

Nov. 9, 1926.

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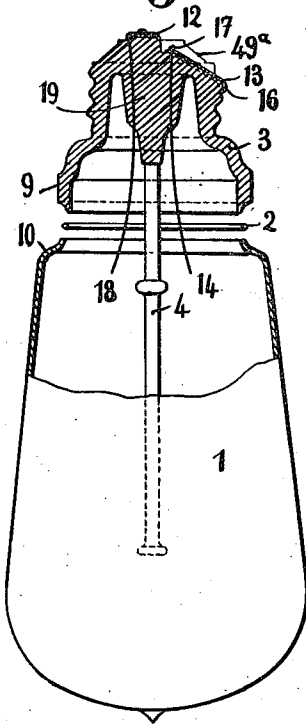
L. S. VELLO

APPARATUS AND METHOD FOR THE PRODUCTION OF INCANDESCENT LAMPS

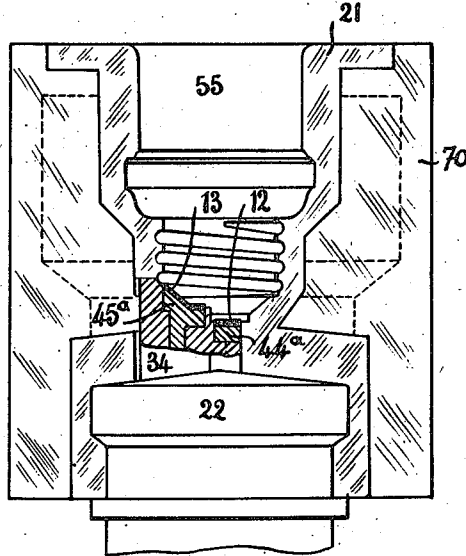
Filed Oct. 21, 1922

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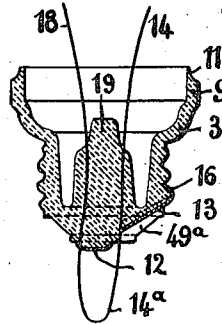
*Fig. 1.*



*Fig. 17^a*



*Fig. 2.*



*Fig. 4.*



*Fig. 6.*



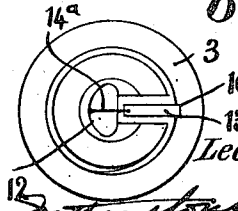
*Fig. 5.*



*Fig. 7.*



*Fig. 3.*



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Nov. 9, 1926.

