(No Model.)

2 Sheets—Sheet 1.

W. P. WIEMANN.

ELECTRIC ARC LAMP.

No. 551,244. Patented Dec. 10, 1895.

Fig. 1.

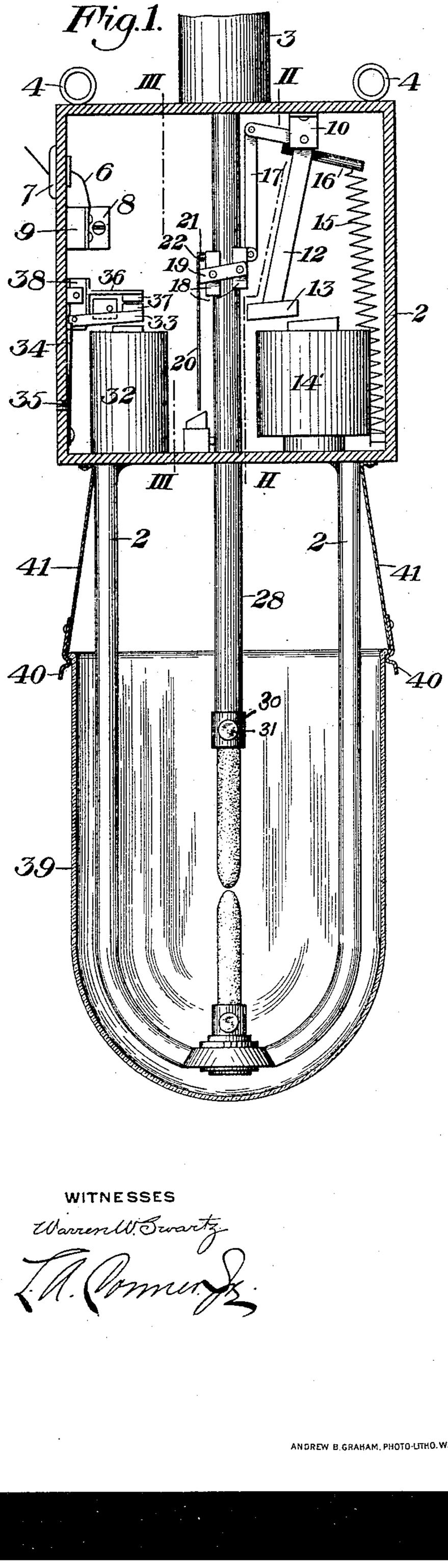


Fig. 2.

