Nov. 1, 1927. 1,647,625

J. J. HIGGINS ET AL

AUTOMATIC BULB PRINTING DEVICE

Filed Oct. 4, 1923 4 Sheets-Sheet 1

FIG. 3.

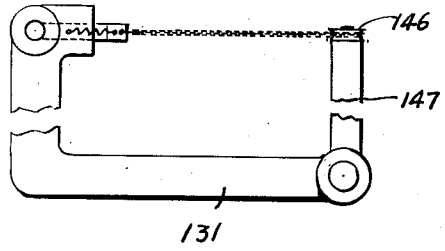


FIG. 1.

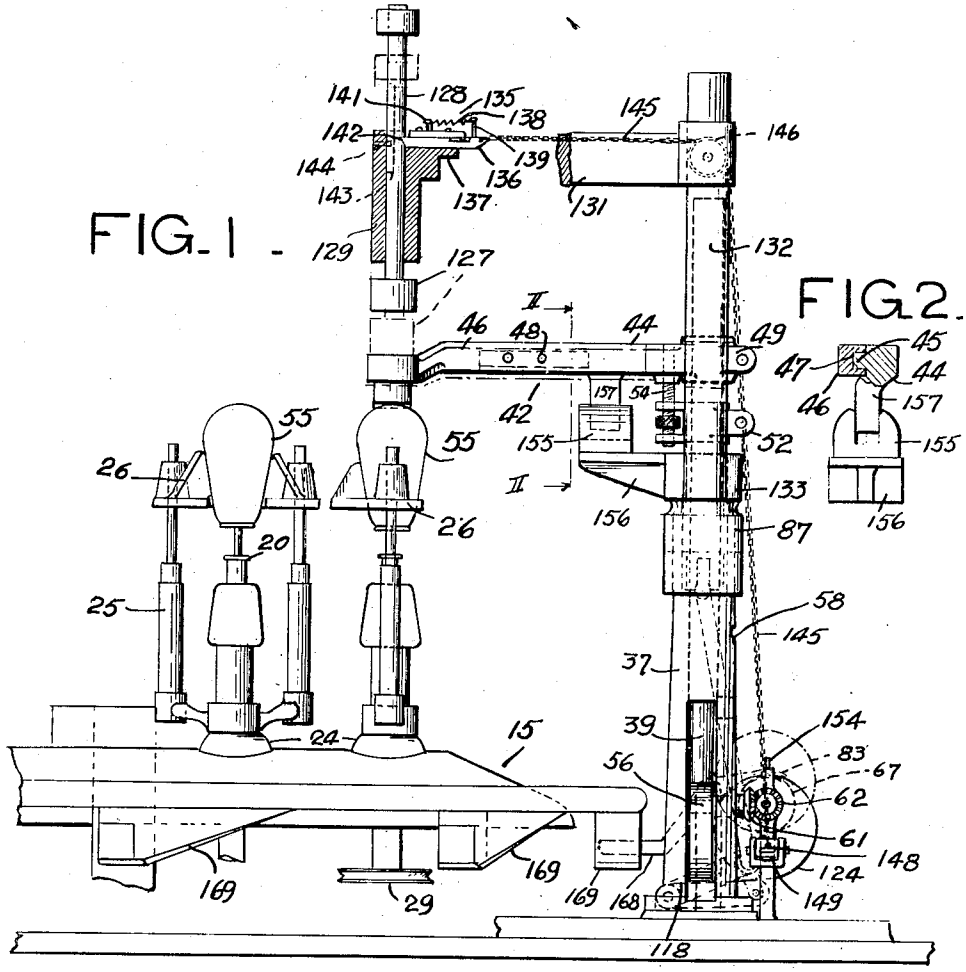


FIG. 2.

INVENTORS
JOHN J. HIGGINS
ROBERT H. BURNS
BY
J. J. Higgins
ATTORNEY

Nov. 1, 1927. 1,647,625

J. J. HIGGINS ET AL

AUTOMATIC BULB PRINTING DEVICE

Filed Oct. 4, 1923 4 Sheets-Sheet 2

FIG. 4.

