(No Model.) 2 Sheets—Sheet 1.

E. BLASER.

ELECTRIC ARC LAMP.

No. 597,601. Patented Jan. 18, 1898.

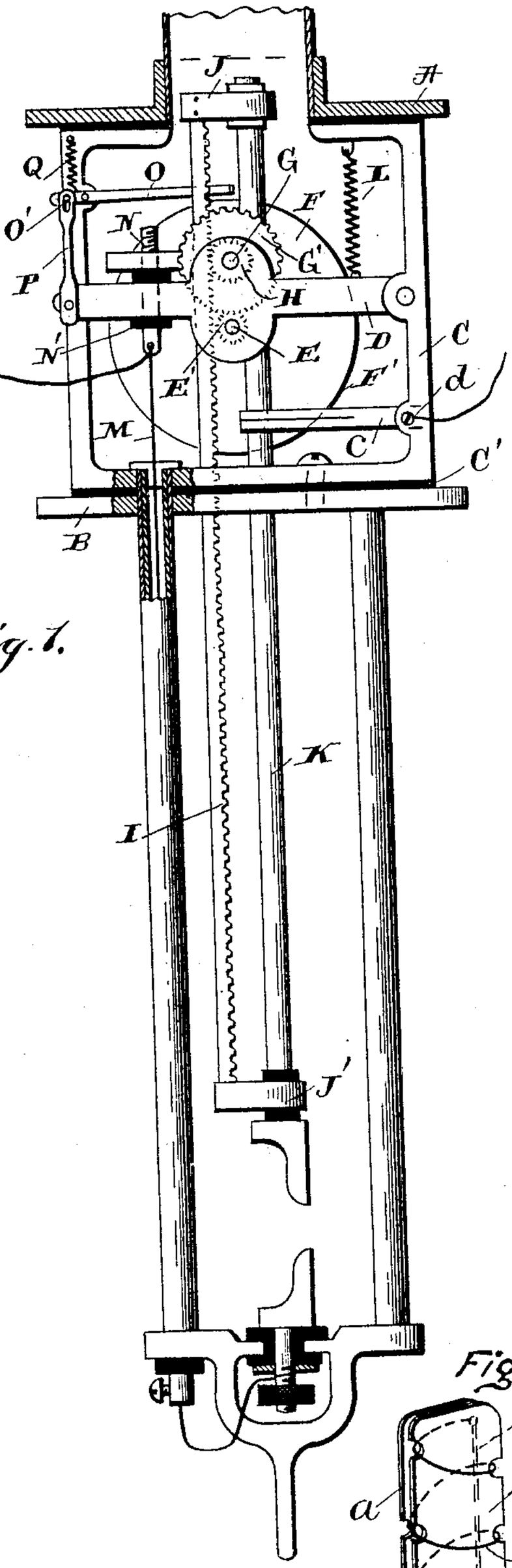


Fig. 1.

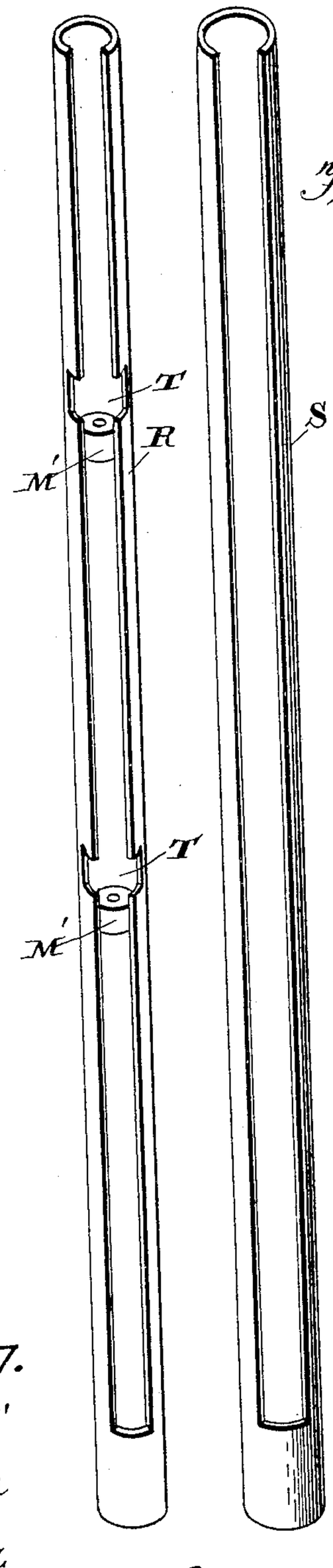
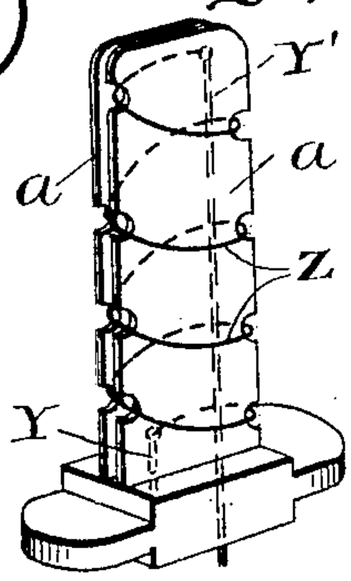


