No. 774,404. PATENTED NOV. 8, 1904.

A. SWAN.

BASE FOR INCANDESCENT LAMPS.

APPLICATION FILED APR. 1, 1901.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

Fig. 3.

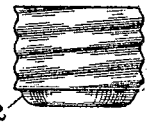


Fig. 2.

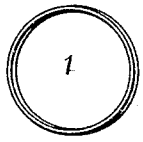


Fig. 4.

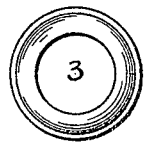


Fig. 5.

Fig. 7.

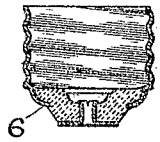
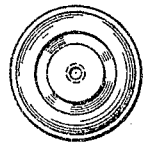


Fig. 6.

Fig. 8.



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No. 774,404. PATENTED NOV. 8, 1904.

A. SWAN.

BASE FOR INCANDESCENT LAMPS.

APPLICATION FILED APR. 1, 1901.

NO MODEL. 2 SHEETS—SHEET 2.

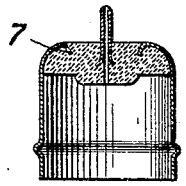

Fig. 9.

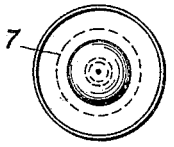

Fig. 10.

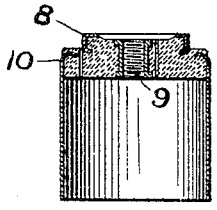

Fig. 11.

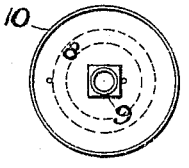

Fig. 12.

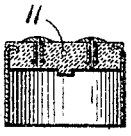

Fig. 13.

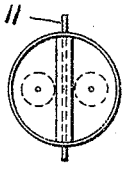

Fig. 14.

Witnesses
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No. 774,404. Patented November 8, 1904.

UNITED STATES PATENT OFFICE.

ALFRED SWAN, OF NEW YORK, N. Y., ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

BASE FOR INCANDESCENT LAMPS.

SPECIFICATION forming part of Letters Patent No. 774,404, dated November 8, 1904.

Application filed April 1, 1901. Serial No. 53,882. (No model.)

To all whom it may concern:

Be it known that I, ALFRED SWAN, a subject of the King of Great Britain, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Bases for Incandescent Lamps, of which the following is a specification.

This invention relates to the manufacture of bases for incandescent electric lamps, and has for its object the cheapening, as well as the improvement, of that part of the lamp.

The well-known "Edison" lamp-base consists of a cylindrical sleeve or shell of thin metal having a thread rolled or otherwise formed in it from end to end. The length of this shell is about three-quarters of an inch, and on account of the large number of "sockets" at present in use this length must for commercial reasons be retained to permit new lamps to be used on existing sockets.

It is one purpose of my invention to make a shell of practically the same length as that now in use, but to alter the shape in such a way as to involve less waste of material in its manufacture than in that of the shell in its present form. In the usual type of base the shell is drawn in cup shape with a disk-shaped bottom, which is cut away after threading the shell. I reduce the waste by forming the cup with a dome-shaped bottom, reducing the length of the cylindrical wall in which the thread is formed, thus producing a base of the same length, but of less material and smaller waste. The center contact in this type of base is secured in place by the plaster-of-paris which cements the base to the neck of the lamp, the base before attaching to the lamp being thus composed of two independent pieces, which require care in attaching to the bulb.

In some bases the shell and contact are held in proper relation and insulated from each other by a glass button, which is molded into the desired form before the parts of the base are assembled. This button is provided with a central opening, and in assembling the base the center contact is inserted therein and held by having its end turned over the edge of the opening. The button is then placed in the shell, and the end of the latter is crimped in around the button to hold it in position. Obviously such a base is far from moisture-proof and air-tight, and it is not as strong as is desired.

