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APPARATUS FOR REMOVING AND INSERTING ELECTRIC BULBS

Filed June 23, 1926

Fig.1

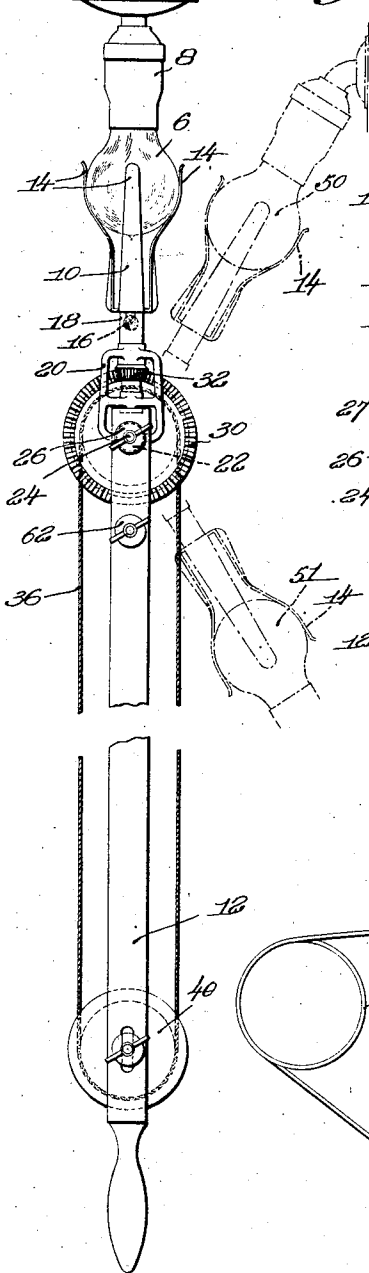


Fig.2

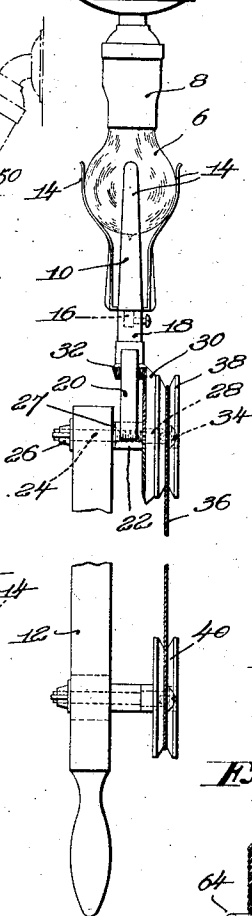


Fig.3

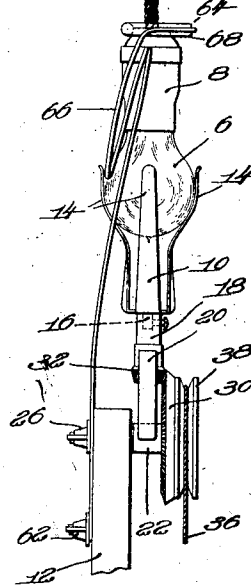


Fig.4

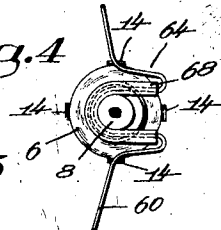
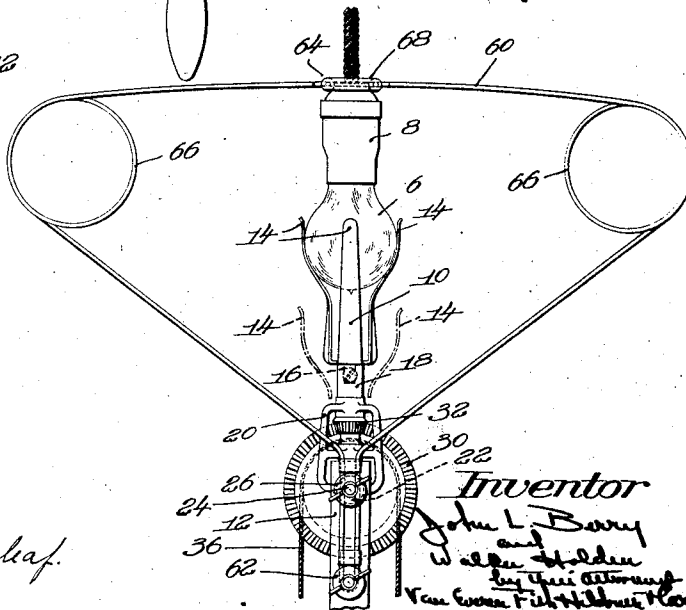


Fig.5



Witness

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR REMOVING AND INSERTING ELECTRIC BULBS.

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The present invention relates to apparatus for removing and inserting electric bulbs and more particularly to apparatus for manipulating bulbs into or out of sockets, fixtures and chandeliers at a considerable height above the floor.

The principal object of the present invention is to provide a simple, inexpensive and easily operated device for inserting or removing bulbs with a particular view to manipulating bulbs which may be placed at any angle from the vertical.