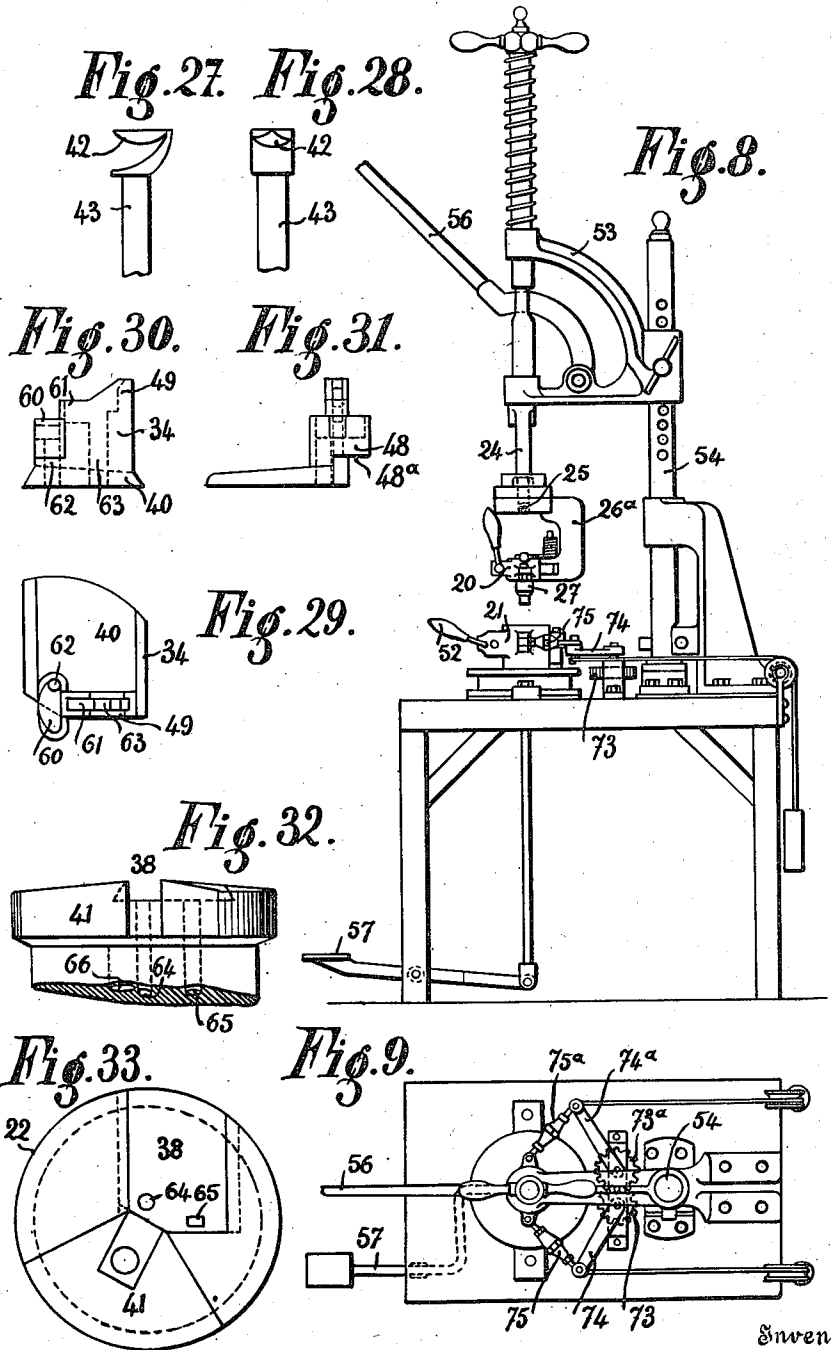
1,606,276

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APPARATUS AND METHOD FOR THE PRODUCTION OF INCANDESCENT LAMPS

Filed Oct. 21, 1922

8 Sheets-Sheet 2



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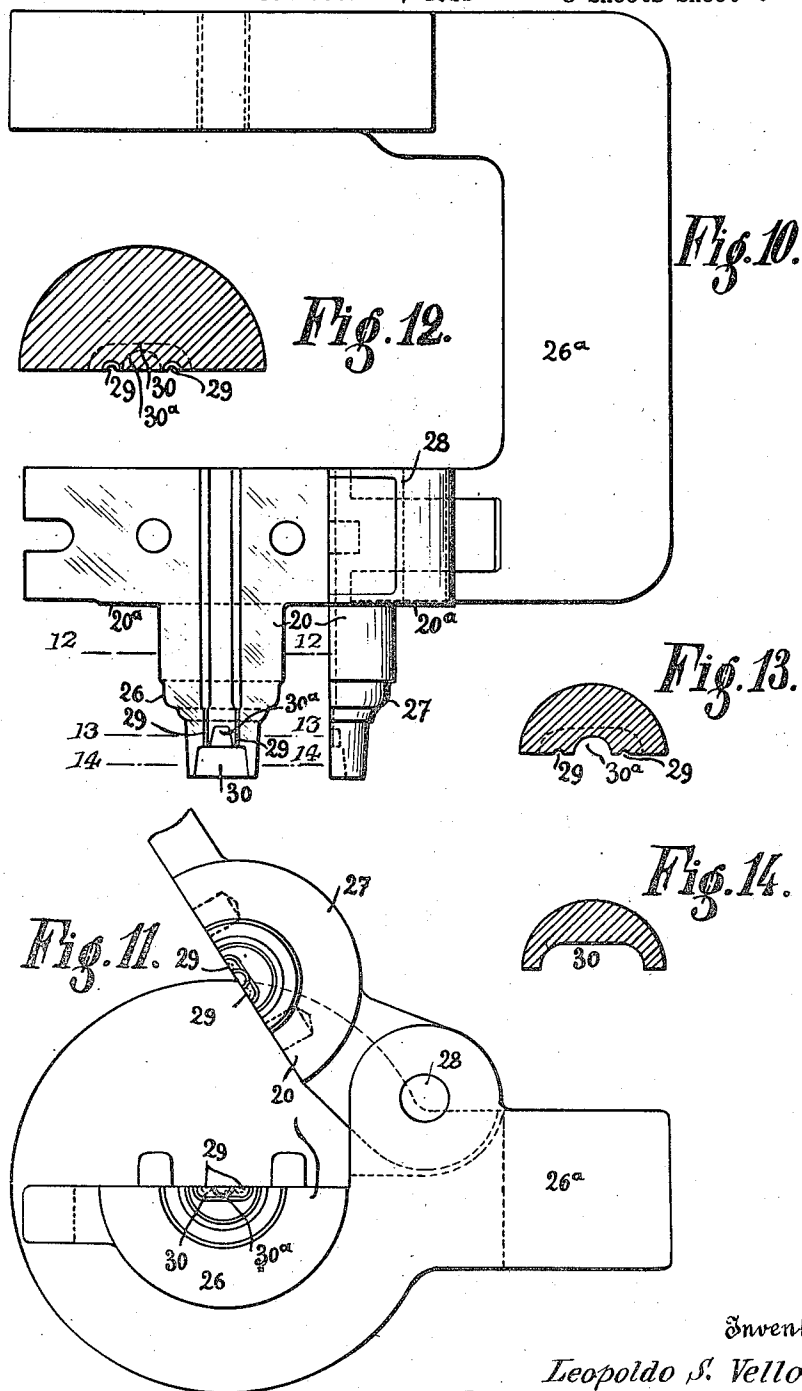
1,606,276

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APPARATUS AND METHOD FOR THE PRODUCTION OF INCANDESCENT LAMPS

Filed Oct. 21, 1922

8 Sheets-Sheet 3



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1,606,276

L. S. VELLO

APPARATUS AND METHOD FOR THE PRODUCTION OF INCANDESCENT LAMPS

Filed Oct. 21, 1922

8 Sheets-Sheet 4

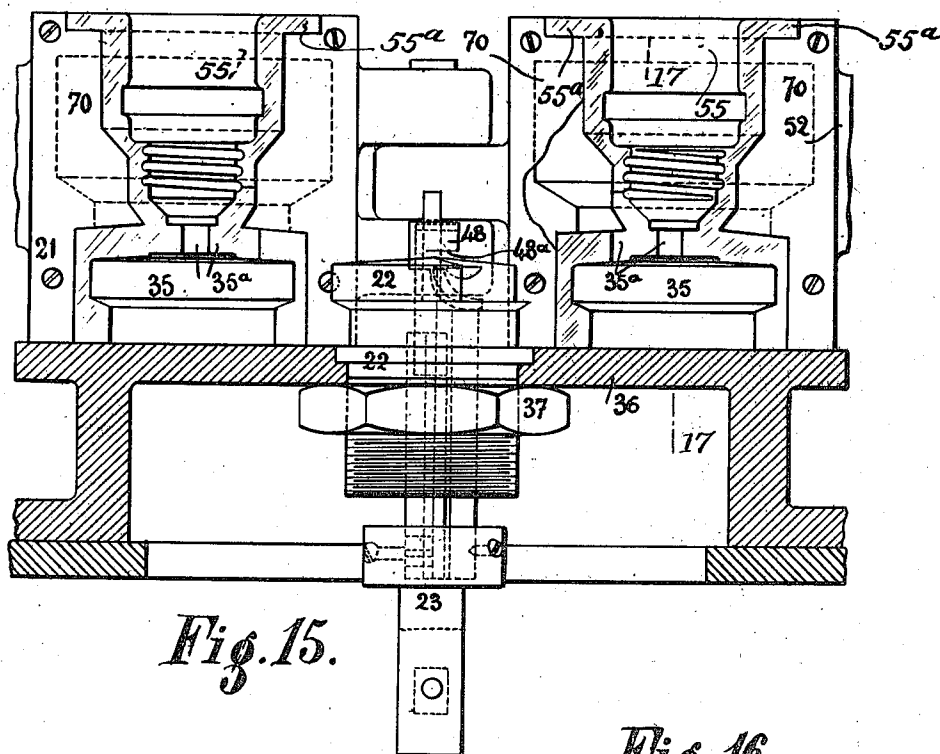
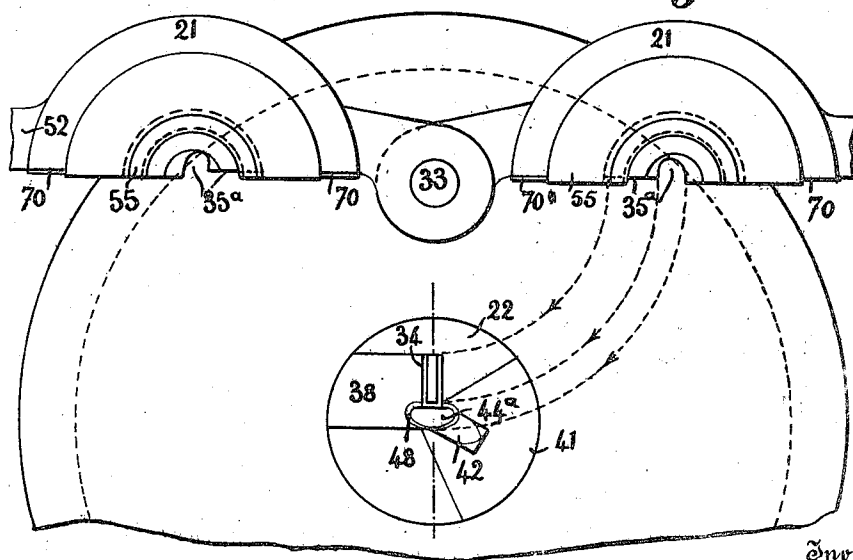