Fig. 5.

Fig. 7.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

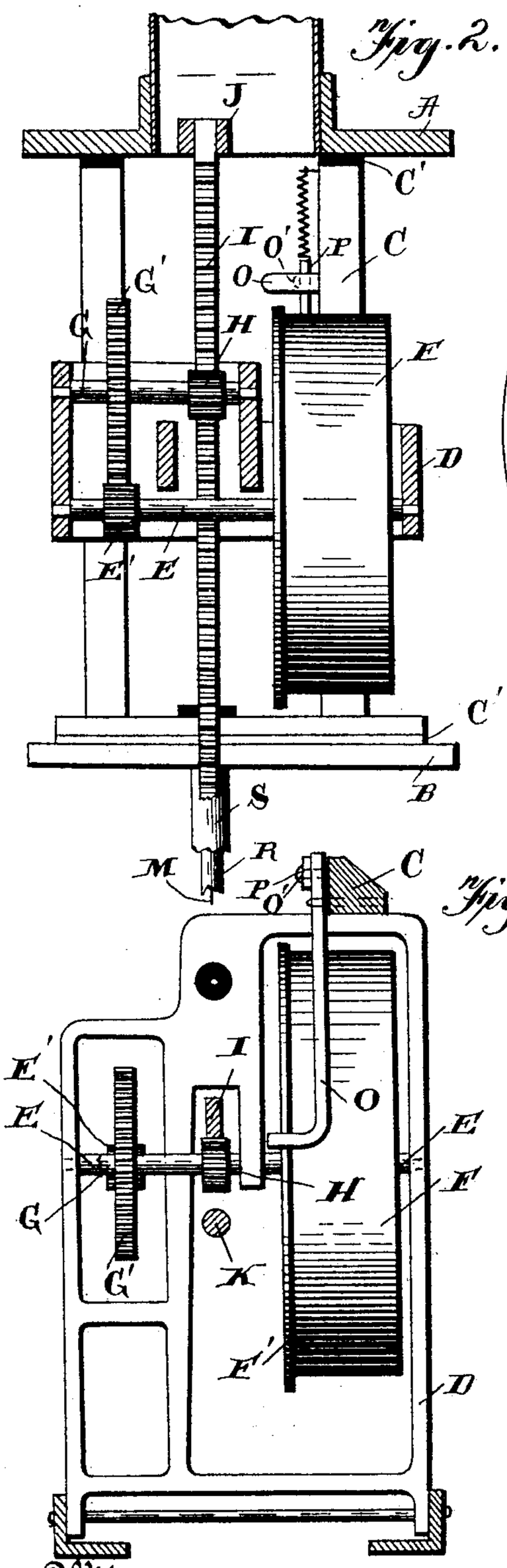


Fig. 4.

