

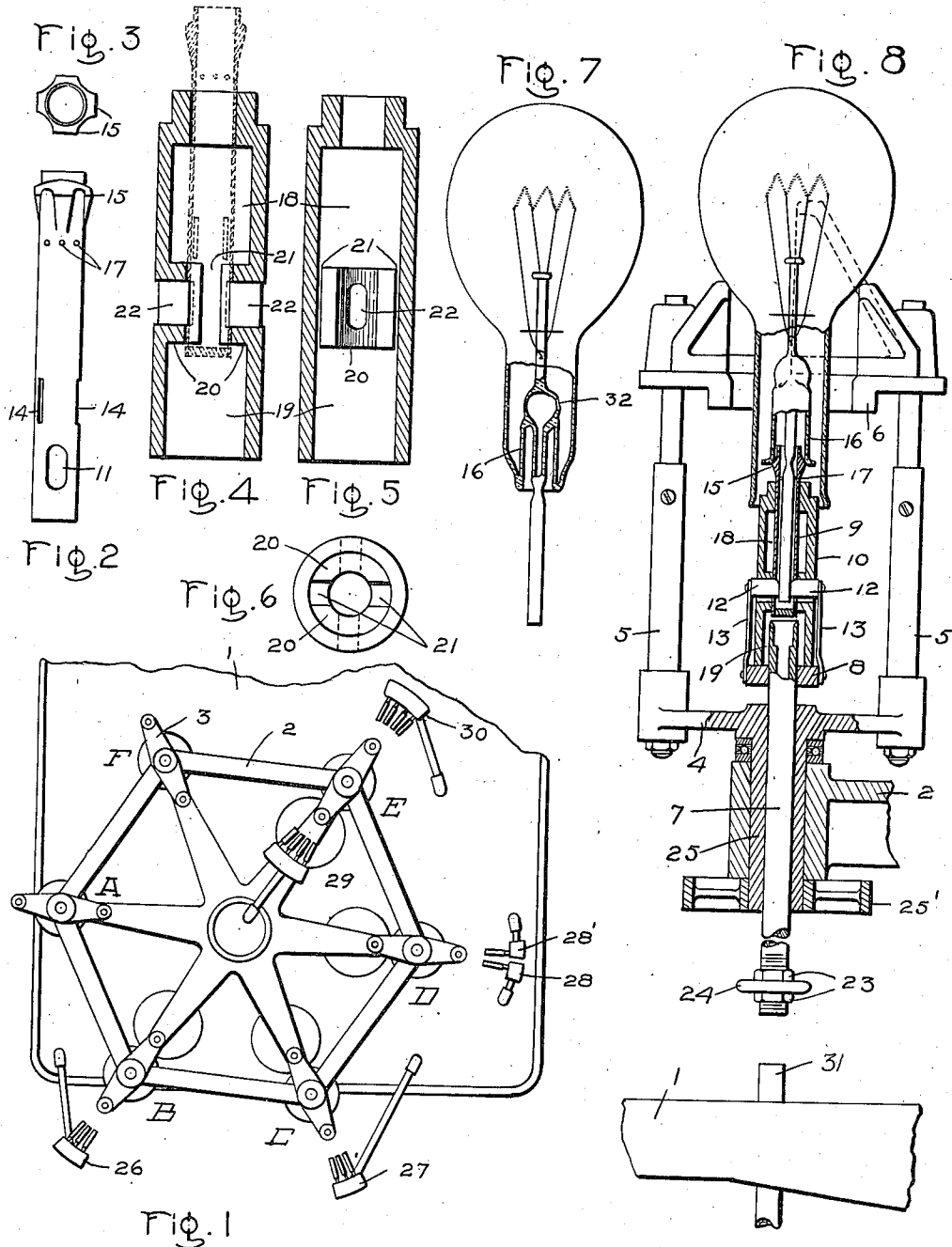
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L. E. MITCHELL ET AL

SEALING-IN MACHINE

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UNITED STATES PATENT OFFICE.

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SEALING-IN MACHINE.

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To all whom it may concern:

Be it known that we, LORIS EDWIN MITCHELL and ARTHUR JAMES WHITE, citizens of the United States, residing at Cleveland, in the county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Sealing-In Machines, of which the following is a specification.