Fig. 15.

Fig. 16.



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1,606,276

APPARATUS AND METHOD FOR THE PRODUCTION OF INCANDESCENT LAMPS

Filed Oct. 21, 1922

8 Sheets-Sheet 5

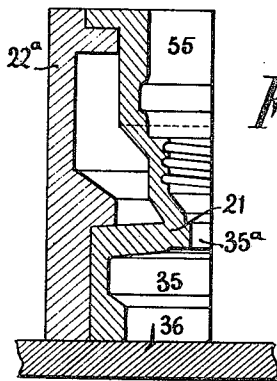


Fig. 17.

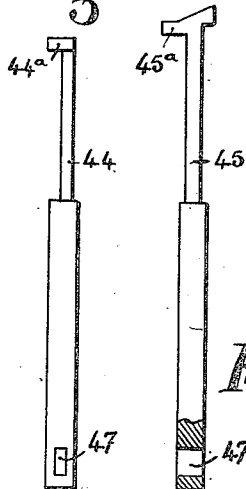


Fig. 23.

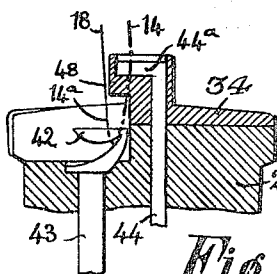


Fig. 22.

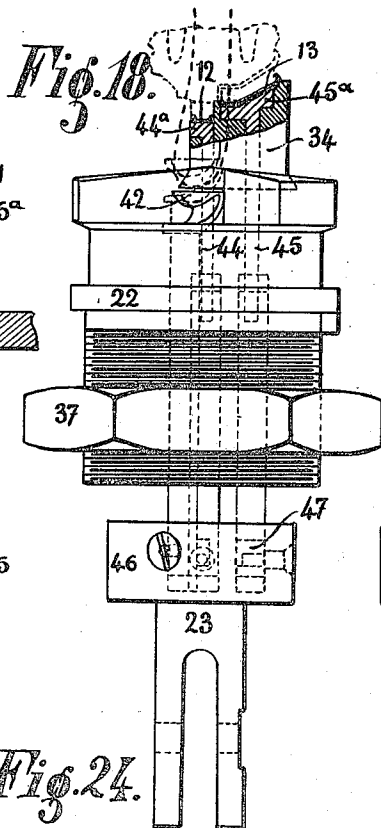


Fig. 24.

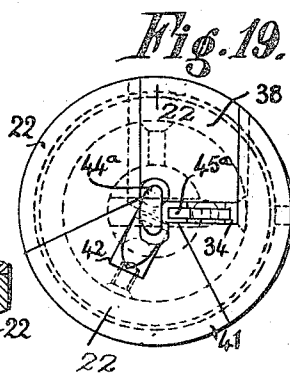


Fig. 19.

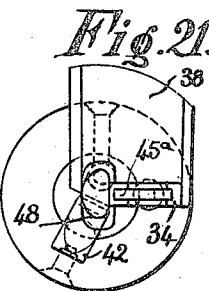


Fig. 21.

Fig. 26.  
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1,606,276

APPARATUS AND METHOD FOR THE PRODUCTION OF INCANDESCENT LAMPS

Filed Oct. 21, 1922

8 Sheets-Sheet 6

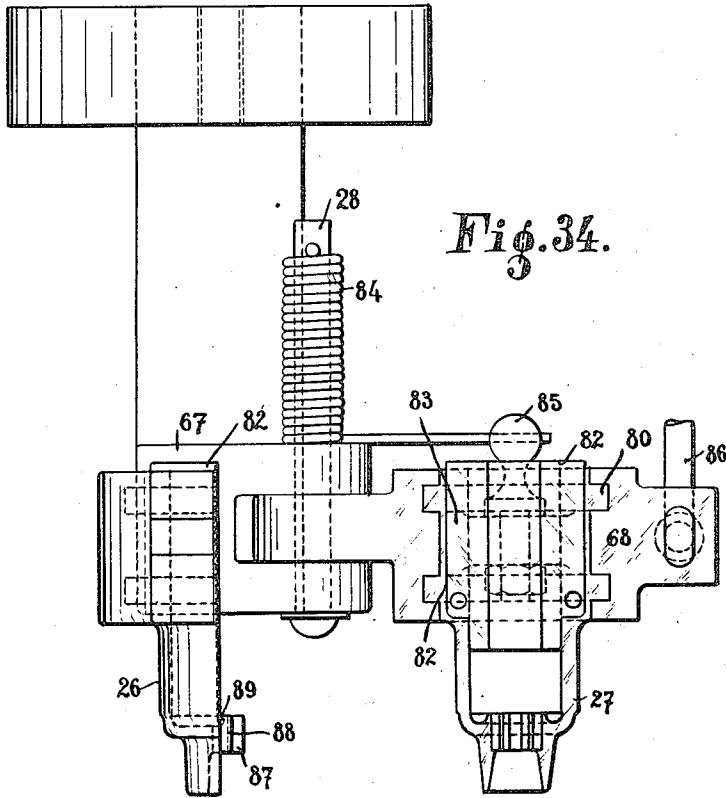


Fig. 34.