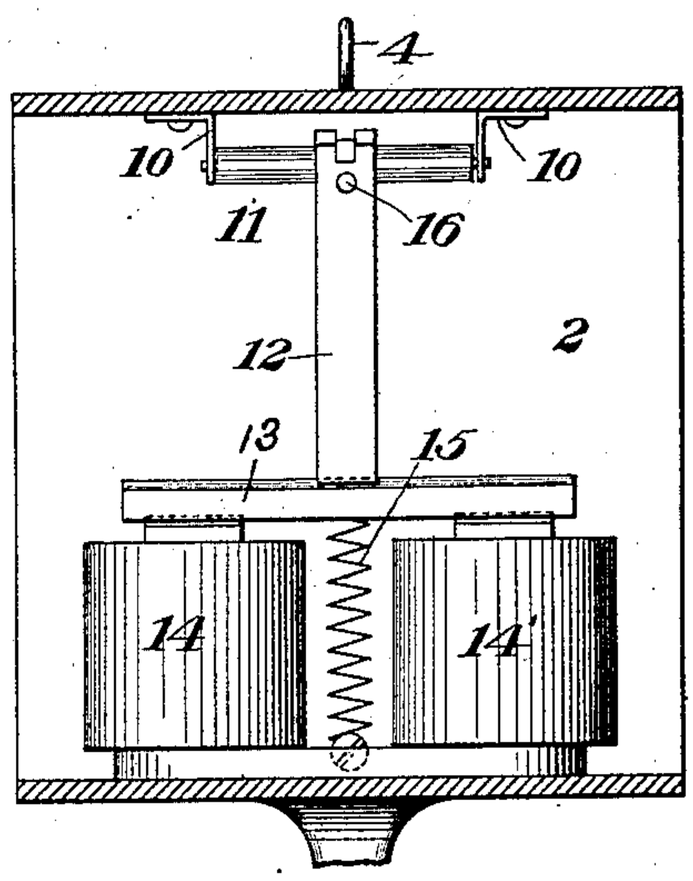
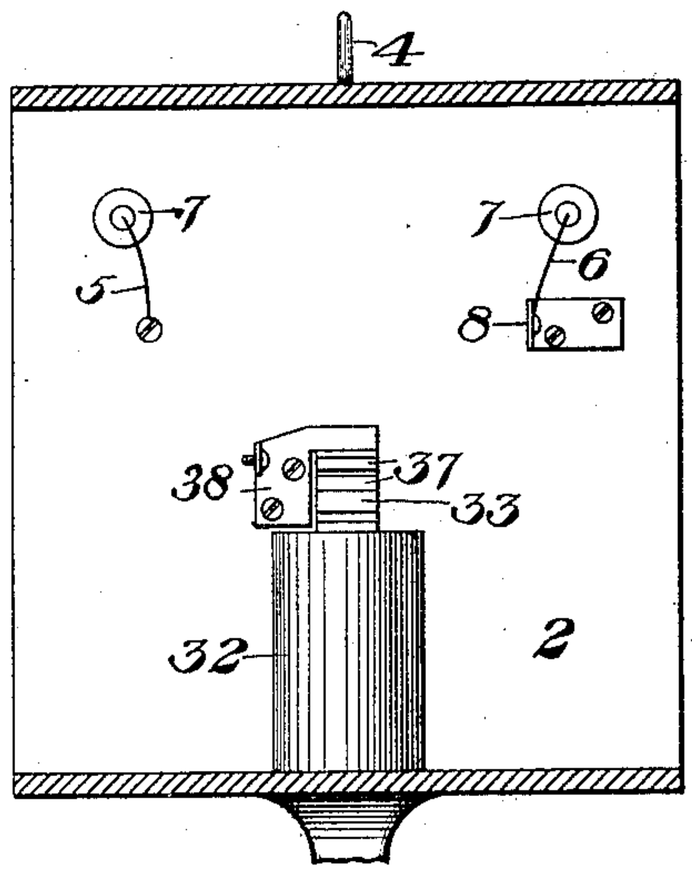


Fig. 3.



WITNESSES

Warren W. Swartz

T. A. Connolly Jr.

INVENTOR

William P. Wiemann

by Bakewell & Bakewell

his attys.

(No Model.) 2 Sheets—Sheet 2.

W. P. WIEMANN.

ELECTRIC ARC LAMP.

No. 551,244. Patented Dec. 10, 1895.

Fig. 4.

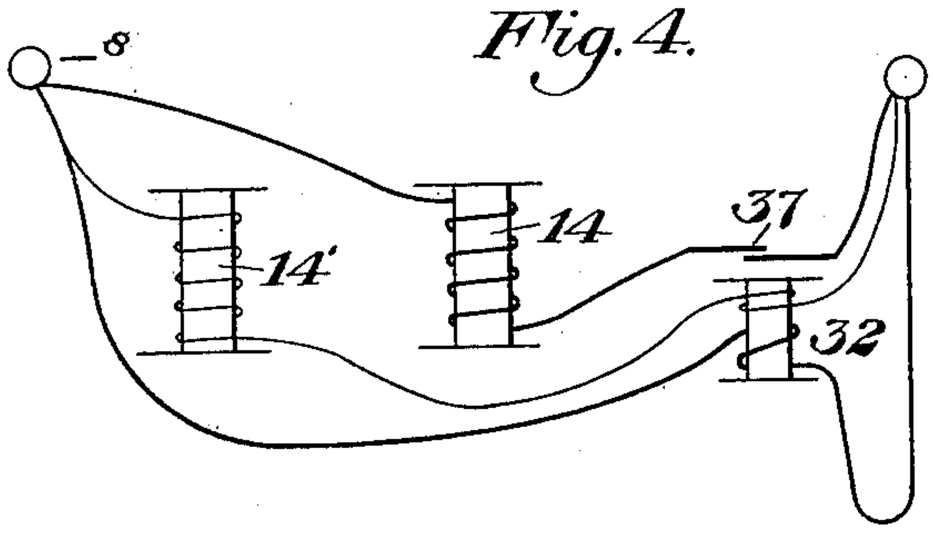


Fig. 8.

