

M. M. MERRITT.
PROCESS FOR THE MANUFACTURE OF INCANDESCENT LAMP BASES.
APPLICATION FILED MAY 27, 1907.

Fig.1.

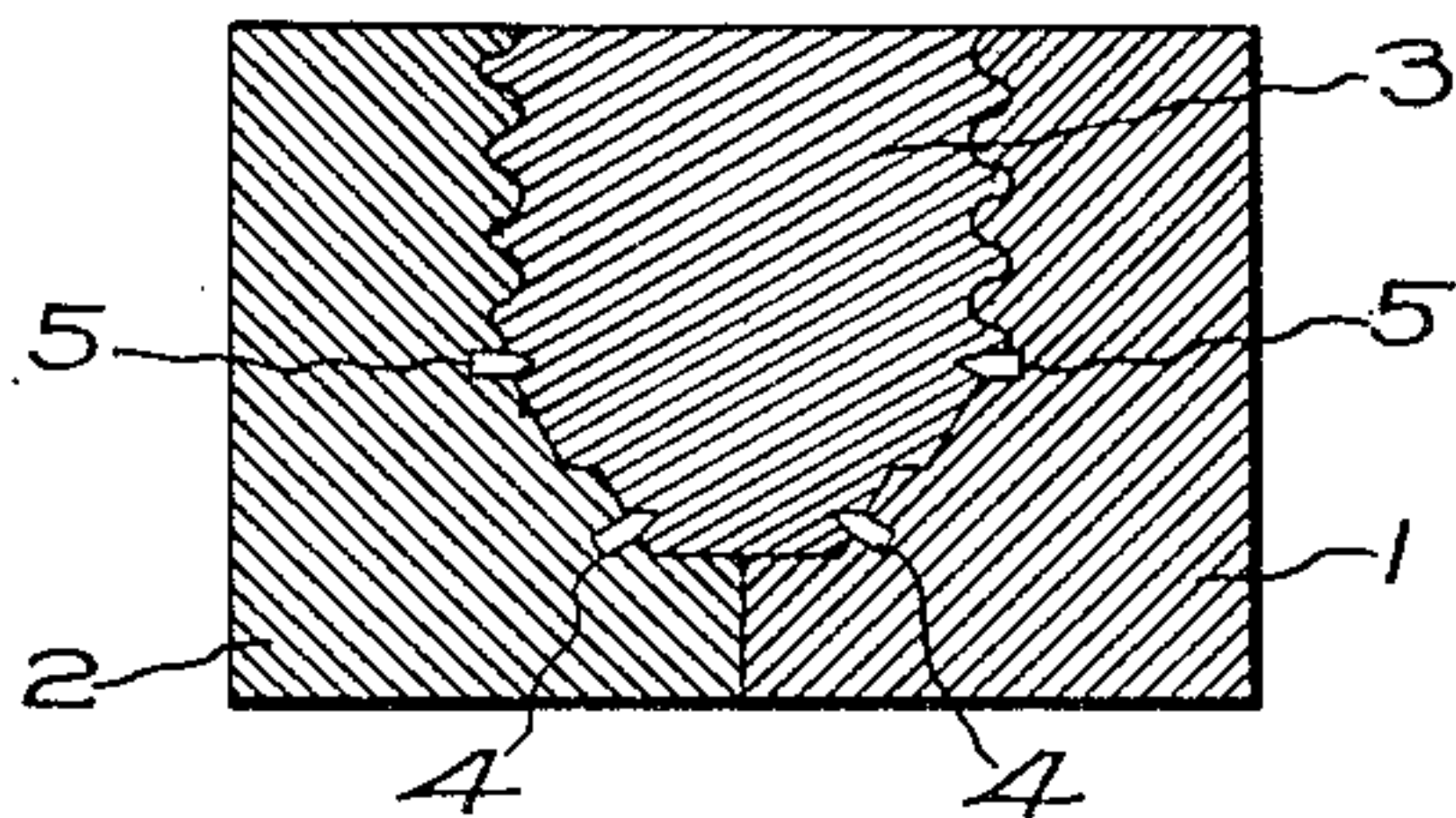


Fig.2.