Our invention relates to sealing-in machines and more particularly to spindles therefor. The operation of sealing-in comprises uniting the stem tube to the neck of the bulb and blowing off the surplus neck. In the common type of sealing-in machine, a mount, consisting of the stem tube, filament and associated parts, is placed with the leading-in wires inserted therein, on a tubular spindle in a rotatable head mounted on a rotatable frame and a lamp bulb is placed over the mount and is heated until the neck thereof is fused to the stem tube whereupon the surplus of the neck is blown off. Air for the blowing off of the surplus neck is supplied at the appropriate time to the lower end of the spindle from which it is permitted to escape through openings just below the stem tube and also through the upper opening of the spindle. The neck of the bulb having been softened by heat, it is easily blown outwardly until the glass becomes thin enough to separate leaving the mount sealed into the bulb with surplus neck removed.

With a tipless lamp such as disclosed in our application, Serial Number 283,801, in which the exhaust tube is combined with the mount and projects outwardly beyond the stem tube, the aforesaid type of spindle would prove unsatisfactory for the reason that the exhaust tube, which, with the leading-in wires, must be inserted in the spindle for protection against the heat, would conduct the air supplied to the spindle into the bulb and blow out the seal between the neck and bulb. This must be prevented and, at the same time, the passage through the exhaust tube must be left open to permit the escape of expanding air during the sealing-in process which would otherwise blow out the seal.

According to our invention, the air passing up the spindle is prevented from entering the end of the exhaust tube but is permitted to pass around it and continue to the point where the surplus neck is blown off.

We accomplish this result by placing baffles near the end of the exhaust tube and passing the air around the baffles. Through our invention, we are also enabled to accurately position the mount and associated parts with respect to the lamp bulb. This is of especial advantage in making lamps having non-transparent bulbs through which the filament and mount are not visible.

Our invention will be more clearly understood by referring to the accompanying drawing in which Fig. 1 is a fragmentary top plan view of a sealing-in machine; Fig. 2 is an elevation of a mount support tube comprised by our invention and Fig. 3 is a top plan view of the same; Fig. 4 is a sectional elevation of the baffle tube with the mount support tube shown in dotted lines in cross-section in operative position with respect to the baffle tube and Fig. 5 is a sectional elevation of the baffle tube at right angles to the view of Fig. 4; Fig. 6 is a bottom plan view of the baffle tube; Fig. 7 is an elevation partially in section showing a tipless lamp after the sealing-in operation has been performed; and Fig. 8 is a fragmentary elevation partially in section of a rotatable head of the sealing-in machine.

In Fig. 1 is shown a sealing-in machine of the general type disclosed in Patent No. 1,011,523 granted to A. Swan, December 12, 1911. The bed 1 of the machine has mounted thereon a rotatable frame 2 carrying a number of rotatable heads 3 which carry the lamp parts during the operation of sealing-in.

The assembly of lamp parts in a rotatable head is shown in Fig. 8. The rotatable head comprises a base 4 having mounted thereon two upright supports 5 which carry on their upper ends the bulb support 6. Through the center of the base 4 passes the main support tube 7 which carries at its upper end, by means of the collar 8, the mount support tube 9 and the baffle tube 10. The mount support tube (Figs. 2 and 3) is closed at one end and has two diametrically disposed lateral openings 11 near this end for the reception of the blocks 12 on the end of the spring fingers 13 attached to the collar 8 diametrically opposite each other. Above the openings 11 are three long narrow lateral openings 14 for the admission of the air into the mount support tube. Just below the open end is a shoulder 15 which serves as a rest for the stem 16

of the mount and below the shoulder is an annular series of lateral openings 17 through which air is emitted to blow off the fused surplus neck of the lamp bulb. Some air 5 may be emitted at the top of the mount support tube and pass between the shoulder and stem tube to assist in the blowing off operation.

The baffle tube (Figs. 4, 5 and 6) has an 10 opening in its upper end of substantially the same diameter as the outside diameter of the mount support tube. The opening in the opposite end of the baffle tube is of substantially larger diameter than the outside diameter 15 of the main support tube 7. The inside of the tube is divided into an upper chamber 18 and a lower chamber 19 by the baffle 20 having an opening therethrough of substantially the same diameter as the mount support tube. This baffle is provided with two 20 channels 21 which afford a passage for the air through the said baffle. Two diametrically opposite lateral openings 22 extend through the tube and baffle for the reception 25 of the blocks 12 heretofore described.

The main support tube 7 has a beveled cupped opening in the upper end to direct the air toward the channels. The lower end 30 is threaded for the reception of the nuts 23 which hold the circular gripping disc 24 in place. The tube 7 is held in the base 4 and extension 25 by friction and may be raised or lowered as by pressing up or down 35 on the disc 24. The head 3 may be rotated by means of a gear 25' attached to the extension 25.