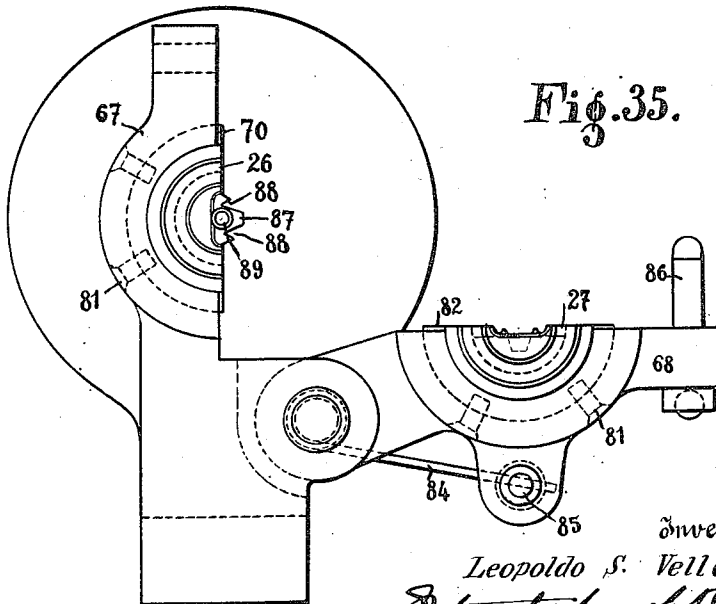


Fig. 35.

33

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Nov. 9, 1926.

1,606,276

L. S. VELLO

APPARATUS AND METHOD FOR THE PRODUCTION OF INCANDESCENT LAMPS

Filed Oct. 21, 1922

8 Sheets-Sheet 7

Fig. 36.

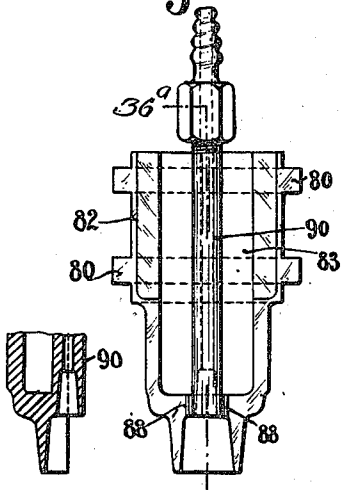


Fig. 36^a 36^a

Fig. 40.

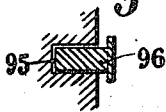


Fig. 41.

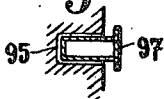


Fig. 37.

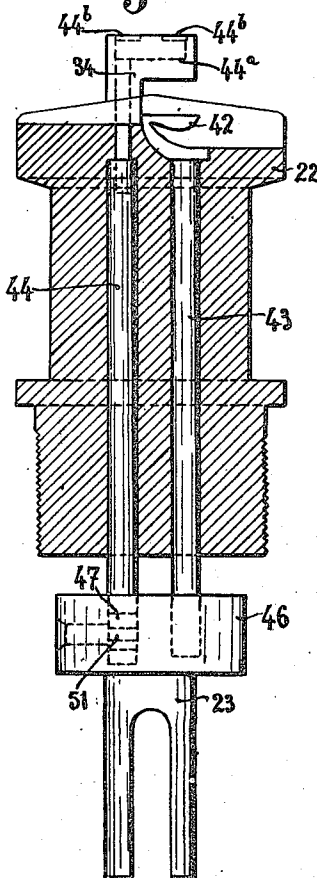
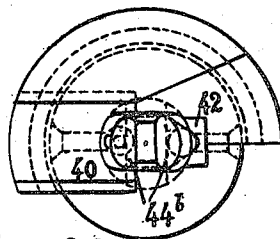


Fig. 38.



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Nov. 9, 1926.

1,606,276

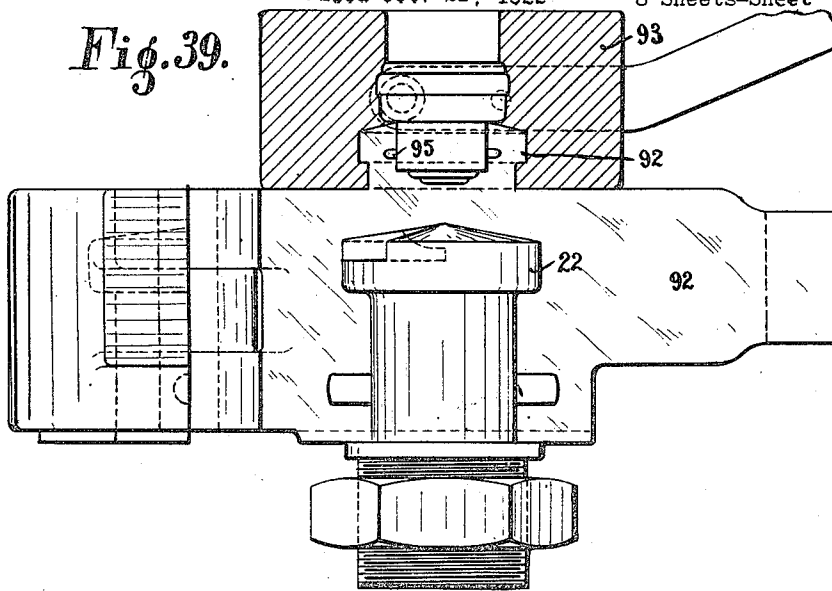
L. S. VELLO

APPARATUS AND METHOD FOR THE PRODUCTION OF INCANDESCENT LAMPS

Filed Oct. 21, 1922

8 Sheets-Sheet 8

*Fig. 39.*



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## UNITED STATES PATENT OFFICE.

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## APPARATUS AND METHOD FOR THE PRODUCTION OF INCANDESCENT LAMPS.

Application filed October 21, 1922, Serial No. 596,173, and in Spain October 29, 1921.

In my co-pending application No. 596,172 filed October 21, 1922 there is described and claimed an incandescent lamp or similar bulb-enclosed electric appliance, the body of which lamp consists of a glass head with leading in wires and contacts embedded therein and adapted for mounting directly in a socket, and a glass bulb fused to said glass head by means of a ring of glass of greater fusibility than either the head or bulb.