It has been proposed to make a lamp-base by forcing a lump of plastic glass under great pressure around projections on the base parts, so that the glass interlocks with the projections. In this case, however, the glass becomes thoroughly chilled by contact with the metal shell, and consequently does not flow freely around the base parts and come into close engagement with them. The stability of this base depends entirely upon the projections on the base parts, and the base is not moisture-proof and air-tight.

In my improved type of lamp-base the contacts are united by a web of glass; but this glass is admitted to them in a completely fluid or liquid state and is solidified *in situ*. This effects a union of far greater strength between the base parts. The hot glass, due to its high fluidity and to the application of pressure, runs in around the brass parts, drives out air-bubbles, and hardens in close engagement with them. The base thus formed besides possessing great mechanical strength is for all practical purposes air-tight and moisture-proof. To further increase the strength of the base, I provide on the shell an incurled flange about which the glass is hardened, so that the flange is firmly embedded in the glass. Using highly fluid or liquid glass greatly facilitates the manufacture of the bases, as the molten glass may be poured or dropped upon the base parts while the latter are held in proper relation, thus enabling me to complete the manufacture of the base in one operation. In addition to these advantages the finished product is decidedly attractive in appearance.

My invention is also applicable to other types of lamp-base, making a cheaper, better, and more uniform product. For example, in some types of Westinghouse, Thomson-Houston, and Edison-Swan bases a molded

porcelain button is used, the metal base parts being crimped or in some similar fashion secured to the porcelain. In my type of these bases the parts are united by a web of highly fluid or liquid glass which intimately engages the metal parts and solidifies, thus increasing the strength of the product.

My invention therefore involves a lamp-base having the metal parts united by a web of highly fluid or liquid glass which solidifies around and closely unites the metal parts. It comprises also a lamp-base having a shell to inclose the neck of the lamp and a center contact or contacts united by a web of insulating material and a flange on the shell embedded in the material.

In the accompanying drawings, which illustrate several types of lamp-base constructed according to my improvements, Figure 1 represents a side elevation of the shell of an ordinary Edison lamp-base, and Fig. 2 an end view of the same. Fig. 3 is a side elevation of the shell of my type of Edison improved base. Fig. 4 is an end view of the shell. Figs. 5 and 6 represent a side elevation and end view of the center contact of my improved base. Fig. 7 is a central sectional elevation of a completed Edison base involving my improvements. Fig. 8 is an end elevation of such a base. Figs. 9 and 10 are sectional elevation and plan of my improved type of Westinghouse base; Figs. 11 and 12, my improved type of Thomson-Houston base, and Figs. 13 and 14 my improved type of Edison-Swan base.

The familiar type of Edison base consists of a threaded shell of thin brass formed in cup shape with a disk-shaped bottom. After being made in cup shape a thread is rolled or otherwise produced on the cylindrical portion of the shell, and the disk is cut out from the end, leaving an opening, as indicated at 1 in Fig. 2, of substantially the diameter of the cup. I avoid the considerable waste of this large disk, which is cut from the end of the shell, by making the shell in the form indicated in Figs. 3 and 4. I effect a further saving by shortening the thread length of the base while still maintaining the over-all length, so as to adapt the base to existing sockets, as it is desirable to maintain the same base length by reason of the large number of sockets now in use, to which new lamps may be applied. The length of the threaded portion of the Edison base is about three-fourths of an inch. I shorten this somewhat, and in forming the cup before the thread is put on the shell I provide it with a dome-like bottom, as indicated in Fig. 3 at 2, which extends the length at the expense of less material and at the same time reduces the amount of waste, since the flat disk cut from the end, as indicated at 3 in Fig. 4, is of smaller diameter than in the common type of Edison base.