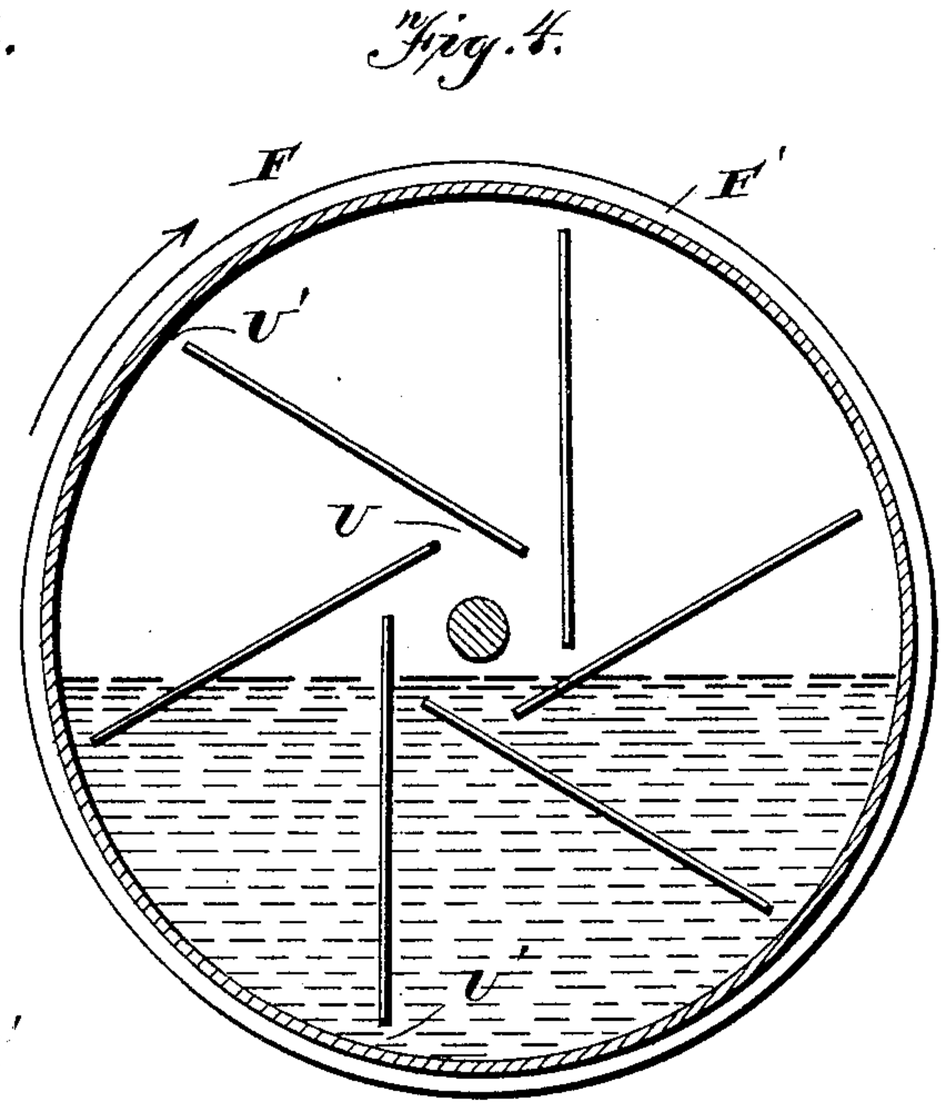
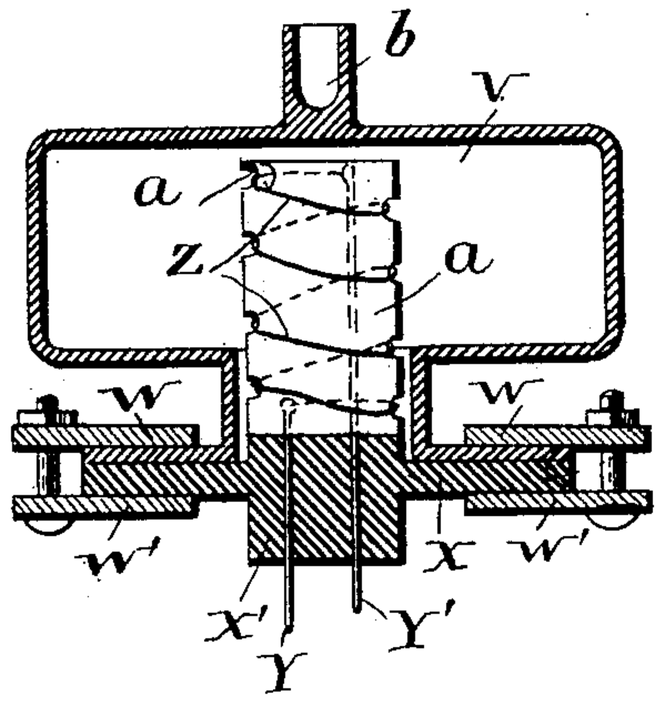


Fig. 3.

Fig. 6.



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UNITED STATES PATENT OFFICE.

EMANUEL BLASER, OF CALIFORNIA, MISSOURI, ASSIGNOR TO CHARLES G. CORRAO, OF MATTAPAN, MASSACHUSETTS.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 597,601, dated January 18, 1898.

