

June 9, 1953

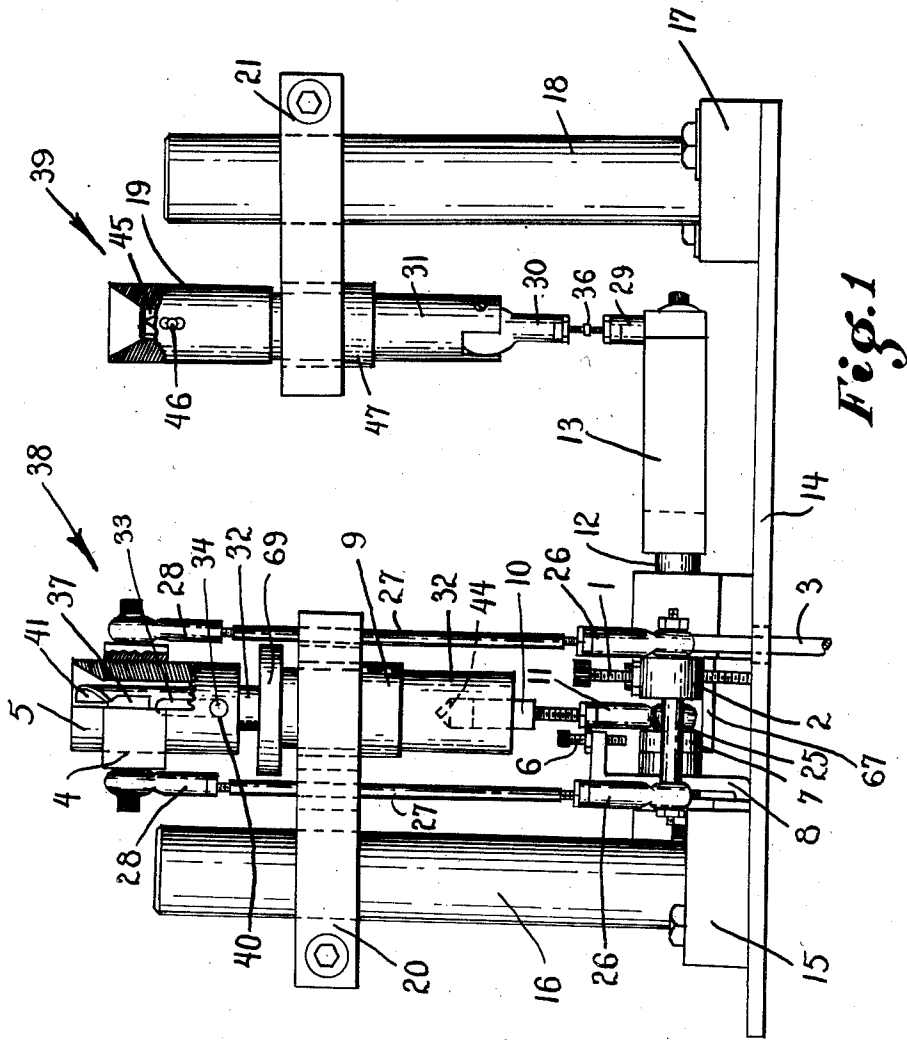
G. S. QUINN ET AL

2,641,286

APPARATUS FOR SHAPING ELECTRIC LAMP MOUNTS

Filed May 29, 1948

8 Sheets-Sheet 1