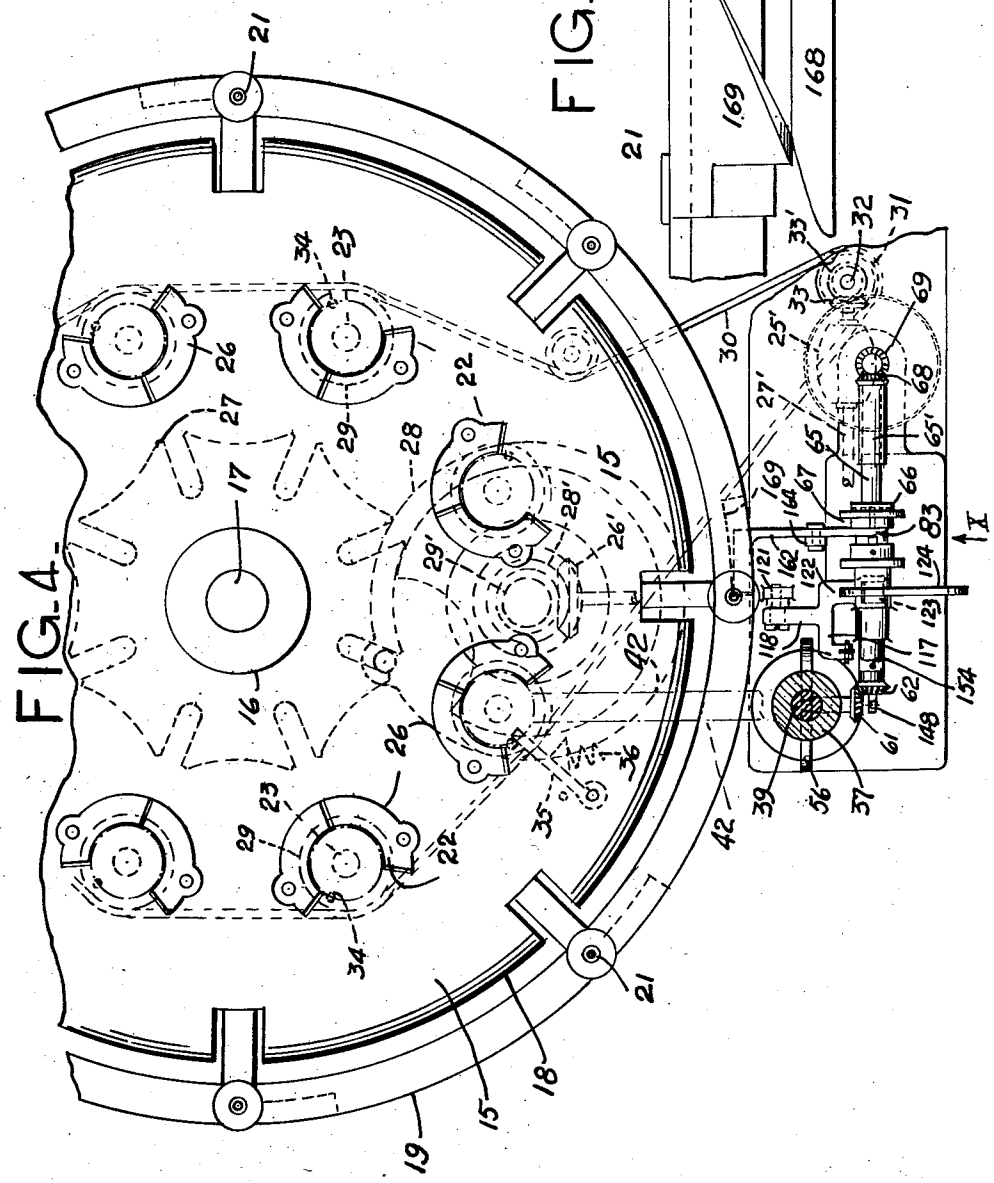


FIG. 5.

INVENTORS
JOHN J. HIGGINS
ROBERT H. BURNS
BY
ATTORNEY

Nov. 1, 1927. 1,647,625

J. J. HIGGINS ET AL

AUTOMATIC BULB PRINTING DEVICE

Filed Oct. 4, 1923 4 Sheets-Sheet 3

FIG. 9.

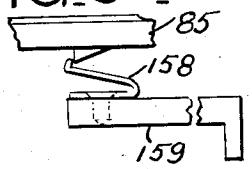


FIG. 8.

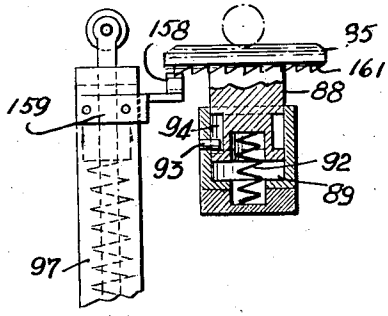


FIG. 6.

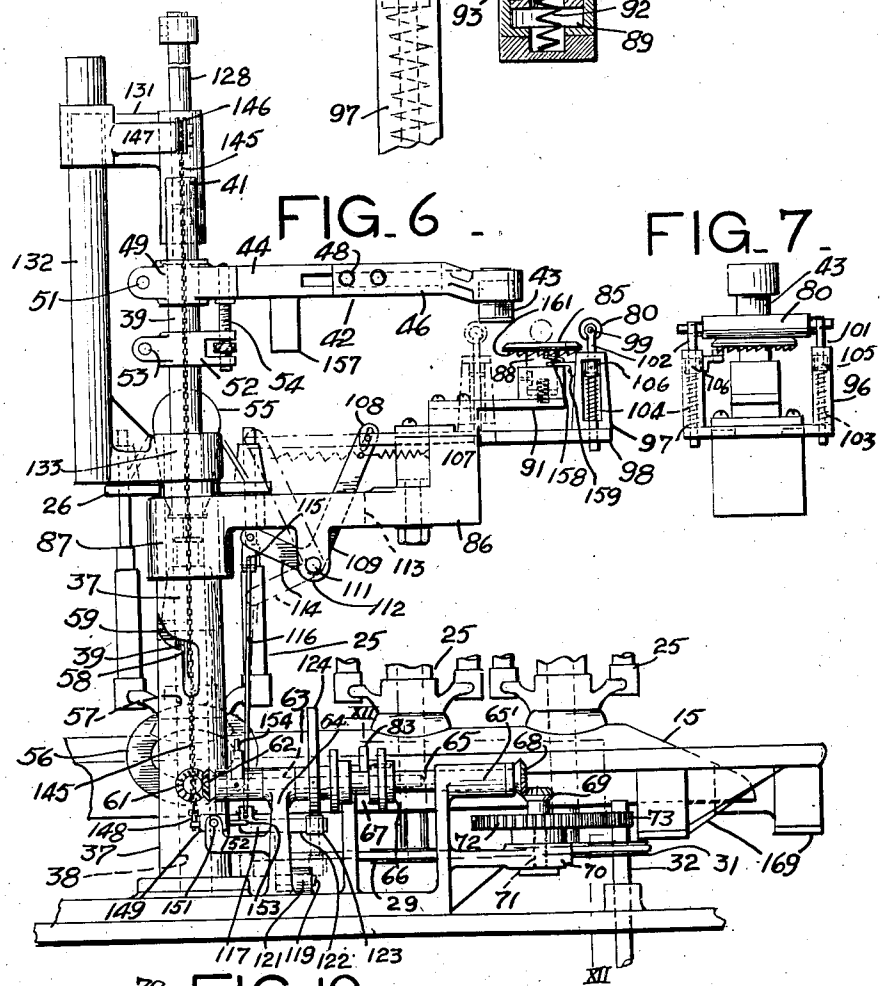
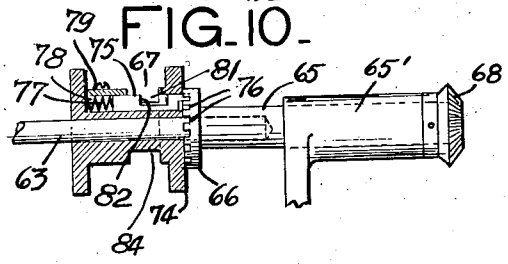


