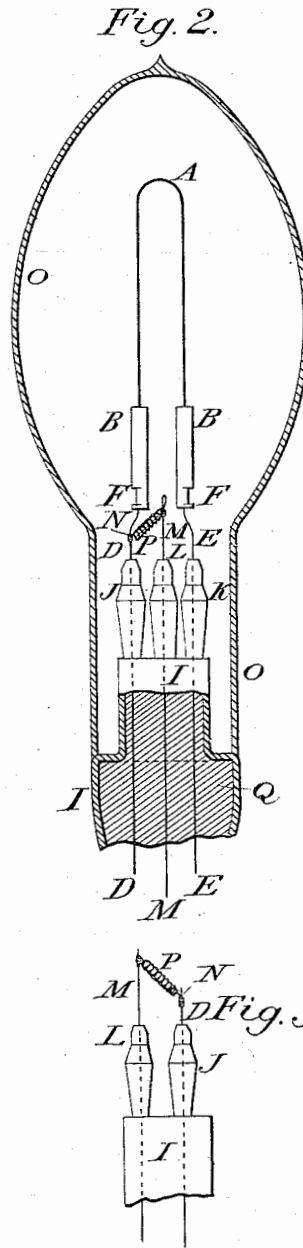
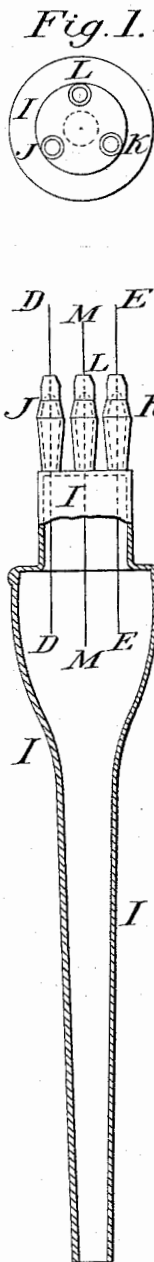


(No Model.)

D. G. FITZ GERALD.  
INCANDESCENT ELECTRIC LAMP.

No. 286,916.

Patented Oct. 16, 1883.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

DESMOND GERALD FITZ-GERALD, OF BRIXTON, COUNTY OF SURREY,  
ENGLAND.

## INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 286,916, dated October 16, 1883.

Application filed April 18, 1883. (No model.) Patented in England September 8, 1881, No. 3,890; in France March 8, 1882, No. 147,798, and in Belgium March 10, 1882, No. 57,317.

*To all whom it may concern:*

Be it known that I, DESMOND GERALD FITZ-GERALD, of Brixton, in the county of Surrey, England, have invented a new and useful Improvement in the Means for Production of a Vacuum in Electric Incandescence Lamps; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention has for its object to produce a more complete vacuum in electric incandescence lamps by effecting the removal of residual oxygen, and, in some cases, residual nitrogen. To this end I employ a supplementary carbon filament, or a wire which may itself be made of oxidizable metal—such as iron or zinc—or be covered with an oxidizable metal—such as magnesium or other suitable substance placed within the bulb—and capable of being temporarily thrown into circuit, so that by the passage of the current, after more or less complete exhaustion by the pump, the carbon filament or oxidizable wire will be heated, and thereby effect the absorption of the residual oxygen, and when magnesium is employed the residual nitrogen contained in the bulb.

The invention is illustrated in the accompanying drawings, in which Figure 1 represents a plan and sectional side view of the neck of a lamp provided with an additional conductor. Fig. 2 is a section of a complete lamp, and Fig. 3 is a detail view of the extra or supplemental filament mounted upon its conductors.

D and E are the usual wire conductors, carrying the light-giving filament A. Into the neck of the lamp I introduce another conducting-wire, M, and upon this wire and one of the other conducting-wires, D, is mounted the supplemental filament N. By means of the conductors D and M a current may be passed through the filament N without going through the light-giving filament A. This extra filament N may be formed either of an oxidizable metal—such as iron or zinc—in which case, when sufficiently heated, it effects directly the abstraction of oxygen, or it may be of unoxidizable metal—such as platinum—in which case it may be utilized for raising the temperature of the atmosphere within the glass vessel during the process of exhaustion,

and also for heating an oxidizable metal—such as magnesium or other suitable oxidizable substance placed in contact with the wire— and by means of which the abstraction of oxygen or other gaseous body may be completely effected. Of these methods I prefer to use iron wire surrounded by a ribbon of magnesium, as shown at P. The length of the iron wire should not exceed one and one-half inch, and the magnesium ribbon may be three-fourths of an inch long. While the lamp is under the action of the mercury-pump, a current is passed through the filament N of sufficient strength to produce a low red heat, and at the same time external heat may be applied to prevent any of the magnesia formed from cracking the glass should it fall away from the heated wire. When the magnesium has absorbed all the residual oxygen, the connections are shifted to the two main conductors D E, and the carbon filament A is raised to the required temperature, thus driving out any secluded gases, which will be carried away by the air-pump. The supplemental filament may be again heated and caused to absorb any trace of oxygen that may have been left, and also, as it would appear, some portion of the nitrogen.

What I claim as new is—

1. In an electric lamp having main-wire terminals and a light-giving filament, an additional or supplemental filament and an independent electrical conductor for absorbing the oxygen, as described.

2. In an electric lamp having main-wire terminals and a light-giving filament, a supplemental filament and an independent electrical conductor, the said supplemental filament being formed of or provided with a material readily oxidized, as and for the purpose set forth.

The foregoing specification of my invention for improvement in electric incandescence lamps signed by me this 14th day of March, A. D. 1883.

DESMOND G. FITZ-GERALD.

Witnesses:

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