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June 9, 1953

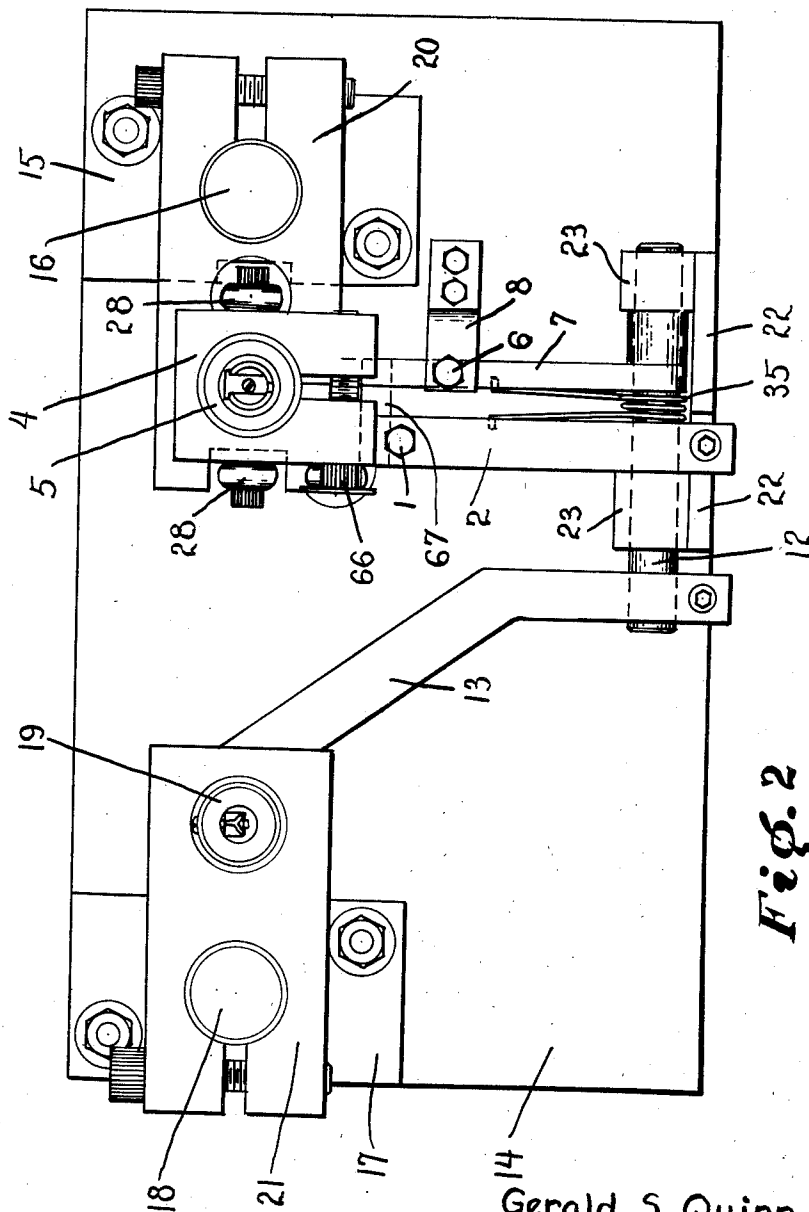
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8 Sheets-Sheet 2



