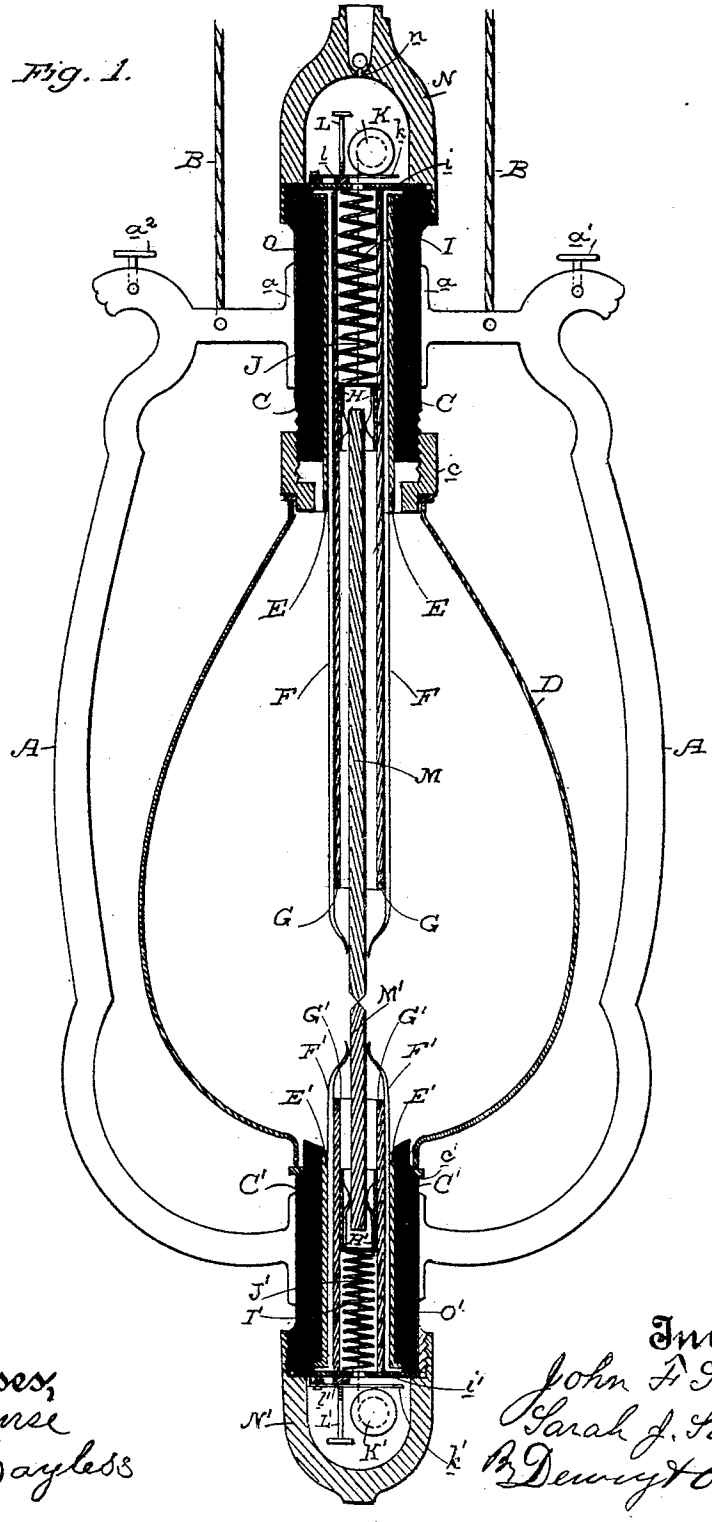
(No Model.) 2 Sheets—Sheet 1.

J. F. & S. J. SANDERS.

ELECTRIC ARC LAMP.

No. 496,702. Patented May 2, 1893.

Fig. 1.



Witnesses,
J. Thorne
J. A. Bayless

Inventors,
John F. Sanders.
Sarah J. Sanders
By Dewey & Co. Attys

(No Model.) 2 Sheets—Sheet 2.

J. F. & S. J. SANDERS.

ELECTRIC ARC LAMP.

No. 496,702. Patented May 2, 1893.

Fig. 2.

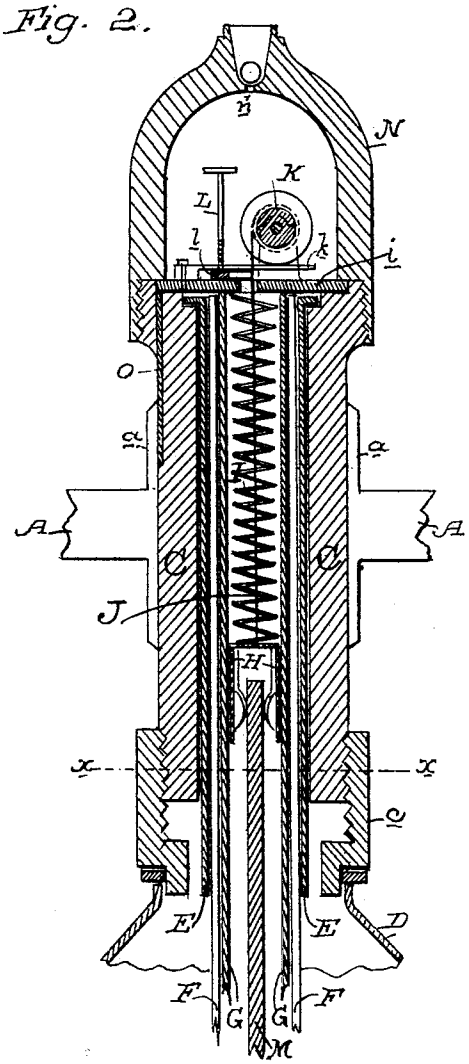


Fig. 3.