FIG. 7.

FIG. 10.



INVENTORS
JOHN J. HIGGINS
ROBERT H. BURNS
BY
ATTORNEY

Nov. 1, 1927. 1,647,625

J. J. HIGGINS ET AL

AUTOMATIC BULB PRINTING DEVICE

Filed Oct. 4, 1923 4 Sheets-Sheet 4

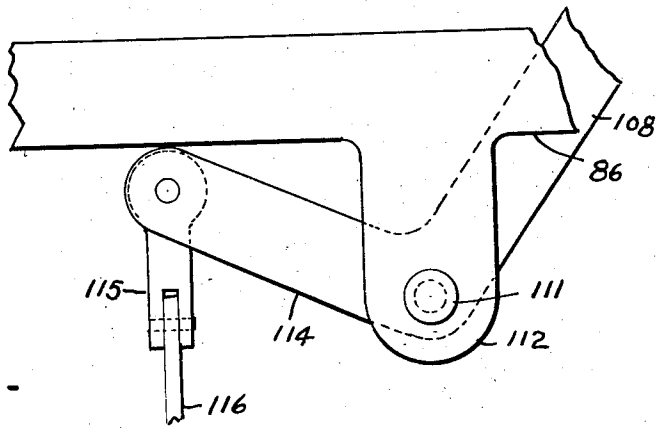


FIG. 11.

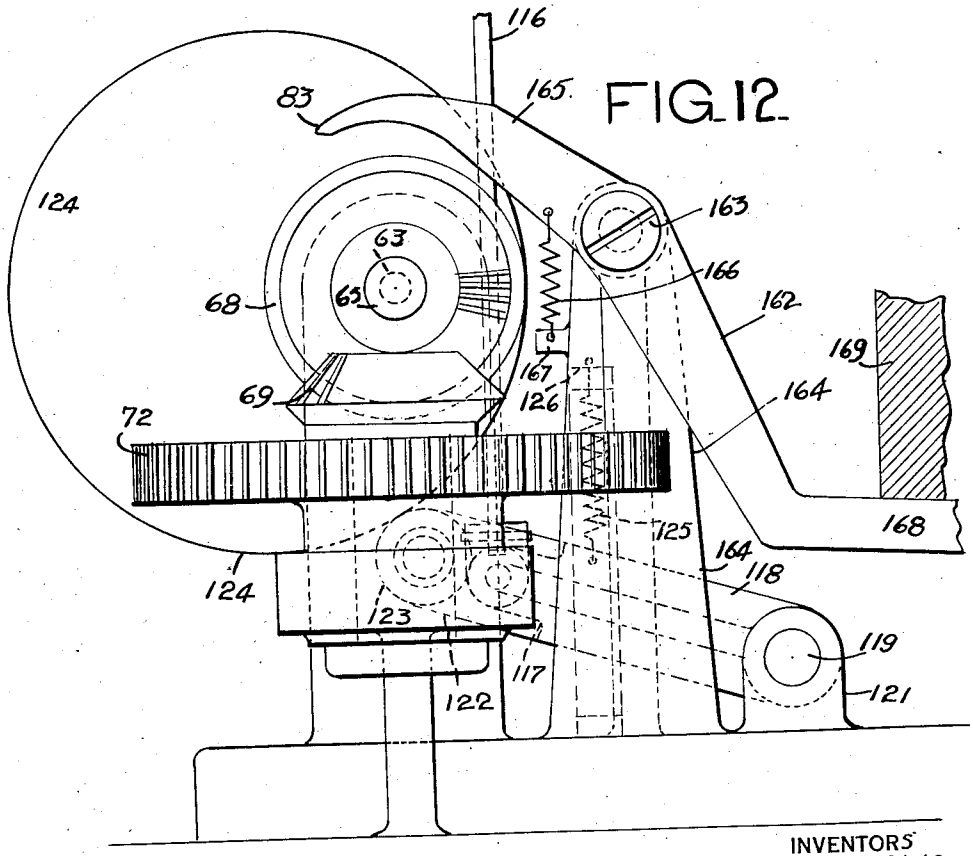


FIG. 12.