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8 Sheets-Sheet 3

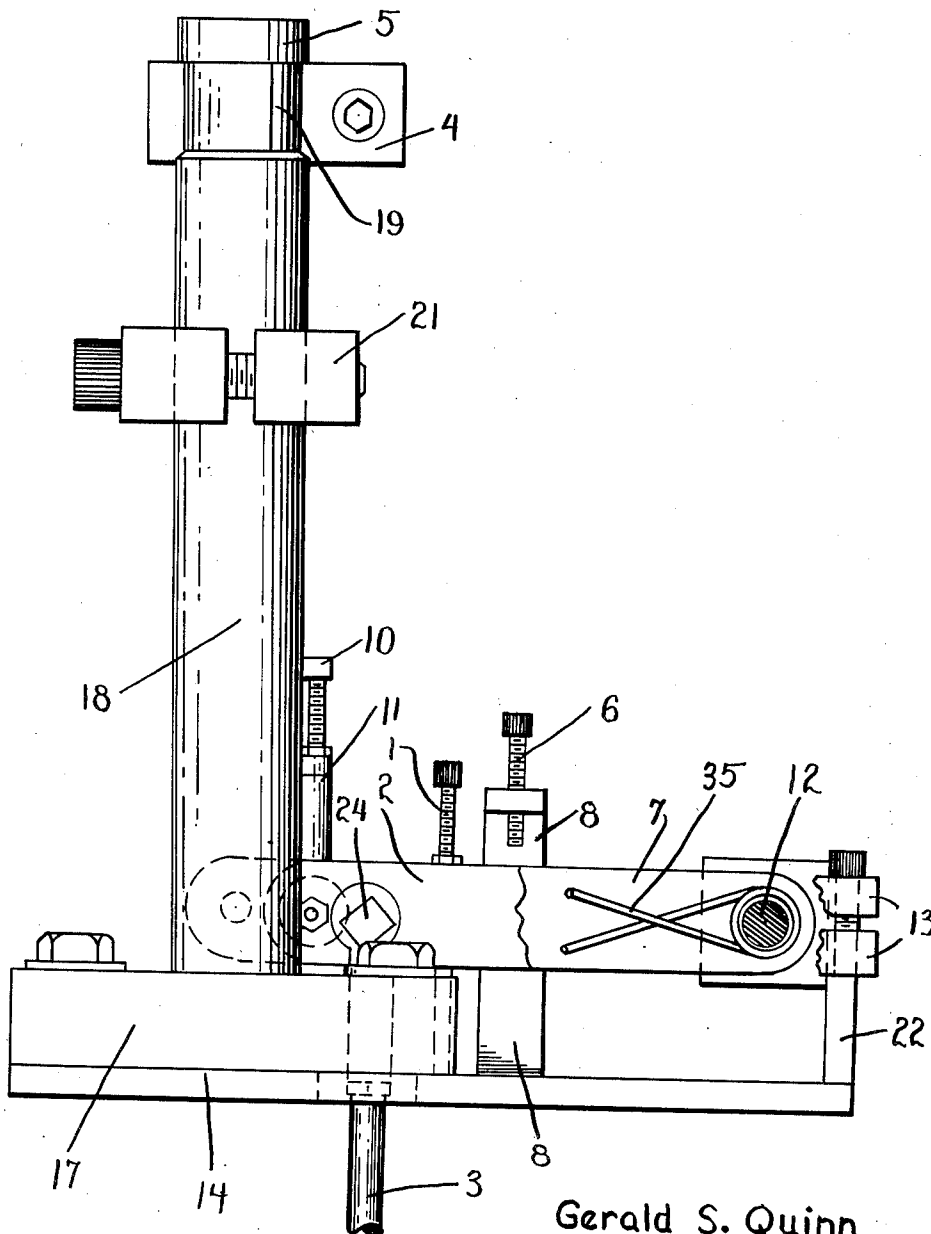


Fig. 3

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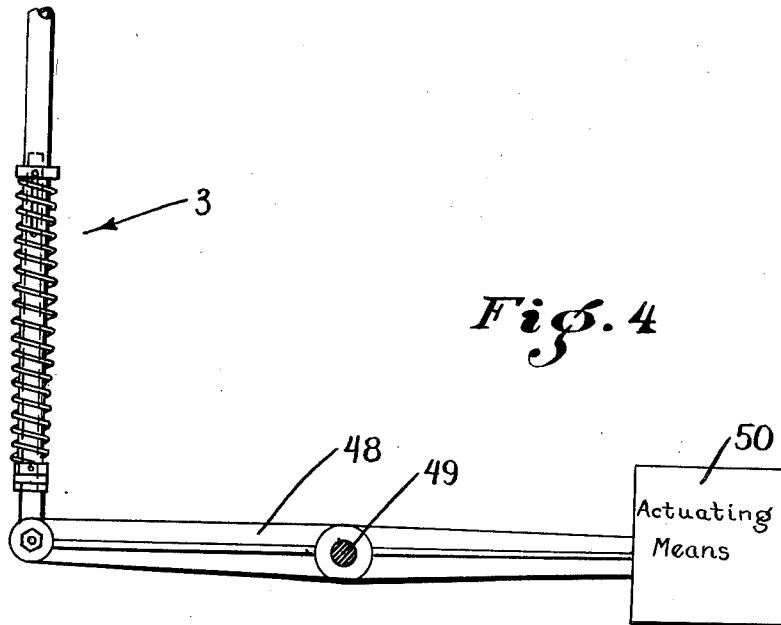