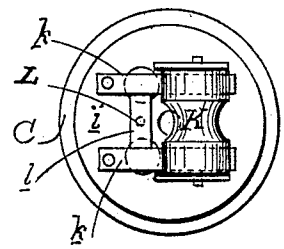


Fig. 5

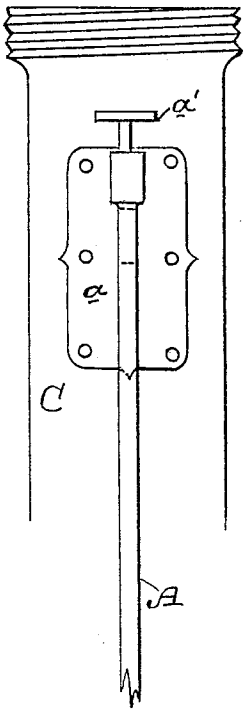
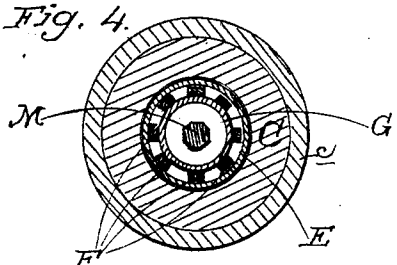


Fig. 4.



Witnesses,
L. Stowe
J. A. Bayless

Inventors,
John F. Sanders
Sarah J. Sanders
By Dewey & Co.
Attys.

UNITED STATES PATENT OFFICE.

JOHN FREDERICK SANDERS AND SARAH J. SANDERS, OF PORTLAND, OREGON.

ELECTRIC-ARC LAMP.

SPECIFICATION forming part of Letters Patent No. 496,702, dated May 2, 1893.

Application filed June 15, 1892. Serial No. 436,831. (No model.)

To all whom it may concern:

Be it known that we, JOHN FREDERICK SANDERS and SARAH J. SANDERS, citizens of the United States, residing at Portland, Multnomah county, State of Oregon, have invented an Improvement in Electric-Light Lamps; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to that class of electric light lamps in which the carbons are held in actual and constant contact, and it consists in the novel construction, combinations and arrangement of parts hereinafter fully described and specifically pointed out in the claims.

The object of our invention is to provide a lamp of simple and effective construction adapted to maintain the contact of the carbons accurately, and with the required pressure.

Referring to the accompanying drawings for a more complete explanation of our invention,—Figure 1 is a vertical section of our lamp. Fig. 2 is an enlarged vertical section of the upper portion. Fig. 3 is a plan of friction drum K and controlling devices. Fig. 4 is a cross section on line *x*—*x* of Fig. 2. Fig. 5 is an elevation showing the connection of frame side A to casing C.

A is the frame of the lamp consisting of metallic side pieces suitably ornamented, each of said pieces having at top and bottom the foot plates *a* by which they are connected with the other portions of the lamp. The frame is adapted to be suspended in any suitable manner, as by cords or cables B.

In the upper portion of the lamp is a tubular casing C to which the foot plates *a* of the frame sides are secured. This tubular casing is made of any suitable material which is a non-conductor of electricity, as, for example, wood or ebonite. A similar casing C′ is situated at the lower end of the lamp. To the lower end of the upper tubular casing C is screwed a nut *c* between which and a shoulder *c*′ on the upper end of the lower tubular casing is located a globe D, being held thereto by the adjustment of the nut *c* tightening it to place.

Within the upper tubular casing C is a sleeve E in which is carried the stationary guide clamp F for the upper carbon. This clamp consists of a suitable number of spring arms, the lower ends of which project below the sleeve and their extremities are inwardly bent to rest upon and clamp the carbon, serving as a guide therefor, and a means for steadying and holding it in accurate contact with the lower carbon. Inside of the arms of this clamp and extending downwardly nearly to its lower end, is a guide tube G within which is mounted and adapted to slide the carbon-holder H. This carbon-holder consists of a short piece provided with spring arms or a spiral spring adapted to grasp the upper end of the carbon. It is constantly fed downwardly by a spring I seated in the guide tube G and bearing with its lower end on the holder H, and with its upper end against a perforated metallic plate *i* on the top of the tubular casing C, and to which the tube G is attached. The tension of this spring is regulated and controlled by a cord or cable J, the lower end of which is attached to the holder H, and the upper end passes through plate *i* and around a friction drum K, the ends of which have bearing upon them the friction springs *k* acting as brakes, the power of said springs being regulated by a cross-bar *l* operated by a screw L. By turning this screw the cross-bar pulls up on the springs *k* causing them to bind with greater friction upon the ends of the friction drum K and thereby controlling through the cord or cable J the power of the main feed spring I in forcing the holder H downwardly. The friction drums K K′ and the brake springs are carried by the plates *i i*′ as shown.