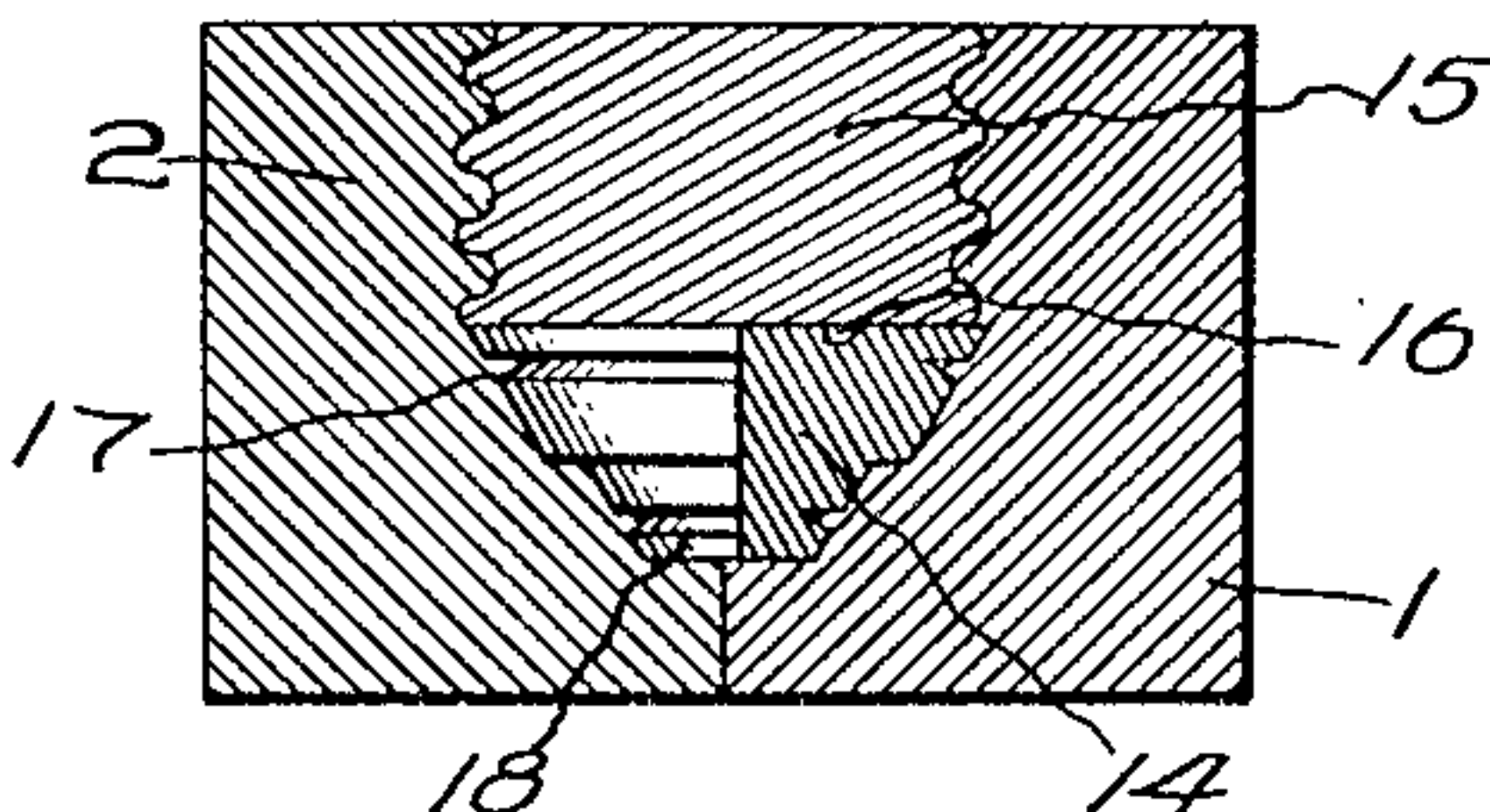


Fig.3.