The present invention relates to lamp heads of the kind aforesaid and has for its primary objects to provide a method of and apparatus for manufacturing such lamp heads with contacts and leading in wires embedded in the glass or similar material of which the head is made, and formed with a screw threaded plug or shank, for mounting in a socket of the Edison type, or formed with a fin or projection for mounting in a bayonet joint socket.

The invention consists in a method of producing lamp heads of the kind described, comprising, the steps of positioning contact wires in a mould, introducing molten glass into the mould in direct contact with the walls thereof and around the wires, inserting a punch into the mould to shape the inner surfaces of the lamp head, and extracting the lamp head from the mould.

The invention also consists in providing, in apparatus for moulding lamp heads of the kind described, a mould adapted to receive molten glass in direct contact with its wall, a base for said mould, a claw guided in said base for holding the leading in wires of the lamp head during the moulding thereof, a core punch with ducts therein for the leading in wires, means for bringing the mould and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

The invention further consists in the several constructions of moulding apparatus hereinafter described.

The following description, with reference to the accompanying drawings, given as examples, will enable the manner in which the invention is carried out into practice to be fully understood.

Figure 1 is a longitudinal elevation, partially in section, of an incandescent electric

lamp, the head of which is made by means of the moulding machine and has a screwed plug or shank for a socket of the Edison's type, the three elements, namely, globe, head and welding ring, which constitute it being shown separately.

Figure 2 is a view in longitudinal section of a head in its moulding position, showing the wire embedded into the glass of the head during the moulding process.

Figure 3 is an underside view.

Figures 4 and 5 are a transverse section and a plan view, respectively, of the electric contacts of the head.

Figures 6 and 7 illustrate in longitudinal section and in plan view the second electric contact.

Figures 8 and 9 are general views in elevation and a plan of the moulding machine for making lamp heads with screw plugs or shanks;

Figures 10 and 11 illustrate in side view and in underside plan view a punch intended to form the interior of the head;

Figures 12, 13 and 14 are sections upon lines 12—12, 13—13 and 14—14 of Figure 10;

Figures 15 and 16 are, respectively, a front-view partially in section, and a plan view of the table supporting a die intended to form the external part of the cover.

Figure 17 is a section upon line 17—17 of Figure 15;

Figure 17<sup>a</sup> shows, on an enlarged scale, the right hand portion of the die in contact with a stationary base piece forming the bottom, or central part, of the mould.

Figures 18 and 19 are, in side-elevation and plan, detail views of the stationary base piece and showing a claw for holding fast the leading in wire during the moulding process and extractors.

Figures 20 and 21 show, in elevation and plan-view, the claw and the extractors borne by a stationary piece assembled by a dovetail-joint with the base piece.

Figure 22 is a vertical section upon line 22—22 of Figure 19;

Figures 23 and 24 illustrate the pushing members of the extractors.

Figures 25 and 26 are plan views of Figures 23 and 24;

Figure 27 is a separate view of the claw which holds the loop of the leading in wire, the two branches of which are to be embedded in the glass of the head;

Figure 28 is a front view.

Figure 29 is a plan view showing, in detail, the stationary piece supporting, during the moulding of the head, the metallic contacts which are to be fastened upon said head, which piece is assembled by a dovetailed joint with the base piece shown in Figures 32 and 33.

Figure 30 is a front view of Figure 29; Figure 31 is a side-view of Figure 30 turned down on the right hand side.

Figure 32 is a detail view showing in elevation the stationary piece or base in which slide the extractor-rods and the claw-rod.

Figure 33 is a plan view of Figure 32.

Figures 34 and 35 are a front view and an underside view of a modified embodiment of the punch, in which the punch proper is removable and interchangeable.

Figure 36 is a further modified embodiment of said punch;

Figure 36<sup>a</sup> is a section upon line 36<sup>a</sup>—36<sup>a</sup> of Figure 36;

Figures 37 and 38 are a longitudinal section and a plan view of a base piece similar to that of Figures 18 and 19, but arranged so as to form heads locked by means of a bayonet-joint into their sockets.

Fig. 39 shows a modification of the die for effecting bayonet joint lamp heads.

Figures 40 and 41 illustrate in section and on an enlarged scale details of a modified bayonet joint for the lamp head.

The moulding machine illustrated generally in Figures 8 and 9 enables one to obtain a head with screw-threaded shank adapted to fit sockets of the Edison's type; in this case, the head 3 (Figures 1 to 7) is provided with two metallic contacts 13 and 12 inlaid superficially into the mass itself of the glass, and they have the shape illustrated in Figures 4 and 5 for the contact 12 and in Figures 6, 7 for the contact 13. It is to be observed that the contact 13 establishes the electrical connection of the wire 14 with the screw-threaded socket, though the wire 14 be inlaid in the middle of the head, and, for this purpose, the contact 13 is located at the bottom of a groove 49<sup>a</sup> provided into the head itself, and its curved part 16 follows the outline of the first coil of the screw-threading of the head, so that, when the end of the wire 14 is welded, at 17, onto the contact 13, the current may flow from the socket up to the internal part of the lamp by following the path 16, 13, 17, 14.

The location of the contact 13 in the bottom of the groove of the head prevents short-circuits from taking place.

As aforesaid, the wires 14 and 18 are inlaid hermetically into the glass and pass through the head 3 and its central extension 19, which latter may be provided, in its middle part, with a welded glass-rod 4 intended to serve as a support for the filament.

As seen in Figures 10 to 21, the mould consists of three parts, viz: the punch 20 (Figures 10 to 14), the die or spoon 21 (Figures 15 to 17<sup>a</sup>), and the base 22 (Figures 18 to 20) together with the extractor 23 (seen separately in Figures 20 and 21); on these figures, the punch 20, as well as the die, are shown open. Figures 8 and 9 illustrate the elevation and the plan view of the moulding press ready for use.

The punch 20 is connected to a rod 24 of the press by means of a screw 25 and its lower extension has the shape of a stirrup 26<sup>a</sup> for the purpose of enabling the manipulations described hereinafter. The lower part, namely the punch body 20, is formed of two parts 26, 27, the latter being pivoted to the former at 28; the part 27, in its position of greater opening makes with the other part 26, an angle of about 90°. These two parts when closed provide a single punch the lower end of which has a shape appropriate for shaping the inside of the head. Each of the internal surfaces of the two parts forming this punch comprises flutings 29 constituting cylindrical ducts when the two surfaces join each other. Moreover, the internal faces of each part of the punch have two recesses 30 and 30<sup>a</sup> which, together constitute a cavity corresponding to the external shape of the central extension 19 of the head, in which extension 19 are embedded the branches 14 and 18 of the leading in wire.