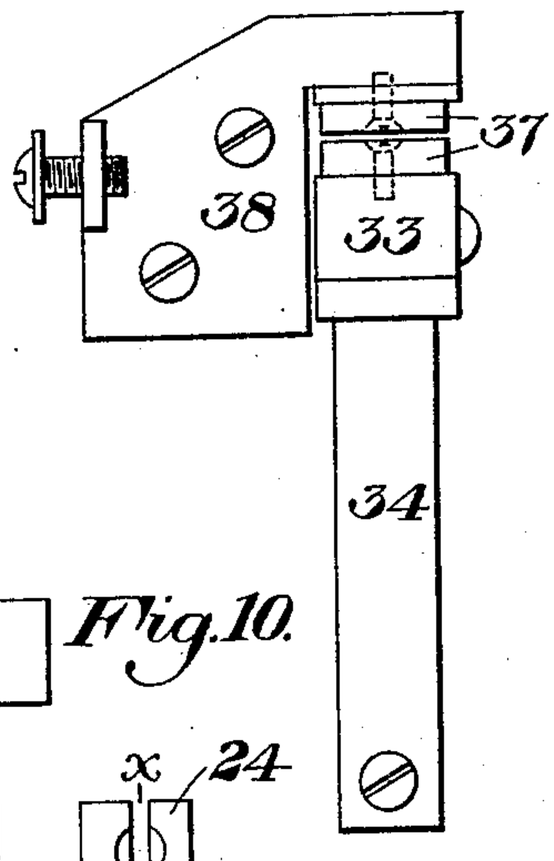
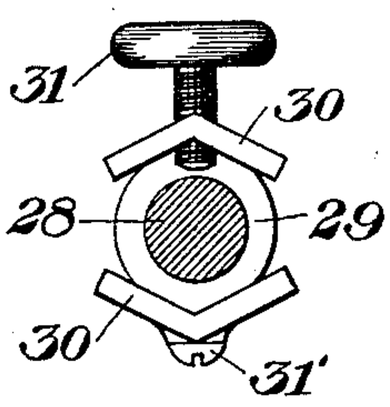


Fig. 6.



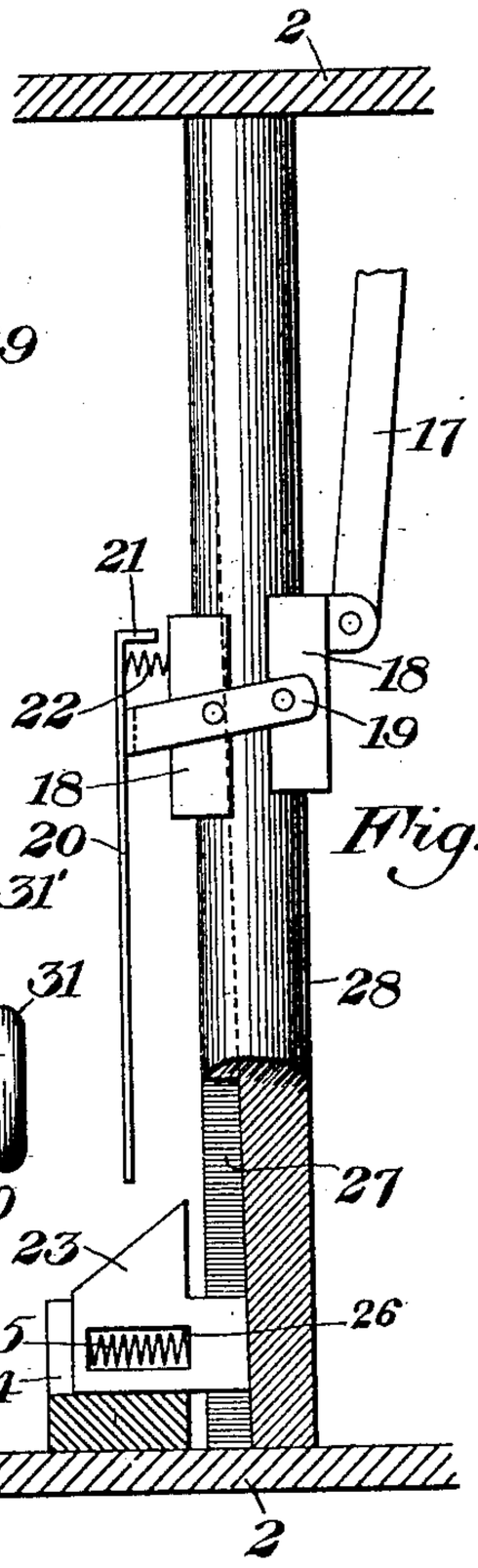


Fig. 10.

