(No Model.)

C. SEEL.

ELECTRIC LAMP.

No. 359,328. Patented Mar. 15, 1887.

Fig. 1.

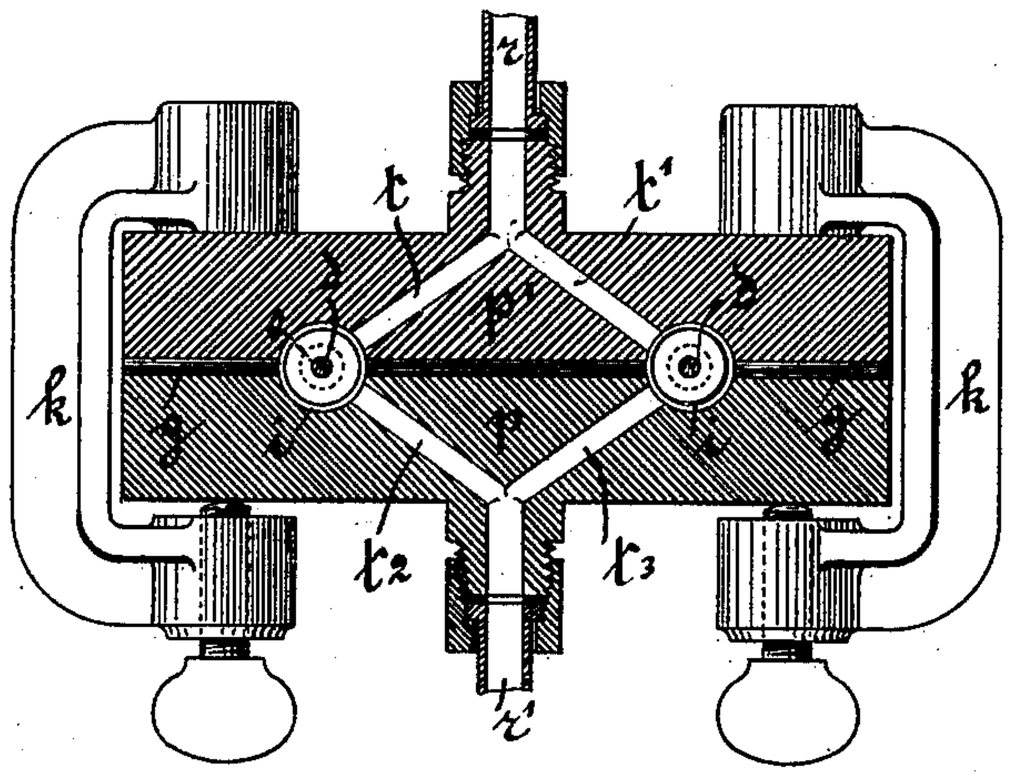
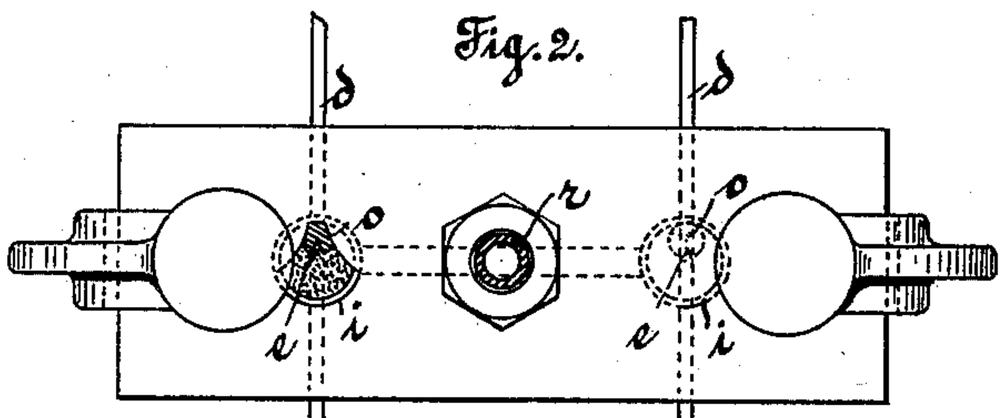


Fig. 2.



