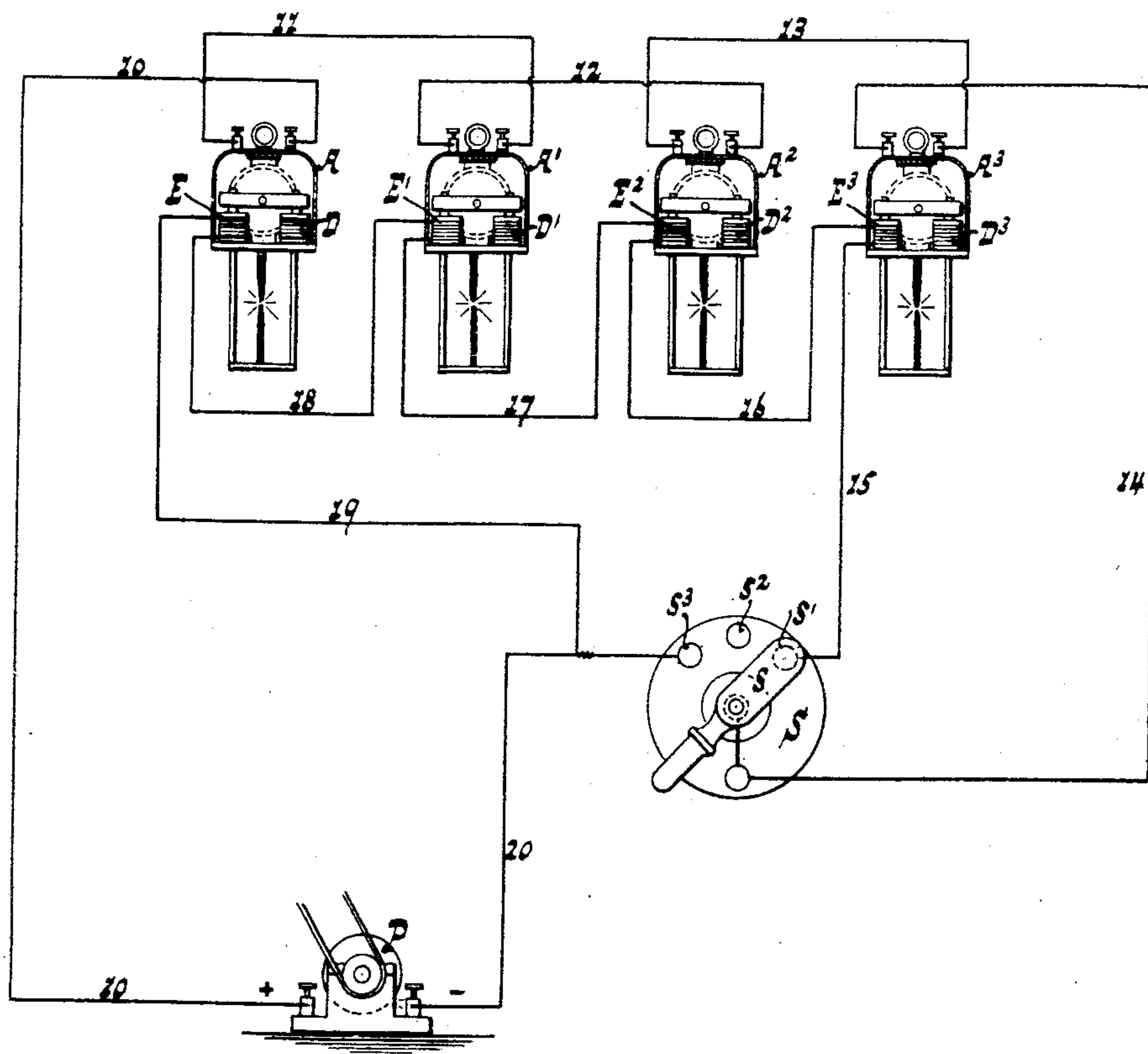
2 Sheets—Sheet 1.

C. J. SCHWARZE.
ARC LIGHT SYSTEM.

No. 446,298.

Patented Feb. 10, 1891.

Fig. 1.