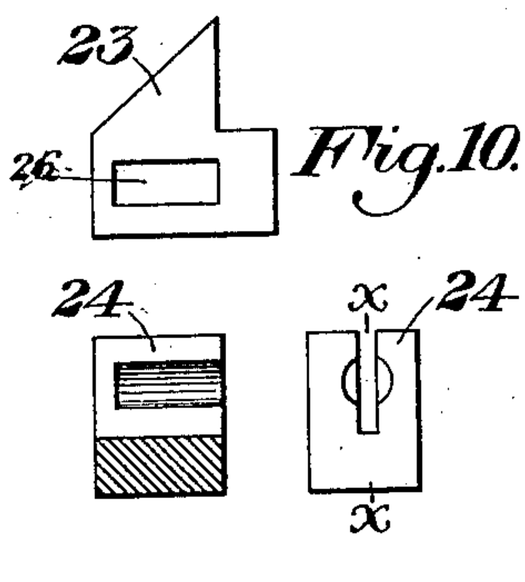


Fig. 7.

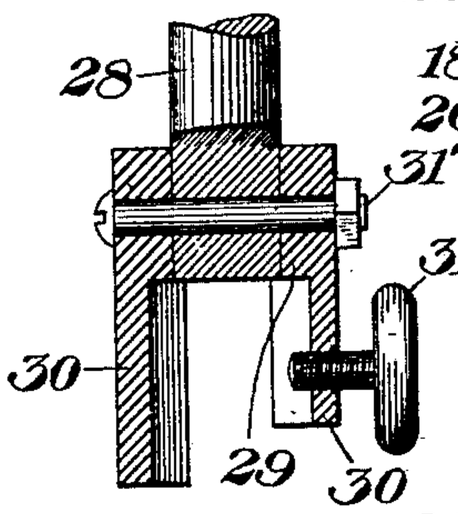
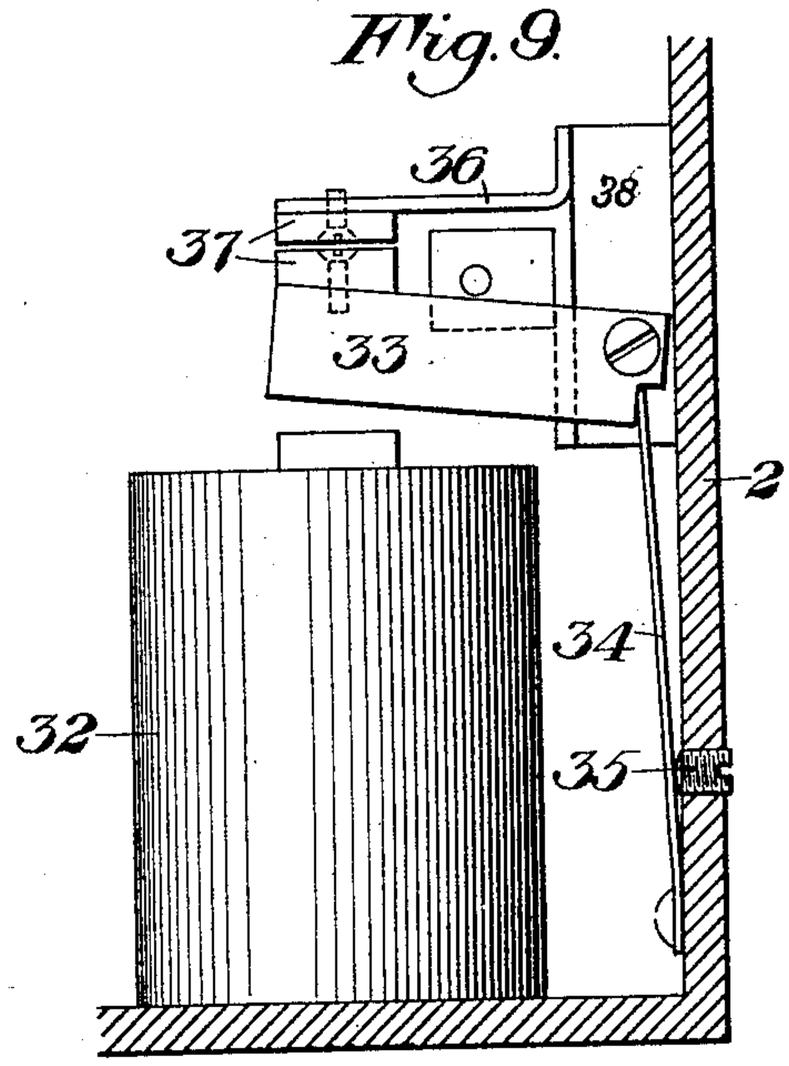


Fig. 5.