Fig. 4

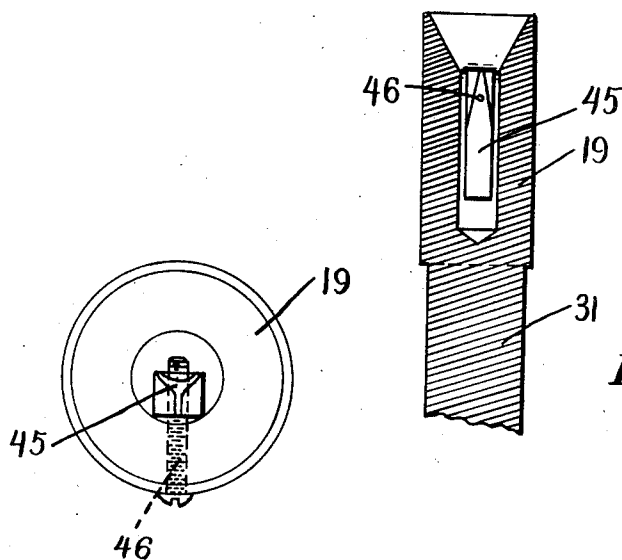


Fig. 5

Fig. 6

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8 Sheets-Sheet 5

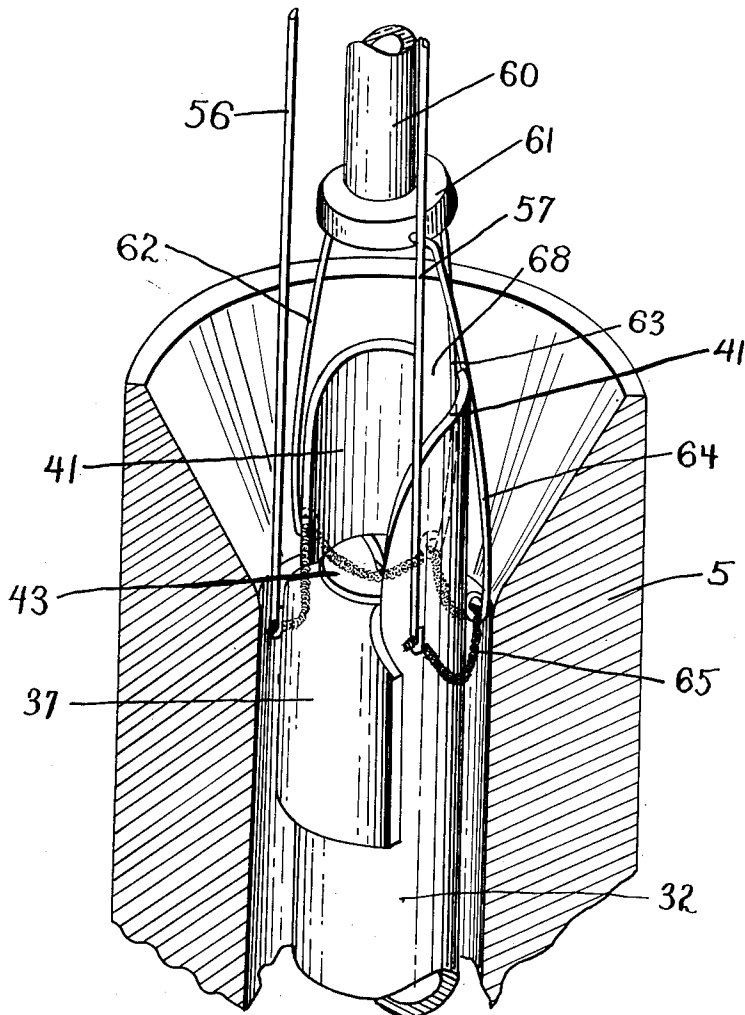


Fig. 7

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APPARATUS FOR SHAPING ELECTRIC LAMP MOUNTS

