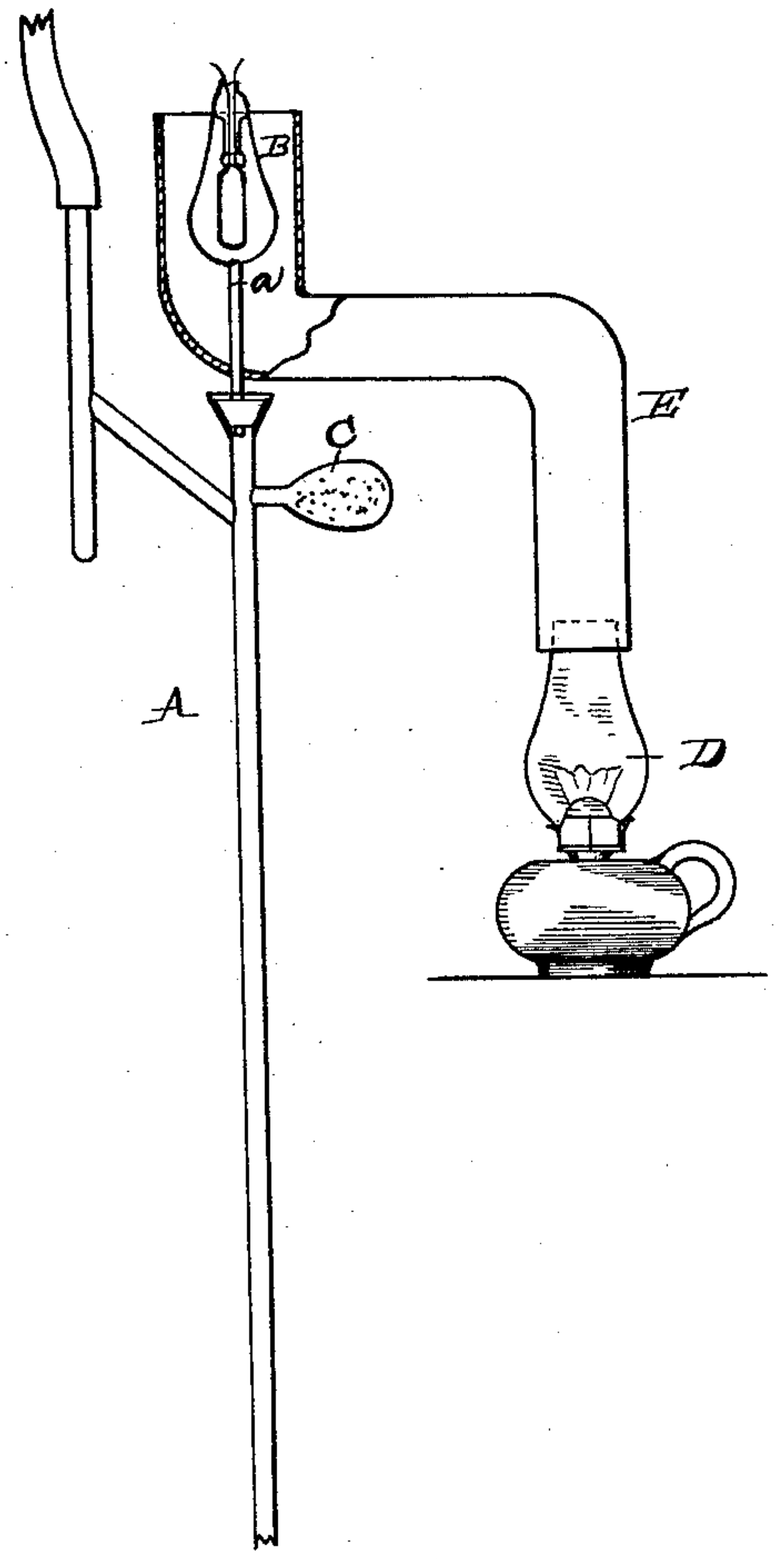
(No Model.)

T. A. EDISON.

MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

No. 411,018. Patented Sept. 17, 1889.



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UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF LLEWELLYN PARK, NEW JERSEY.

MANUFACTURE OF INCANDESCENT ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 411,018, dated September 17, 1889.

Application filed July 17, 1886. Serial No. 208,242. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Llewellyn Park, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Processes of Manufacturing Incandescent Electric Lamps, (Case No. 666,) of which the following is a specification.

The object of my invention is to simplify the process of exhausting the globes of incandescent electric lamps and to do away with danger of injury to the filament, which has sometimes occurred in the process heretofore followed.

Heretofore the lamp to be exhausted has been placed in connection with a Sprengel vacuum-pump, and during the operation of such pump the carbon filament has been heated to high incandescence by the passage of an electric current, the object of such heating being to expel from the carbon certain gases and vapors which were supposed to be "occluded" or contained in the pores of the carbon, such gases and vapors being then withdrawn by the pump. I have discovered that the amount of gases and vapors contained in the pores of the filament is so small as to be of practically no consequence in impairing the vacuum within the globe, and that the gases and vapors which were drawn off from the lamp by the heating of the filament came not from the filament, but in fact from the inner surface of the globe, to the glass of which they adhered until drawn off by heat. It was thus necessary to bring the filament up to a very high incandescence—higher than that at which it was intended to be used—in order to sufficiently heat the glass to drive off the adhering fluids. This high incandescence was of course in some cases dangerous to the filament, and also diminished the life of the lamp in use. By my invention I do away with this heating of the filament, and so avoid these dangers, and also do away with the expense and inconvenience of providing the power required to produce the current necessary for such heating.

My invention consists in heating the globe from an external source during the process of exhaustion. This heating may be accomplished in various ways. A convenient apparatus for the purpose is shown in the accompanying drawing.

A is a Sprengel vacuum-pump, to which the incandescent electric lamp B is attached in the usual manner.

C is a receptacle containing phosphoric anhydride or other absorbent of moisture.

D is a heating-lamp burning oil or alcohol. From its chimney a metal tube or chamber E extends, which surrounds the electric lamp B, such tube having a hole for the exhaust-tube of the lamp. Through this tube the heat from the flame passes up around the electric-lamp globe, and such globe is thereby heated until the adhering gases and vapors are driven off from the glass and are withdrawn through the pump or absorbed by the substance in bulb C.

After the lamp is exhausted it is sealed off at *a*, and is then ready for use.

What I claim is—

1. The herein-described process of manufacturing incandescent electric lamps, consisting in externally heating the lamp-globe during the process of exhaustion.

2. The herein-described process of manufacturing incandescent electric lamps, consisting in exhausting the globe by a Sprengel vacuum-pump and at the same time heating such globe externally.

3. The herein-described process of manufacturing incandescent electric lamps, consisting in heating the lamp-globe by a current of heated air or gas during the process of exhaustion.

This specification signed and witnessed this 15th day of July, 1886.

THOS. A. EDISON.

Witnesses:
WM. PELZER,
A. W. KIDDLE.