

(No Model.)

2 Sheets—Sheet 1.

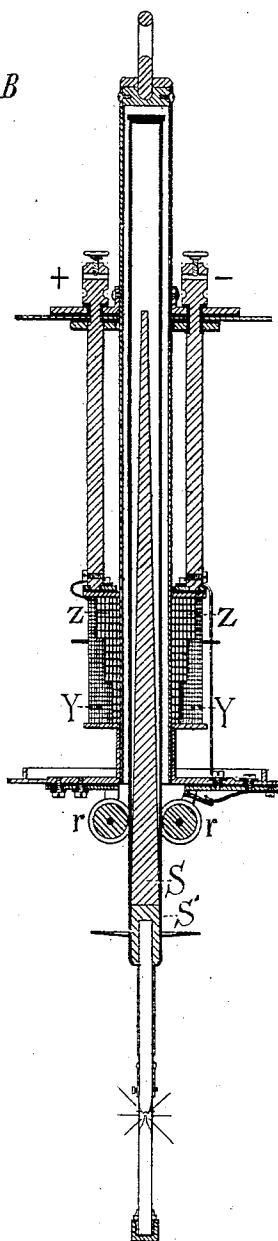
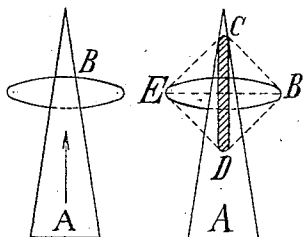
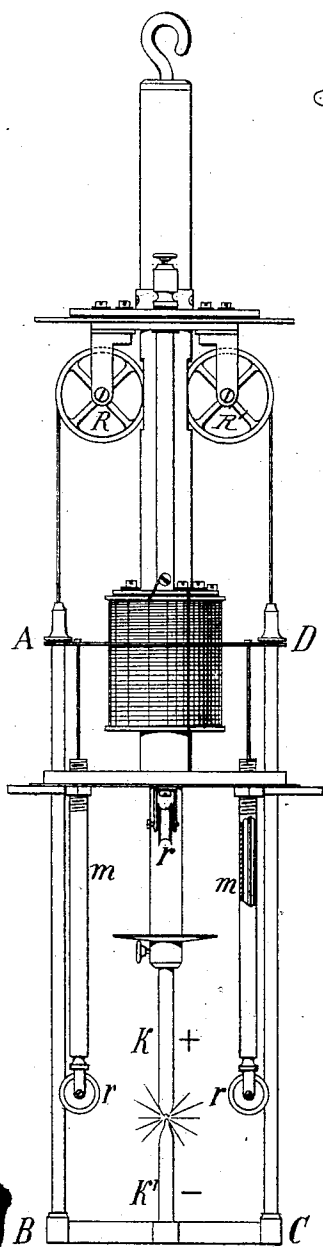
L. PIETTE & F. KRIZIK.

ELECTRIC LAMP.

No. 293,076.

Patented Feb. 5, 1884.

Fig. 3 Fig. 1 Fig. 2 Fig. 4



Witnesses.

Will D. Powell.
Thos. J. McGhee

Inventors—
Ludwig Piette
Franz Krizik

By Connolly Bros.
Attorneys

(No Model.)

L. PIETTE & F. KRIZIK.

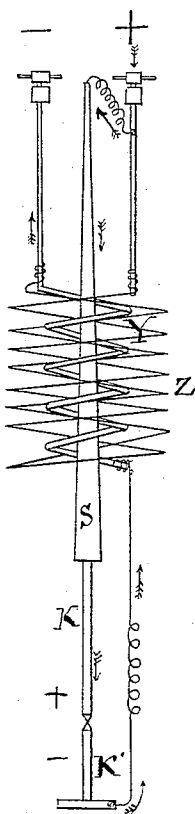
2 Sheets—Sheet 2.

ELECTRIC LAMP.

No. 293,076.

Patented Feb. 5, 1884.

Fig. 5



Witnesses.

Wm H. Powell

Jos. B. Corinally

Inventors.

Ludwig Piette

Franz Krizik

By Corinelly Bros
attys

UNITED STATES PATENT OFFICE.

LUDWIG PIETTE AND FRANZ KRIZIK, OF PILSEN, AUSTRIA-HUNGARY.

ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 293,076, dated February 5, 1884.

Application filed July 1, 1882. (No model.) Patented in Belgium June 6, 1882, No. 53,113; in France June 7, 1882, No. 149,433; in England June 9, 1882, No. 2,712, and in Germany June 11, 1882, No. 21,372.

