

(No Model.)

R. M. HUNTER.
ELECTRIC ARC LAMP.

No. 500,657.

Patented July 4, 1893.

FIG. 1

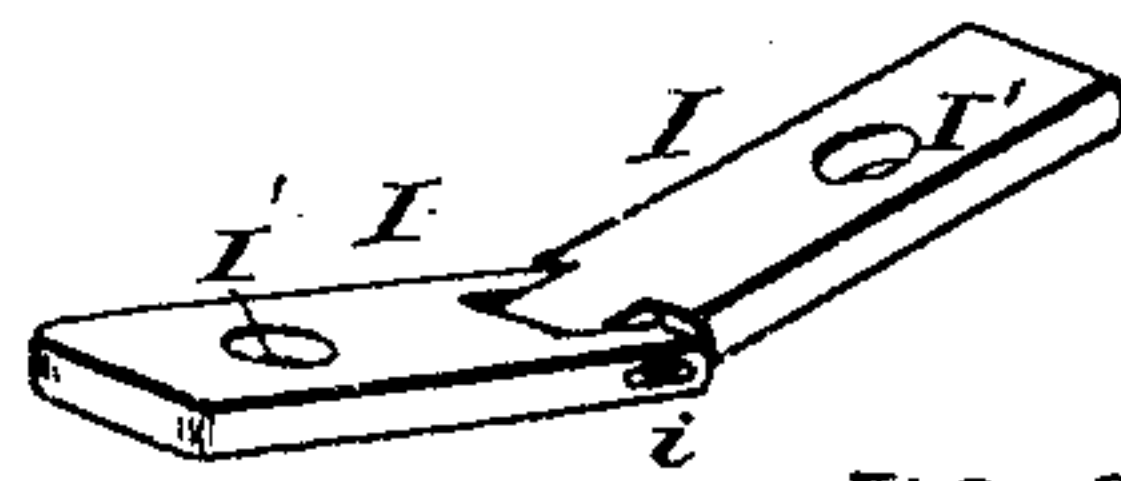
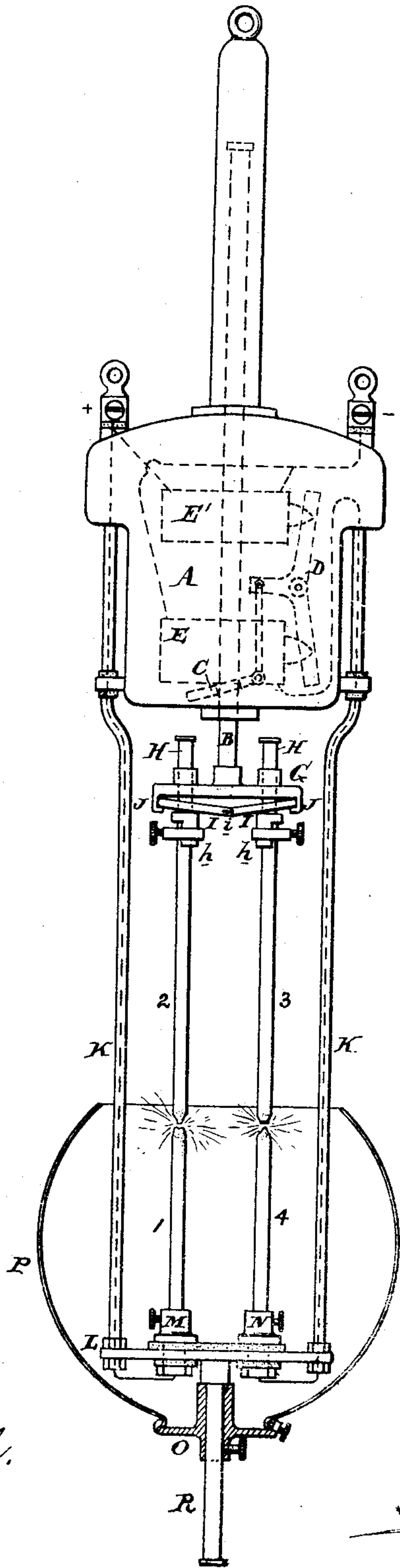


FIG. 2

Attest
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RUDOLPH M. HUNTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 500,657, dated July 4, 1893.