The spindle parts are assembled as shown 40 in Fig. 8, the main support tube first being placed in the base 4 and the collar 8 slipped on and fastened to the main support tube. The mount support tube is then inserted in 45 the baffle tube and the latter placed over the main support tube and substantially resting on the collar 8 with the openings 11 of the mount support tube registering with the openings 22 and with the blocks 12 on the 50 end of the spring fingers 13 inserted therein. The exhaust tube and leading-in wires of the mount are inserted in the mount support tube until the stem rests on the shoulder 15, 55 the exhaust tube extending nearly to the bottom of the mount support tube. The lamp bulb is then placed over the mount and supported in proper relation thereto by the bulb support 6.

The assembly of lamp parts just described, 60 takes place at position A. At positions B and C the head 3 is rotated while the gas jets 26 and 27, respectively, preliminarily heat that portion of the bulb neck which is to be sealed to the mount. At position D, while 65 the head is rotated, an intensive heating is given by the gas jets 28 and 28' sufficient to cause the bulb neck to fuse to the stem of the mount.

At position E, while the head is rotated, 70 the gas jets 29 and 30 direct a sharp flame on the neck of the bulb at a point somewhat below the seal just made between the stem and neck. In this position, the lower end 75 of the main support tube is in line but somewhat above an open air-pipe 31 (shown in Fig. 8) which is fastened to and passes 80 through the bed of the machine and which is connected to a source of air pressure. Air emitted from the pipe 31 enters the main support tube and passes upward through it 85 to the lower chamber 19 of the baffle tube, striking the end of the mount support tube and the baffle upon leaving the upper end of the main support tube. From the chamber 90 19 the air passes the baffle by going through the channels 21 into the upper chamber 18 and from here passes into the mount support tube through the openings 14. From 95 the mount support tube the air is emitted through the openings 17, and also through the upper end of the mount support tube, to blow off the surplus neck by blowing out the fused portion until it becomes so thin as 100 to separate, the surplus neck falling down around the spindle. Heated air in the lamp after the seal is formed may escape through the opening 32 into the exhaust tube which 105 conducts it to the lower inner end of the mount support tube 9 from where it passes through the openings 11 and 22 out into the atmosphere. The head is permitted to stay 110 in this position for a short time after the separation in order to polish the seal.

Position F is a cooling position and here 115 the head is not rotated. Through the gripping disc 24 the spindle is preferably drawn down slightly at this point in order to permit the stem to draw in the neck slightly 120 around the seal and form a better shaped neck for basing.

In position A, the lamp is removed and 125 another set of lamp parts assembled.

What we claim as new and desire to secure 130 by Letters Patent of the United States, is:—

1. In an apparatus for sealing into a bulb 135 a mount having an exhaust tube extending therefrom, the combination of a supporting means for the bulb, means for supporting said mount within said bulb and means for 140 directing an air flow outwardly against the neck of the said bulb, said means comprising a support tube through which the air flows for receiving the end portion of said exhaust 145 tube and means for preventing the said air from entering said exhaust tube.

2. In an apparatus for sealing into bulb 150 a mount having an exhaust tube extending therefrom, a head comprising a bulb-supporting means, means for supporting the 155 mount with a portion thereof within the neck of said bulb, and means for directing a flow of air outwardly against the neck of said bulb below the line of seal, said means 160

comprising a support tube having air discharge openings and being adapted to receive the end portion of said exhaust tube, means for supplying air to said support tube to be discharged through said openings and means for preventing the air from entering the exhaust tube.

3. In an apparatus for sealing into a bulb a mount having an exhaust tube extending therefrom, a head comprising a bulb-supporting means, means for supporting the mount with a portion thereof within the neck of said bulb, and means for directing a flow of air outwardly against the neck of said bulb below the line of seal, said means comprising a support tube having air discharge openings and adapted to receive the end portion of said exhaust tube, means for supplying air to said tube to be discharged through said openings, means for preventing the air from entering the exhaust tube, and means for allowing the passage of air from the inside of the bulb through said exhaust tube to the outer atmosphere.

4. In an apparatus for sealing into a bulb a mount having an exhaust tube extending longitudinally therefrom, the combination of means for supporting the bulb with its neck projecting downwardly and means for supporting said mount in a substantially vertical position within said bulb with said exhaust tube extending downwardly therefrom, said means comprising a support tube disposed to receive the end portion of said exhaust tube and having air outlet openings therein, means for supplying air to said support tube to be discharged through said openings and means for preventing the flow of air from said support tube into said exhaust tube.