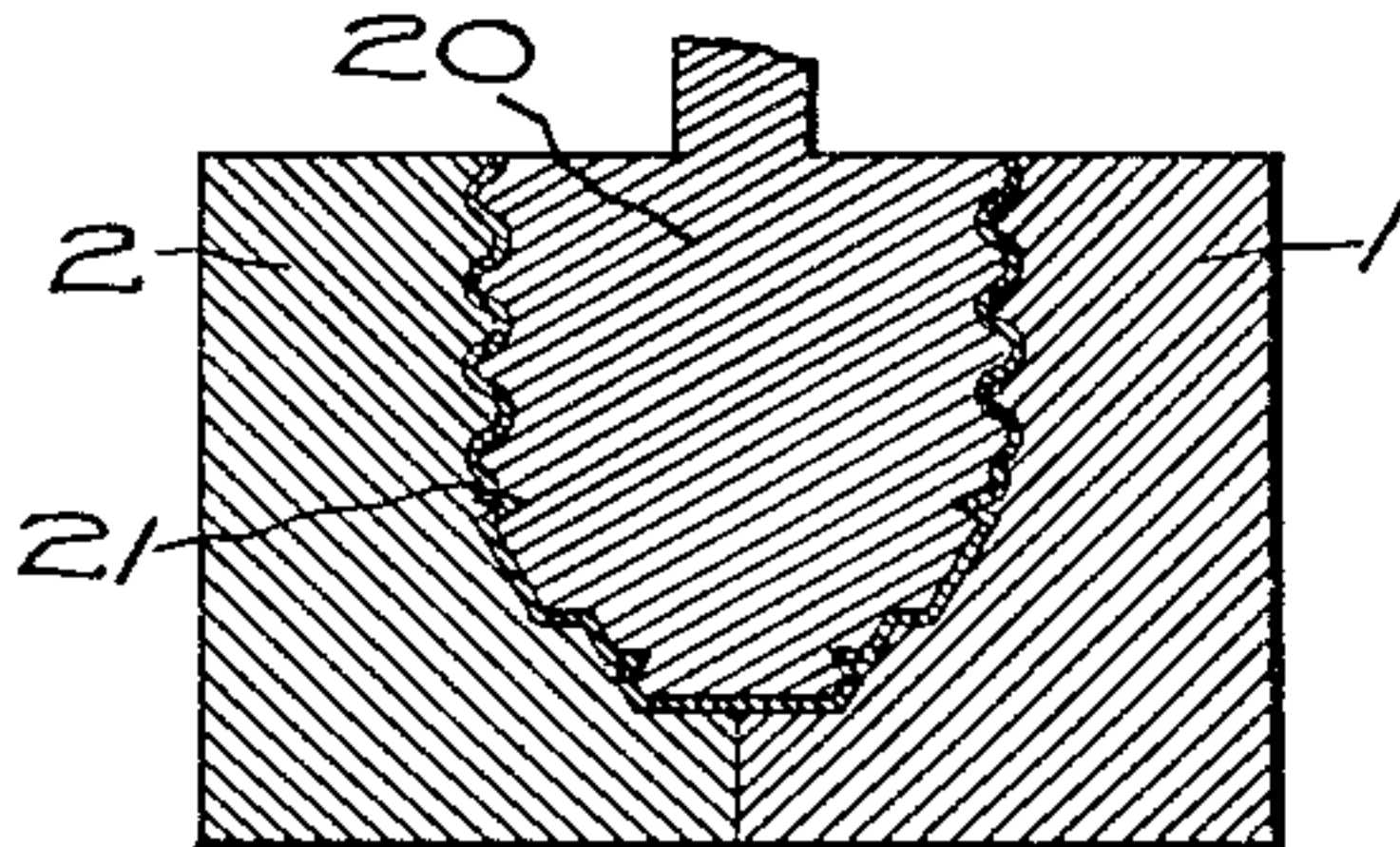


Fig.4.

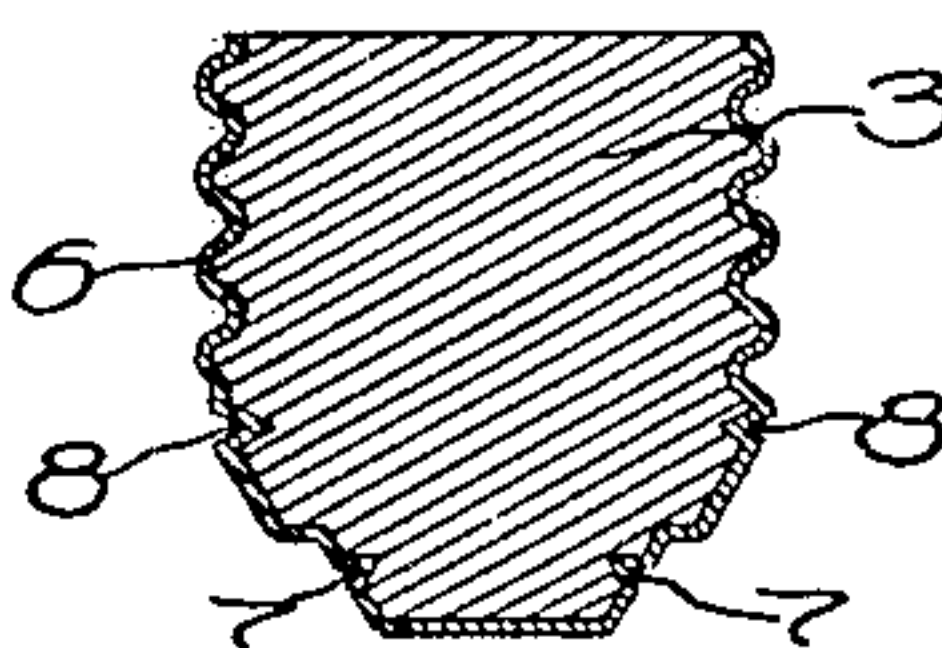


Fig.5.