Application filed April 3, 1893, Serial No. 468,758. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH M. HUNTER, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Arc Lamps, of which the following is a specification.

My invention has reference to arc lamps, and consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings which form a part thereof.

This application, Case No. 248, comprehends certain improvements in arc lamps especially adapted for incandescent circuits or those which are commonly known as constant potential circuits. In constant potential circuits the voltage remains fixed irrespective of the number of translating devices put into or out of circuit, the said translating or current consuming devices being arranged in parallel or multiple. The ordinary voltage of an arc is approximately fifty volts, and therefore when the constant potential mains carry a voltage of one hundred to one hundred and ten, it becomes necessary to include two arcs in series across the mains to prevent too great a flow of current. The construction of the lamp may be such that but a small current will be permitted to flow, so that the consumption in watts of the lamp need not exceed that of an ordinary arc lamp.

In carrying out my invention, I provide the usual carbon lifting rod with a cross head supporting two independently adjustable carbon holders or clamps, and below the said carbon holders or clamps I arrange two fixed carbon holders. The current passes through the regulator of the lamp which controls the feeding of the movable carbon holder rod, and thence through the two sets of carbons carried by the carbon holders, whereby the two arcs are in series with the regulator. The adjustable connection of the movable carbon holders with the cross head is such that either carbon holder may automatically adjust itself to compensate for any relative variation in the combustion of one set of carbons over that of the other, whereby both arcs may be maintained at substantially uniform brilliancy irrespective of any differences in composition

of the carbons. I do not confine myself to any special means for permitting this automatic adjustment but have shown a construction which I have found in practice excellently adapted to the purpose.

Referring to the drawings: Figure 1 is an elevation of an arc lamp embodying my improvements; and Fig. 2 is a perspective view of the feeding device of the carbon holders.

A is the case of the regulator.

B is the vertically movable rod carrying at its lower end the cross head G upon which the adjustable carbon holders *h, h* are carried.

C is the ordinary lifter clutch for feeding the rod B downward and for adjusting the brilliancy of the arc. This lifter clutch C is operated in any suitable manner by the armature lever D, which armature lever is operated by the series coil E and shunt coil E' in any well known manner.

I do not confine myself to any special form of regulator mechanism as nearly all of the forms now in the market may be readily adapted to the lamp embodying my invention.

The adjustable carbon clamps or holders *h, h*, are each provided with a vertical rod H guided in the cross head, and encircling these rods H are clutches I, I, which are provided with holes I', I', making a fairly tight fit to the rods H. The clutches I, I, are preferably linked together as at *i* and their outer ends are pivotally supported at J, J, to the cross head G. It will be observed that the operation of either one of these clutches I will operate the other and permit the carbon holder corresponding to said clutch to fall. The under portions of the clutches rest upon the shoulders of the holders so that should either of said carbon holders be moved upward the clutch will be operated and the other carbon holder permitted to be lowered.

The frame L at the base of the lamp is secured to the supporting tubular rods K, K, suitably connected at the top to the case A. The fixed carbon holders M and N are insulated from said frame L but secured thereto in alignment with the upper carbon holders *h, h*. For clearness I have shown the rods K and the two sets of carbons in the same plane, but it will be understood that in practice it

will be customary to arrange the plane of the carbons at right angles to the plane of the rods K, K though this feature is unimportant in describing the invention. The globe P is
 5 carried by a holder O adjustably secured to a vertical rod R projecting downwardly from the frame L. When the lamp is to be trimmed the frame O and the globe P are lowered to expose the lower carbon holders M and N.
 10 After trimming the lamp, the globe may be raised to the position shown.