Fig. 9.



WITNESSES

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T. A. Somers Jr.

INVENTOR

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UNITED STATES PATENT OFFICE.

WILLIAM P. WIEMANN, OF WASHINGTON, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO H. P. CHAMBERS, OF SAME PLACE.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 551,244, dated December 10, 1895.

Application filed April 17, 1895. Serial No. 546,142. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. WIEMANN, of Washington, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Arc Lamps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved arc lamp with the casing broken away to show the parts. Fig. 2 is a vertical section on the line II II of Fig. 1, looking toward the left. Fig. 3 is a similar section on the line III III of Fig. 1, looking to the right. Fig. 4 is a diagram view of the circuits employed. Fig. 5 is an enlarged detail view of the rod and clutch with the compensating device in section. Figs. 6 and 7 are enlarged detail views of the carbon-holder, Fig. 7 being in longitudinal section. Figs. 8 and 9 are enlarged front and side elevations, respectively, of the cut-out mechanism; and Fig. 10 shows the separated parts of the compensating device.

Like symbols of reference indicate like parts in each figure.

My invention relates to the class of arc lamps, and is designed to afford means for keeping the arc at a constant resistance by automatically compensating for the loss in weight of the upper carbon due to its consumption by the arc, as well as to improve the general construction and arrangement of the lamp and its parts.

In the drawings, 2 indicates the general frame of the lamp, the upper part being of rectangular box shape to inclose the working parts. The rod-protecting chimney 3 is arranged in the usual way above the frame, and screw-hooks 4 4 are supplied for hanging the lamp in place. The positive and negative wires 5 and 6 enter the case through insulating-plugs 7, and the positive wire is connected to the frame while the negative wire leads to a terminal 8 mounted on an insulating-support 9. Within the case are provided two angled supports 10 10, electrically connected thereto, and between them is pivoted a shaft 11, which carries the three-armed or T lever 12, to the longer downwardly-extending arm of which is secured the armature 13, having an inclined or beveled lower face, which moves in close proximity to the beveled upper ends of the cores of magnets 14 and 14′, these cores being connected to an iron plate secured to the frame. The armature is normally held away from the cores by a spring 15 secured to the frame and to one arm of the lever which is constituted by an adjustable screw 16. The third arm of the lever is pivotally connected by a link 17 with a rod-clutch consisting of two similar half-cylinders 18 pivotally connected by a yoke or fork 19, to whose outer end is rigidly secured a stiff rod 20, which is provided with a short upward extension 21, having a spring 22, which normally binds the clutch upon the rod.

The lower end of the rod 20 is arranged to be engaged by the sliding inclined-faced compensator-block 23, which is guided within a vertical slot in the stationary block 24, a coiled spring 25 held within a cylindrical hole in the block 24 passing through a slot 26 in the compensator-block and pressing it against the inner tapering or inclined face of a vertical groove or slot 27 in the carbon rod 28. The carbon-holders are of simple and effective construction, as shown in Figs. 6 and 7, each consisting of a collar 29, which fits the rod and to the outer opposite sides of which are secured by bolts 31′ passing through the rod the angle-pieces 30, one of which is provided with the clamping-screw 31.

The cut-out I employ is clearly shown in Figs. 8 and 9, its coil 32 having a series and shunt winding, while above its core is pivoted the armature-lever 33, the outer end of which is normally held in raised position by a spring 34, which is adjusted by a screw 35. The block to which the lever 33 is pivoted is of insulating material, and the armature-lever when in raised position makes contact with the contact-piece 36 by the carbon contacts 37 arranged on each. The contact-piece 36 is mounted upon the insulating-block 38, secured to the frame of the lamp.

The lamp-globe 39 is closed at the bottom, and is provided with an upper flange, which is engaged by spring-clamps 40, secured around the spark-arrester 41, thus protecting the arc from air-currents and not interfering with the light which is thrown downwardly, as when the bottom globe-support is employed.

