Oct. 3, 1933. G. ILLINGWORTH 1,929,313

APPARATUS FOR TIPPING-OFF INCANDESCENT LAMPS AND SIMILAR DEVICES

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Fig. 1

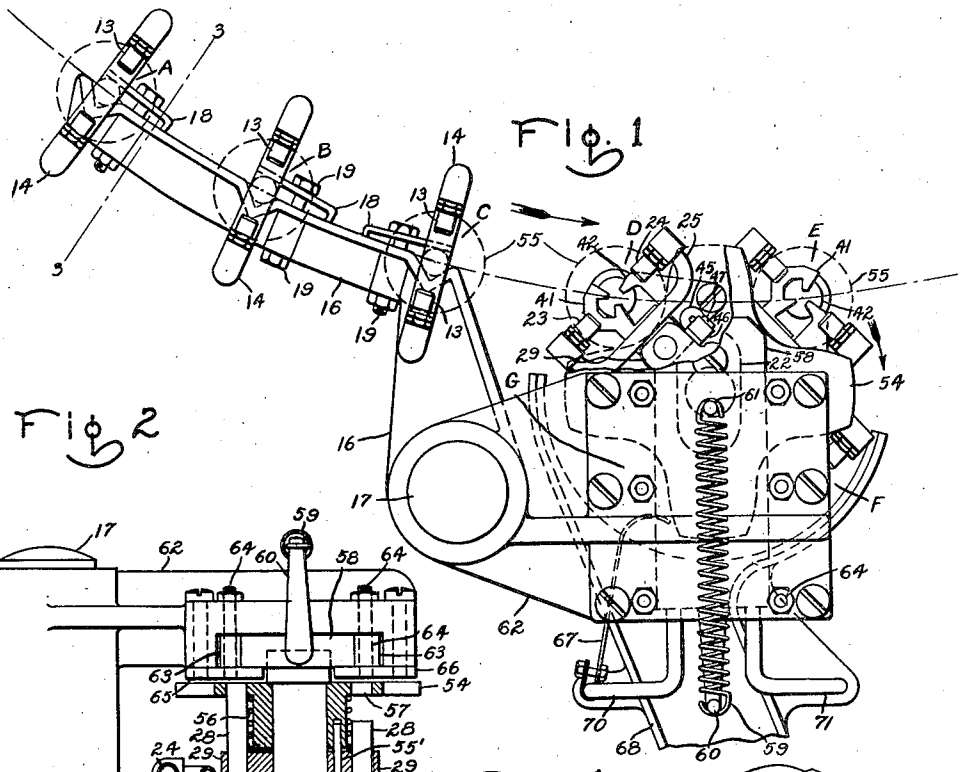

Fig. 2

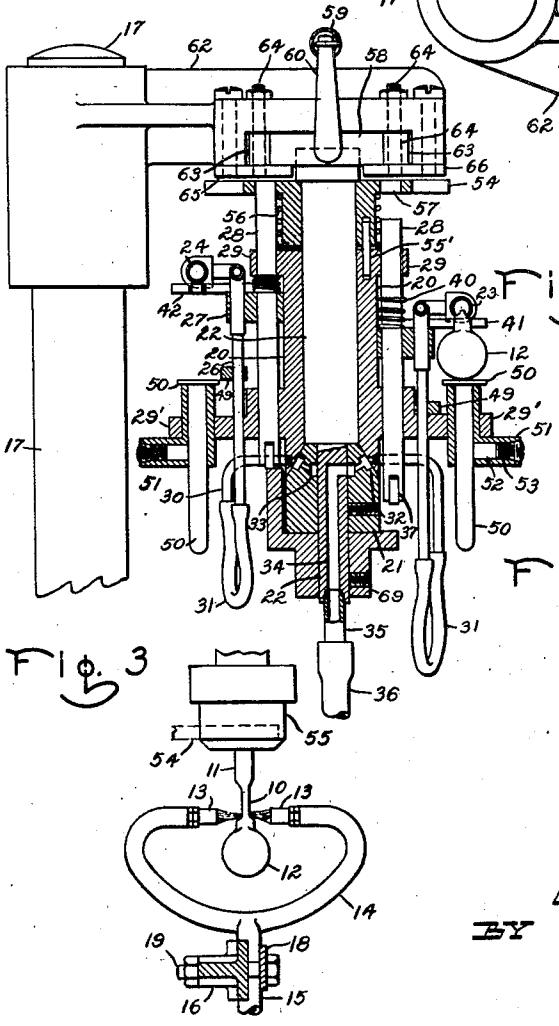

Fig. 4

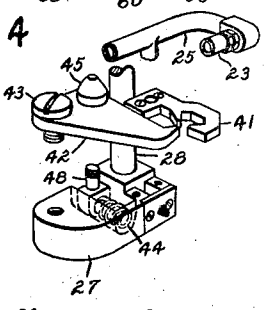

Fig. 5

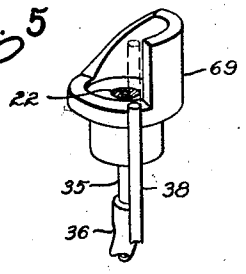

Fig. 3

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APPARATUS FOR TIPPING-OFF INCANDESCENT LAMPS AND SIMILAR DEVICES

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Serial No. 582,109

5 Claims. (Cl. 176—2)

My invention relates to apparatus for exhausting incandescent electric lamps and similar devices, and more particularly to the portion of such apparatus for sealing-off the exhaust tube of the device after the evacuation or gas-filling operations have been completed. The exhausting machines which are in use comprise an intermittently rotated carrier having at the periphery thereof a plurality of holders for the incandescent lamp or other device. Each of these devices is indexed from one position to another and the exhausting or gas-filling operations are gradually completed as the device completes the cycle. The last operation is the sealing-off of the exhaust tube, the melting-off of the glass tube below the sealing-off point, and the discharge of the article. Heretofore this sealing-off operation has been performed by devices located along the path of travel of the rotatable carrier and the result has been that the speed of the machine has been diminished because of the necessity of holding each of the articles at this position until the sealing-off is completed. According to my invention I provide a turret which is provided with a plurality of holders each of which in turn takes one of the articles from the holders of the main carrier of the machine and which is indexed around the turret for the performance of the sealing-off operation without holding up the movement of the main carrier which may be governed therefore by the necessities of the exhaust and other operations. Other features and advantages of my invention will appear from the description which follows of a species thereof and from the accompanying drawing.

Referring to the drawing, Fig. 1 is a plan view of the tipping off device of my invention; Fig. 2 is a side elevation of the turret of this device partially in section; Fig. 3 is a vertical section along line 3—3 of Fig. 1; Fig. 4 is a partially disassembled view of a head of this device; and Fig. 5 is a perspective view of the head raising and lowering cam.