5. In an apparatus for sealing into a bulb a mount having an exhaust tube extending longitudinally therefrom, a head comprising means for supporting the bulb with its neck projecting downwardly, said head having a hollow extension rotatably supported in a frame, and a means for supporting the mount in a substantially vertical position within said bulb comprising a support tube disposed to receive the end portion of said exhaust tube and having air outlet openings therein and means extending through said hollow extension for supplying air to said support tube to be discharged through said openings and means for preventing the flow of air from said support tube into said exhaust tube.

6. In an apparatus for sealing into a bulb a mount having an exhaust tube extending longitudinally therefrom, a frame, a head having a hollow extension rotatably supported in said frame and comprising means for supporting the bulb with its neck projecting downwardly and means for supporting the mount in a substantially verti-

cal position within said bulb comprising a support tube closed at the bottom and disposed to receive the end portion of said exhaust tube, said support tube being provided with air outlet openings and being in substantial alignment with said hollow extension, means extending through said hollow extension for supplying air to said support tube and baffling means for permitting the flow of air into said support tube to be discharged through said outlet openings and for preventing said air from entering said exhaust tube.

7. In an apparatus for sealing into a bulb a mount having an exhaust tube extending therefrom, the combination of supporting means for the bulb, means for supporting the mount within the bulb, means for directing an air flow outwardly against the neck of the bulb, means for supplying air to said air directing means and means providing a passage to the atmosphere for the expanded air displaced from the bulb by the heat of the sealing-in operation.

8. In an apparatus for sealing into a bulb a mount having an exhaust tube extending therefrom, the combination of means for supporting the bulb with its neck projecting downwardly, means for supporting the mount in a substantially vertical position within the bulb with the exhaust tube extending downwardly therefrom, means for directing air flow outwardly against the neck of the bulb, means for supplying air to said air directing means and means providing a passage to the atmosphere for the expanded air displaced from the bulb by the heat of the sealing-in operation.

9. In an apparatus for sealing into a bulb a mount having an exhaust tube extending therefrom, the combination of a supporting means for the bulb, means for directing an air flow outwardly against the neck of the bulb, means for supporting the mount within the bulb, said supporting means providing a passage to the atmosphere for the expanded air displaced from the bulb by the heat of the sealing-in operation, and means for supplying air to said air directing means.

10. In an apparatus for sealing into a bulb a mount having an exhaust tube extending therefrom, the combination of a supporting means for the bulb, means for supporting the mount within the bulb, and means providing a passage to the atmosphere for the expanded air displaced from the bulb by the heat of the sealing-in operation.

11. In an apparatus for sealing into a bulb a mount having an exhaust tube extending therefrom, the combination of means for supporting the bulb with the neck thereof projecting downwardly, means

- for supporting the mount in a substantially vertical position with a portion thereof within the neck of the bulb, and means for directing a flow of air outwardly against the neck of the bulb, said means comprising a tube having air discharge openings and adapted to receive the end portion of the exhaust tube, means for supplying air to said tube substantially above the end of the exhaust tube to be discharged through said openings and means providing a passage to the atmosphere for the expanded air displaced from the bulb by the heat of the sealing-in operation.
12. In an apparatus for sealing into a bulb a mount having an exhaust tube extending therefrom, the combination of a support for said bulb and means for supporting said mount within said bulb comprising means for receiving and positioning the said exhaust tube.
13. In an apparatus for sealing into a bulb a mount having an exhaust tube extending therefrom, the combination of a support for said bulb and means for supporting said amount within said bulb comprising a chuck for receiving and positioning the said exhaust tube.
14. In an apparatus for sealing into a bulb a mount having an exhaust tube extending longitudinally therefrom, the combination of a support for said bulb and means for supporting said mount within said bulb comprising a tubular member for receiving a portion of said exhaust tube and a chuck having members extending through said tubular member and engaging the sides of said exhaust tube.
15. In an apparatus for sealing into a bulb a mount comprising an exhaust tube attached thereto and disposed substantially axially thereof the combination of a support for said bulb and means for supporting said mount within said bulb comprising means adapted to receive and center relatively thereto said exhaust tube and to center thereby said mount within said bulb.
16. In an apparatus for sealing into a bulb a mount comprising an exhaust tube attached thereto and disposed substantially axially thereof, the combination of a support for said bulb and means for supporting said mount within said bulb comprising a tubular member adapted to receive said exhaust tube and having therein means for centering said exhaust tube relatively to said member and to center thereby said mount within said bulb.

In witness whereof, we have hereunto set our hands this 22nd day of April, 1919.

LORIS EDWIN MITCHELL.
ARTHUR JAMES WHITE.