

(No Model.)

H. D. BURNETT & S. E. DOANE.
SEAL FOR LEADING IN WIRES.

No. 475,998.

Patented May 31, 1892.

FIG. 1.

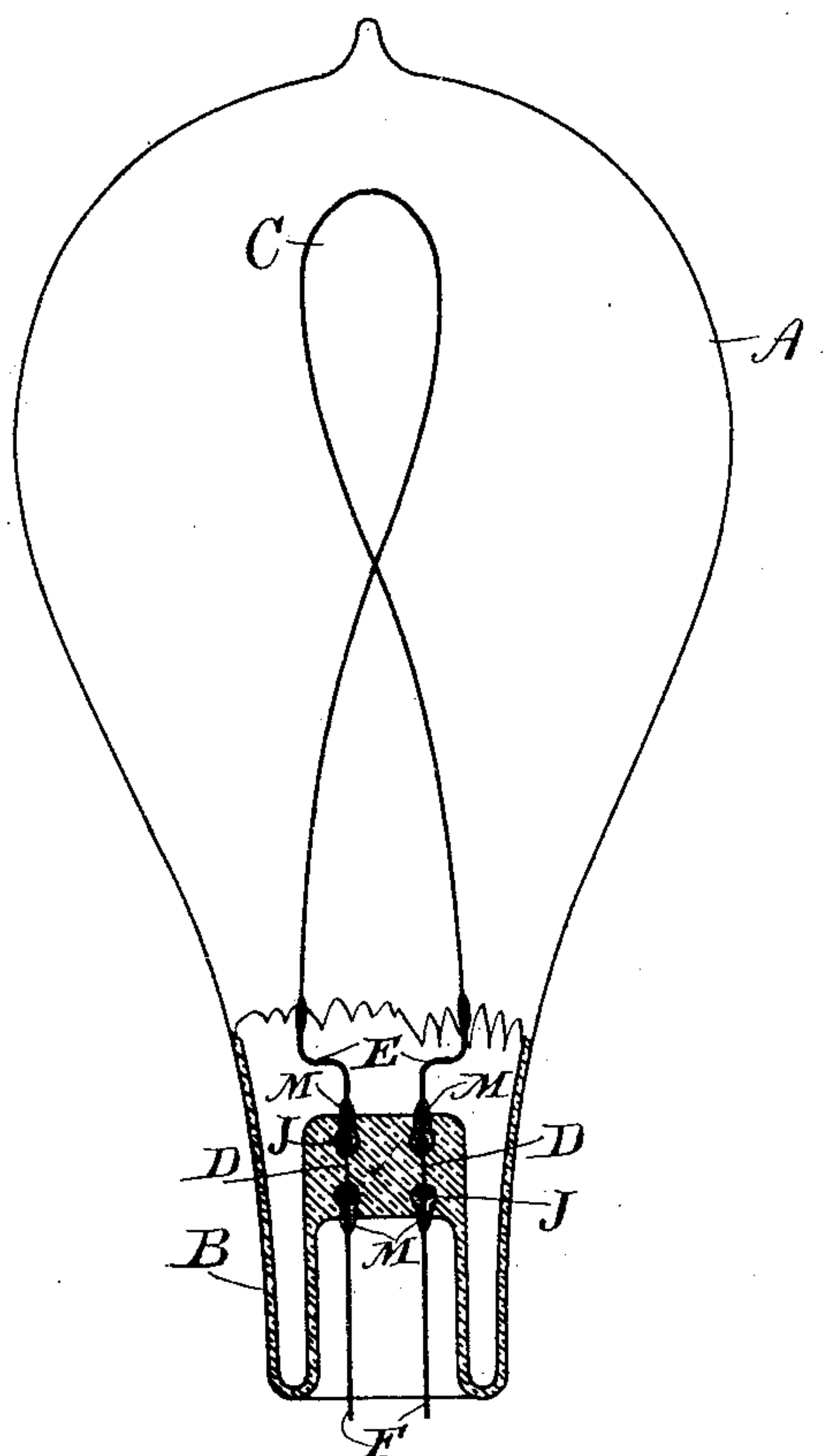


FIG. 2.