INVENTORS
JOHN J. HIGGINS
ROBERT H. BURNS

BY J. J. Gilbert

ATTORNEY

Patented Nov. 1, 1927. 1,647,625

UNITED STATES PATENT OFFICE.

JOHN JOSEPH HIGGINS, OF EAST ORANGE, AND ROBERT HENRY BURNS, OF BLOOMFIELD, NEW JERSEY, ASSIGNORS TO WESTINGHOUSE LAMP COMPANY, A CORPORATION OF PENNSYLVANIA.

AUTOMATIC BULB-PRINTING DEVICE.

Application filed October 4, 1923. Serial No. 666,442.

The present invention relates to lamp making machinery and more particularly to a device for printing upon the surface of a lamp bulb.

An object of the invention is to provide a machine for applying a stamp to a lamp bulb in an efficient and expeditious manner.

Another object of the invention is to provide a bulb printing device which may be disposed in cooperation with other lamp making apparatus and operated thereby to impress a stamp upon a lamp carried by said apparatus.

Another object of the invention is to provide a bulb device for impressing a stamp upon a spherical surface without distortion to the impressed description.

Another object of the invention is to provide a bulb printing device which may be operated by and in relation to a sealing-in machine to impress a stamp upon a bulb supported in said machine.

A further object of the invention is to provide a printing device in which a stamp is moved in contact with a lamp bulb and subsequently moved downwardly to impress the stamp more firmly upon said bulb.

A still further object of the invention is to provide a bulb printing device in which coordinating machine elements operate to move a stamp in contact with a lamp disposed in a sealing-in machine and subsequently deliver an impact blow upon said stamp.

Other objects and advantages will be apparent as the description proceeds.

In the manufacture of electric incandescent lamps, it is found desirable to impress a marking or legend upon the bulb of the lamp. Such mark may be sand blasted through a stencil upon the lamp or may be printed thereon, as for example, with an acid to provide an etching, making a permanent mark for identification or descriptive purposes.

The present invention has to do with the printing upon a bulb, utilizing ink or other preparation containing an acid which is subsequently further treated to bring about a reaction and a permanent marking.

As lamps are now manufactured without the usual pointed end or tip, it has been found desirable to impress a mark upon the spherical portion or top of the lamp bulb. It will be appreciated that certain difficulties may arise when it is necessary to apply a printing member to a spherical surface. Ordinarily, the member might be of concave printing surface with the type raised thereon. Such a form of printing member or stamping plate will, however, only answer the requirement if the spherical surfaces to which it is to be applied are of uniform dimensions. Uniformity within narrow limits is not practical, or possibly not attainable in the production of electric lamp bulbs. Thus a slight difference in the convex surface of the bulbs would make it impracticable to use a concave stamp.

In the present invention a stamp of flexible material is employed and impressed upon the bulb to take the contour thereof and apply ink. Any suitable flexible or resilient material may be employed such for example as a gum composition or soft rubber. It has been found, however, that the best results are not obtained by directly impressing the stamp upon the lamp with a continual applied force and the present invention provides for the disposition of the stamp upon the lamp bulb and a subsequent application of force to complete the stamping operation.

Although the present invention may be employed to perform the printing operation upon the bulb at any stage throughout the manufacture of a lamp, it has been found practical to apply the stamp to a bulb during what is termed "a sealing-in operation." The present device, therefore, is arranged to operate in connection with a sealing-in machine and comprises a printing arm adapted to carry an impression member or stamp.

Inking means are provided for inking the stamp and other mechanism then operates to move the stamp in contact with the top of a bulb positioned in a sealing-in machine. After the stamp has been so positioned, a weighted member is caused to fall and strike the upper portion of the stamp and impress it upon the bulb. The printing arm is then returned to position for inking and the sealing-in machine indexed to position another lamp bulb for the printing operation It will be understood that the operations per-

formed by an operator in applying the necessary parts to the sealing-in machine is the same as heretofore and that the operator may operate the sealing-in machine at the maximum rate of production.

The invention will be more fully understood by reference to the accompanying drawings, in which

Fig. 1 is a side elevation of a machine embodying the present invention, shown partly in section and in operative relation to a sealing-in machine;

Fig. 2 is a section taken on line II—II in Fig. 1;

Fig. 3 is a plan view of the upper portion of the bulb printing device and shows an off-set arm carrying trip mechanism;

Fig. 4 is a plan view of the bulb printing device in operative relation to a sealing-in machine; the upper portion of the printing device being broken away to more clearly show other parts;

Fig. 5 is a detail of a portion of a sealing-in and exhausting machine and shows a cam member in operative relation to a lever arm of the bulb printing machine;

Fig. 6 is an elevational view of the bulb printing machine and the sealing-in and exhaust machine viewed in the direction of the arrow "X" in Fig. 4;

Fig. 7 is an end view of the inking mechanism shown in Fig. 6;

Fig. 8 is an enlarged detail of an ink pad or feed plate and shows ratchet mechanism for rotating the plate;

Fig. 9 shows a portion of the ink feed plate and more clearly shows the ratchet for engaging with a ratchet wheel upon the under side of the plate;

Fig. 10 is an enlarged detail partly in section showing a clutch mechanism for starting and stopping the bulb printing mechanism;

Fig. 11 is an enlarged view of the bell-crank and bearing for operating the inking mechanism, and

Fig. 12 is an enlarged view taken substantially on line XII—XII in Fig. 6 and shows the mechanism for operating the various mechanisms to perform the printing operation, also the relation of the clutch-operating-lever to the cam of the sealing-in and exhausting machine.