M is the upper carbon secured at its upper end in the holder H and guided near its lower end by extremities of the guide clamp F.

The construction in the lower portion of the lamp is similar to that heretofore described, and the several parts are designated as follows:—E′ is the sleeve. F′ is a guide clamp. G′ is the guide tube. H′ is the holder for the lower carbon. I′ is the feed spring. *i*′ is the perforated metallic plate. J′ is the cord or cable. K′ is the friction drum. *k*′ the friction springs. *l*′ the cross-bar and L′ the operating screw. M′ is the lower carbon. Screwed to the upper end of the tubular casing C is a cap N having within its top a valve controlled port *n* to the exterior air. Screwed

to the lower end of the lower tubular casing C′ is a cap N′. It will be seen from this construction that the meeting ends or points of the carbons M and M′ are held constantly in positive and actual contact, and are accurately guided and steadied by clamps F and F′.

The feed springs I and I′ continually force them together, and in order to prevent too great a pressure between them, the cords or cables J and J′ are so regulated upon their friction drums as to allow the feeding springs to press them together only with the required force. A binding post a' is attached to one side of the frame A, and a similar post a^2 is attached to the other side of said frame. The foot plate a at the lower end of one side of the frame A comes in contact with a metallic conducting plate O′ on the side of the lower tubular casing C′, and said plate has its lower end in contact with the perforated metallic plate i' which is itself in contact with the metallic feed spring I′. The upper foot plate of the other side of the frame A is in contact with a metallic conducting plate O secured to the side of the upper tubular casing C, said plate being itself in contact with the perforated metallic plate i heretofore mentioned, and which is in contact with the metallic feed spring I. The current enters the lamp at the binding post a' and thence passes down through that side of the frame A through the conducting plate O′, metallic plate i', spring I′, holder H′, and lower carbon M′. It thence passes through the upper carbon M, holder H, spring I, plate i, conducting plate O, and the other side of frame A, and out from binding post a^2. When a globe such as D is used, the carbons will last a much longer time than when burned in the open air. This result is due to the formation and maintenance of a partial vacuum within the globe. The air in said globe being highly heated expands and much of it passes off through the hollow tubular casing C, cap N and out through the valve n. Not being able to return, it follows that a vacuum more or less complete is maintained in the globe and the carbons will burn much longer.

In order to remove and replace the carbons, the caps N N′ are removed, thus exposing the plates i i', and these being lifted or drawn away, all the attached parts come with them, namely, the friction drums and springs, the tubes G G′, feed springs I I′ and holders H H′.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an electric lamp, the combination of opposing sliding holders for the carbons, springs operating upon said holders for forcing them toward each other to feed and keep their carbons in actual contact, and the means for regulating the tension of said springs to cause them to press the holders together with the required force, consisting of the cords or cables secured to said holders and the friction drums to which said cords or cables are attached, substantially as herein described.

2. In an electric lamp, the combination of opposing sliding holders for the carbons, springs operating upon said holders for forcing them toward each other to feed and keep their carbons in actual contact, means for regulating the tension of said springs to cause them to press the holders together with the required force, consisting of the cords or cables secured to said holders and the friction drums to which said cords or cables are attached, the braking springs operating upon said drums to regulate their axial movement, and the adjusting screws for regulating the braking springs, substantially as herein described.

3. In an electric lamp, the combination of the frame sides A, the tubular casings C and C′, the spring armed guide clamps within said casings to hold the adjacent ends of the carbons, the sliding holders within said clamps for carrying the carbons, and the springs for forcing said holders toward each other, substantially as herein described.

4. In an electric lamp, the combination of the metallic frame sides A having foot plates a, the tubular casings C and C′ of non-conducting material and to which the foot plates are secured, the sliding holders within said casings for carrying the carbons, the springs for forcing said holders toward each other, the metallic plates i and i' in contact with said springs, and the conducting plates O and O′ in contact with said metallic plates and with the foot plates of the main frame, substantially as herein described.

5. In an electric lamp, the combination of the main frame, the tubular casings C C′ above and below carried by said frame, the sleeves E E′ within said casings, the guide clamps F F′ within the sleeves, the guide tubes G G′ within the clamps, the sliding carbon-holders H H′ within the tubes and the feed springs I I′ for forcing the holders toward each other to keep their carbons in constant and actual contact, substantially as herein described.

6. In an electric lamp, the combination of the frame, the casings carried thereby, the removable plates i i' on the casing ends, the guide tubes and feed springs secured to said plates, the carbon-holders carried by the springs, and the removable caps over the casing ends, substantially as herein described.

In witness whereof we have hereunto set our hands.

JOHN FREDERICK SANDERS.
SARAH J. SANDERS.

Witnesses:
WM. F. BOOTH,
HOLLAND SMITH.