My device operates in conjunction with a lamp exhausting or gas-filling machine which comprises a number of heads (preferably thirty-two) which are indexed intermittently in a counter-clockwise direction as indicated in Fig. 1. Because of the high speed of this machine, it is desirable to divide the sealing-off operation into five steps taking place respectively at five successive positions which are designated by letters A to E inclusive. The first three of these, A, B, and C, are occupied by preheating fires which are directed as shown in Fig. 3, upon a section of the contraction 10 in the exhaust tube 11 of the bulb 12. The fires are produced by burners 13 in each end of yokes 14 which are supported through pipes 15 which are in turn connected to the gas and air mains through valves and hose not shown. Pipes 15 are supported by bracket 16 which extends from the stationary shaft 17 of the machine and which holds said pipes in grooves in which they are clamped by plates 18 and bolts 19.

Position D into which the lamps next pass is occupied by a head of the tipping turret. The turret 20 carries four such heads mounted equidistantly thereabout (Fig. 2) and is slidably mounted on valve block 21 and about shaft 22. The first operation of the turret mechanism takes place as fires from the oppositely disposed burners 23 and 24 on yoke 25 strike the preheated section of the exhaust tube. The yoke is supported through pipe 26 which is attached to block 27 on shaft 28 which in turn is slidably mounted in arms 29 and 29′ of the turret 20. Pipe 26 is connected to pipe 30 protruding from the wall of the turret by flexible hose 31 which receives the gas fuel mixture entering said pipe from passages in valve block 21 and shaft 22. Passage 32 is circular and connects to each of the four ports leading to the heads while passage 33 is also circular but connects to passage 34 in shaft 22 which is fed by pipe 35 and hose 36 from the main supply of fuel mixture. During the time interval that the head is located at this position, the exhausting or gas charging of the machine is completed and the exhaust tube is closed off by the fires. The head is then dropped so as to stretch the fused glass and perhaps separate the surplus portion of the exhaust tube. This movement is produced by the lowering of shaft 28, the roller 37 in the end of which rests at that stage of the operation on the end of rod 38 (Fig. 5) which is reciprocated by mechanism (not shown) comprising the cam and weight commonly used in this class of devices, the weight in this producing the descent while the cam returns the weight and rod 38 to its former or raised position. The early part of the drop is accelerated by spring 40 which surrounds shaft 28 and causes the bulb neck to be gripped by jaws 41 and 42. Of these jaws (Fig. 4), jaw 41 is fastened to block 27 and jaw 42 is pivotally attached to said block by screw 43. The closing swing of the latter which is produced by spring 44 occurs as the lowering movement pulls the cone-shaped button 45 away from roller 46 (Fig. 1)

on pin 47 in arm 29 of the turret. Said spring 44 operates in a recess in said block between a wall thereof and pin 48 protruding from the jaw. The head drops until block 49 on pipe 26 strikes arm 29' and the bulb 12 strikes rest 50 in bracket 51 attached to said arm. The rest 50 is frictionally engaged by block 52 pressed by spring 53 which permits its being adjusted vertically to accommodate other types of bulbs.