Application filed July 15, 1897. Serial No. 644,719. (No model.)

To all whom it may concern:

Be it known that I, EMANUEL BLASER, of California, in the county of Moniteau and State of Missouri, have invented certain new and useful Improvements in Arc-Lamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to arc-lamps, and has particular reference to that class of lamps employing an expansion device, usually a wire, for governing the adjustment of the carbon. These lamps as now used usually employ a form of clutch or clamp which by the expansion or contraction of an expansion-wire clutches the carbon-rod more or less firmly. So long as the arc has the proper resistance the clutch holds the carbon-rod firmly in one position, but as the arc becomes longer and the resistance increases the expansion-wire gets cooler until it contracts sufficiently to slowly release the clutch and permit the carbon-rod to drop. This dropping or sliding down takes place very slowly, almost imperceptibly, so that as the carbons approach and the resistance decreases and the current increases the expansion-wire will have time to become hotter and expand enough to again clutch the carbon-rod more tightly, so as to arrest its downward movement before the carbons contact. If the adjustment is perfect and the lamp new—*i. e.*, the carbon-rod true and its surface polished--the arrangement works fairly well; but in practice under the action of the weather, changes in temperature, and indifferent attention the adjustment is usually far from perfect. Also from wear and action of the current and corrosion the surface of the carbon-rod soon loses its polish, when it will stick in the clutch until the arc is too long or is extinguished, and when it does slide it will fall entirely down. It is therefore impracticable to use a long arc and high voltage, as in practice the carbons are almost constantly in slight contact, producing what is termed an "incandescent-arc light."

The object of the present invention is to provide an improved alternating-current arc-lamp that will have a wider range of adjustment—in other words, a lamp that will not need the delicate adjustment, as above described, of those now in use; a lamp that with slight modification in the capacity of the expansion-wire and the travel or lift of the feed mechanism may be used on high or low tension currents with corresponding long or short arc, as will be fully explained in the following specification.

Referring to the accompanying drawings, Figure 1 is an elevation, partly in section, of my improved lamp. Fig. 2 is a sectional edge view of the upper portion of the same. Fig. 3 is a sectional plan view. Fig. 4 is a sectional view of the governor-drum. Fig. 5 is a detail view of the expansion-wire casing. Fig. 6 illustrates a modification, and Fig. 7 a detail.

A designates the upper part, and B the lower part, of the lamp frame or support, said parts being separated, but connected by the interposed framework C, insulated therefrom at C'.

Arranged horizontally in frame C and hinged at one end is vertically-swinging frame frame D, and journaled centrally therein is shaft E, carrying governor-drum F, also pinion E'. This pinion meshes with gear G' on shaft G, the latter also carrying pinion H, and meshing therewith is the elongated vertically-movable rack-bar I. Clamps J J' at the upper and lower ends, respectively, of this bar secure carbon-rod K, said clamps insulating the rod from the bar, and the rod at its lower end carries the upper carbon K. Coiled spring L, connecting frames C and D, tends constantly to raise the latter, the spring pulling against expansion-wire M, having the adjustable screw connection N at its upper end with the free side of frame D, said connection being insulated by bushing N' from the frame, the lower end of the wire being secured to but insulated from the lower end of bottom portion B of the hanger-frame. Brake-lever O is fulcrumed between its ends to frame C, its inner end being arranged over and adapted to bear on peripheral flange F' of drum F, and its outer end connected by pin O' to slotted link P, the latter being pivoted at its lower end to frame D. Contracti-

ble spring Q, secured to the brake-lever and the frame, gives to the inner end of the lever a constant downward tendency toward engagement with the drum.

The casing inclosing expansion-wire M consists of two longitudinally-split tube-sections R and S, the latter embracing the former and adapted to be turned to entirely close the same. Inner tube R is notched occasionally at T to pass perforated insulating-blocks M′, which when moved longitudinally tightly fit the tube and serve to loosely hold the wire centrally in the casing. Much more ready access may thus be had to the wire for repairing, &c., than though it were incased by a solid tube.

Within drum F are a series of tangentially-arranged partitions which divide the drum-cavity into compartments. The inner end of each partition stops short of the partition next adjacent to form passage-way U, while at the outer end of each partition is a port U′. The drum is partially filled with a liquid—alcohol, for example—and is then hermetically sealed.