To all whom it may concern:

Be it known that we, LUDWIG PIETTE and FRANZ KRIZIK, subjects of the Emperor of Austria-Hungary, and residents of Pilsen, in the Empire of Austria-Hungary, have invented a certain Improvement in Electric Lamps, of which the following is a specification.

This invention relates to an improved method of effecting automatically the regulation of the distance of the carbons in an electric lamp, without the aid of clock-work or other like mechanism, by the use of a solenoid or solenoids having a tapering iron core.

With reference to the accompanying drawings, Figures 1 and 2 illustrate the principle of the present invention, and Figs. 3 and 4 show an electric lamp constructed according to the present invention. Supposing the tapering or conical iron rod A to be surrounded by a current, B, and supposing the rod A to be free to slide lengthwise within this electric circuit, then the electric current would cause the said rod to move until the thick end is drawn within the said circuit, as in the thicker end there are more molecules to be attracted than in the pointed end. Supposing, as shown in Fig. 2, the limits of attraction of the electric circuit to be C D, then all the molecules lying between these limits will be attracted, and the rod will be moved lengthwise by a force proportionate to the variation in its thicknesses. If, instead of the simple circuit shown in Figs. 1 and 2, a solenoid-coil is used, the action will be increased. Figs. 3 and 4 show an electric-arc lamp, and Fig. 5 a diagram of the circuits thereof, constructed according to the invention, with a tapering iron core arranged within two solenoids, Z and Y, of a peculiar construction.

R R' are two pulleys, over which two cords run, carrying a brass tube containing the tapering iron core S. To the other ends of the cords the frame A B C D is attached, so that the iron core S and the frame A B C D nearly balance each other. The brass tube carries the upper positive carbon, while the frame A B C D carries the negative carbon. The weight of the frame A B C D is so regulated that it is somewhat less than that of the brass tube with the iron core, so that the latter will, by its overweight, have the tendency to keep the

carbons in contact until a current passes through the solenoid-coil.

For the purpose of guiding the brass tube, as well as the frame A B C D, in a straight direction, the rollers *r* are used. When a current circulates through the lamp, it can take the following course, viz: through the positive (+) terminal or post, pulleys R R', brass tube S', carbon K, voltaic-arc frame A B C D, guide-pulleys *r r*, into the whole framing of the lamp, isolated coil Z, of thick wire, to the negative (—) terminal or post. Almost the entire current takes this course, and has the tendency to raise the iron core S, and thus to separate the carbons. This takes place only when the attraction of the solenoid-coil is greater than the overweight of the iron rod S balancing the frame A B C D. When this is the case, the iron core is attracted until the weakening of the current, caused by the formation of the voltaic arc, reaches such a degree that the attractive force and the said overweight counterbalance each other. If, in the course of the consumption of the carbons, the current decreases still more in intensity, then the overweight of the rod S will overcome the attractive force of the coil Z, and if the difference is large enough to overcome the friction and the like, then the carbons will approach each other. In this manner these two forces constantly balance each other and regulate the proper distance of the two carbons from each other.

For the purpose of increasing the delicacy of the adjustment, the main solenoid-coil Z is covered by a second solenoid, Y, of high resistance, by which the effect of the first one is weakened, and that in the same ratio as the main current is weakened by the increase of the voltaic arc. These two solenoids Z and Y are not wound uniformly; but the number of layers is decreased stepwise, as represented in Fig. 4, in such a manner that the two solenoids together form a single cylinder. By this arrangement the object in view is attained in a better and more reliable manner than if the two solenoids were wound cylindrically.

The rods *m m*, carrying the guide-pulleys *r* for the frame A B C D, may be made hollow, and in this case mercury may be introduced into them, and by means of wires, which would have to be suitably fixed to the con-

necting-piece of the frame A B, a better conducting connection for the passage of the current from the frame A B C D to the framing of the lamp may be attained.

5 We claim—

1. In an electric-arc lamp, the combination, with the sliding solenoid-core S, of the solenoid-coils Y Z, wound one around the other, the convolutions in each coil gradually increasing toward one end, substantially as described.

10 2. In an electric-arc lamp, the combination,

with the solenoid-core S, of the coils Y and Z, wound one around the other, and tapered or graduated in opposite directions, as shown and 15 described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

LUDWIG PIETTE.

FRANZ KRIZIK.

Witnesses:

C. O. PAGET,

E. G. J. RODLER.