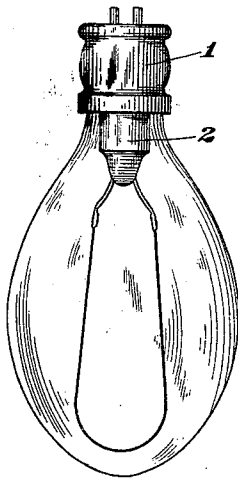


(No Model.)

F. S. SMITH.
INCANDESCENT ELECTRIC LAMP.

No. 519,099.

Patented May 1, 1894.



WITNESSES:

Chas F. Cox
Alman W. Wirt

F. S. Smith INVENTOR

BY *Terry & Mackay*

ATTORNEY ✓

UNITED STATES PATENT OFFICE.

FRANK S. SMITH, OF PITTSBURG, PENNSYLVANIA.

INCANDESCENT ELECTRIC LAMP.

SPECIFICATION forming part of Letters Patent No. 519,099, dated May 1, 1894.

Application filed November 29, 1892. Serial No. 453,552. (No model.)

To all whom it may concern:

Be it known that I, FRANK S. SMITH, a citizen of the United States, residing in Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Incandescent Electric Lamps, (Case No. 517,) of which the following is a specification.

My invention relates to that class of incandescent electric lamps wherein the leading in wires are made of iron preferably covered with a vitreous enamel. Said invention has particular reference to lamps of this class wherein the globe has an opening which is closed by means of a stopper.

The object of my invention is to supply a form of glass adapted for the part of a lamp surrounding the leading in wires, the coefficient of expansion of which is as nearly as possible equal to that of the iron wires, and which is adapted to unite with and absorb any oxide forming on the surface of the iron. These are important factors in the preservation of the seal. The elements and proportions employed by me in the manufacture of glass for this purpose are as follows, the proportions given being approximate. It is, of course, to be understood that I do not limit myself to the exact proportions named: silica (SiO_2), fifty per cent.; boracic acid (B_2O_3), 5.2 per cent.; sodium oxide (Na_2O), 13.2 per cent.; barium oxide (BaO), 26.4 per cent.; zinc oxide (ZnO), 5.2 per cent.

As above stated, the percentages here given are those which I have found best suited to my purpose, but a considerable variation in these percentages is allowed. I may, for instance, vary the percentage of silica from fifty to sixty per cent.; that of boracic acid from three and a half to six per cent.; sodium oxide from ten to twenty; barium oxide from twenty to thirty; zinc oxide from five to six per cent.

My invention is illustrated in the accompanying drawing which is an elevation of a preferred form of lamp made of my composition, 45 in whole or in part.

I can either make the whole lamp of this composition or the neck 1 of an ordinary lamp in which iron leading-in wires are employed may be alone made of this particular glass. 50

In those lamps wherein the globe is closed by a stopper through which the wires pass as shown in the figure, I prefer to make the stopper 2 alone of this composition. This glass is best used in connection with iron wires which have been covered with a vitreous enamel before the glass is molded around them. Any fluxing enamel may be found useful in this connection. 55

What I claim is—

1. In an incandescent lamp, a glass globe and leading in wires, the glass around the wires having substantially the following composition:—silica, fifty to sixty per cent., boracic acid, three and a half to six per cent., sodium oxide, ten to twenty per cent., barium oxide, thirty to forty per cent., zinc oxide, five to six per cent. 60

2. In an incandescent lamp, a bulb having an open neck, a stopper fitting said neck and leading-in wires molded into said stopper; said stopper having substantially the following composition:—silica, fifty to sixty per cent., boracic acid, three and a half to six per cent., sodium oxide, ten to twenty per cent., barium oxide, thirty to forty per cent., zinc oxide, five to six per cent. 70

In testimony whereof I have hereunto subscribed my name this 10th day of October, A. D. 1892. 75

FRANK S. SMITH.

Witnesses:

JAMES WM. SMITH,
HAROLD S. MACKAYE.