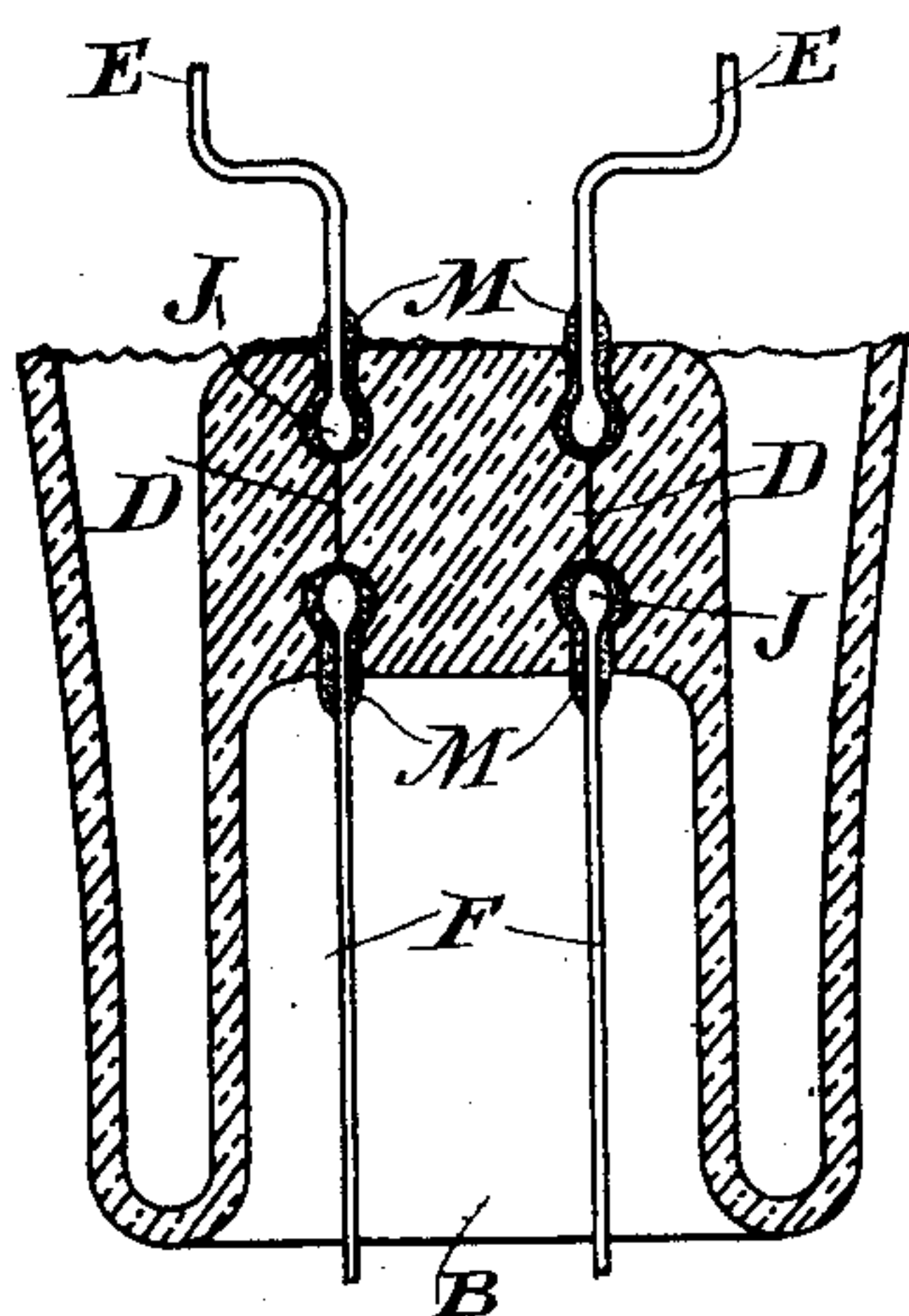
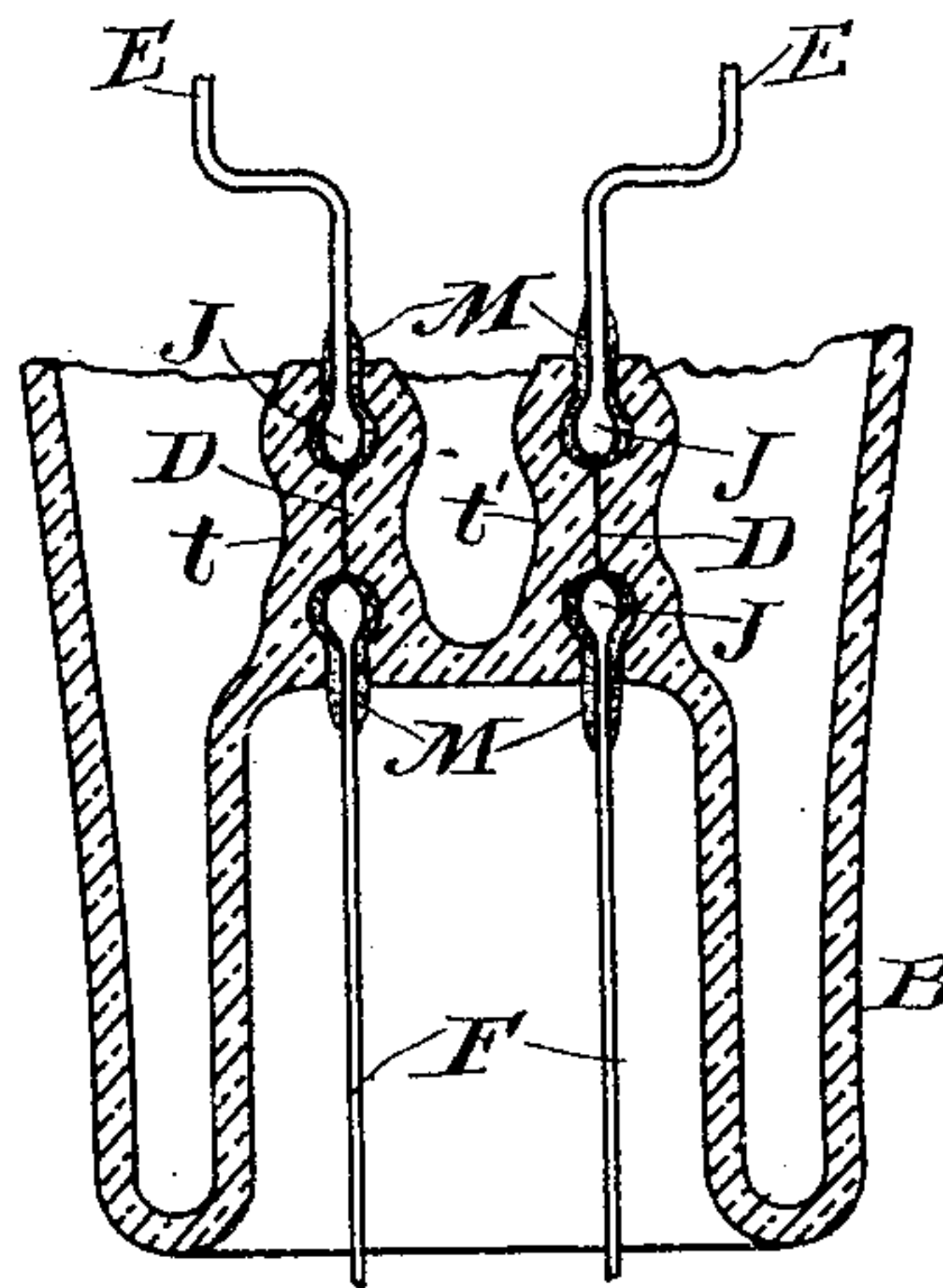