Another object of the invention is to provide a device for conveniently removing bulbs from or inserting them into a fixture which is flexibly suspended, as from a drop cord, at a considerable height from the floor.

With these objects in view, one feature of the present invention contemplates the provision of a rotatable bulb gripping device which is attached at one end of a pole or other suitable support, together with means for operating the device while maintaining the pole itself stationary. By this construction, manipulation of the bulb is entirely independent of any movement of the pole and provision may, therefore, be made for operating the bulb gripping device in any desired angular position with respect to the axis of the pole. Accordingly, bulbs which are arranged at any and all angles from the vertical are removed with equal facility. This is accomplished without resort to universal joints or other couplings which make rotation of the pole necessary, and which render it impossible to remove or insert a bulb situated at any considerable angle from the vertically downward position. In fact, with the present invention, a bulb which extends upwardly from the fixture can be as readily manipulated as one which extends vertically downward.

When the lamp socket is flexibly suspended, as by a drop cord, another feature of the invention contemplates the provision of means attached to the upper end of the pole for engaging with the socket and having provision for permitting relative movement between the gripping device and the socket while maintaining the latter depressed. According to this construction, when it is desired to remove a bulb from a drop cord socket, the holding device is caused to engage with the top of the socket and then to draw the gripping device around the walls of the bulb. A similar relative

movement between the gripping device and the socket is caused to take place for insertion of a new bulb into the socket.

Still further features of the invention consist of certain novel features of construction, combinations and arrangements of parts hereinafter described and particularly defined in the claims.

In the accompanying drawings, Fig. 1 is a front elevation of an apparatus for removing and inserting electric lamps embodying the several features of the present invention; Fig. 2 is a side elevation of the apparatus shown in Fig. 1; Fig. 3 is a side elevation of the apparatus provided with the attachment for permitting manipulation of bulbs in flexibly suspended sockets; Fig. 4, is a detail plan view of a part of the apparatus shown in Fig. 3 and Fig. 5 is a front elevation of the apparatus shown in Fig. 3.

The apparatus shown in Figs. 1 and 2 is for the manipulation of electric lamps in rigid fixtures, such as wall fixtures or chandeliers which may present the bulbs in any angle with respect to the vertical. In the full line position in Fig. 1, the apparatus is shown for manipulating a bulb 6 received in a socket 8 forming a part of a fixture secured directly to the ceiling. The illustrated embodiment of the invention includes a bulb gripping device 10 which is adapted to be attached to the upper end of a pole or other supporting means 12. The bulb gripping device comprises a plurality of resilient fingers 14 arranged to form a cage like structure for firmly engaging the wall of an electric lamp. This structure has secured to it a pin 16 which is received in a rotatable shaft 18 journaled in a bracket 20. The spring fingers are arranged to engage closely and firmly about the walls of the bulb with sufficient friction so that upon rotation of the gripping device the bulb may be either removed from the socket or inserted therein. The gripping fingers may be of different sizes to accommodate different sizes of bulbs and are accordingly made removable by provision of the pin 16 in the shaft 18, any particular gripping device being maintained in proper position during the operation by a set screw or other retaining device.

The bracket 20 is provided with a hub 22, which is secured to the pole by means of a bolt 24 threaded into the hub, a wing

nut 26 and a lock washer 27. The axis of the hub is substantially at right angles to the axis of the pole, and it will be seen that the mounting of the bracket is such
 5 that the axis of the bulb gripping device may be adjusted to any desired angular position with respect to the axis of the pole. The hub is formed with a reduced portion
 10 28 on which is mounted a bevel gear 30 engaging with a bevel pinion 32 on the shaft 18 of the gripping device. The bevel gear is arranged for free rotation on the bracket
 15 hub, being secured against endwise movement by a screw 34. Rotation of the bevel gear 30 is effected by a flexible connection
 20 36 consisting of a cord or wire passing over a pulley 38 secured to the bevel gear and a second pulley 40 journaled for rotation
 25 at the bottom of the pole. It will be seen that by drawing on the flexible connector the bulb gripping device may be caused
 30 to rotate in either direction as may be desired for removal or insertion of a bulb. The apparatus may be used for removing
 35 bulbs which are arranged at any angle merely by adjusting the angular position of the bracket 20 with respect to the axis
 40 of the pole. In dot and dash lines in Fig. 1 are shown two angular positions in which the gripping device may be placed for
 45 manipulation of bulbs at different angles. The bulb 50 is shown as received in a wall socket depending at an angle from the wall
 50 and the bulb 51 is shown as extending upwardly at an angle from a socket. It will be understood that in the lowermost position
 55 of the gripping device, as illustrated in Fig. 1, the apparatus may be used for removing bulbs which extend vertically upward, in
 60 which case alinement of the gripping device with the bulb is effected by tipping the pole slightly from the vertical. The actuation
 65 of the driving means is independent of any movement of the pole and is carried out while the pole is held substantially stationary. Moreover the rotation of the gripper through the bevel gear drive is entirely independent of the angular position of the gripper with respect to the pole.