Although the present invention may be applied to various types of machines, or in fact in connection with any suitable support for an electric incandescent lamp bulb, it is herein illustrated as applied to a sealing-in and exhausting machine as commonly employed in the lamp art.

For the purpose of making the following description more comprehensive, a brief outline of the sealing-in and exhausting machine will be given.

As illustrated, (see Figs. 1, 4 and 6) a sealing-in and exhausting machine may comprise a conveyor 15 having a suitable hub 16 mounted rotatably upon a vertical shaft 17. The conveyor may consist of a disc 18 having an outer annulus 19 provided with suitably spaced exhaust-tube-receiving apertures 21 connected with exhaust mechanism. Such mechanism is well known in the art and further description of the exhaust apparatus is not necessary for the purpose of understanding the present invention.

The disc 18 is provided with a plurality of sealing-in heads 22. Eight heads are employed in the machine as illustrated and are mounted on shafts 23 and rotatable in hubs 24 integral with the disc 18. The heads may be of any well known type and as shown, comprise a mount holder 20 and a bracket 25 upon which is mounted a bulb-holder or adapter 26, the mount being positioned and the bulb placed thereover and in the adapter for the sealing-in operation and also for the printing operation.

The conveyor is rotated intermittently through the action of a Geneva drive, a slotted disc 27 of which may be secured to the conveyor 15 and the driving member 28 may be rotated through the action of a motor 25 indicated in dotted lines in Fig. 5. Any suitable speed reduction mechanism may be interposed between the shaft 27′ of the motor 25′ and bevel gear 26′ adapted to mesh with a bevel gear 28′ secured to the vertical shaft 29′ of the driving member 28. The intermediate reduction mechanism is not shown, but such mechanism will be obvious to one skilled in the art.

In machines of this character, the sealing-in heads are continuously rotated during the greater part of the movement of the conveyor. For this purpose, each head is provided with a sheave 29 which may engage with an endless belt 30 passing around a driving sheave 31 secured to a vertical shaft 32 (see Figs. 4 and 6). The shaft 32 may be driven by geared connection to the motor 25′. Such connection may comprise a bevel gear 33 secured to the shaft of the motor and a bevel gear 33′ secured to the shaft 32. It will be evident that the motor 25′ may serve as a common source of energy for various movable elements.

For the purpose of terminating the rotation of the heads 22 during the printing operation, the sheaves 29 may be provided with pins 34 to engage with a suitably positioned pivoted stop arm 35. A spring 36 may be provided to oppose movement of the arm and may be of sufficient tension to prevent a rotation of the heads but adapted to move when the machine is indexed and the conveyor rotates to carry the head away from the stop arm.

The foregoing description generally sets forth the sealing-in and exhausting machine,

with which it has been found preferable to employ the present invention, which may include a hollow standard 37 having a cylindrical bore 38, in which a plunger 39 may be reciprocated and partially rotated. The upper or projecting end 41 of the plunger 39 is provided with an arm 42 having stamping or printing member 43 mounted at its free end. The arm 42 may be adjustable and for this purpose is shown as comprising a member 44 (see Fig. 2) having a tongue 45 and a member 46 having a groove 47 to fit the tongue, bolts 48 being provided to secure the members in a given position. The member may be provided with a split collar 49 and secured to the plunger 39 by a bolt 51.

Another split collar 52 may be secured to the plunger 39 by a bolt 53. The collar 52 may have an off-set bearing and may be provided with a set screw 54 adapted to engage with the arm 42 to obtain an accurate adjustment and to avoid lost motion.

The arm 42 which carries the stamp for making an impression upon a bulb will hereafter be termed the "printing member." This member must be movable both upwardly and about the vertical axis of the plunger 41.

In the present machine the ink is applied to the stamp 43 and the printing arm is then rotated substantially 90°, at the same time it is lowered to bring the surface of the stamp 43 into contact with the spherical surface at the top of a lamp bulb 55, the bulb being supported in an adapter 26 of a sealing-in head 25.

Mechanism for accomplishing the rotary and reciprocatory movement of the printing arm may be imparted through the action of a cam 56 (see Fig. 6) adapted to engage with the lower end 57 of the plunger. The standard 37 is, however, constructed in the form of a barrel cam provided with a suitable slot 58 and the plunger 39 is provided with a roller 59 movable in the slot 58. The lower portion of the slot 59 is vertical and terminates in a substantially helical slot at its upper portion. Thus when the cam 56 effects a reciprocation of the plunger 39, the plunger and consequently the printing member, will be moved vertically for a portion of its travel vertically and rotatably during the other portion of its travel.

Driving means for the cam 56 may include bevel gear 61 secured to the cam and disposed in mesh with a bevel gear 62 secured to a horizontal shaft 63. The shaft 63 may be supported in an intermediate bearing 64 and may extend into a shaft 65 having secured thereto a notched disc 66 constituting one member of a clutch 67. The shaft 65 is rotatable in a bearing 65′ and is provided with a bevel gear 68 disposed in mesh with a bevel gear 69 carried on a vertical shaft 71 mounted in an extension bearing 70 and gear wheel 72 may also be secured to the shaft 71 and disposed in mesh with a pinion 73 suitably secured to the shaft 32, which is driven as above described. It will be evident that the driving of the cam 56 is dependent upon a manipulation of the clutch 67. Any suitable form of clutch may be provided, the one herein employed, as more clearly shown in Fig. 10, comprises the member 66 and a collar 74 secured to the shaft 63.