FIG. 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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SEAL FOR LEADING-IN WIRES.

SPECIFICATION forming part of Letters Patent No. 475,998, dated May 31, 1892.

Application filed March 7, 1892. Serial No. 423,973. (No model.)

To all whom it may concern:

Be it known that we, HENRY D. BURNETT, residing at Lynn, and SAMUEL E. DOANE, residing at Swampscott, in the county of Essex, State of Massachusetts, citizens of the United States, have invented certain new and useful Improvements in Seals for Leading-In Wires, of which the following is a specification.

This invention relates to seals for leading-in wires for incandescent electric lamps; and the object of the invention is to enable very thin and fragile sealing-wires to be used, while obviating the danger of breakage of them at or near the point where they leave the glass or where they are joined to the larger and stouter connecting-wires. The platinum wire sealed through the glass is made as thin as possible, in order to use no more platinum than is absolutely necessary. The extent to which its diameter can be reduced is only limited in using our invention by the condition that it must convey the working current without excessive heating, and it has been found in practice that before this limit is reached the platinum wire becomes so small as to be incapable of supporting the filament or withstanding the other mechanical strains to which it is subjected. On this account the glass seal has been made to cover not only the said platinum wire, but also the joints whereby it is secured to the stronger connecting-wires, which are thus supported directly from the glass. The seal thus formed is, however, very apt to be imperfect or to be soon injured in use on account of the joint and the stout copper connecting-wire failing to seal well into the glass or to crack the glass at the point of sealing on account of unequal expansion of the glass, joint, and wire.