In order to permit removal of lamps from sockets which are suspended from flexible cords, the attachment shown in Figs. 3, 4 and 5 is employed. This attachment is arranged to hold the socket in fixed position while
 55 permitting a relative movement between the gripping device and the socket for insertion or removal of a bulb. The attachment comprises a wire frame indicated generally
 60 at 60, which is formed at its lower end with a yoke adapted to be engaged beneath the wing nut 26 and an additional wing nut 62 on the pole. The upper part of the frame
 65 is formed at its center with a U shaped portion 64 which is adapted to engage with the top surface of the socket. The frame

is of resilient material and is formed at its sides with spring loops 66. The frame is so mounted on the pole that when the apparatus is not in use, the resiliency of the frame causes the socket engaging portion 64
 70 thereof to lie closely above the gripping device 10. In operation the pole is manipulated so that the socket retaining frame engages with the upper part of the socket and then the pole is pulled downwardly so that
 75 the gripper assumes the dot and dash position in Fig. 5 directly below the bulb. The downward pull on the pole is then relieved and the resilient action of the frame permits the pole to be drawn upwardly so that the
 80 gripper fingers engage about the bulb, the socket being held against upward movement by the engagement of the frame therewith. The spring action by which the relative movement between the gripper and the
 85 socket is caused to take place is afforded not only by the natural resiliency of the material of the frame but also by the loops 66. After engagement of the gripper with the bulb, the latter may be removed from the
 90 socket by rotation of the gripping device through the bevel gear drive. At this time rotation of the socket is effectively prevented by the frictional engagement of the U
 95 shaped part 64 of the frame with the socket, this part of the frame being preferably covered with rubber tubing 68 to enhance the frictional gripping action. The operation of the apparatus for insertion of a bulb into
 100 a socket is similar to that required for removal of the bulb. In this case the bulb is inserted into the gripping device, the part 64 of the frame is caused to engage with the socket, the pole is then pulled downwardly
 105 until the base of the bulb clears the bottom of the socket, whereupon the pole is permitted to be pulled upwardly by the spring tension until the base of the bulb is received within the socket, and then the gripping
 110 device is rotated to turn the bulb in such a direction as to seat it within the socket. It will be noted that the frame 60 is of considerable dimensions in a lateral direction. This is not only for the purpose of affording
 115 sufficient relative movement between the gripping device and the socket by virtue of the resiliency of the frame, but also to provide clearance around a globe if one is attached to the socket. This apparatus there-
 120 fore makes it possible to manipulate a bulb in a flexibly suspended socket whether or not the lamp is shaded or protected by a depending globe, it being only necessary that the lamp be exposed in a manner to permit en-
 125 gagement of the gripping device therewith.

Having thus described the invention, what is claimed is:

1. An apparatus for removing and inserting electric bulbs comprising a support, a bulb gripping device mounted on one end of

the support and having provision for angular adjustment with respect to the support, actuating means in fixed position with relation to the support and associated with the gripping device to rotate the latter independently of the angular position thereof, and a flexible connection from the opposite end of the support to the actuating means for operating the latter independently of any movement of the support.

2. An apparatus for removing and inserting electric bulbs comprising an elongated support, a bracket, a rotatable bulb-gripping device journaled on the bracket, a rotary actuator journaled on the bracket, connections between the bracket and one end of the support permitting angular adjustment of the bracket about an axis coincident with the axis of the rotary actuator, connections between the rotary actuator and gripping device for rotating the latter in any angular position of the bracket, and rotative connections between the actuator and the opposite end of the pole.

3. An apparatus for removing and inserting electric bulbs comprising a bulb gripping device adapted to be mounted at one end of a pole in an angularly adjustable position with respect to the axis of the pole, and a driving gear connected with the gripping device and disposed on the axis at substantially right angles to the axis of the pole and coincident with the axis of adjustment of the gripping device for driving the gripping device independently of the angular position thereof.

4. An apparatus for removing and inserting electric bulbs comprising a pole, a bracket having a hub portion, a drive wheel journaled upon the hub, a stud extending through the hub for adjustably clamping the bracket to one end of the pole, a bulb-gripping device rotatably mounted upon the bracket to rotate about an axis parallel with the plane of rotation of the drive wheel, connections between the drive wheel and bulb-gripping device for rotating the latter, an operating member connected to the opposite end of the pole, and a flexible operating connection between the member and drive wheel.

5. An apparatus for removing and inserting electric bulbs comprising a rotatable bulb gripping device, a pole on which the gripping device is mounted, and resilient means attached to the pole and adapted to engage with a flexibly suspended socket to cause relative movement between the gripping device and the socket by spring tension.

6. An apparatus for removing and inserting electric bulbs comprising a rotatable bulb gripping device, a pole on which the gripping device is mounted, and a wire member attached to the pole and having spring loops whereby the wire member is caused to engage with a flexibly suspended socket and to permit movement of the gripping device with respect to the socket.

In testimony whereof we have signed our names to this specification.

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