A dog or ratchet 75 is slidably positioned in the collar 74 and normally urged toward notches 76 in the disc 66 by a spring 77. The spring 77 may be disposed in a recess 78 and held in place by a retainer plate 79. The ratchet is provided with a notch 81 and may be moved from engagement with the disc 66 by the application of a force upon a side 82 of the notch.

In the present invention a movement of the ratchet is attained by disposing a wedge-shaped-finger 83 (see Fig. 4) in an annular groove 84 in the collar 74 for engagement with the side 82 of the pawl. When the member 83 enters the notch 81, it disengages the members of the clutch and consequently prevents an actuation of the shaft 63 and the operation of elements connected thereto.

Means for operating the wedge 83 and its association with other mechanism will hereinafter be more fully described.

Ink or other substance is applied to the stamp 43 on the printing arm when the arm is in position as shown in Fig. 6. The inking mechanism may be of any suitable form, that illustrated comprising an ink feed pad or plate 85 and an inking roller 80. The roller 80 is adapted to be moved in contact with the plate 85 to receive ink therefrom and subsequently make contact with the stamp 43 to apply ink thereto.

The inking plate 85 may be of disc shape and carried at the exposed end of a bracket 86. The bracket 86 may be secured by a hub 87, to the upper end of the standard 37. The ink pad 85 is provided with a cylindrical shank 88 disposed in a socket 89 at the end of a projection 91 secured to the bracket 86. The ink pad, as more clearly shown in Fig. 8, is normally urged upwardly through the action of a spring 92 disposed between the lower portion of the shank and the bottom of the socket 89. A pin 93 extends through the wall of the socket 89 and has an end disposed in an annular recess 94 in the shank 88 to limit the vertical movement of the inking disc resulting from the action of the spring 92. It will thus be evident, that the ink feed plate may be reciprocated vertically and is free to be rotated about its vertical axis. Means to effect such rotation will be described presently.

The inking roller 80 which applies ink to the stamp 43, is resiliently mounted in a pair

of bearings 96 and 97 disposed at opposite sides of the end of a slide bar 98. The roller 80 is provided with a shaft 99 journaled in bearings at the ends of rods 101 and 102.

For the purpose of resiliently mounting the inking roller 80, springs 103 and 104 are positioned on the rods 101 and 102 respectively and disposed between collars 105 and 106 and the lower portions of the bearings 96 and 97. Thus the roller 80 is normally maintained in a predetermined upper position and may yieldably engage with the ink feed plate 85, by reason of the resilient mounting of the disc in the socket 89.

The roller 80 when traversing the type of the stamp 43 will be pressed firmly thereagainst through the action of the springs 103 and 104. A reciprocation of the inking roller is attained by disposing the slide plate 98 in a suitable guide bearing 107 which may be integral with the end of the bracket 86. The end of the slide bar 98 opposite to the end upon which the inking roller is carried, is pivotally connected to an end 108 of a bell crank 109. The bell crank may be pivoted on a pin 111 disposed in a depending bearing 112 integral with the bracket 86. The bracket may be provided with a slot 113 to permit movement of the arm 108. The opposite arm 114 of the bell crank is attached by means of a universal connection 115 to a link 116, the end of the link being pivotally connected to one arm 117 of a double arm rocker member 118 (see Fig. 12). The rocker member is pivoted on a pin 119 journaled in a bearing 121. The other arm 122 of the rocker member is provided with a roller 123 adapted to engage with a cam 124 secured to the shaft 63. The cam may be of any suitable form and as illustrated, consists of a disc eccentrically disposed upon said shaft. A rotation of the cam operates to depress the rocker member and a spring 125, having one end secured to the rocker arm and the other end secured to a stationary bracket 126 serves to lift the rocker arm when the opposition of the cam is removed.

It will thus be evident, that a rotation of the cam results in an oscillation of the rocker arm and a consequent translation of motion to the bell-crank 109 to effect a reciprocation of the slide bar 98. It will be readily seen that since the cam 124 is secured to the shaft 63, its operation is controlled by the clutch 67 which also controls other mechanism hereinbefore mentioned.

After the stamp 43 has received ink and the shaft 63 is permitted to operate, the printing arm is rotated until it takes the position as shown in Fig. 1, with the stamp in contact with the top of a bulb 55.

The actual stamping operation in the present invention is, however, performed by impact and is imparted to the stamp through contact with a falling body which may be in the form of a weight 127, the positions of the parts during impact being shown in dotted lines. The weight 127 may be attached to one end of a slide rod 128 movable in a guide 129 at the end of a projection 131. The projection may be secured to an upright 132 having an off-set collar 133 which may be integral with the hub 87 and therefore carried at the upper end of the standard 37. The projection 131 may be of angular form to properly dispose the weight 127 over the axial line of a bulb when positioned for the stamping operation. The mechanism is provided to support the weight ready for descent and may consist of a trip 135 comprising a latch-bar 136 movable in a guide 137 and in a direction transverse to the axis of the slide-rod 128.

The latch-bar 136 is normally urged toward the slide rod by a spring 138, one end of which is secured to a pin 139 projecting from the slide-rod and a pin 141 secured to the guide. When the weight is in its upper position, an end of the latch-bar 136 enters a notch 142 in the rod 128, thus maintaining it in position.

