

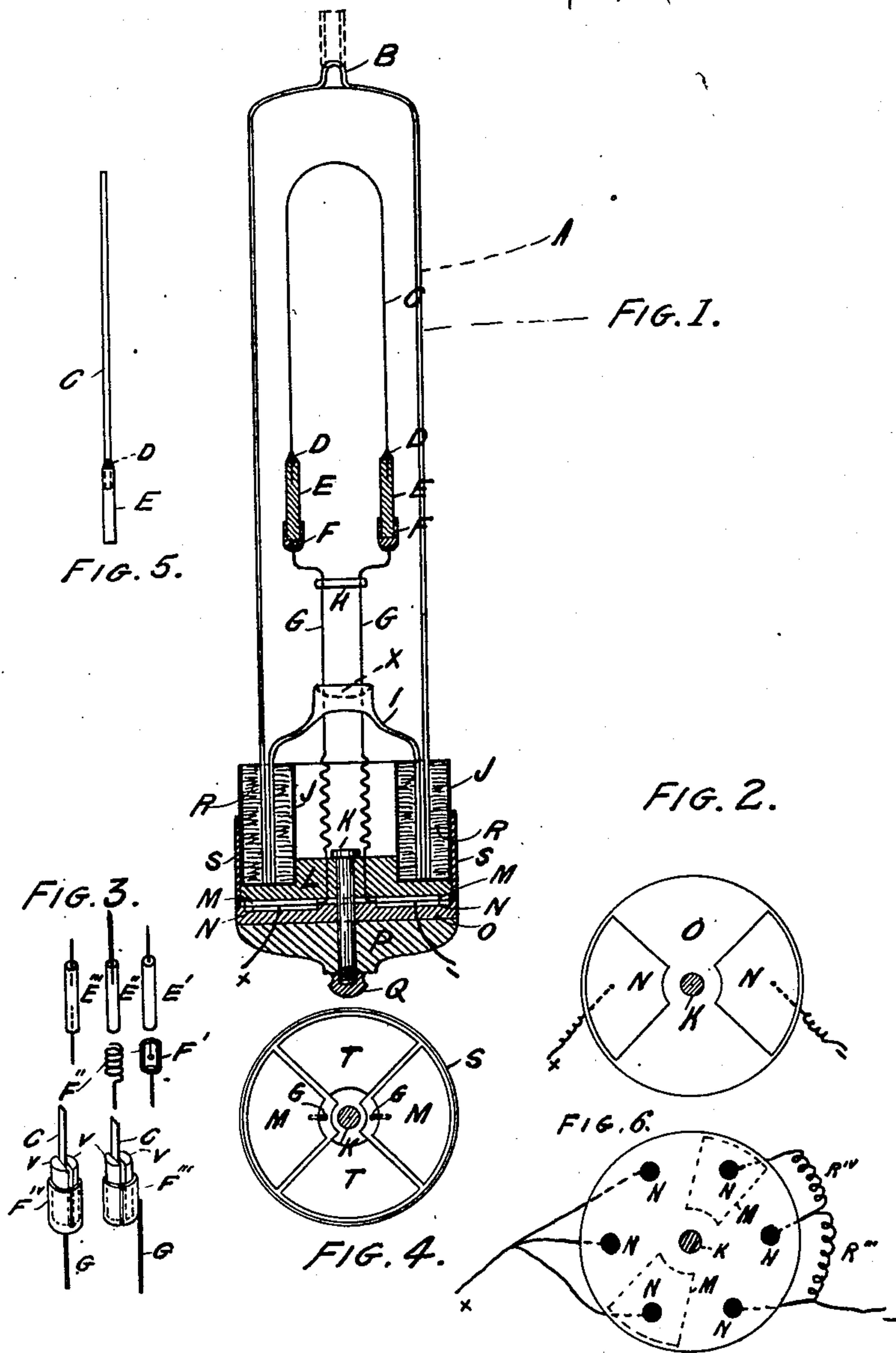
(No Model.)

E. R. KNOWLES.  
INCANDESCENT ELECTRIC LAMP.

No. 282,460.

Patented July 31, 1883.

174-65.5



WITNESSES.  
*B. H. Brooks*  
*J. C. Bull*

INVENTOR.  
*Edward R. Knowles.*



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# UNITED STATES PATENT OFFICE.

EDWARD R. KNOWLES, OF BROOKLYN, NEW YORK, ASSIGNOR OF ONE-HALF  
TO BYRON A. BROOKS, OF SAME PLACE.

## INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 282,460, dated July 31, 1883.

Application filed June 12, 1882. (No model.)

