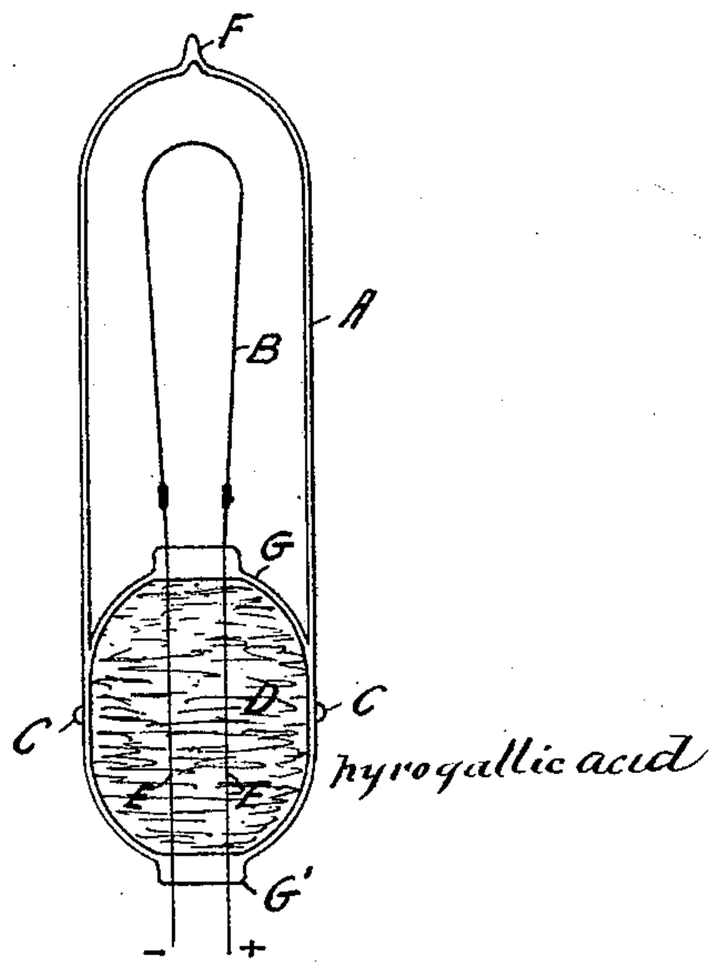
(No Model.)

E. R. KNOWLES & F. E. IDELL.

INCANDESCENT ELECTRIC LAMP.

No. 282,534. Patented Aug. 7, 1883.



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INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 282,534, dated August 7, 1883.

Application filed September 6, 1882. (No model.)

To all whom it may concern:

Be it known that we, EDWARD R. KNOWLES, of Brooklyn, in the county of Kings and State of New York, and FRANK E. IDELL, of Hoboken, county of Hudson, and State of New Jersey, have invented a new and useful Improvement in Incandescent Electric Lamps; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters and figures of reference marked thereon.

In electric lamps formed by sealing an incandescing conductor hermetically in a glass inclosing-globe there is danger that the glass and wire will separate at the point where the conducting-wires pass through and are sealed into the glass globe. This is due to the fact that the wires near the incandescing conductor become heated, and as their rate of expansion is somewhat greater than the glass in which they are sealed they tend to crack it. It is desirable to limit the danger from this source to a minimum, and the object of this invention is to accomplish this in a certain and economical way, at the same time producing a lamp whose appearance is not materially different from other lamps of its class. To do this we construct our lamp as follows, the features of novelty being designated in the claim concluding this specification.

The drawing shows a lamp involving our invention.

A is the glass inclosing-globe, formed with a tube at F for attachment to the exhausting apparatus. This globe is formed from a piece of straight tubing closed at the upper end and left open at the lower end. The conducting-wires E E, to which is attached the incandescing conductor B, are sealed into another piece of straight tube, G, which piece slides inside the tube A. The tube G is inserted a sufficient distance inside the tube A, and the two are fused together, as shown at C C, forming one tube. This lower part, D, is then filled with a non-conducting substance capable of absorbing oxygen, preferably pyrogallic acid, and is then drawn down and again fused to the conductors E E at G′, thus hermetically inclosing the oxygen-absorbing substance in D. The lamp is then exhausted and sealed at F. By this process the air left in the lower chamber, D, is rid of its oxygen by absorption, and should the sealing at G break there will be nothing of a character injurious to the incandescing conductor to pass into the bulb A. We prefer, however, not to exhaust the part A to a high vacuum, as this method involves a great deal of time and labor and is expensive, but rather to substitute for the air a gas in a highly attenuated state—such as nitrogen—which will not combine with the incandescing conductor. The lamps can be rid of their oxygen by this means much more readily and cheaply and more efficiently than by the high-exhaustion method. By making the lamp of this form and only exhausting the upper part we gain the point aimed at, and yet leave the lamp of the same external shape as if it were only a simple exhausted-bulb lamp. Of course the part A can be blown into a sphere or bulb form, if necessary.

We are aware that a lamp has been patented consisting of two hermetically-sealed bulbs, one above the other, and into which the conductors are fused; but in this lamp both bulbs are exhausted to a high vacuum, and to accomplish this it is necessary to make the lamp of a peculiar form, which in itself is objectionable, to say nothing of the difficulty and expense of producing and maintaining the lamp.

Having thus described our improvement in incandescent electric lamps, we claim and desire to secure by Letters Patent—

In an incandescent electric lamp, the combination of two separately-sealed chambers—viz., an illuminating and a sealing chamber, the illuminating-chamber having a vacuum, or being filled with an inert gas, and a sealing-chamber containing a non-conducting oxygen-absorbing substance, (such as pyrogallic acid,) substantially as described, for the purpose specified.

EDWARD R. KNOWLES.
FRANK E. IDELL.

Witnesses:
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J. EDGAR BULL.