For the purpose of preventing the rotation of the side-rod, a guide slot 143 is provided therein and a pin 144 extending through the guide bearing 143 maintains the rod from rotary movement during its reciprocatory movement.

Mechanism for tripping the latch bar may comprise a chain 145 led over a guide pulley 146 suitably positioned at the end of an extension 147 integral with the projection 131. The end of the chain opposite to that secured to the latch bar is fastened to a swivel 148 (see Fig. 6). The swivel is secured to an arm of a lever 149 pivoted on a pin 151 journaled at the end of a bearing arm 152 integral with the bearing 64.

The other arm 153 of the lever 149 projects in the path of the rotary movement of a finger 154. The finger is secured to the shaft 63 and when the shaft is rotated, the finger moves into engagement with the underside of the lever arm 153, thus lifting the arm 153 and rocking or lifting one arm of the lever 149, resulting in a downward pull upon the chain 145 and a consequent disengagement of the latch-bar 136 and a release of the slide-rod 128, thus permitting the weight 127 to drop and make contact with the end of the printing member to impress the stamp firmly upon the spherical portion of a bulb.

It will be understood that the operations of the various parts to effect the printing operation is intermittent and must be performed as each successive bulb on the sealing-in machine is moved to the proper location. The present printing device is, therefore, so constructed as to be operable in timed relation to the sealing-in machine.

The various coordinating machine elements to perform the operations are so timed that one revolution of the shaft 63 moves the printing arm throughout the movement necessary for inking and printing and actuates the weight to effect the stamping operation. When the arm is in position to receive the weighted member 127, it is desirable to lock the arm from slight oscillations. Locking means (see Fig. 2) for the above purpose may comprise grooved part 155 carried upon a support 156 integral with the collar 133 and the printing arm is provided with a projection 157 adapted to fit slidably into the groove of the part 155.

As the printing arm descends to bring the stamp in contact with the bulb, the projection 157 enters the groove in the part 155 and thus prevents vibration. As the shaft 63 operates to actuate the various elements and the slide 98 reciprocates to feed the inking roller 80, the inking plate 85 is rotated a partial revolution with each outward movement of the inking roller. This is accomplished by providing a spring pawl 158 mounted on a bracket 159 secured to bearing 97. The pawl is positioned to be moved into engagement with teeth 161 which constitute a ratchet wheel upon the underside of the inking plate or disc 85. The pawl is so constructed that as the slide bar 98 is moved inwardly and outwardly with each outward movement, the ink feed plate is slightly rotated, thus gradually changing the surface presented to the inking-roller 80.

The association of the sealing-in machine and the bulb printing device preferably consists in the provision of a lever 162 (see Figs. 4 and 12) pivoted on a pin 163 journaled in a bearing 164. One arm 165 of the lever 162 terminates in the wedge shaped finger 83 above referred to and is suitably shaped for disposition in the annular groove 84 of one member of the clutch 67 into which it is normally urged through the action of a spring 166 secured to a lug 167 and to the arm 165. The opposite arm 168 of the lever is disposed in the path of cams 169 spaced at intervals around the periphery of the conveyor 15.

In machines having eight heads, eight equally spaced cams are provided, thus as the conveyor rotates, the cams will engage intermittently with an end 168 of the lever to lift the wedge or finger 83 and permit the members of the clutch 67 to engage and thus permit an operation of the various elements to perform the printing operation. The cams 169 may be positioned and proportioned so as to engage with the arm 168 as the conveyor comes to one of its stationary stages and as soon as the finger 83 is lifted to permit a rotation of the shaft 63, the cam has been moved to release the arm 168. The arm 165 may immediately enter the annular groove 84 ready to make contact with the side 82 of the notch 81 as the shaft 63 rotates to move the dog and release the member 66 and terminate the operation of the printing mechanism until the cam has again engaged with the lever arm 168.

In operation the bulb printing machine is wholly automatic. The operator who attends the sealing-in and exhausting machine, performs only the usual operations of inserting lamp mounts and lamp bulbs 55 into the heads, the bulbs being centered and adjusted by the adapters 26. The sealing-in operations are performed in the usual manner and bulbs are progressively moved until one of the cams 169 engages the lever arm 168. At this time, a bulb to be printed has reached the printing position beneath the weighted member 127. The lever 162 having been actuated to remove the finger 83 from engagement with the dog 75, the shaft 63 is rotated and the bulb printing mechanism is set in operation.

As above set forth, the cam 169 moves from contact with the arm 168 and the finger 83 again rests in the annular groove 184 to disengage the dog upon a complete revolution of the shaft 63. As the shaft 63 rotates, the cam 124 engages with the rocker-arm 118, moving it downwardly, thereby actuating the bell-crank 109 to cause the inking roller 80 to traverse the surface of the feed plate 85 and to roll across the face or impression portion of the stamp 43 to ink the same.

As the shaft 63 continues to rotate, the cam 56 moves to permit the plunger 39 to drop and, by reason of the slot 58, to rotate the printing arm until the same is positioned with the stamp portion in axial alignment with the positioned bulb. Further downward movement of the plunger is in a vertical direction by reason of the longitudinal formation of the lower portion of the slot 58 and the stamp is moved in contact with the top of a positioned bulb. It will be readily seen, that by reason of the downward movement of the printing arm and the length of such downward movement, in the event that the vertical position of a bulb varies, the printing operation will remain uniform, since the printing arm is made to first actually rest upon the top of a bulb before the weight descends.