The indexing motion which carries the machine head from position D to E is accompanied by a similar motion of the tipping turret which is turned by the engagement of gear 54 with the cylindrical portion 55 of the head. The point at which the gear strikes the head is indicated in Fig. 3. Gear 54 is attached to turret 20 through pin 55' and is forced against the enlarged end of shaft 22 by spring 56 which also keeps the turret in contact with valve block 21. Holes 57 in said gear allow shafts 28 clearance for their vertical movement. The arc movement of the main machine head is followed by the turret as gear 54 forces slide 58 to which shaft 22 is attached back against the action of spring 59. Said spring operates between a post 60 in the slide and another post 61 in bracket 62 which supports said slide between roller 63 on pins 64 and plates 65 and 66. Bracket 62 is supported through shaft 17 to which it is attached. At position E the fires cut the thin string of glass which is usually present connecting the bulb and the exhaust tube and fuse the seal more nearly into shape. The lamp is then carried into the next position (position F) in which the seal is completed by the fires and then again indexed into position G. This latter indexing unloads the lamp by causing said lamp to come into engagement with spring 67 which brushes it into chute 68. The lamp is released by jaws 41 and 42 before said lamp is unloaded by the raising of the turret head through the engagement of roller 37 with raised part of cam 69. This movement brings button 45 against roller 46 swinging jaw 42 open. Chute 68 is supported by rods 70 and 71 extending from slide 58 and spring 67 is attached to rod 70. This description covers one cycle of operation which is repeated as the machine continues to operate.

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

1. In an apparatus for exhausting or gas-filling incandescent lamps and similar devices, the combination of a carrier having a plurality of heads arranged therealong and each adapted to receive one of said devices, means for moving said carrier, a turret mounted adjacent the path of travel of said carrier heads and comprising a plurality of heads and means engaging said carrier heads for causing said turret to rotate as the said heads are moved to bring a turret head into alignment with a carrier head, said turret being resiliently coupled with said rotating means thereby causing it to follow the path of travel of said carrier head until another turret head engages a carried head.

2. In an apparatus for exhausting or gas-filling incandescent lamps and similar devices comprising a bulb having an exhaust tube extending therefrom, the combination of a carrier having a plurality of heads arranged therealong and each adapted to receive one of said devices, means for moving said carrier, a turret mounted adjacent to the path of travel of said carrier heads and comprising a plurality of heads each comprising means engaging the bulb portion of a device and burners positioned to heat an exhaust tube carried by said device, and means whereby said turret is caused to move in proper time relation with the movement of the carrier.

3. In an apparatus for exhausting or gas-filling incandescent lamps and similar devices comprising a bulb having an exhaust tube extending therefrom, the combination of a carrier having a plurality of heads arranged therealong and each adapted to receive one of said devices, means for moving said carrier, a turret mounted adjacent to the path of travel of said carrier heads and comprising a plurality of heads each comprising means engaging the bulb portion of a device and burners positioned to heat an exhaust tube carried by said device, means for causing a vertical movement of said bulb engaging means after said exhaust tube has been fused, and means whereby said turret is caused to move in proper time relation with the movement of the carrier.

4. A tipping apparatus, for use in combination with the movable carrier of a machine for exhausting or gas-filling electric incandescent lamps and similar devices comprising a bulb having an exhaust tube extending therefrom, comprising a turret having a plurality of heads each provided with means for engaging one of said bulbs, burners positioned to fuse a portion of said exhaust tube and means for rotating said turret in proper time relation to the movement of said machine carrier.

5. A tipping apparatus, for use in combination with the movable carrier of a machine for exhausting or gas-filling electric incandescent lamps and similar devices comprising a bulb having an exhaust tube extending therefrom, comprising a turret having a plurality of heads each provided with means for engaging one of said bulbs, means for moving each of said heads longitudinally, burners positioned to fuse a portion of said exhaust tube and means for rotating said turret in proper time relation to the movement of said machine carrier.

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