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8 Sheets-Sheet 6

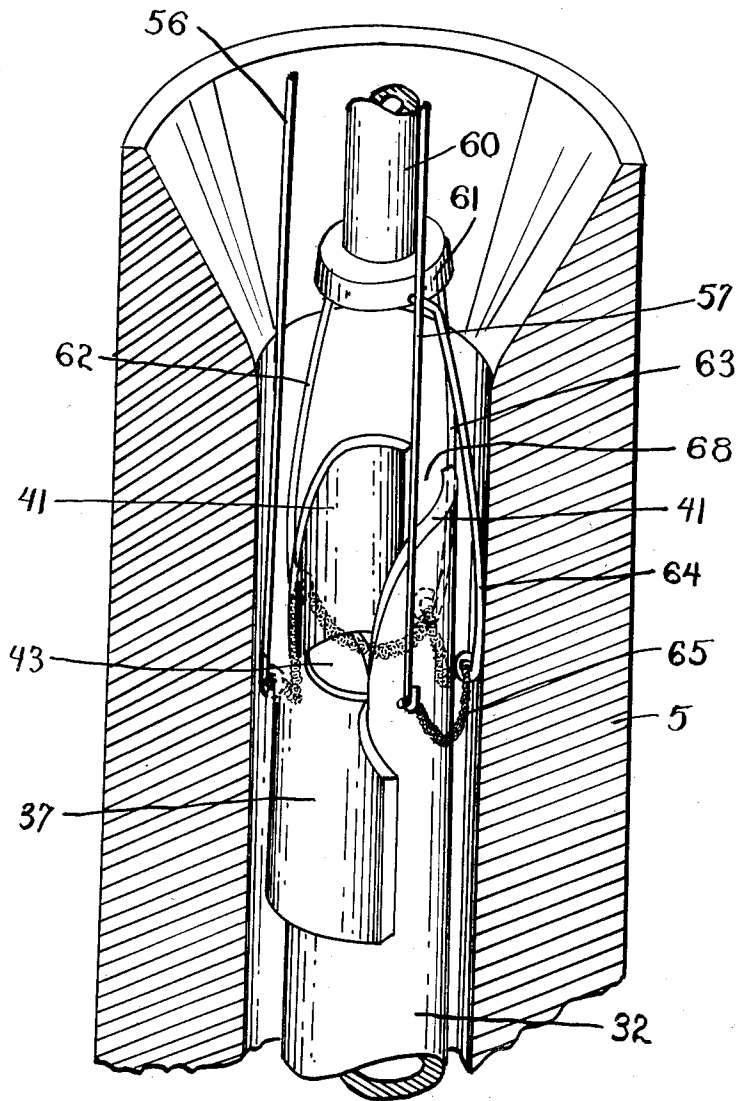


Fig. 8

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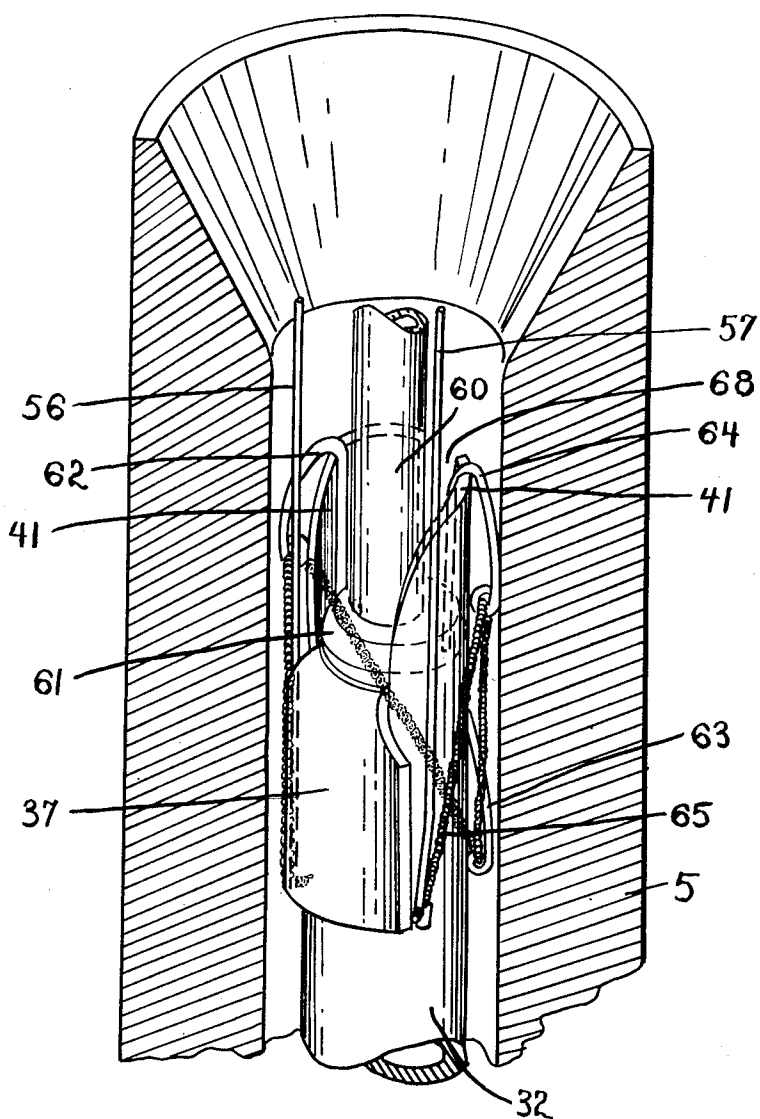


