

No. 654,207.

Patented July 24, 1900.

S. D. WASHBURN & C. H. TINKHAM.
INCANDESCENT LAMP.

(Application filed June 25, 1898.)

(No Model.)

Fig. 1.

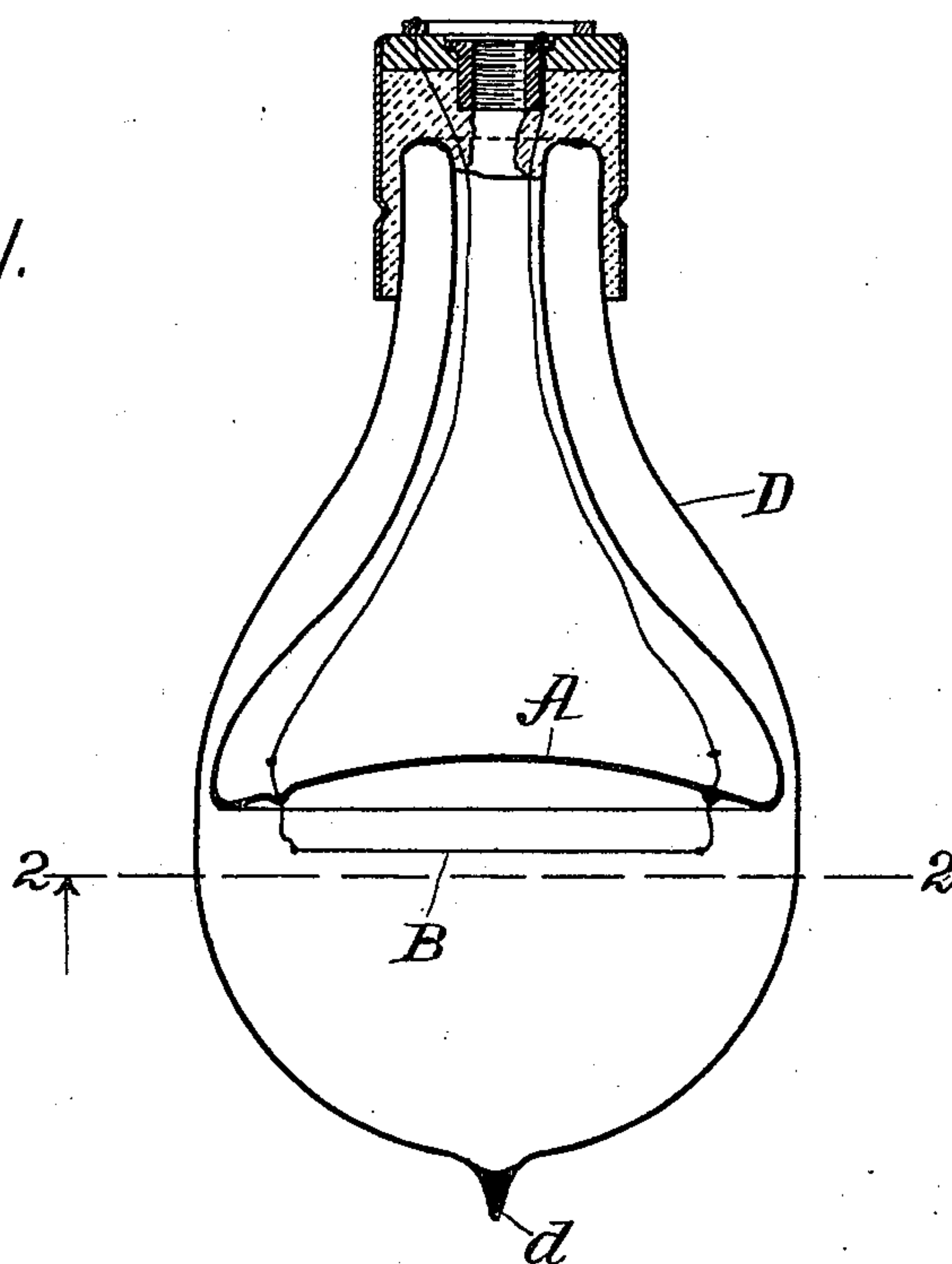
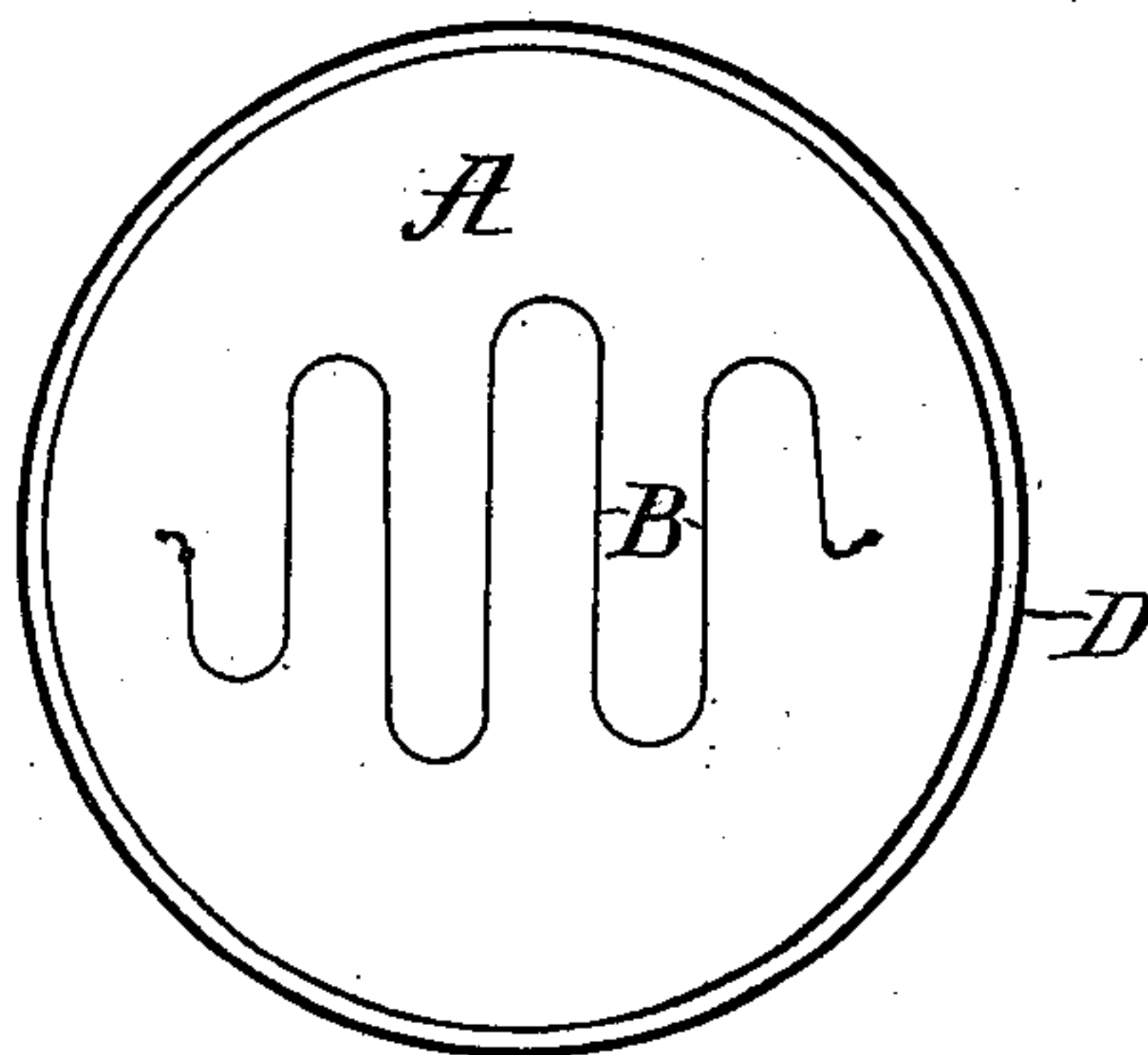


Fig. 2.