The operation is as follows: When the carbons are set and in contact and the current turned on, the expansion-wire, being of suitable resistance, becomes heated and expands, allowing spring L to pull up frame D, together with the several gears, drum F, and the rack-bar, thus separating the carbons. At the same time the weight of rack-bar I and carbon-rod K causes drum F to revolve through the medium of the gearing and the carbons to approach, and the expansion-wire heating still more expands sufficiently to permit brake O to bear down on flange F′ of drum F and prevent further revolving of the drum until the arc becomes of sufficient resistance to somewhat diminish the current, thus allowing the expansion-wire to become cooler until it contracts sufficiently to release the brake. With the drum F revolving in the direction of the arrow (see Fig. 4) one pocket or compartment full of alcohol will be raised sufficiently to counterbalance the propelling force—*i. e.*, the rack-bar and carbon-rod—and then the drum will only revolve as fast as the fluid will escape through port U′. This will cause the carbon-rod to lower very slowly, almost imperceptibly, thus giving the expansion-wire suffcient time to act before the carbons are too close to each other.

It is not my purpose to restrict myself to any particular number or form of partitions within the drum, nor is it essential what kind of fluid is used therein. If a viscous, oily, or semifluid—such as glycerin, for instance—is used, the partition-openings must be sufficiently large. If at any time the expansion-wire should from any cause not be deemed sufficient or practicable, I have designed the apparatus illustrated in Fig. 6 to be used in its stead. The same consists of the india-rubber flask V, having wide brim V′ at its mouth, said rim being forced through an iron or other ring W. The mouth is closed by the hard-rubber disk X, and this disk and brim V′ are clamped between plates or rings W and W′ in hermetically sealing the flask. Disk X is formed with a central hub X′, through which pass wires Y and Y′, connected to the terminals of wire spiral Z within the flask. The latter is coiled on two or more stiff plates of mica *a*, one or more of said plates being on each side of the coil. These plates hold apart the convolutions of the coil and prevent short-circuiting. As the current passes in at Y and out at wire Y′ the resistance-coil Z inside becomes heated, thus heating the air or other gas contained in the flask and causing the same to expand, including its top wall, carrying nipple *b*, to which a suitable connection is fastened leading to the swinging frame D, replacing the expansion-wire of the first-described construction. In this modified construction the course of the current is through the resistance-coil, as described, and to the lower carbon through the upper carbon and carbon-rod, from which it is taken by brush *c* to binding-post *d* of the circuit terminal. In the arrangement employing the expansion-wire the inlet-circuit connection is at the juncture of said wire and its tension-adjusting device.

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

1. The combination of a support, a frame mounted to swing vertically therein, a carbon-carrier movable vertically and independently of the frame, mechanism operatively connecting the carrier and frame, a brake-lever fulcrumed to the support for controlling said mechanism, a connection between the lever and frame for holding the former inoperative while the frame is lowered, and frame-actuating mechanism, substantially as shown and described.

2. The combination of a support, a frame mounted to swing vertically, a carbon-carrier movable vertically and independently of the frame, gearing operatively connecting the carrier and frame, a spring-actuated brake-lever fulcrumed to the support and adapted to control said gearing, a link loosely connecting the lever and frame and adapted to hold the lever inoperative when the frame is depressed, and frame-actuating mechanism, substantially as shown and described.

3. The combination of a support, a frame mounted to swing vertically therein, a carbon-carrier movable vertically and independently of the frame, gearing operatively connecting the carrier and frame, a fluid-containing drum rotatable with the gearing and formed with a peripheral flange, a brake-lever fulcrumed to the support and operatively connected to the frame and adapted to engage the flange of the drum, and mechanism for actuating the frame, substantially as shown and described.

4. An improved arc-lamp, including a sup-

port, a frame pivoted to swing vertically therein, a carbon-carrier and a carrier-governor mounted in the frame, a brake-lever fulcrumed to the support and actuated by a spring to bear on the governor, and a link connecting the free portion of the frame and the lever to release the latter to the action of the spring, substantially as shown and described.

5. The improved expansion-wire casing, consisting of two longitudinally-split tubes, one arranged within the other with the outer tube turnable on and adapted to close the inner tube, and perforated insulating-blocks in the inner tube, substantially as shown and described.

6. The improved expansion-wire casing, consisting of two longitudinally-split tubes, one arranged within the other with the outer tube adapted to turn to close the inner tube, the inner tube being formed with occasional transverse opening, and perforated insulating-blocks adapted to be inserted through said opening and fitted within the inner tube, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

EMANUEL BLASER.

Witnesses:
JAMES S. ROTH,
J. P. JOBE.