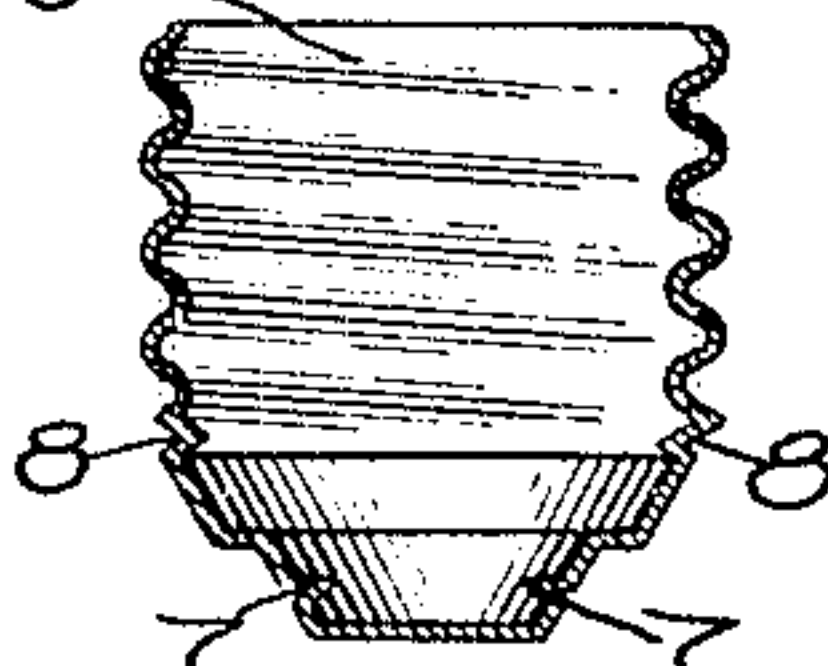


Fig.6.

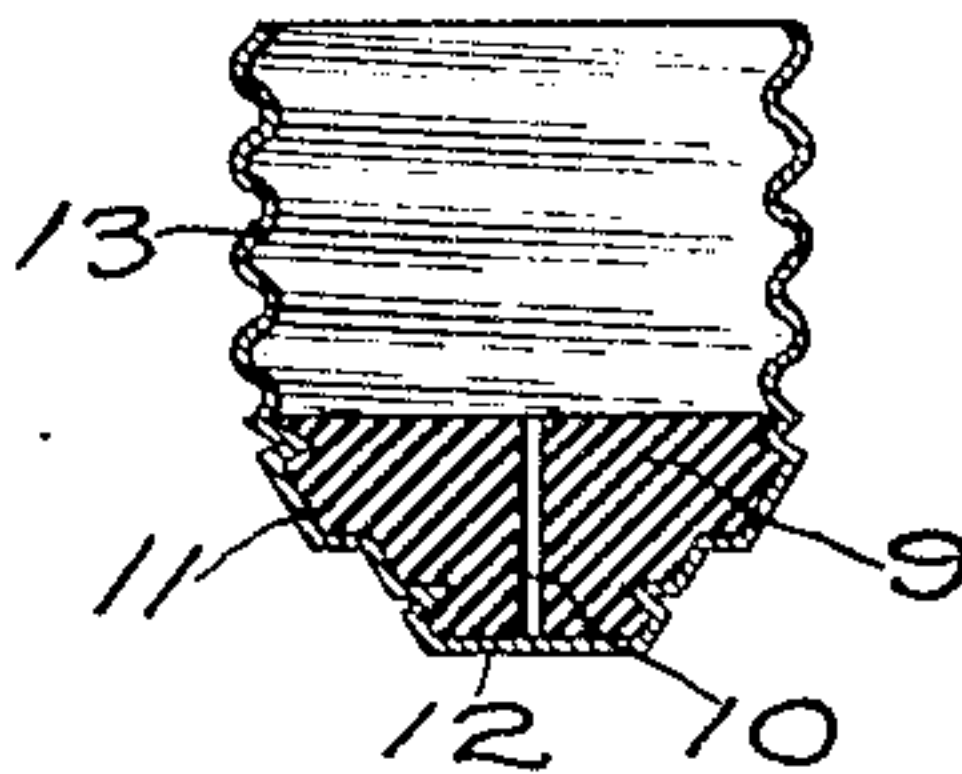


Fig.7.