Fig. 9

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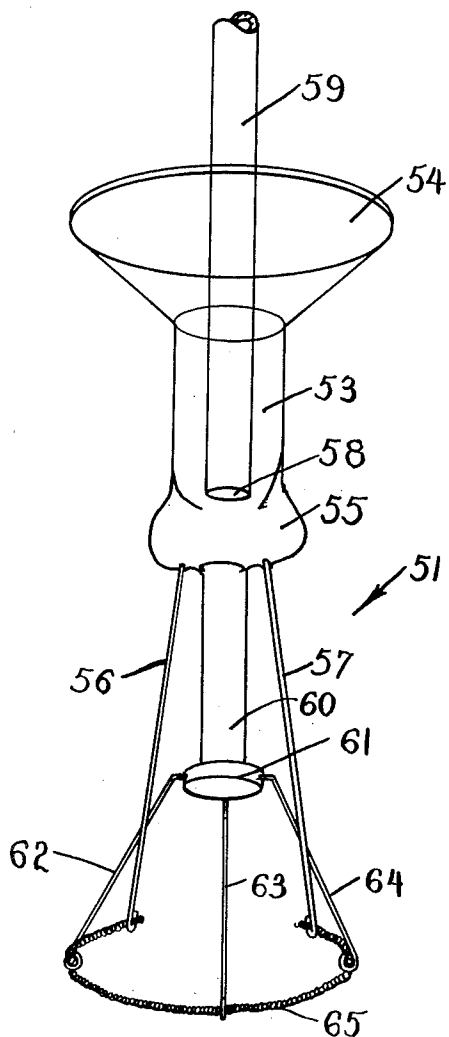


Fig. 10

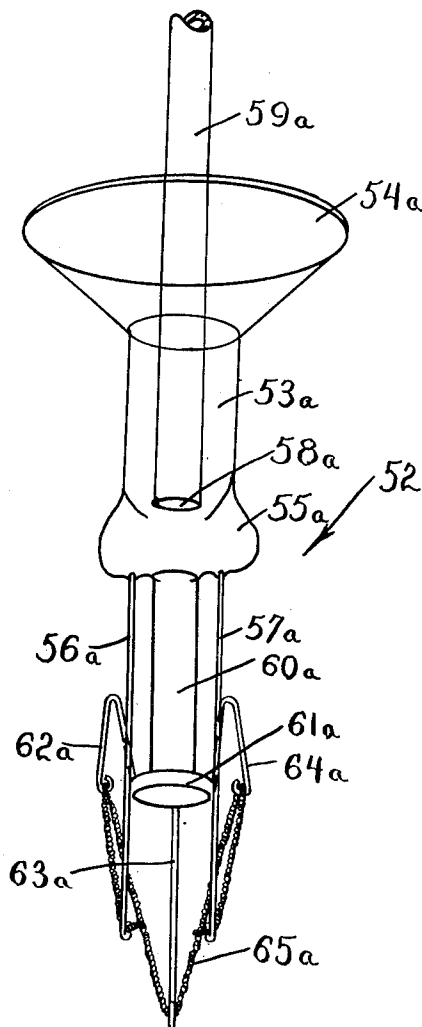


Fig. 11

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UNITED STATES PATENT OFFICE

2,641,286

APPARATUS FOR SHAPING ELECTRIC
LAMP MOUNTS

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Application May 29, 1948, Serial No. 30,038

4 Claims. (Cl. 140-71.6)

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This invention relates to electric lamps and more particularly to incandescent lamp mounts and the fabrication thereof.

An object of this invention is to provide apparatus for shaping a mount.

Another object is to provide apparatus for executing this shaping operation automatically.

A further object is to provide apparatus for re-shaping a filament mount of a certain design to provide a filament mount of different design.

Further objects, advantages and features will be apparent from the following description when read in conjunction with the accompanying drawings in which:

Figure 1 is a front elevational view of the filament mount shaping apparatus.

Figure 2 is a top view of the apparatus.

Figure 3 is a side elevational view of the apparatus with certain portions thereof broken away to permit a more detailed illustration of certain parts of the apparatus.

Figure 4 is a side elevational view of the actuating assembly.

Figure 5 is a detailed view partly in section of the upper portion of the second shaper assembly.

Figure 6 is a top view of the second shaper assembly.

Figure 7 is an enlarged perspective view of the upper portion of the first shaper assembly showing the relative disposition of the several parts thereof and the disposition and configuration of a lamp mount at the end of the first phase of the stroke of this assembly.

Figure 8 is similar to Figure 7 and shows the relative disposition of the several parts of the first shaper assembly, and the disposition and configuration of the lamp mount at the end of the second phase of the stroke.

Figure 9 is similar to Figures 7 and 8 and shows the relative disposition of the several parts of the first shaper assembly, and the disposition and configuration of the lamp mount at the end of the third phase of the stroke.