The die 21 is also made of two parts which pivot on a hinge 33, and have on their internal faces, depressions corresponding to the external projections of the lamp head. When the mould is closed, the die 21 embraces the base 22 as well as a stationary piece 34 mounted thereon in which slides the ejector or extractor. For this purpose, in each internal face of the two die-parts are hollowed two suitable cavities 35 and 35<sup>a</sup> (Figures 15, 16 and 17). The cavity 35 has a depression corresponding to the external outline of the upper end of the base 22, and the cavity 35<sup>a</sup> has a depression corresponding to the external outline of the piece 34; in Figure 17<sup>a</sup> is illustrated the right hand part of the die in closed position, that is to say applying itself against the piece 34 which is shown partially cut away and supporting contacts 12 and 13 seen in cross section. As illustrated in Figure 17, each die may be provided with a jacket 22<sup>a</sup> lined, or not, with asbestos, said asbestos being maintained by two small boards 70 screwed upon the jacketing.

The base 22, illustrated in Figures 18-20 and also separately in Figures 32 and 33, passes through a supporting plate 36 of the press, to which it is strongly fastened by means of a nut 37. Its upper part is enlarged and has two recesses, the one 38 into

which is inserted, with a dovetail joint, the base or pedestal 40 of the stationary piece 34, the other 41 having the shape of a sector, into which the claw 42 fits freely. The base is bored with holes 64 and 65 which register with holes 62 and 63 of the piece 34 and in which slide the pushing members 44 and 45, and also with a hole 66 in which slides the rod 43 of the claw 42 (Figures 27 and 28) which serves to maintain the loop 14<sup>a</sup> of the wire 14, 18 during the moulding of the lamp head.

The stationary piece 34, illustrated as a separate view in Figures 29, 30 and 31 fulfils the following purposes:

1st. It constitutes a fixed support for the contact 12 which rests in a groove 60 of said piece, just above the head 44<sup>a</sup> of the extractor-pushing member 44, and also for the contact 13 which rests in another groove 61 just above the head 45<sup>a</sup> of the pushing member 45; this arrangement enabling the die to close and open without disturbing the contacts 12 and 13.

2nd. It serves as a guide for the rods 44 and 45 of the extractor-pushing members which slide freely in the holes 62 and 63 in the piece 34, the heads 44<sup>a</sup> and 45<sup>a</sup> being housed accurately in the bottom of said grooves 60 and 61.

3rd. It serves to form the groove 49<sup>a</sup> in the lamp head, owing to its upper end 49 projecting into the interior of the die, when the latter is closed, and fulfils the function of a core during the moulding. The base 22 is traversed from top to bottom by three ducts through which pass the rods 43 and 44 of the pushing organs of the extractor and of the claw.

The extracting mechanism illustrated in Figures 18 to 31 is composed of five pieces, viz, the piece 34, the two expulsers or pushing members 44 and 45, the claw 42 and the part of the extractor forming the stroke-regulator 46. Each of the two expulsers 44 and 45 is formed of two pieces; the expulser-head 44<sup>a</sup> and 45<sup>a</sup>, and the rod 44 and 45. The rods of the two expulsers are alike and they comprise, at their lower end, a slot 47. As seen in the drawings, the extractor heads 44<sup>a</sup>, 45<sup>a</sup> correspond in shape with the contacts 12 and 13. The stroke of the claw 42 is limited upwardly by the lower face 48<sup>a</sup> of the shoulder 48 of the stationary piece 34 (see Figure 22) and the strokes of the pushing members 44 and 45, are determined so that the top 49 of the piece 34 will disengage itself from the cavity 49<sup>a</sup> of the lamp head into which it was engaged during the moulding, and the loop 14<sup>a</sup> of the wire 14, 18 may be withdrawn from the claw 42.

For this purpose, the rod 43 of the claw is fastened rigidly to a block 46, called a "stroke-regulator", integral with the extractor 23, whilst the ends of the two other

rods 44 and 45 penetrate into holes 50, into which they may slide vertically to an extent determined by the length of the slot 47, the upper edge of which abuts against a screw 51 of the extractor 23 when the latter is raised. Owing to this arrangement of the stroke-regulator 46, the expulsers 44 and 45 only begin to rise when the ends of the screws 51 have travelled the whole height of the slot, while the claw 42 will have raised immediately at the beginning of the raising of the extractor 23.

There will now be described the working of the mould enabling one to obtain a lamp head for use with a screw-socket of the Edison's type. The metallic wire 14, 18 used for leading in wire is of a nature suited to perfect and hermetical inlaying into the glass and is of a sufficient length in order that this wire, when folded in the shape of a loop 14<sup>a</sup>, as shown by full lines in Figure 2, and engaged with the claw 42, will project, at its upper ends, beyond the punch 20, when the latter is in its uppermost position.

The punch 20 and the die 21 are opened, a pair of contacts 12, 13 are inserted into the piece 34, on the heads 44<sup>a</sup>, 45<sup>a</sup> of the extractor-pushing members, and the loop 14<sup>a</sup> of the wire 14, 18 is engaged as aforesaid with the claw 42, the operator maintaining in his left hand the upper ends of the wire 14, 18. The die is closed by the right hand by means of a handle 52 fastened to the right-hand half-die and which causes the closure of the other or left-hand half-die, by mechanism of a known type (Figures 8 and 9) comprising the two toothed wheels 73 and 73<sup>a</sup> and links 74, 75 and 74<sup>a</sup>, 75<sup>a</sup>, and care is taken that the branches 14 and 18 of the wire locate themselves in the flutings 29 of the part 26 of the punch in which they have sufficient clearance to permit vertical movements of the punch. The punch is then closed.

The movable bracket 53 supporting the punch 20 is slightly rotated around the axis 54 and sufficiently to allow the wires 14, 18, which were directed vertically upon the middle of the die, to place themselves obliquely, so as to leave free the opening 55 of the die (Figures 15 and 17).

