F. BUCHANAN.

ELECTRODE FOR ELECTRIC ARC LAMPS.

APPLICATION FILED MAY 22, 1911.

1,253,572. Patented Jan. 15, 1918.

Fig. 1.

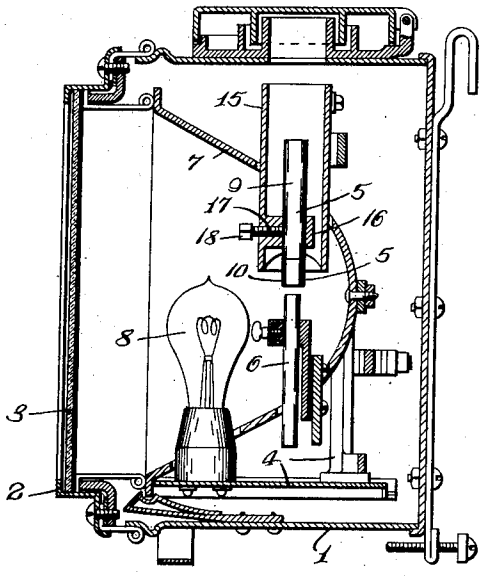


Fig. 2.

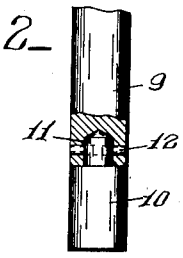


Fig. 4.

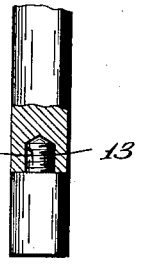
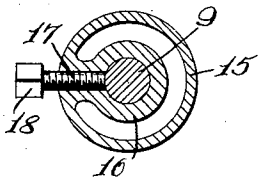


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANK BUCHANAN, OF SYRACUSE, NEW YORK.

ELECTRODE FOR ELECTRIC-ARC LAMPS.

1,253,572. Specification of Letters Patent. Patented Jan. 15, 1918.

Original application filed October 20, 1909, Serial No. 523,579. Divided and this application filed May 22, 1911. Serial No. 628,633.

To all whom it may concern:

Be it known that I, FRANK BUCHANAN, of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Electrode for Electric-Arc Lamps, of which the following is a specification.

My invention has for its object the production of an electrode particularly applicable for use in flaming arc electric lamps, designed to be used in places where there is vibration tending to jar the electrodes loose, such as head lights of the class described in my application Serial No. 523,579 filed Oct. 20, 1909 of which this application is a division; and the invention consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a vertical sectional view of a head light embodying my invention.

Fig. 2 is a detail view of the upper non-consuming electrode.

Fig. 3 is a fragmentary view showing the means for holding the upper electrode.

Fig. 4 is a modified form of parts shown in Fig. 2.

1 is the casing of the head light embodying my invention, the casing having a removable door 2 at its front end, carrying a lens 3.

4 is a frame located within the casing and removable as a whole through the door opening, said frame supporting upright electrodes 5 and 6 and the mechanism for controlling the operation of such electrodes. The frame also supports a suitable reflector 7 and an incandescent lamp 8. The construction of the casing and the frame supporting the lamp mechanism forms no part of this invention and for a full description thereof reference is had to my pending application referred to above.

The upper electrode 5 in this embodiment of my invention is non-consuming or consumes very slowly and comprises two metal rods 9 and 10 arranged end to end and composed of different metals, or metals of different character, the lower rod 10, the lower end of which is opposed to the upper end of the lower electrode 6, being of a comparatively soft metal, which is a better conductor and more subject to expansion under the influence of the heat generated at the arc and to the subsequent contraction produced by the lowering of the temperature when the arc is extinguished and the electrodes are submitted to atmospheric temperatures, than the metal of the upper rod 9 which is composed of comparatively hard metal. The lower rod 10 is usually formed of copper and the upper one 9 of steel.

The rods 9 and 10 are united together by a lapping joint and a fastening member extending transversely through said joint, and usually one rod, as the upper steel rod 9, is formed with an axial socket which receives the reduced upper end 11 of the lower copper rod 10, and a pin 12 is passed transversely through the lower end of the steel rod 9, the socket and the reduced upper end 12 of the copper rod 10.

However, as seen in Fig. 4, the reduced end 13 of the copper rod may be threaded and screwed into a threaded axial socket 14 of the upper rod.

The electrode is held or supported by means clamping the harder or steel rod 9 and as here shown such means is located in a chimney or ventilating tube 15 serving to convey from the arc, the gases formed at the arc, and such clamping means consists of an eye 16 formed integral with the wall of the chimney or ventilating flue 15 and encircling the steel rod 9, and a set screw 17 extending transversely through the walls of the eye and the tube and having its head 18 exposed on the exterior of the tube, the inner end of such screw engaging the steel rod 9.

Owing to the fact that the upper electrode 5 is formed of sections of two metals of different degrees of hardness, and expansion and contraction, the section of soft metal can be used as the electrode proper to coact with the other electrode to form the arc, while the section of harder metal in which the expansion and contraction is comparatively small and substantially the same as the expansion and contraction of the eye 16 and the set screw 17 when subjected to the heat from the arc and atmospheric temperatures can be used to coact with the electrode holding, or supporting means in order that the electrode will be at all times tightly held.

What I claim is:

In a flaming arc electric lamp and in combination, means comprising a ring for encir-

cling and detachably holding an electrode, and a metallic electrode comprising two sections arranged end to end and having their contiguous ends detachably secured together, one section being engaged and held by said ring and composed of a metal having substantially the same expansion and contraction as said ring when subjected to the heat from the arc and to atmospheric temperatures, and the other section having greater expansion and contraction under said heat and temperatures, the latter section being softer than the section engaged by the holding means, and the metal of the softer section being slower consuming than the electric arc, substantially as and for the purpose set forth.

In testimony whereof, I have hereunto signed my name in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 8th day of May, 1911.

FRANK BUCHANAN.

Witnesses:
WM. CORNELL BLANDING,
C. C. SCHOENECK.