Another advantage incidental to the manufacture of my improved base is that the operation of drawing is facilitated by reason of the dome-shaped cup, as compared with the flat-bottomed cup. The extent of screw-thread is not quite so great, but there are a sufficient number of turns to firmly support the lamp in any type of Edison socket, and the depth of the base, as will be seen by an examination of Figs. 1, 2, 3, and 4, is the same as that of the Edison base, and therefore sufficiently deep to reach the contacts in any socket of that type. The shape of shell thus produced lends itself with especial advantage to the mounting of the center contact, which in my type of base is firmly connected to the shell so as to form of the whole a unitary structure which may be handled with more convenience in attaching to the neck of the lamp. In the common type of Edison socket it is customary to form the center contact and the shell of independent pieces which are set on a plane surface and connected together by plaster-of-paris, which cements the shell to the neck of the lamp. I connect the two parts together before they are put on the lamp by means of a button or wall of fusible insulating material, for which I prefer to employ glass, or such material as forms a good insulator will withstand the working temperatures of the lamp, and which may be rendered fluid at a moderately high temperature. The parts are set in a mold and the glass brought to a high degree of fluidity, so that a limited quantity may be dropped or poured into the shell, after which pressure is applied to squeeze it into shape and form a firm bond between the two pieces, as indicated in the sectional view in Fig. 7. The method and apparatus for effecting this result are described in a companion application filed by me March 25, 1901, and serially numbered 52,707. The product is a base having a very pleasing finish and waterproof and strong. The center contact is made of thin brass having a hollow stem 4 and a flat base 5, the top of the stem being flared outwardly, as indicated in Figs. 5 and 7. The quantity of glass admitted to the mold is just sufficent to give the base the necessary strength, allowing for a rather large factor of safety, and flows around the circular edge of the base, as indicated at 6 in Fig. 7, interlocking with said edge and forming a tight joint which prevents the parts working loose. The glass forms a good insulating connection between the two contacts and is not affected by damp air or water. The shell as thus completed may be attached to a lamp by any suitable insulating-cement. The leading-in wires are fastened to the respective parts, one being soldered in the hole to the center contact and the other to any suitable part of the shell.

Figs. 9 and 10 show a Westinghouse type of base which involves my improvements. In this as in the Edison type the edge of the shell interlocks with a button of insulating ma-

terial, as indicated at 7, and the contact-terminal may be hollow and flanged at the inner end, thereby interlocking with the insulating material when pressed into the shell. An opening may be formed through the insulating-button to permit transit of the terminal, which may be effected by a pin in the mold or any other suitable manner.

In Figs. 11 and 12 are shown my improved type of Thomson-Houston base, in which the two terminal contacts 8 and 9 interlock with the substance of the insulating-button, holes being provided in the molding operation for transit of the leads, and the shell may be flanged, as indicated at 10, so as to anchor the insulating-button in place.

In Figs. 13 and 14 are shown a base of the Edison-Swan type which involves the same advantages of construction as those hereinbefore described, the locking-pin 11 employed in this type of base being completely embedded in the substance of the insulating-button by the molding operation.

In all of these types it will be noted that a distinctive feature is the effective fastening together of the several parts of the base by a web of glass which is admitted in a highly fluid or liquid state and hardened *in situ*, so that it intimately engages the glass base parts and forms with them joints possessing great mechanical strength and which are practically moisture-proof and air-tight.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A base for an incandescent lamp comprising a metallic shell to inclose the neck of the lamp, a contact, and a web formed from highly fluid or liquid glass which solidifies around and closely unites the shell and contact.

2. A base for an incandescent lamp comprising a threaded metallic shell to inclose the neck of the lamp having a dome-shaped bottom, a center metallic contact perforated to facilitate connection of one of the lamp-wires, and a web of highly fluid or liquid glass which solidifies around and closely unites the center contact to the dome-shaped bottom of the shell.

3. A base for an incandescent lamp comprising a threaded metallic shell and a metallic center contact insulated from each other and supported in proper relative position by a filling of vitreous insulating material, and a flange on the shell embedded in said material.

4. A base for an incandescent lamp comprising a metallic shell, a metallic center contact, and a web of glass in intimate engagement with the shell and contact, said shell having a flange thereon embedded in the glass.

In witness whereof I have hereunto set my hand this 28th day of March, 1901.

ALFRED SWAN.

Witnesses:
JAMES FINDLAY,
CHAS. H. HEELEY.