WITNESSES:

William Miller
Edward Wolff

INVENTOR:

Carl Joseph Schwarze

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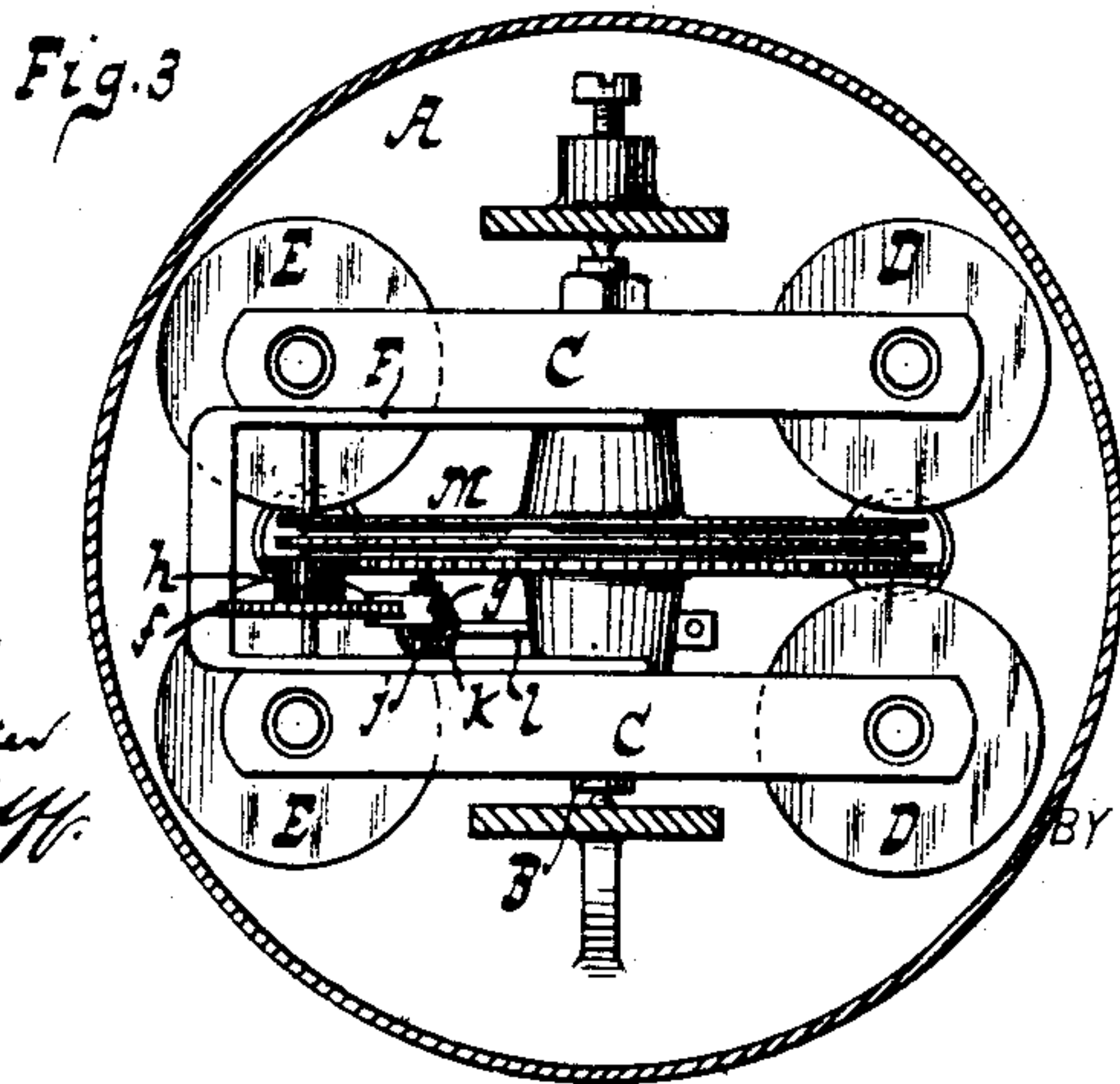
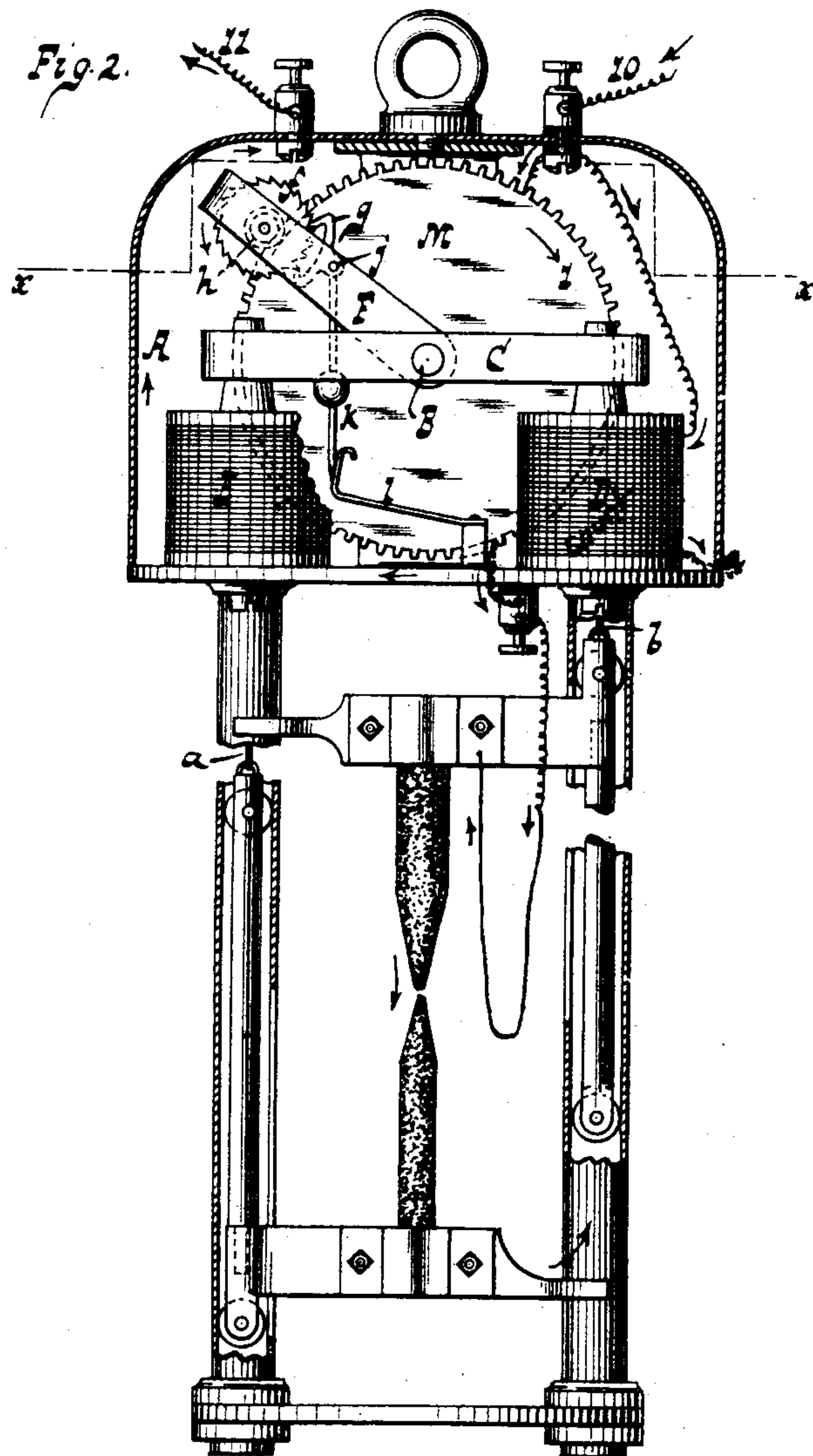
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INVENTOR:
Carl Joseph Schwarze
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UNITED STATES PATENT OFFICE.