The circuits are shown in Fig. 4, the positive wire leading to the frame and the negative wire to the terminal 8, the cut-out circuit being connected from the frame to contact 36 through cut-out lever 33, spring 34, and carbon contacts 37 to the starting-coil 14 and to the terminal 8.

The main circuit is from the positive frame to the general movement through the lever 12 to the carbon rod and through the arc to the lower holder, which is insulated from the frame, and through the series winding of coil 32, and to the terminal 8. The shunt-circuit is from the frame to coil 32, to regulating shunt-coil 14′ and to terminal 8. The series and shunt windings of the cut-out coil are so connected that their ends are of reverse polarity.

The operation of the lamp is as follows: It will be understood that the carbons will be separated when the current is not flowing, as the rod is elevated by the tension-spring 15, and the cut-out contact is closed by the tension of its controlling-spring. When the current enters the lamp it is divided into two branches, finding least resistance through the starting branch, so that the greater portion of the current flows through the starting-coil 14, while very little current passes through the shunt on account of the high resistance of the shunt-circuit. The current passing through the coil 14 magnetizes the core of same and attracts the armature 13 forward, overcoming the tension of the spring 15, which draws the extension of the clutch-fork against the compensating block 23, the inclined face of which moves the lower end of the fork out and releases the clutch, allowing the rod to feed so that the carbons come together. The current now passing through the series coil of the cut-out draws the armature 33 down and opening the circuit to the starting-coil the spring 15 now draws the lever 12 back, which raises the upper carbon and forms the arc. As the carbons part the resistance of the arc increases and sufficient current is forced through the shunt-coils 14′ to again attract the armature 13, checking the further movement upward of the upper carbon. Regulation is effected by adjusting the spring so that the attraction of the magnets and the tension of the spring 15 will counterbalance when a proper arc is burning. Should the resistance of the arc become too great, the increased current through the shunt-winding of the cut-out coil will neutralize the magnetic polarity of the cut-out series coil sufficiently to release the cut-out and the starting-coil will again be cut in circuit. The low resistance of the same will cut the arc out.

The degree of angularity of the incline upon the compensator-block is adjusted by filing until the feed is proper for the full length of the rod, and the feeding-point is gradually raised by the outward movement of the block as the carbon rod descends, forcing the clutch to release the rod at a higher point as the consumption of the carbons proceeds. The loss in weight of the upper carbon is thus compensated for as it is consumed, keeping the arc at a constant resistance throughout the life of the carbon.

What I claim is—

1. In an arc lamp, the combination with the rod controlling mechanism, of a releasing point therefor, and means for automatically changing its position as the carbon decreases in weight; substantially as described.

2. In an arc lamp, the combination with the rod clutch, of a releasing point therefor, and means for automatically changing its position as the carbon decreases in weight; substantially as described.

3. In an arc lamp, the combination with a rod-clutch, of a pivoted T-shaped lever having an armature secured to the lower arm, a spring adjustably connected to the second arm, and a link connecting the third arm to the rod-clutch, substantially as described.

4. In an arc lamp, the combination with the rod-clutch, of a rod secured thereto, an inclined faced compensator-block with which the rod contacts, and means for changing the position of the said block; substantially as described.

5. In an arc lamp, the combination with the rod-clutch, of a rod rigidly secured to the connecting link or fork thereof, an inclined faced compensator-block with which the rod contacts, and means for changing the position of the block as the carbon rod descends; substantially as described.

6. In an arc lamp, the combination with a carbon-rod, having a tapering slot therein, of a compensator-block movable in the slot, said block being operatively connected with the rod-clutch, substantially as described.

7. In an arc lamp, a rod-clutch connected to a pivoted lever, an armature upon said lever arranged to coact with the cores of a starting coil and a regulating coil, a spring secured to the lever, and means for changing the position of release of the clutch as the carbon rod lowers, substantially as described.

8. In an arc lamp, a rod clutch connected to a pivoted lever, an armature upon said lever arranged to coact with the cores of a starting coil and a regulating coil, a spring secured to the lever, a carbon-rod having a tapering slot, and a compensator-block movable in said slot and operatively connected to the rod-clutch; substantially as described.

9. In an arc lamp, a carbon holder consisting of a collar upon the rod, two angle pieces secured thereto by a screw, and a carbon-screw in one of said angle-pieces, substantially as described.

In testimony whereof I have hereunto set my hand.

WM. P. WIEMANN.

Witnesses:
C. A. COVERT,
H. P. CHAMBERS.