Witnesses:

H. P. Guillo.

Wm. Maynard

Inventor:

Samuel D. Washburn
Clarence H. Tinkham
by their attorney
J. E. Maynard

UNITED STATES PATENT OFFICE.

SAMUEL DEXTER WASHBURN, OF BOSTON, AND CLARENCE HERBERT TINKHAM, OF CAMBRIDGE, MASSACHUSETTS.

INCANDESCENT LAMP.

SPECIFICATION forming part of Letters Patent No. 654,207, dated July 24, 1900.

Application filed June 25, 1898. Serial No. 684,456. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL DEXTER WASHBURN, of Boston, in the county of Suffolk, and CLARENCE HERBERT TINKHAM, of Cambridge, in the county of Middlesex, in the State of Massachusetts, have invented a new and useful Incandescent Lamp, of which the following is a description, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional elevation, and Fig. 2 a cross-section on line 2 2 of Fig. 1, of the best form of our new lamp.

Our invention is an incandescent electric lamp composed of the usual glass bulb, the usual glass tube for the leading-in wires, and a disk-shaped mirror extending across but separate from the bulb and supported by the glass tube sealed at its outer end to the neck of the bulb, through which tube and the disk-shaped mirror the leading-in wires extend and connect with the ends of the filament.

The best way now known to us for manufacturing our lamps is to make the mirror A as a glass vessel with a broad base and a neck, the base when silvered constituting a concave mirror. In this glass vessel A the terminals of the filament B are sealed, as will be well understood by all skilled in the art, and the neck of the vessel A is then united with the mouth of the bulb D by contracting it when at the proper heat about the neck of vessel A, also properly heated, as will be well understood by glass-workers. In this way a bulb is obtained like that shown in the drawings, but containing a sheet of glass across it, one surface of which can be silvered by pouring in the proper solution (well known to all skilled in the art) through the neck of the vessel A. The bulb is exhausted and sealed at *d* in the usual manner and is then in all material respects an ordinary incandescent lamp, except for the sheet of glass across it, which preferably is not silvered until after the lamp is ready for the lighting-current, but may of course be silvered at any time after the vessel A is united with the bulb D, for the heat necessary in sealing the bulb at *d* is not sufficient to injure the mirror. Of course one or both of the terminals of the fila-

ment must be insulated from the silvering-film to prevent that film from acting as a shunt-conductor.

We have found it essential for the best results to make the mirror concave, substantially as shown in the drawings, and to use a sinuous filament substantially of the form shown in the drawings in a plane which is approximately parallel with the concave surface of the mirror, for by this arrangement the rays from that portion of the filament nearest the mirror and which but for the mirror would be dispersed so as to be of little practical use are reflected by the mirror and made to reinforce those rays which proceed from that portion of the filament farthest from the mirror, thereby greatly increasing the practical lighting of the lamp.

We are aware of patents to Welsh, No. 299,885, dated June 3, 1884; to Weaver and Manypenny, No. 476,501, dated June 7, 1892, and to Wilkins, No. 467,270, dated January 19, 1892, and disclaim all that is shown in them. While a disk-shaped mirror is shown in Patent No. 299,885, it is sealed around its periphery to the walls of the bulb, and we have discovered that the mirror when disk-shaped must for the best results be wholly within the bulb and be supported by the usual glass tube connected by its outer end with the neck only of the bulb. The mirrors in Patents Nos. 476,501 and 467,270, while wholly within the bulb, extend axially of the bulb and tend rather to disperse the rays from the incandescent filament than to prevent dispersion.

What we claim as our invention is—

The improved incandescent lamp above described comprising an exhausted bulb; a disk-shaped mirror extending across but separate from the bulb; a glass tube with its outer end sealed in the neck of the bulb supporting the mirror; and leading-in wires extending through the glass tube and the mirror and connected to the filament.

SAML. DEXTER WASHBURN.

CLARENCE HERBERT TINKHAM.

Witnesses:

J. E. MAYNADIER,
JOHN R. SNOW.