Figure 10 is a perspective view of an incandescent lamp mount of a type which may be re-shaped by the apparatus of our invention.

Figure 11 is a perspective view of the mount of Figure 10 after the re-shaping operation has been completed.

In the incandescent lamp art, mounts of certain designs readily lend themselves to fabrication on automatic machinery whereas others do not. It is one of the objects of this invention to provide a new incandescent lamp mount,

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and a method of and apparatus for shaping it automatically. More specifically, we have developed a method of and apparatus for re-shaping a mount having an approximately semi-circular filament, the entire portion of which is disposed in substantially the same plane, to provide a new mount in which the filament is a series of V's when viewed from the side, the free end of at least one of the filament supports lies in substantially the same plane as the arbor button, and the free end of another filament support lies in substantially the same plane as the free ends of the lead wires, which lie in a plane substantially different from that of the arbor button.

The apparatus for our invention effects a shaping of the alternate filament supports to form the lower filament supports and an inward displacement of the other supports to form the upper filament supports. The inward displacement of certain of the supports to form the upper filament supports is accomplished by the action of a shaper cone thereon. Formation of the lower filament supports is accomplished by the action of suitably shaped and positioned tongues located within the smaller diameter of the shaper cone. These parts are adjustable in relation to each other as to the distance of their longitudinal travel and also as to timing and positioning sequence. A further reduction in the outside diameter of the mount (inward displacement of the filament supports) may be obtained by using a second shaper cone with a smaller minimum diameter than the first shaper cone.

The apparatus of our invention readily lends itself to incorporation in conventional lamp mount machinery, such as that shown in Otaka 1,821,894, or Flaws 1,907,532, for example. We prefer to mount our apparatus on the conventional mount machine at a point just prior to the station at which the gettering operation is performed. In this way we are able to re-shape a mount of predetermined design which has just been fabricated and obtain a mount of different design without the necessity for building a whole new mount machine. The apparatus of our invention is mounted on a table 14 which is, in turn, mounted on the main frame of the mount machine. However, if desired, the table 14 may be eliminated and the apparatus mounted directly on the mount machine frame. The apparatus is positioned on the mount machine so that its mount re-shaping mechanisms will en-

gage the mounts which are held in the heads of the mount machine.

In Figures 1, 2 and 3 a pair of standards 16 and 18 mounted in blocks 15 and 17 respectively aid in supporting a first shaper assembly 38 and a second shaper assembly 39 respectively through guide blocks 20 and 21 respectively.

The first shaper assembly 38 comprises a shaper cylinder 32 with a shaper cone 5 slidably mounted on one end thereof. The shaper cone 5 is fixedly mounted in a block 4 and its position therein may be adjusted by means of a screw 66. A pair of adjustable drive links 27 are connected at one end thereof through universal joints 28 to the block 4. The other end of each of the drive links 27 is connected through universal joints 26 to a bearing shaft 25 which extends through one end of an actuating lever 2.

The shaper cylinder 32, which is supported by the block 20 through a bushing 9, is provided with an elongated slot 33 therein and the shaper cone 5 is provided with an aperture 40 in register with the slot 33. A pin 34 for driving cylinder 32 during a portion of its stroke, and keeping the shaper cone 5 oriented thereon extends through the aperture 40 and into the slot 33. The upper end of the shaper cylinder 32 is hollow and the wall thereof is slotted to define tongues 41.

A lead wire separator 37, an inverted L-shaped member, is mounted on the top of the shaper cylinder 32, the base portion thereof being connected thereto by a screw 43 and the leg portion thereof extending downwardly along the outside wall of the cylinder 32. One end of a link 10 extends into an aperture 44 in the base of the cylinder 32 and the other end thereof is connected to one end of a spring-loaded lever 7 through a universal joint 11.

The second shaper assembly 39 comprises a shaper cylinder 31 with a shaper cone 19 mounted on the upper end thereof, and a lead wire separator 45 disposed in the cone 19 and secured in position therein by a screw 46 (Figures 5 and 6). The shaper cylinder 31 is supported by the block 21 through a guide bushing 47. The shaper cylinder 31 is connected to one end of an actuating lever 13 through an adjustable drive link 36. The ends of the drive link 36 are provided with universal joints 29 and 30, the joint 29 being connected to the actuating lever 13, and the joint 30 being connected to the lower end of the shaper cylinder 31.