This opening being cleared, into the closed die is let fall a drop of glass. The punch, with its supporting bracket, is brought back again above the die; it is sunk by means of the lever 56 and, during this sinking movement, the punch slides upon the wires 14, 18 kept stretched with the left hand; it penetrates into the die with an easy sliding fit and it presses the glass and inlays superficially into the mass thereof the two contacts 12 and 13 and internally compacts the glass around the wires 14, 18. The maximum stroke of the punch brings the face 20<sup>a</sup> of

the punch (Figure 10) into contact with the upper face 55<sup>a</sup> of the die (Figure 15); the height of the punch 20 and its width must be suitably chosen so that, at the end of the downward stroke of the punch, the lamp head has the desired thickness and is moulded to shape. For withdrawing it from the mould, the punch is lifted and opened and, in this manner, the wires 14 and 18 are free; the die is also opened and the glass-rod 4, previously heated at one end, is welded to the central extension 19 of the still hot head. Then, the extractor is put into function by means of the treadle 57, and thus the claw 42, while rising, releases the loop 14<sup>a</sup> of the wire and the extractor-heads 44<sup>a</sup>, 45<sup>a</sup> lift the finished head, as shown by dash-and-dot lines in Figure 18.

There will now be described with reference to Figures 34 to 40, modified structural forms of the punch and of the die.

Figures 34 and 35 show a modified form of punch. The two parts 26 and 27 which constitute the punch proper are removable and mounted on a support or punch-holder formed of two parts 67 and 68 hinged at 28. The fastening of each punch in its support is effected, on one hand, by means of ribs 80 which engage grooves provided in the support, and, on the other hand, by means of screws 81 which prevent movement of the ribs in the grooves. The two half-punches 26 and 27 may be hollowed internally at 83, the cavity thus formed being if necessary lined with asbestos-wool, sand, or any other insulator held in place by plates 82; in this cavity 83 might also be located an electric resistance for the heating. If, on the contrary, the punch is required to be cooled, an air current can be led through this cavity.

Another modification consists in the provision of a spring 84, for instance a helical spring coiled upon the extension of the hinge axis 28. One of the ends of the spring 84 is fast to the axis 28, whilst the other end is engaged into the head of a bolt 85 mounted upon the movable punch-holder 68, the spring 84 having for its effect to automatically open the punch after each operation when the lock or closing device 86 has been disengaged.

In some cases (Figures 34 and 35) the stationary half-punch 26 may comprise a projection 87 with two grooves 88, 88 fulfilling the same function as the grooves 29 (Figures 10 and 11); or two hooks serving as a guide for the wire, this projecting part 87 having, in its center, a hole 89 drilled vertically. The projection 87 may be surmounted, opposite to the hole 89, by a tube 90 (Figure 36) which may be stoppered in the upper part, or freely open in the air, or also extended by means of a tube provided with a cock for connecting it alter-

natively with the atmosphere and with a compressed air-tank; or further also alternatively with a vacuum-producing apparatus and a compressed air-tank. In this manner, a portion of the glass-drop pressed into the mould rises through the hole 89, assisted, if necessary, by the suction produced by the vacuum, and when the lamp head is pressed, the compressed air forces the glass-bar thus formed to go out from its hole or cell.

In Figures 37 and 38 is illustrated a modified form of the extractor adapted to be utilized in a mould for a bayonet joint lamp head wherein the two contacts 12 are alike, and it is composed of similar elements as in the extractor described in connection with the mould for a screw joint lamp head. In the case of a bayonet joint, the projection 49 of the piece 34 may be dispensed with, as well as the expulser 45; as far as the remaining expulser 44 is concerned, its head 44<sup>a</sup> has two cells 44<sup>b</sup>, in each of which is disposed a contact 12 which must be superficially cast into the lamp head. It will thus be seen that, in this case, the extracting mechanism is reduced, on one hand, to the claw 42 and, on the other hand, to a single expulser 44.

It is obvious that, if the extractor have two claws and the punch four flutings 29 instead of two, the cover may be traversed by four wires instead of two. In the same manner several expliers may be provided according to the number of metallic contacts inlaid into the cover.

As seen in Figure 39, the upper part of each half-die 92 may comprise lateral recesses 95 into which the glass will penetrate during the moulding and which will constitute the fins or projections of a bayonet joint.

It would equally be possible to previously place in the recesses 95 small metallic gudgeons, solid or hollow, which would be embedded into the glass of the head during the moulding process, and which would constitute the fins of the interlocking joint. In Figures 40 and 41 has been illustrated in section, on an enlarged scale, the disposition of solid gudgeons 96 and hollow gudgeons 97.

It will be understood that the head 3 is attached by vitreous soldering to the bulb 1 of the lamp or the like, by means of a fusible glass ring 2 which unites the reduced part 10 of the bulb to the thin rim 11 of the head as described in my co-pending application No. 596,172.

It is obvious that modifications may be eventually made in the apparatus just described without, therefore departing from the scope of the present invention as hereinafter claimed.

In the claims, the term "glass" is intended

to include glass, quartz, crystal or any material plastic at moulding temperatures, of which lamp bodies and the like are customarily made, and "lamp head" is intended to cover the socket engaging, or terminal carrying, portion of any kind of bulb, tube, or other hermetically closed receptacle for incandescent electric lamps and similar devices.

I claim:

1. The method of producing lamp heads of the kind described, comprising, the steps of positioning contact wires in a mold, introducing molten glass into the mold in direct contact with the walls thereof and around the wires, inserting a punch into the mold to shape the inner surfaces of the lamp head, and extracting the lamp head from the mold.

2. The method of producing lamp heads of the kind described, comprising, the steps of positioning contacts and leading in wires in a mold, introducing molten glass into the mold in direct contact with the walls thereof and with the contacts and around the wires, inserting a punch into the mold to shape the interior surfaces of the lamp head and extracting the lamp head from the mold.

3. The method of producing lamp heads of the kind described, comprising, the steps of positioning contacts and leading in wires in a mold, introducing molten glass into the mold in direct contact with the walls thereof and with the contacts and around the wires, inserting a punch into the mold to shape the interior surfaces of the lamp head, extracting the lamp head from the mold, and forming a filament support on the lamp head.