CARL JOSEPH SCHWARZE, OF BROOKLYN, NEW YORK.

ARC-LIGHT SYSTEM.

SPECIFICATION forming part of Letters Patent No. 446,298, dated February 10, 1891.

Application filed October 9, 1890. Serial No. 367,542. (No model.)

To all whom it may concern:

Be it known that I, CARL JOSEPH SCHWARZE, a citizen of the German Empire, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Devices for Changing the Normal Arc in Arc Lamps, of which the following is a specification.

The object of this invention is a device whereby the normal arc in one or more arc lamps can be changed without interfering with the mechanism for automatically maintaining the normal arc when the lamp is burning, as pointed out in the following specification and claims and illustrated in the accompanying drawings, in which—

Figure 1 represents a diagram of a series of arc lamps connected with each other and with a dynamo-machine according to my invention. Fig. 2 is a side elevation of one of the lamps on a larger scale than the previous figures. Fig. 3 is a plan or top view of the same.

In the drawings, the letter A designates an electric-arc lamp, the carbon-holders of which are suspended from ropes *a b*, which are secured to a wheel M, the rope *a*, which supports the lower carbon-holder, being wound upon the wheel in one direction, while the rope *b*, which supports the upper carbon-holder, is wound upon the wheel in the opposite direction, so that if said wheel is turned in the direction of the arrow 1, Fig. 2, the carbons close up, and if said wheel is turned in the opposite direction the carbons are moved apart. The wheel M is mounted loosely upon a shaft B, on which is firmly mounted an armature-lever C, one end of which extends over the electro-magnet D, while its opposite end extends over the electro-magnet E. The wheel M is held in gear with the shaft B by a clutch mechanism, so that if the electro-magnet D attracts the armature C said wheel is turned in the direction of arrow 1, causing the carbons to close up, and if the electro-magnet E attracts the armature C the wheel M is turned in the direction opposite to arrow 1 and the carbons are caused to move apart. From this description it will be seen that the electro-magnet E opposes the action of the electro-magnet D, and if the attractive force of both electro-magnets should be the same