The electric circuits are indicated and are readily traced as follows: The current enters at the positive binding post and passes
 15 through a conductor indicated in dotted lines, inclosed in the left hand tubular rod K and connected at the bottom with the carbon holder M. The current then passes upward through the fixed carbon 1, thence through
 20 the adjustable carbon 2, thence through the cross head or any suitable flexible connection between the rods H, H, thence downward through the carbon 3, thence through carbon 4 to the fixed carbon holder N, thence up through
 25 the right hand tubular rod K, and thence through a series coil E and to the negative binding post. The shunt coil E' is of high resistance and in a shunt circuit around the carbons and series coil. It will be observed
 30 that the arcs between the two sets of carbons are in series with the series coil of the regulator so that the latter is affected by any material variation in the arcs and will respond as is customary in arc lights. In the operation of the lamp the clutch C will alone per-
 35 form the feeding of the carbons until one of the carbons 2 and 3 becomes consumed from any cause to a greater extent than the other carbon. Then the lowering of the carbon
 40 holder rod B due to the abnormal arc will cause the longer carbon to strike the lower carbon and trip the clutches of the carbon holders permitting the carbon abnormally consumed to re-adjust itself, and the lamp will
 45 continue to burn as before, performing its main regulation by the clutch C and main regulator. By this construction it will be seen that either of the carbons 2 or 3 through its holder and clutch will be automatically em-
 50 ployed to adjust the position of the other carbon and its holder so as to maintain the arcs at substantially uniform brilliancy. Under some conditions this automatic adjustment of the carbon holders upon the cross head would
 55 never take place, while under other conditions it would take place at intervals.

The apparatus is self-compensating and requires no particular attention.

It is quite evident that the rods H may be
 60 of any desired length, though the proportions shown in the drawings are thought to be adequate for any ordinary operation of the lamp. It is also evident that the clutch or feeding mechanism for the independent holders h, h,
 65 may be of any suitable construction as a large variety of such devices are well known in the

art and may be substituted for that herein shown. I therefore do not confine myself to the details of construction herein set out.

What I claim as new, and desire to secure 70 by Letters Patent, is—

1. In an arc lamp, the combination of two carbon holders a vertically adjustable cross head or frame, feeding mechanism for feed-
 ing said cross head or frame vertically, two 75 independent carbon holders carried by said cross head or frame and in alignment with the first mentioned carbon holders, independent clutch devices for said carbon holders to adjust them upon the cross head or frame, 80 and electric circuits including the carbon holders in series.

2. In an arc lamp, the combination of two carbon holders, a vertically adjustable cross head or frame, feeding mechanism for feed- 85 ing said cross head or frame vertically, two independent carbon holders carried by said cross head or frame and in alignment with the first mentioned carbon holders, independent clutch devices for said carbon holders to 90 adjust them upon the cross head or frame mechanically connected together whereby either carbon holder upon being moved up- ward may automatically trip the other car- bon holder to permit it to become lowered, 95 and electric circuits including the carbon holders in series.

3. In an arc lamp, the combination of two fixed carbon holders, two independently ver- 100 tically adjustable carbon holders, a mechanical device connecting the two adjustable carbon holders whereby one may adjust the other automatically, and an electrically controlled regulating device for simultaneously feeding the adjustable carbon holders toward the 105 fixed carbon holders.

4. In an arc lamp, the combination of two fixed carbon holders, two independently ver- 110 tically adjustable carbon holders, a mechanical device connecting the two adjustable carbon holders whereby one may adjust the other automatically, an electrically controlled reg- ulating device for simultaneously feeding the adjustable carbon holders toward the fixed 115 carbon holders, and electric circuits for maintaining the said several carbon holders in series with each other.

5. In an arc lamp, the combination of four carbon holders arranged in pairs one pair of which is movable as a unit, a single electri- 120 cally actuated feeding device for feeding the movable carbon holders simultaneously in the same direction, and an adjusting device controlled by the varying consumption of car- bons in the several holders for causing a rela- 125 tive adjustment between the carbon holders of one pair.

6. In an arc lamp, the combination of four carbon holders arranged in pairs one pair of which is movable as a unit, a single electri- 130 cally actuated feeding device for feeding the movable carbon holders simultaneously in

the same direction, an adjusting device controlled by the varying consumption of carbons in the several holders for causing a relative adjustment between the carbon holders
5 of one pair, and electric circuits for maintaining the electrically actuated regulator and the several carbon holders in series.

In testimony of which invention I have hereunto set my hand.

R. M. HUNTER.

Witnesses:

ERNEST HOWARD HUNTER,
HELEN L. MOTHERWELL.