174-52,57

To all whom it may concern:

Be it known that I, EDWARD R. KNOWLES, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Incandescent Electric Lamps, of which the following is a description in such full, clear, concise, and exact terms as to enable any one skilled in the art to which it appertains or with which it is most nearly connected to make and use the same, reference being had to the accompanying drawings, making part of this specification, and to the figures and letters of reference marked thereon.

My invention consists of a novel means for sealing the illuminating-chamber of the lamp.

The construction and operation of the lamp is as follows: the points of novelty being designated by the claim concluding the specification:

Figure 1 is a vertical section through the lamp. The other figures indicate parts in detail, to be hereinafter referred to.

Like letters refer to like parts on all the figures.

The illuminating-chamber of the lamp is made of glass and is illustrated by A. The illuminating-conductor is made of carbon, and is shown by C. It is supported by small cylinders E, of carbon, into each of which a cavity is made of the desired form and depth to receive the ends of the burner, and into which is placed around the ends of the conductor a

cement composed of bichloride of platinum, platinum black or platinum sponge and sugar, or a mixture of india-ink and platinum, or platinum black or sponge and water or water-glass, all of which, when dry, form a good conductor of electricity and bind the illuminating-conductor firmly to the supporting-cylinders

E. The ends of the illuminating-conductors being fitted to the supporting-cylinders, as described, they are connected to the ends of the electrodes G by means of cups F, soldered to or formed upon the ends of the electrodes

in the manner shown. The ends of the electrodes being held in position by an insulating-brace, H, and to insure a perfect contact between the carbons E and cups F, the latter is slitted longitudinally and the ends of the carbon slipped in the cup, which, being made a little less in diameter than the carbon, grips

it firmly and forms a close contact and permanent connection between the two. The ends of the carbons may be coated with the cement above-mentioned, if necessary, to insure a more perfect contact.

Various modifications of making the connection and electrical contact between the illuminating-conductor and the electrodes are shown by Fig. 3. E''' shows the cylinder perforated at both ends, the end of the illuminating-conductor being connected in one and the electrode in the other. E'' shows the supporting-cylinder slitted and the end of the burner passed snugly in the slit. E' shows the cylinder perforated in the top end only, having the burner set in, as described. F' shows the cup slit longitudinally to receive the end of the cylinder, as described. F'' shows a spiral tube on the end of the electrode to receive the supporting-tube. F''' and F'' show the ends of the illuminating-conductors supported in divided pieces of carbon V V, set in cups connected to the electrodes, all of which are different forms of the same principle, and either of which will make a very good connection and electrical contact between the burner and the electrode and avoid the necessity of enlarging the connecting-ends of the burners.

In the construction of the lamp, before connecting the illuminating-conductors and electrodes as I have described, I make a cup, I, of glass, somewhat in the form of a cone, through the top of which I pass the electrodes, making a nipple or cavity, X, of glass, around the conductors on the top side of the inverted cup, by which to seal the electrodes air-tight, either by fusing the glass around them or by a cement sealing. After securing the electrodes in the cup I, I make a second cup, J, in the form of a cylindrical ring, and fill it with a suitable cement, R, into which cement I invert the cup I and press its sides down to the bottom of the cup J. I then take the illuminating-chamber of the lamp and insert it in the cement over the cup I and press its sides also down to the bottom of the cup J. Then, after allowing the cement time to set and harden, I exhaust the air through the tube B, which is then closed by fusing, the chamber being first charged with nitrogen gas unless it is intended to illuminate in vacuum. The lamp, having



been thus constructed, is set upon an insulating base-piece, L, against the bottom of which is fixed the metal sectors M, Fig. 4, between which, and insulated from them, the metal piece T is placed, and the conductors G are connected electrically to the sectors M. Now, to make the electrical connection between the lighting-circuit and the lamp, a fixture, P, is made and faced with an insulating-disk, O, into which the metal sectors N, Fig. 2, are set, to which the circuit-conductors + and -- are connected. The lamp is then set on this fixture and held by a pivot-bolt, K, secured at its lower end by a screw, Q. By these means the lamp is left free to turn about the pivot as a center and place the contacts N M in or out of circuit, as may be desired, to illuminate or extinguish the lamp. The contact-points M and N may consist of a series of metal points instead of single sectors,

by which the current can be gradually transferred from the circuit to the lamp, as shown by Fig. 6.

Having thus described my improved lamp, I claim as my invention—

In an incandescent electric lamp, the combination of an inclosing-chamber, A, an inverted cup, I, to support the electrodes, and in which they are hermetically sealed, and a sealing-cup, J, the end of the inclosing chamber and the inverted supporting-cup being both set in the sealing-cup and hermetically sealed therein with any suitable sealing material, substantially as herein described.

EDWARD R. KNOWLES.

Witnesses:

J. EDGAR BULL,  
B. A. BROOKS.