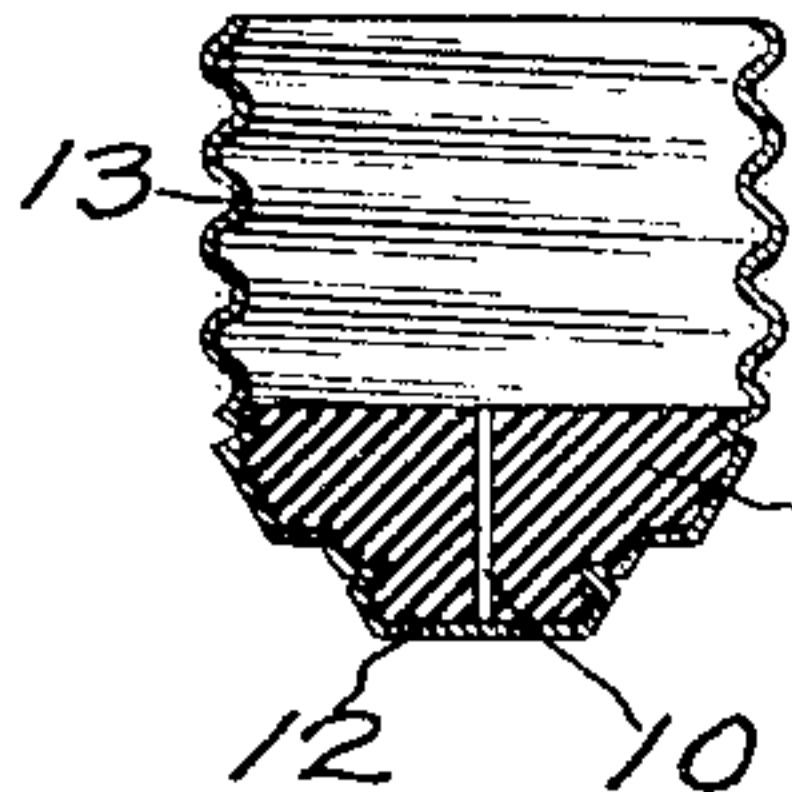


Fig.8.