they would produce no action upon the carbons; but the electro-magnet E is constructed so that its attractive force is smaller than that of the electro-magnet D, so that if both magnets are included in the electric circuit the action of the electro-magnet D upon the armature C will be equal to its own attractive force less that of the electro-magnet E. The clutch mechanism which holds the wheel M in gear with the shaft B may be of any suitable construction. In the example represented in the drawings said clutch mechanism consists of a ratchet-wheel *f*, an anchor *g*, and the pinion *h*. The ratchet-wheel *f* and the pinion *h* are firmly mounted on an arbor *i*, which has its bearings in a yoke F, mounted firmly upon the shaft B, and the anchor *g* is mounted upon an arbor *j*, from which depends a pendulum *k*. The bottom end of this pendulum bears against a stop *l*, and thereby the anchor *g* is prevented from oscillating, and consequently the ratchet-wheel *f* and the pinion *h* cannot rotate. The pinion *h* gears into cogs formed on the circumference of the wheel M, and since this pinion cannot rotate while the bottom end of the pendulum *k* bears against the stop *l*, the wheel M is compelled to rotate when the shaft B is rotated. If, however, the armature C is attracted by the electro-magnet D to such an extent that the pendulum *k* clears the stop *l*, the wheel M is free to rotate on the shaft B, and the upper-carbon holder, the weight of which is larger than that of the lower-carbon holder, sinks down, so that the carbons close up. The electro-magnet D, armature C, and wheel M, with its clutch mechanism, compose the means employed for automatically maintaining the normal arc of the lamp. The electric current passes from the dynamo P, Fig. 1, through wire 10 to the upper carbon of the lamp A, thence through the lower carbon and wire 11 to lamp A', through the carbons of this lamp and wire 12 to lamp A², through the carbons of this lamp and wire 13 to lamp A³, and thence through wire 14 to the switch-board S, a portion of the current commensurate to the resistance of the carbons being passed through the electro-magnets D D' D² D³, respectively, in each lamp, as indicated in Fig. 2.

The switch-board is provided with a switch-lever S and with contact-plates S' S² S³, and

the wire 14 is in a metallic connection with the switch-lever S. The contact-plate S' of the switch-board connects by a wire 15 with the opposing magnet E³ of the lamp A³, thence
 5 through wire 16 to magnet E² of lamp A², through wire 17 to magnet E' of lamp A', through wire 18 to magnet E of lamp A, and through wires 19 and 20 back to the dynamo. If the switch-lever is brought in contact with
 10 plate S', as shown in Fig. 1, the current passes through the principal magnet D, and also through the opposing magnet E of each lamp, and the normal arc of all the lamps is increased. If the switch-lever is brought into
 15 contact with the plate S³, the current passes from wire 14 directly to wire 20, and the principal magnets D D' D² D³ are rendered active, while the opposing magnets remain inactive. If a powerful light is desired therefrom, the
 20 switch-lever is turned upon the contact-plate S³; but if it becomes desirable to reduce the power of the light the switch-lever is turned upon the contact-plate S', and if the switch-lever is turned upon the plate S² the lights
 25 are extinguished.

In many localities it is desirable that during the fore part of the night a bright light shall be furnished, while during the after part of the night a light of less brightness is suffi-
 30 cient, and if arc lamps are used which, when their carbons are adjusted at a normal arc of three millimeters produce a light of eighteen hundred candle-power, the same lamps with their carbons placed at a normal arc of
 35 five millimeters produce a light of only six hundred candle-power each, and at the same time the power required for imparting motion to the dynamo-machines in the central station is proportionately decreased. If the switch

is placed in the central station, the normal arcs of all the lamps in the circuit controlled by said switch can be adjusted according to the light required.

I do not claim in this application for a patent the mechanism for automatically main-
 45 taining the normal arc of the lamp, such being described and claimed in an application for a patent filed by me October 20, 1890, Serial No. 366,808, and allowed November 22, 1890.

What I claim as new, and desire to secure
 50 by Letters Patent, is—

1. In an electric-arc lamp, the combination, with the magnet for automatically maintain-
 ing the normal arc when the lamp is burning, of an opposing magnet for changing the
 55 normal arc of the lamp, a switch for throwing the opposing magnet in and out of the circuit, and suitable connections with a dynamo-machine or other source of electricity, substan-
 60 tially as described.

2. The combination, with a number of lamps connected in series and with the magnets in
 each lamp for automatically maintaining the normal arcs when the lamps are burning, of
 65 opposing magnets for changing the normal arc in each lamp, a switch for throwing all the opposing magnets in or out of the circuit, and suitable connections with a dynamo-machine or other source of electricity, substantially as
 70 described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CARL JOSEPH SCHWARZE.

Witnesses:

WM. C. HAUFF,
 E. F. KASTENHUBER: