

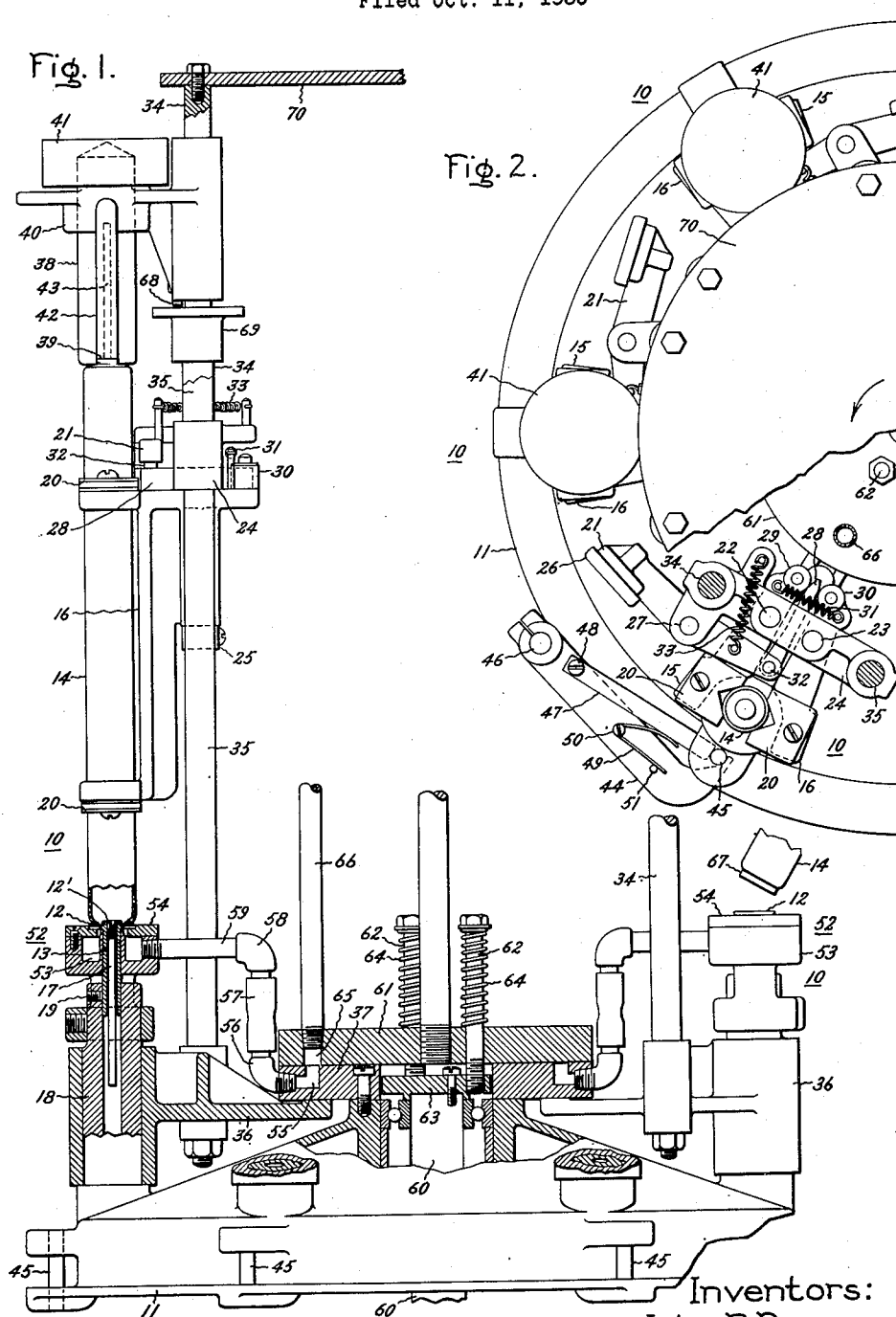
June 21, 1938.

J. F. DONOVAN ET AL

2,121,627

APPARATUS FOR SEALING METAL TO GLASS

Filed Oct. 11, 1935



Inventors:
John F. Donovan,
Frank J. Malloy,
by *Harry E. Dunham*
Their Attorney.

UNITED STATES PATENT OFFICE

2,121,627

APPARATUS FOR SEALING METAL TO GLASS

John F. Donovan, East Cleveland, and Frank J. Malloy, Cleveland Heights, Ohio, assignors to General Electric Company, a corporation of New York

Application October 11, 1935, Serial No. 44,556

1 Claim. (Cl. 49—2)

Our invention relates to apparatus for manufacturing electric lamps and similar articles and more particularly to sealing machines.

One of the objects of our invention is to provide a machine for effectively and efficiently sealing a terminal member, such as a metal disc, directly to an end of a glass bulb.

According to our invention, the machine comprises a turret having thereon a plurality of heads each comprising a support for the metal terminal member, a holder for holding the bulb with its end abutting against the terminal member, and means for pressing the bulb against the said terminal member while a flame is directed against said terminal member to heat it and to fuse and seal thereto the portion of the bulb in contact therewith. A stop is preferably provided to automatically limit the downward movement of the bulb during the fusion of its end.

Further features and advantages of our invention will appear from the following detailed description thereof and from the drawing.

In the drawing Fig. 1 is a side elevation, partially broken away, of a sealing machine comprising our invention and Fig. 2 is a top view of one-half of said machine, also partially broken away.

The machine comprises in this particular instance six heads 10 which are equally spaced around a turret 11. The heads 10 are preferably loaded and unloaded at one position, the loading consisting in placing the metal disc 12 on a spindle 13 and the tubular bulb 14 in jaws 15—16. The metal disc 12 is of the type covered in application Serial No. 3,334, H. D. Blake, filed January 24, 1935, and assigned to the assignee of the present application and has an indented portion 12' which fits snugly over the end of the spindle 13. The disc 12 also has an exhaust tube 17 sealed thereto which extends downwardly into the said spindle. The spindle 13 is mounted in a hollow post 18 extending from the turret 11 in which it is held by a screw 19. The bulb 14 is engaged by V-notched blocks 20 on the upper and lower portions of each of the jaws 15 and 16. The said jaws are separated to permit insertion of the bulb therebetween by pressure on lever 21. The jaws 15—16 are rotatably mounted on pins 22 and 23 respectively in the bracket 24 and are prevented from slipping off the lower ends of said pins by a collar 25 which is clamped to the end of each pin. The lever 21 is operated manually by pressure on pad 26 and turns about pin 27 in the bracket 24, pulling wedge 28 from between the rollers 29—30 on the jaws 15—16.

The jaws are then opened by a spring 31 extending between posts in said jaws and a bulb 14 is inserted therebetween with its lower end abutting against the disc 12. The jaws 15—16 are then closed by the wedge 28 which is again forced between the rollers 29—30 by a return movement of the lever 21. The wedge 28 slides in ways in the bracket 24 and is provided with a pin 32 which extends into a hole in one end of lever 21. The return movement of lever 21 is produced by a spring 33 which extends between posts in bracket 24 and lever 21 respectively and pulls the lever 21 back, thereby moving the wedge 28 into position between the rolls 29 and 30. Bracket 24 is mounted on a pair of rods 34—35 extending upwardly from the bracket 36 which is mounted on the post 18 which is attached to the turret 11 and to the lower half 37 of a rotary valve.

After the bulb 14 has been placed in the jaws 15—16 a weighted tube 38 is swung over and onto the disc 39 on the upper end of said bulb 14 causing said bulb 14 to be pressed more firmly against the disc 12. The said tube 38 is mounted in bracket 40 which is slidably mounted on rod 34 so that it may be turned and moved vertically on said rod as required. The tube 38 is pressed down by a weight 41 mounted on the upper end thereof and is slotted at 42 to provide clearance for an exhaust tube 43 in some instances extending from disc 39. The turret 11 is now indexed manually.

In order that the turret may be indexed a catch 44 (Fig. 2) is swung outward away from a pin 45 in the turret by manual rotation of a post 46 on which the catch 44 is mounted and which is preferably rotated by a foot pedal (not shown). The catch 44 is swung back before said head 10 is fully indexed and another pin 45 suitably placed in the turret strikes a latch 47 swinging it outward. When the new position of the heads is reached the pin 45 takes the position shown in Fig. 2 and the latch 47 swings in behind the pin, preventing clockwise rotation of the turret. The said latch 47 is mounted on a screw 48 on the catch 44 and is engaged by one arm of a spring 49 which is mounted on a screw 50 on the catch 44. The other arm of the spring 49 engages a pin 51 on the catch 44.

At the second position of the head 10 a combustible gas mixture is caused to flow through a burner 52 and is ignited by a stationary flame (not shown). The burner 52 comprises a hollow body portion 53 surrounding the upper end of the spindle 13 and a plate 54 which closes off the in-

terior thereof except for a space directly below the disc 12 where the flame is produced. The flame is directed against the disc 12 so that only the glass of the bulb 14 in contact therewith is fused and the remainder is not deformed. The combustible gas mixture is conducted to the burner 52 through a passage 55 in the lower half 37 of the rotary valve, through elbow 56, pipe 57, elbow 58 and pipe 59. The lower half 37 of the rotary valve is mounted on the turret 11 which is supported by a post 60, and the upper half 61 of the valve is mounted through studs 62 and cap 63 on the end of said post 60. Springs 64 around the studs 62 press the halves of the valve together. An arcuate passage 65 is provided in the upper valve half 61 to carry the combustible gas mixture from pipe 66 to the passage 55 of the head as it passes through the three positions following the loading position. As the bulb 14 passes through these positions it is sealed to the disc 12 as shown at the left in Fig. 1 and at the next two positions the heated parts are allowed to cool. The end of the bulb 14 is preferably provided with a flange 67 which is smaller in diameter than the remainder of the bulb as shown at the right in Fig. 1 and which melts down onto the upper surface of the disc 12. When the flange 67 is completely melted the stop screw 68 in the weighted arm 40 strikes the stationary collar 69 on rod 34, thereby preventing further

vertical movement of the bulb. The upper ends of the rods 34 and 35 are attached to a plate 70 for increased rigidity.

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

In a sealing machine, the combination of a turret rotatably mounted on a vertical axis, a plurality of heads mounted on said turret, each of said heads comprising a vertically disposed spindle adapted to hold a metal disc on its upper end and a pair of jaws disposed above said spindle and adapted to hold a tubular glass bulb in a vertical position with its lower end abutting against the upper surface of said disc, a burner surrounding the upper part of said spindle and having an annular opening therein around the upper end of said spindle for directing a flame at the bottom of the disc on said spindle to heat said disc and cause the end of the bulb abutting against the disc to be fused and sealed thereto, means for pressing said bulb downwardly as the lower end thereof is fused down, a stop for engaging said means and limiting the downward movement of said bulb and means for causing gas to be supplied to the said burners as the heads carrying them are indexed from a loading position.

JOHN F. DONOVAN.
FRANK J. MALLOY.