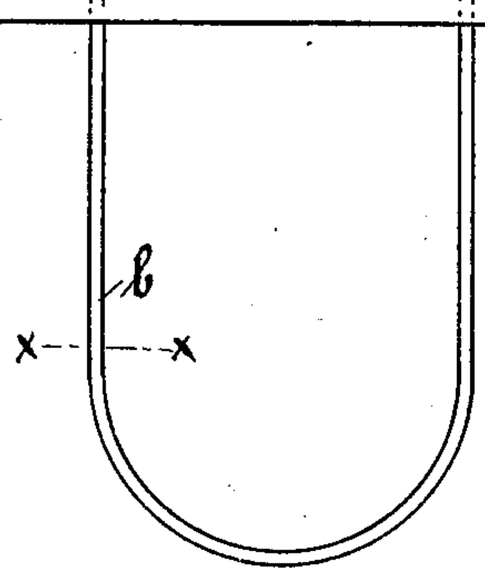


Fig. 4.

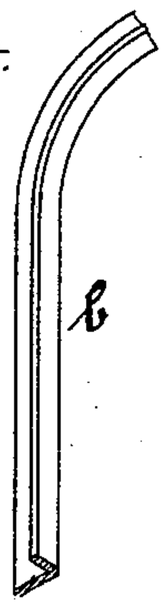


Fig. 5

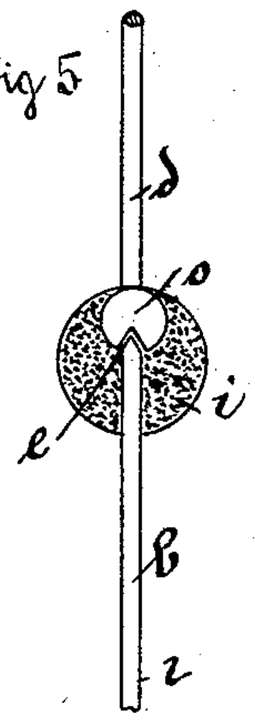


Fig. 3.

Witnesses.
Gabriel J. W. Galster.
K. M. Suffle.

Inventor
Carl Seel.
By Richardson
Attorneys

UNITED STATES PATENT OFFICE.

CARL SEEL, OF CHARLOTTENBURG, PRUSSIA, GERMANY.

ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 359,328, dated March 15, 1887.

Application filed January 11, 1886. Serial No. 188,179. (No model.)

To all whom it may concern:

Be it known that I, CARL SEEL, of Charlottenburg, Prussia, in the German Empire, have invented a new and useful Improvement in a Device for Joining Carbon Filaments to Conduit-Wires for Electric Lamps; and I hereby declare the following to be a full and clear description thereof.

This invention relates to a device for joining the carbon filaments to the conduit-wires of an electric lamp; and it consists of a globular attachment formed on or at the end of the conduit-wire with a V-shaped slot cut therein on the side to which the carbon filament is to be joined, and the said carbon filament is introduced into the said cut or slot, and held fast therein by a paste of graphite, after which the parts are fused together under a blow-pipe in the usual method. A suitable machine or apparatus is devised for performing this joining operation in the manner hereinafter fully described and set forth.

The invention will be readily understood by reference to the accompanying drawings, of which—

Figure 1 is a sectional elevation of the apparatus used for joining the carbon filaments to the conduit-wires. Fig. 2 is a plan of the said apparatus, showing a carbon filament and the conduit-wires coupled in the apparatus, as in the state of being joined. Fig. 3 is an enlarged view of a transverse section of the carbon filament, taken on the line *x x* of Fig. 2. Fig. 4 is a detailed elevation of a portion of the carbon filament, on an enlarged scale, the lower end of the filament in said figure showing the V-shaped construction of it. Fig. 5 is an enlarged view of the device for joining the filament to the conduit-wire.