If it were necessary to arrange the printing arm to move a uniform distance to make contact with a bulb, it is obvious that in the event that the length of a bulb varied or if for any other reason the top of a bulb was at a different elevation than that originally provided, the stamp would not properly engage therewith and the applied pressure would vary. After the printing arm has moved the stamp in contact with a bulb, the rotation of the shaft 63 brings the finger

154 in contact with the arm 153 of the lever 149, thereby exerting a pull upon the chain 145 and tripping the slide rod 128 to drop the weighted member upon the end of the printing arm to firmly impress the stamp upon the bulb.

After these operations have been performed, the shaft continues to rotate and the printing arm rises vertically and lifts the weighted member causing the latch-bar to engage with the notch 142 to hold the weight until again released for a subsequent operation. The printing arm then returns to its normal position, at which time the finger 83 engages with the dog 75 and terminates the rotation of the shaft 63. The printing device will then be prevented from operation until the operator of the sealing-in machine causes such machine to index and position another lamp bulb to receive the impression.

Considerable practical advantage is derived from the use of the present invention, particularly since the printing operation may be performed without attention from an operator or reducing the rate of production of lamps as manufactured on the standard sealing-in and exhausting machines.

Although a preferred embodiment of the invention is herein shown and described, it is obvious that modifications may be made therein without departing from the spirit and scope of the appended claims.

What is claimed is:

1. A bulb printing machine comprising a bulb support, a printing member, inking means for supplying ink to said member, means for moving said member to position to receive ink, means for moving said member in relatively light compressive engagement with said bulb and means for increasing the compressive relation with said member and bulb.

2. A bulb printing machine comprising a bulb-support, a printing member, a roller for applying ink to said member, means for moving said member to position for inking, means for moving said inked member in relatively light compressive engagement with said bulb and means for increasing the compressive relation of said member and bulb.

3. A bulb printing machine comprising a bulb-support, a printing member, a roller for applying ink to said member, means for moving said member to position for inking, means for moving said inked member in contact with a bulb supported in said holder and means for delivering an impact blow upon said member.

4. A bulb printing machine comprising a bulb-support, a flexible printing member, an inking roller, means for moving said member to position for an inking operation, means for bringing said member in contact with a spherical portion of said bulb and means for changing the relative position of said bulb and member to flex said member to bring portions thereof in contact with the surface of said spherical portion.

5. A machine for making incandescent electric lamps comprising a conveyor having bulb supports thereon, means for intermittently rotating said conveyor, printing mechanism disposed in operable relation to said conveyor, a printing member, a weight, means associated with said conveyor for effecting a movement of said printing member to position it above a lamp disposed in one of said supports and for operating said weight to deliver an impact blow upon said member.

6. A bulb printing machine comprising a bulb-support, a printing member, an inking-pad, means for transferring ink from said pad to said member, means for moving said member into contact with a bulb positioned in said support and means for suddenly increasing the degree of contact between said bulb and said member.

7. A bulb printing machine comprising a bulb-support, a printing member, a resiliently mounted inking-pad, an ink-feed-roller, means for actuating said roller to apply ink to said member, means for positioning said member in operative relation to a bulb positioned in said support, means for moving said member to make contact with said bulb and means for increasing the degree of contact between said lamp and bulb.

8. A bulb printing machine comprising a bulb-support, a flexible printing member, a resiliently mounted inking-pad, a feed-roller adapted to tensionally engage with said pad, means for actuating said feed-roller to apply ink to said member, means for positioning said member in operative relation to a bulb positioned in said support, means for moving said member in contact with said bulb and means for suddenly increasing the degree of pressure between said bulb and said member.

9. A bulb printing machine comprising a bulb-support, a flexible printing member, a resiliently mounted inking-pad and a feed-roller adapted to tensionally engage the surface thereof, means for actuating said feed-roller to apply ink to said member, means for positioning said member in contact with the surface of a bulb positioned in said support and means for delivering an impact blow to said member.

10. A bulb printing machine comprising a bulb-support, a flexible printing member, a resiliently mounted inking-pad, a feed-roller adapted to tensionally engage with said pad, means for actuating said roller to apply ink to said member, means for moving said member in contact with a bulb and means for suddenly flexing said member to bring a

given portion thereof in contact with the bulb.

11. A bulb printing machine comprising a bulb-support, a flexible printing member, an inking-pad, means for transferring ink therefrom to said member, means for positioning said member with a portion thereof in contact with a bulb positioned in said support and means for suddenly flexing said member to bring other portions thereof in contact with said bulb.

12. A bulb printing machine comprising a bulb-support, a flexible printing member, a resiliently mounted inking-pad, an ink-feed-roller adapted to traverse the surface of said pad, means for moving said roller over the surface of said printing member, means for tensionally maintaining said roller in contact with said printing member, means for moving said member to position a portion thereof in contact with a bulb positioned in said support and means for suddenly increasing the degree of contact between said bulb and said member.

13. A machine for printing electric incandescent lamp bulbs comprising a main drive, an intermediate driving shaft, clutch mechanism for connecting said shaft with said main drive associated with said intermediate shaft, a printing arm, a weighted member for engagement therewith and means associated with said shaft whereby a rotation thereof causes a vertical and rotary movement of said printing arm and a downward movement of said member to make contact therewith and means for operating said clutch mechanism to effect the rotation of said shaft.

In testimony whereof, we have hereunto subscribed our names this 3rd day of October 1923.

JOHN JOSEPH HIGGINS.
ROBERT HENRY BURNS.