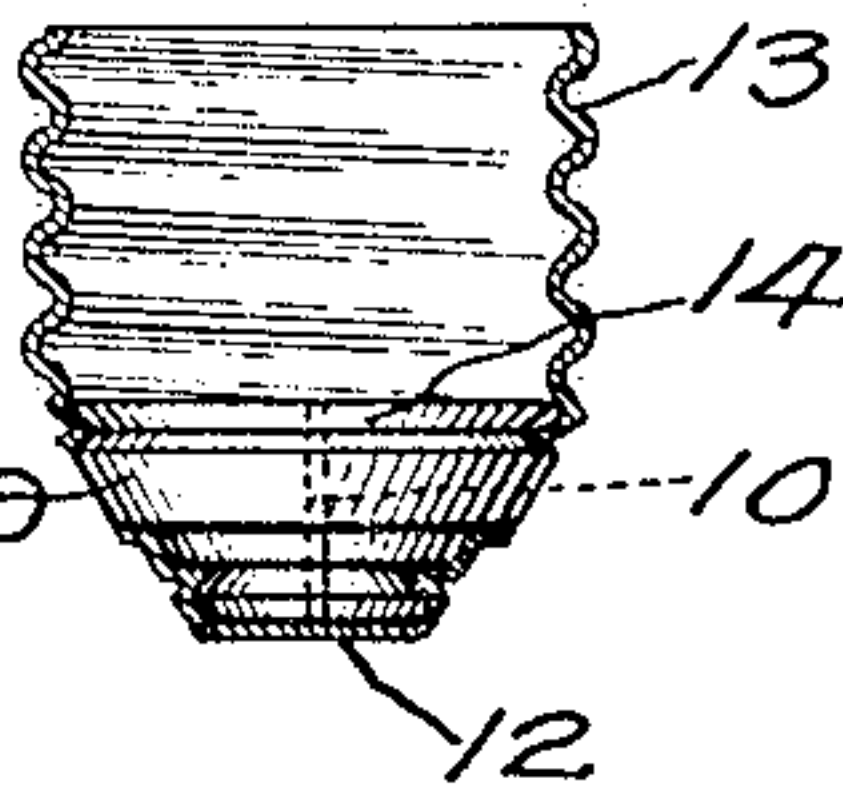
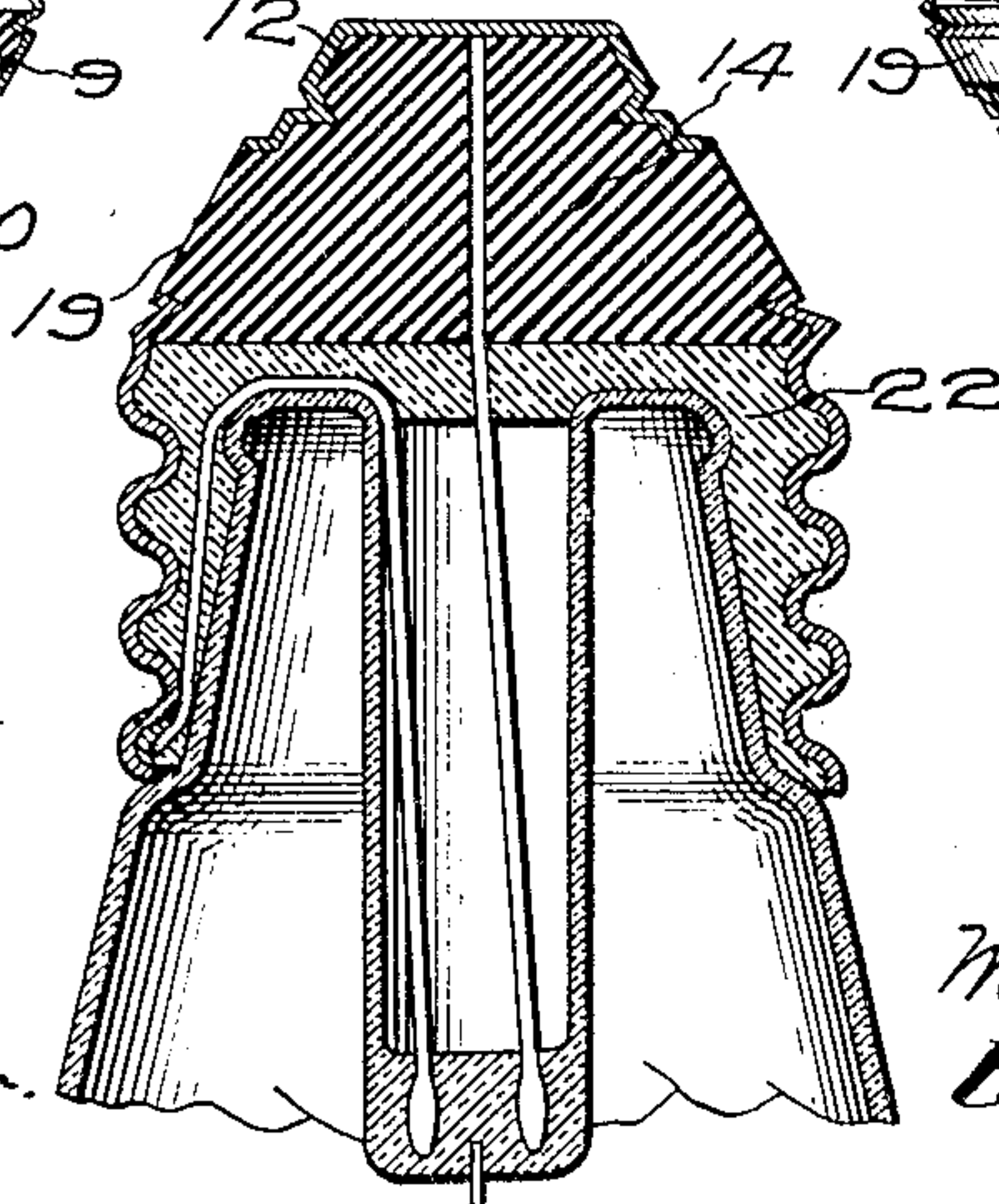


Fig.9.



Witnesses

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UNITED STATES PATENT OFFICE.

MATTHEW M. MERRITT, OF MIDDLETON, MASSACHUSETTS, ASSIGNOR TO NATIONAL ELECTRIC LAMP COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF NEW JERSEY.

PROCESS FOR THE MANUFACTURE OF INCANDESCENT-LAMP BASES.

No. 882,258.

Specification of Letters Patent.

Patented March 17, 1908.

Original application filed February 11, 1907, Serial No. 356,666. Divided and this application filed May 27, 1907. Serial No. 375,829.

To all whom it may concern:

Be it known that I, MATTHEW M. MERRITT, a citizen of the United States, residing at Middleton, county of Essex, and State of Massachusetts, have invented an Improvement in Processes for the Manufacture of Incandescent-Lamp Bases, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention relates to incandescent lamps, and is more particularly concerned with a novel process for the manufacture of lamps, and particularly the bases thereof.

This application is a division of my prior application, Serial No. 356,666, filed February 11, 1907.

My invention will be best understood by reference to the following description when taken in connection with the accompanying illustration of one specific embodiment of the same.

In the drawings:—Figure 1 shows in section a form of mold for molding a dummy or false base of fusible metal or other like material; Fig. 2 shows a like mold where a solid insulating button is employed for the tip of the dummy base; Fig. 3 shows a modified form of mold for casting the metal in the form of an outer shell; Fig. 4 shows the dummy base electro-plated with conductive material; Fig. 5 shows the shell of conductive material with the fusible metal removed; Fig. 6 shows the shell illustrated in Fig. 5 with an inserted end filling of insulating material; Fig. 7 shows the completed base with a strip of conducting material removed from the sides of the insulating filling; Fig. 8 shows a completed base made with the aid of the false base shown in Fig. 2, and, Fig. 9 shows a completed lamp having attached thereto a base of the type shown in Fig. 8.