4. Apparatus for making glass lamp heads of the kind described, comprising, a mold adapted to receive molten glass in direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading in wires, means for bringing the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

5. Apparatus for making glass lamp heads of the kind described, comprising, a mold adapted to receive molten glass in direct contact with its wall, a base for said mold, means extending from said base for supporting the contacts of the lamp head during the molding thereof, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading in wires, means for bring-

ing the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

6. Apparatus for making glass lamp heads of the kind described, comprising a mold constituted of portions hinged to each other and adapted to receive molten glass in direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading in wires, means for bringing the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

7. Apparatus for making glass lamp heads of the kind described, comprising, a mold constituted of portions hinged to each other and adapted to receive molten glass in direct contact with its wall, a base for said mold, means extending from said base for supporting the contacts of the lamp head during the molding thereof, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading in wires, means for bringing the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

8. Apparatus for making glass lamp heads of the kind described, comprising, a mold constituted of portions hinged to each other and adapted to receive molten glass in direct contact with its wall, a base embraced by said mold portions, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading in wires, means for bring the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

9. Apparatus for making glass lamp heads of the kind described, comprising, a mold constituted of portions hinged to each other and adapted to receive molten glass in direct contact with its wall, a base embraced by said mold portions, means extending from said base for supporting the contacts of the lamp head during the molding thereof, a claw guided in said base for holding the leading in wires of the lamp head during the

molding thereof, a core punch with ducts therein for the leading in wires, means for bringing the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

10 10. Apparatus for making glass lamp heads of the kind described, comprising, a mold adapted to receive molten glass in direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during  
15 the molding thereof, a core punch having two hinged parts and with ducts therein for the leading in wires, means for bringing the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished  
20 lamp head from the apparatus, and means for operating the claw and the extractor means.

11. Apparatus for making glass lamp  
25 heads of the kind described, comprising, a mold adapted to receive molten glass in direct contact with its wall, a base for said mold, means extending from said base for supporting the contacts of the lamp head  
30 during the molding thereof, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch having two hinged parts and with ducts therein for the leading in  
35 wires, means for bringing the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw  
40 and the extractor means.

12. Apparatus for making glass lamp heads of the kind described, comprising, a mold constituted of portions hinged to each other and adapted to receive molten glass in  
45 direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch having two hinged parts and with ducts  
50 therein for the leading in wires, means for bringing the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and  
55 means for operating the claw and the extractor means.

13. Apparatus for making glass lamp heads of the kind described, comprising, a mold constituted of portions hinged to each  
60 other and adapted to receive molten glass in direct contact with its wall, a base for said mold, means extending from said base for supporting the contacts of the lamp head during the molding thereof, a claw guided

in said base for holding the leading in wires  
65 of the lamp head during the molding thereof, a core punch having two hinged parts and with ducts therein for the leading in wires, means for bringing the mold and core punch into and out of co-operative relationship  
70 with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

14. Apparatus for making glass lamp  
75 heads of the kind described, comprising, a mold constituted of portions hinged to each other and adapted to receive molten glass in direct contact with its wall, a base embraced by said mold portions, a claw guided in said  
80 base for holding the leading in wires of the lamp head during the molding thereof, a core punch having two hinged parts and with ducts therein for the leading in wires, means for bringing the mold and core punch  
85 into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

15. Apparatus for making glass lamp  
heads of the kind described, comprising, a mold constituted of portions hinged to each other and adapted to receive molten glass in direct contact with its wall, a base embraced  
95 by said mold portions, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, means extending from said base for supporting the contacts of the lamp head during  
100 the molding thereof, a core punch having two hinged parts and with ducts therein for the leading in wires, means for bringing the mold and core punch into and out of co-operative relationship with each other, extractor  
105 means for removing the finished lamp head from the apparatus, and means for operating the claw and the extractor means.

16. Apparatus for making glass lamp heads of the kind described, comprising, a  
110 mold adapted to receive molten glass in direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch  
115 with ducts therein for the leading in wires, means for moving the punch vertically with respect to the mold, extractor means for removing the finished lamp head from the apparatus, and means for operating the claw  
120 and the extractor means.

17. Apparatus for making glass lamp heads of the kind described, comprising, a mold adapted to receive molten glass in  
125 direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with

ducts therein for the leading in wires, means for moving the punch vertically with respect to the mold, extractor means for removing the finished lamp head from the apparatus, means for operating the claw and extractor means, and means for enabling the punch to be moved laterally with respect to the mold.

18. Apparatus for making glass lamp heads of the kind described, comprising, a mold adapted to receive molten glass in direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading in wires, means for moving the punch vertically with respect to the mold, a pair of extractor rods slidable in the base, heads on said extractor rods adapted to hold the contacts during the molding operation, and means for operating the claw and the extractor rods.

19. Apparatus for making glass lamp heads of the kind described, comprising, a mold adapted to receive molten glass in direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading in wires, means for moving the punch vertically with respect to the mold, a pair of extractor rods slidable in the base, heads on said extractor rods adapted to hold the contacts during the molding operation, and a single mechanism for operating the claw and extractor rods, said mechanism having means for retarding the movement of the extractor rods relatively to that of the claw.

20. Apparatus for making glass lamp heads of the kind described, comprising, a mold adapted to receive molten glass in direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading in wires, means for moving the punch vertically with respect to the mold, a pair of extractor rods slidable in the base, heads on said extractor rods adapted to hold the contacts during the molding operation, means for operating the claw and the extractor rods, and a removable block mounted in the base, said block

having guides and seatings for the extractor rods and heads.

21. Apparatus for making glass lamp heads of the kind described, comprising, a mold adapted to receive molten glass in direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading in wires, means for moving the punch vertically with respect to the mold, a pair of extractor rods slidable in the base, heads on said extractor rods adapted to hold the contacts during the molding operation, a single mechanism for operating the claw and extractor rods, said mechanism having means for retarding the movement of the extractor rods relatively to that of the claw, and a removable block mounted in the base, said block having guides and seatings for the extractor rods and heads.

22. Apparatus for making glass lamp heads of the kind described, comprising, a mold adapted to receive molten glass in direct contact with its wall, a base for said mold, a claw guided in said base for holding the leading in wires of the lamp head during the molding thereof, a core punch with ducts therein for the leading wires, means for bringing the mold and core punch into and out of co-operative relationship with each other, extractor means for removing the finished lamp head from the apparatus, means for operating the claw and the extractor means, and means for forming a filament supporting stem on the lamp head while same is in the mold.

23. Apparatus for making glass lamp heads of the kind described, comprising, a mold with mutually separable mold parts, a core punch traversed by ducts traversable by the leading in wires of the lamp head and having two hinged core parts, means for moving the core punch vertically relatively to the mold, and means for supporting the conducting wires below the mold.

24. Apparatus as specified in claim 23, having means enabling the core punch to be moved laterally relatively to the mold.

In witness whereof, I have hereunto signed my name.

LEOPOLDO SANCHEZ VELLO.