Our invention consists in interposing between the glass and the joint or generally in applying to the conductor near the point where it leaves the glass a layer or support of a material which will yield sufficiently on expansion or contraction of the parts to prevent cracking, but which will be firm enough to give a support to the connecting-wire sufficient to withstand the strains to which it is subjected. This material should also be suf-

ficiently refractory to enable it to stand the heat of sealing without fusion, for in order to be yielding it must be non-vitreous and of such a character that it will not unite with the glass during the sealing operation. The material we prefer to use for this purpose is asbestos.

In the accompanying drawings, Figure 1 is an elevation of an incandescent electric lamp, showing in section the neck thereof with the wires sealed therein according to our invention. Fig. 2 shows the neck and seals on a larger scale, and Fig. 3 shows a modified form of seal.

A represents the globe of an incandescent lamp, B the neck, and C the filament. Connection through the glass of the neck is made by fine platinum wires D, which are secured to conductors E, leading to the filament, and to external conductors F by joints J. The platinum wires extend entirely through the glass, and the joints are therefore outside of the glass, but preferably in close proximity thereto. The yielding or elastic material M, preferably asbestos or asbestos paste, is applied to the joints J or to the conductors E or F in proximity to the joint and is supported by the glass of the neck in some suitable manner. It is preferred to extend the glass up around the joint and neighboring portions of the conductor, leaving a space between the glass and the joint, and in this space is placed the asbestos M.

In practice the asbestos is generally applied to the joint before the wires are mounted, and the wires are then baked at a temperature sufficient to drive off all volatile matter. A thin coating or glazing may be applied to the platinum wire before putting on the asbestos covering, so as to facilitate intimate union of the wire and glass. The wires, with their joints and the neighboring parts coated with asbestos, are placed in the neck and sealed therein in the manner usual in those lamps wherein the glass is made to extend around the joint. The layer of asbestos, however, prevents the glass from coming in contact with the joint of the larger conductor and forms a yielding or elastic

support therefor. In making the seal shown in Fig. 2 the two wires are inserted in a comparatively wide glass tube, the end of which is then closed and sealed on the wires either
 5 by being fused and pressed down thereon or by the application of an additional mass of fused glass. If the teat-seal shown in Fig. 3 is desired, the wires are sealed into separate glass tubes t t' , which extend up over the
 10 joints and are preferably firmly compressed, while softened by heat, upon the asbestos covering M or by any of the other well-known existing methods.

What we claim as new, and desire to secure
 15 by Letters Patent, is—

1. An incandescent electric lamp having a leading-in conductor sealed in the glass of the inclosing globe and a yielding support for said leading-in conductor near the point where
 20 it enters the glass.

2. An incandescent electric lamp having a leading-in conductor, with a smaller portion sealed in the glass of the inclosing globe and a larger portion joined thereto, and a yield-
 25 ing support for said larger portion independent of said smaller portion.

3. An incandescent electric lamp having a leading-in conductor sealed in the glass of the lamp-globe, a portion of the glass extending
 30 beyond the point of sealing therein, and a layer of yielding material interposed between the glass extension and the conductor.

4. An incandescent electric lamp having a leading-in conductor sealed in the glass of the
 35 lamp, the glass being formed with a space around the conductor near where it enters

the glass, and a yielding filling material in said space.

5. The combination, in a seal for leading-in conductors, of a smaller conductor, a larger
 40 conductor joined thereto, a glass body having the smaller conductor sealed therein and having a space around the joint of said conductors, and a filling of yielding material in said space.

6. The combination, in a seal for leading-in conductors, of the glass body, the small conductor sealed in and passing through the glass, the large conductor joined thereto, the glass body having a space around the joint,
 50 and an asbestos or equivalent filling material in said space.

7. The method of sealing leading-in conductors, which consists in applying a coating of refractory and yielding material to a por-
 55 tion of the conductor and then sealing the glass on both coated and uncoated portions of the conductor.

8. The method of sealing jointed leading-in conductors, consisting in coating the joint with
 60 refractory yielding material, heating the coating to expel volatile matters, and sealing the glass on both coated and uncoated portions of the conductor.

In witness whereof we have hereunto set
 our hands this 1st day of March, 1892.

HENRY D. BURNETT.
 SAMUEL E. DOANE.

Witnesses:

JOHN W. GIBBONEY,
 BENJAMIN B. HULL.