The apparatus used for joining the conduit-wires and the carbon filaments consists of two metallic plates, *p* and *p'*, held together during the operation in which they are used by two clamp-plates or couplers, *k*, as shown in Figs. 1 and 2. Each of the said metallic plates *p* and *p'* has an india-rubber or other suitable cushion, *g*, on its joining face, as in Fig. 1, so as to join the two said pieces *p* and *p'* together air-tight. The adjacent parts of *p* and *p'* are chambered out, as at *i*, so as to form two globular chambers, as shown in Fig. 1, one-half of each of said chambers being in each piece, so that the molding-plates *p* and *p'* may be easily parted on the centers of said globular cavities for the purpose of removing the finished work, as hereinafter described. One of the said molding-plates has an air-outlet pipe, *r*, attached to its outside, from the inner end of which pipe ducts *t* and *t'* lead, respectively, to the two above-described globular chambers *i*. The other of said molding-plates in like manner has an inlet-pipe, *r'*, attached to it, and from the inner end of it two ducts, *t''* and *t'''*, respectively, lead to the aforesaid globular chambers *i*.

The machine thus constructed is ready for operation, and the wires *d*, of platinum or other metal, are inserted in the joints between the clamping-plates *p* and *p'*, the soft cushions *g* readily yielding an air-tight seat for them, and the inner ends of the said metallic wires, terminating, respectively, in globular-shaped projections *o*, as shown most clearly in Fig. 5, are placed in the aforesaid globular chambers *i*, as shown best in said Fig. 5. The contiguous ends of the carbon filament *b* are then inserted in the V-shaped recesses *e*, to which they are accurately fitted and joined. These carbon filaments are made in a V shape, as shown in Figs. 3 and 4, so as to give them a considerable degree of transverse strength.

After the parts shall all have been joined, as above described, an air-pump is applied to the tube *r* and the air is all exhausted from the chambers *i*, and all their connecting passages, pipes, or ducts, and then after a vacuum shall have been produced therein a mixture of graphite and albumen, or an equivalent compound—such as a mixture of albumen with the oxide of wolfram and graphite—is forced in through the pipe *r'* and the ducts *t''* and *t'''* to the chambers *i*, which are thus filled with the said compound in intimate contact with the conductors *b* and *d*, and this compound is then allowed to indurate, after which the clamps *k* are removed and the plates *p* and *p'* separated, when the joined wires *b* and *d* and their joining globes of carbon are easily removed from the matrix in which they were joined together, and the further fixing of the parts *b* and *d* together is further consummated or perfected by fusing these parts together under the blow-pipe in the usual manner.

The ducts or tubes *r*, *r'*, *t*, *t'*, *t''*, and *t'''* can

readily be cleaned after each operation by passing through them a flexible metallic needle or wire, as the material contained in them only hardens on exposure to the air.

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

1. An apparatus for joining the filaments of electrical carbons to the conduit-wires, consisting of a pair of matched metallic holding-plates held together by clamping-screws, and provided with chambered cavities in their contacting faces, adapted to receive and hold in contiguity the joining ends of the carbons and the conduit-wires, and provided with ducts leading to and from the said chambered cavities in which the carbons and wires are joined, so as to exhaust the air through one set of the ducts and through the other force a cementing compound into the chambers of the holding-plates and around the joined ends of the filaments and conduit-wires, so as to join the ends of the said filaments and conduit-wires together when they shall have been taken from the apparatus by the unclamping of the holding-plates, substantially as described and set forth.

2. A pair of clamping-plates, *p* and *p'*, held together by temporary screw-clamps *k*, and provided in the contacting faces with matched semi-globular cavities *i*, with ducts *r*, *r'*, *t*, *t'*, *t''*, and *t'''*, leading to and from the said cavities *i*, whereby the air may be exhausted therefrom, and a cementing compound forced into the said cavities and around the joining wires and filaments of electrical lamps, which said wires and filaments are passed between the said clamping-plates and joined in the chambers *i*, substantially as described and set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

CARL SEEL.

Witnesses:
GEOR. MÜHLNER,
B. ROI.