Referring to the drawings and to the embodiment which I have there shown for the illustration of my invention, the construction of the lamp base, in accordance with the principles herein described, comprehends generally the production of a shell of conducting material by the electrolytical depositing of metal upon a core or body of suitably formed filling material, which latter may afterwards be removed, as by fusion,

such filling material, by way of example, being of ordinary fusible metal fusing at a low temperature,—or some of the harder waxes, such as paraffin. Such procedure leaves a shell of copper, or such other conducting metal as may be employed, and this shell may be formed with walls suitably threaded to fit the lamp socket, and this shell may be then subjected to various operations, resulting in the final production of a lamp base similar in general appearance to the standard type of base now employed, but consisting of a threaded portion and a tip portion, each consisting of electrolytically deposited conducting metal and the two separated by insulating material.

In carrying out my invention I preferably provide a mold, such as is represented in Fig. 1, comprising two split or separated portions 1 and 2, which mold is provided with a recess having the shape of the desired lamp base, and suitably dimensioned to allow for the subsequent shrinkage of metal, and the deposition of copper. This mold may be of any desired material, such as metal, paper or other suitable substance, and may be constructed in any well-known and usual way, and the shape of the mold, may, of course, be varied to suit the desired requirements and conditions.

The mold having been prepared, it is then filled with some material, which, after the deposition of the copper, may be readily withdrawn or extracted. For such material, in the present instance, I have taken a fusible metal, such as Babbitt metal having a low melting point, for example, at or about 200°. Instead of fusible metal, wax, paraffin or other like substance may be employed, or any substance may be used which is capable of ready removal. This substance when hardened forms the false or dummy base 3, having substantially the outline of the finished lamp base.

In order to provide suitable anchorage for the subsequently deposited conducting material, provision of some kind is preferably made. In the described embodiment of my invention the mold is provided near its bottom with inwardly projecting pins 4—4, and just below the threaded portions with other pins 5—5, so that the false base when taken out is provided with corresponding recesses. The base is then preferably dipped in or

coated by some substance which will prevent the copper from clinging to it too tenaciously when it is desired to separate the same. This substance may be, for example, 5 bronze powder or graphite, which assists the metal in dropping away from the copper when it is melted. If a non-conducting substance, such as wax or the like, is employed for the false or dummy base, it is of course 10 necessary to coat the base with a substance like bronze powder or graphite as a prerequisite to the electro-plating operation.

For coating the base with metal by electroplating, any suitable apparatus or process 15 may be employed. A large number of bases may be coated at the same time by placing them in an electrolytic bath of suitable nature in contact with the terminals of an electric circuit passing through the bath and containing a battery or other suitable source 20 of electro-motive force. The nature of the bath will of course depend upon the nature of the metal which it is desired to deposit. If copper, the usual bath employed is an acid 25 solution of copper sulfate, but it will be obvious that nickel, silver or any desired metal may be utilized.

The bases are subjected to the action of the electro-plating bath as long as may be 30 necessary to secure a deposit of conducting material of sufficient or desired thickness, and the latter, when formed, will provide a thin, tenacious skin of conducting material over the exposed portions of the false base 35 and conforming to the irregularities in the surface of the latter. This leaves a deposit of copper which is represented by the heavy outline upon the base indicated at 6 in Fig. 4.

Having formed the shell of conducting 40 metal in this fashion, the false base is withdrawn from the shell by fusing the same at a relatively low temperature, which, of course, has no effect upon the copper or other conducting material employed for the shell, 45 which material has a relatively high fusing point. This leaves the shell of conducting material as represented in Fig. 5, the same being provided, however, with the inwardly directed anchoring points 7—7 and the other 50 anchoring points 8—8. With the shell formed as shown in Fig. 5, the bottom is then filled or partly filled with a plug or button 9 of the insulating material having the axial passage 10 for the lead wire of the lamp. 55 Such button may consist of any desired material and be inserted in any suitable way, but preferably the same is formed of some plastic substance which can be pressed in either by hand or by machinery, if desired, 60 and about a suitable form to leave the passage 10 and there allowed to harden.

Any desired substance may be employed for the insulating plug or button 9, such as glass, artificial stone, or the like, or any of 65 the usual cements employed in this art, but

the substance should preferably have a heat resistance of not less than 400° in order to withstand the probable steps of the lamp manufacture. I preferably, though not necessarily, employ some substance which is 70 plastic at a low temperature, but will harden through standing, such, for example, as a mixture of silicate of soda, sand and cement.

In order to leave separate metallic coatings to act as contacts for the lead wires the 75 portion 11 of the metallic shell is then removed from the truncated conical side of the insulating plug 9, leaving the finished base ready for application to the lamp, as represented at Fig. 7, the remaining end portion 80 12 of the shell comprising the metallic terminal or contact for one lead wire of the lamp and the threaded portion 13, separated from the end portion by the insulating plug 9, forming the terminal or contact for the 85 other lead wire.

Prior to inserting the insulating button the inner surface of the shell thereat is preferably coated with some substance, such, for example, as collodion, which will assist 90 the copper in separating from the button when it is removed.

The metal portion 11 may be removed in any desired way and may be ground off from the insulating button or cut away by suitable 95 machinery.

When the base is completed, as shown in Fig. 7, it will be seen that the anchors 7 effectively retain the shell portion 12 in position upon the insulating plug, while the 100 threaded shell portion 13 has firm engagement with the plug by means of the anchors 8.

Instead of forming the insulating plug or button in the shell as described, a previously 105 formed button, such as 14 (Fig. 2) may be placed in the bottom of the mold, which latter is shaped accurately to receive the same, and the false base is then cast on top of this button, as represented at 15, Fig. 2. Suitable interlocking surfaces 16 may be provided 110 between the button and the fusible metal portion of the base to cause adherence between the two.

The button 14 may be formed of any suitable substance, such as glass, lava, bone, 115 slate, artificial stone, porcelain, white enamel, or any other suitable insulating material, and may be given some such shape as shown whereby there is provided the neck or groove 17 and the smaller neck or groove 120 18 nearer the tip, these grooves acting effectively to anchor the subsequently deposited metal shell thereto. This false base with the insulating button 14 attached is then electro-plated as above described, the fusible 125 portion 15 of the base melted out and the strip of metal overlying the truncated conical portion 19 of the base cut or ground away, as described, leaving the finished base as represented in Fig. 8. 130

In order to diminish the amount of fusible metal required, a core may be employed in connection with the mold shown in Fig. 1, so that the false base is formed in the shape of a shell instead of a solid plug. Furthermore, if desired, a mold, such as shown in Fig. 3, may be used where a core 20 of about the size of the completed base is used, and a shell 21 of fusible metal formed, on the inside of which the metallic shell of conducting material is deposited in the general fashion described. After this conducting shell has been formed upon the interior of the fusible metal shell, the latter is melted away as before.

In electro-plating the false base shown in Figs. 2 and 8 it will be understood, of course, that the insulating button is coated with graphite or bronze powder before being placed in the electrolytic bath in order that the deposit of copper may take place upon its entire surface. If desired, instead of cutting away the strip or area of metal intervening between the two terminal contacts of the lamp, the metal may be deposited, in the first instance, upon separated areas, if desired, by omitting the coating of bronze powder or other conducting material along the portion 19 of the button, or wherever the deposit of metal is not required. The same result may be accomplished in the forming of the base shown in Figs. 1, 4, 5, 6 and 7 by coating over the portion 11 of the base, where no deposit of copper is required, with some insulating substance, such as wax or paraffin.

The base after completion may be applied to the lamp in any desired way, such, for example, as is shown in Fig. 9, where it is cemented thereto by a body 22 of cementitious material consisting of plaster, cement, or any other suitable substance, the lead wires being secured to the end contacts and the threaded shell portion, respectively, in the manner above described.

The lamp base as constructed by the de-

scribed process may be made economically in large quantities and with almost exact uniformity.

While I have shown and described one form of my invention and one mode of carrying the same into effect, it is to be understood that the same is not limited to the details of construction here described or to the exact steps of the process herein set forth, but that extensive modifications therein may be made without departing from the spirit of the invention.

Claims.

1. The process of forming an incandescent lamp base which consists in providing a suitably formed support of fusible material, electrolytically depositing a coating of conducting metal thereon, and providing insulating material for separating the end and side contacts of the electrolytically deposited shell.

2. The process of forming an incandescent lamp base which consists in forming a false base of fusible material, and producing through the aid of such false support electrolytically deposited metal shell portions separated by intervening insulating material.

3. The process of forming an incandescent lamp base which consists in providing a suitable mold, placing an insulating filler in the bottom of the mold, filling the mold above the filler with a material having a low fusing point, electrolytically depositing a coating of conducting material upon the sides of the fusible material and upon the tip or base of the insulating filler, and withdrawing said fusible material by subjecting it to a temperature above its melting point.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

MATTHEW M. MERRITT.

Witnesses:

CHAS. S. BRASLEN,
OSCAR E. JACKSON.