As was mentioned above, the front end of the actuating lever 2 supports the bearing shaft 25, the front end of lever 7 is connected through universal joint 11 to link 10, and the front end of actuating lever 13 is connected through the universal joint 29 to the adjustable drive link 36. The rear end of levers 2, 7, and 13 are mounted on a shaft 12 which is supported by journals 23. The journals 23 are mounted on a bracket 22 which extends upwardly from the table 14 (Figures 2 and 3).

Actuation of the first shaper assembly 38 and the second shaper assembly 39 is effected through a spring loaded telescoping rod 3, one end of which is connected through a bearing stud 24 to the lever 2 (Figure 3), and the other end of which is connected to one end of a primary drive lever 48 (Figure 4). The primary drive lever 48 is rotatably mounted intermediate its ends on a shaft 49 which may be supported by the mount machine frame, and the other end of the lever 48 is

connected to a suitable actuating means 50, such as a cam, for example.

An adjustable stop 1, which consists of a screw threaded through the actuating lever 2, defines the end of the return stroke of the lever 2. An adjustable stop 6, which consists of a screw mounted in a bracket 8, defines the end of the first phase of the upward stroke of the shaper cylinder 32. The lever 7 is provided with an arm 67, the free end of which is engaged by lever 2 to insure a positive return of the lever 7.

Figure 10 shows a mount 51 of a type which can be re-shaped by the apparatus of our invention to provide a mount 52 like the one shown in Figure 11. Similar reference members have been used to identify the several elements of the mount 51 of Figure 10 and the mount 52 of Figure 11, except that, in the latter case, an alphabetic character has been added. The mounts 51 and 52 comprise a tube 53, one end thereof having a flared portion 54, and the other end having a stem press 55 in which a portion of lead wires 56 and 57 are sealed. The tube 53 is provided with an aperture 58 therein to which an exhaust tube 59 is connected for evacuation purposes. One end of an arbor 60 is fused to the top of the stem press 55, the other end thereof being provided with a button 61 in which an end of filament support wires 62, 63, and 64 are fused. The other ends of the filament support wires 62, 63 and 64, and the adjacent ends of the lead wires 56 and 57 are deformed to define loops and hooks respectively through which a coiled filament 65 of tungsten wire is supported.

As was mentioned above, the apparatus of our invention may be incorporated in conventional lamp mount machinery of the type shown in Otaka 1,821,894 and Flaws 1,907,532, for example, at a point after the last fabricating position thereon, and thereby effect a re-shaping of mounts like the one shown in Figure 10 to give a mount like the one shown in Figure 11. When a head of the mount machine, from which the mount 51 is supported during the several mounting operations, carries the mount to a position where it is disposed above and in register with the first shaper assembly 38, said assembly moves upwardly and engages the mount 51.

Actuation of the first shaper assembly 38 is effected by a suitable actuating means 50, such as a cam for example, through the primary drive lever 48, and the spring loaded telescoping rod 3 which are shown in Figure 4, and thence through the bearing stud 24 and the actuating lever 2 in which it is mounted (Figure 3). Movement of the actuating lever 2, one end of which is fixedly mounted on the rotatable shaft 12, effects the upward stroke of the first shaper cylinder 32 and the first shaper cone 5 independently of each other. This movement is transmitted to the cone 5 through the bearing shaft 25 and the drive links 27 which connect the bearing shaft 25 to the block 4 in which the cone 5 is mounted (Figure 1).

The upward movement of the actuating lever 2 is transmitted into the upward stroke of the first shaper cylinder 32 through the spring loaded lever 7 one end of which is rotatably mounted on the shaft 12, on which the actuating lever 2 is fixedly mounted. The upward movement of the actuating lever 2 effects an upward movement of the lever 7 through the spring 35 (Figures 2 and 3). The first shaper cylinder 32 is connected to the spring loaded lever 7 through the universal joint 11 and the link 10, one end of which slidably fits

into the base of the cylinder 32 (Figure 1). Since the cylinder 32 is not fixedly mounted on the link 10, we have provided means for preventing rotation thereof to make sure that it will always engage the mount 51 in a predetermined manner, with the tongues 41 engaging the filament support wires 62 and 64 and the elongated slot 68 therebetween providing a free path for the filament support wire 63. This means consists of an elongated rod (not shown), one end of which is fixedly mounted in a collar 69 which is in turn fixedly mounted on cylinder 32, which extends through an aperture therefor in the supporting block 20 (Figure 1).

The upward stroke of the first shaper assembly 38 is divided into three distinct phases. In the first phase, the first shaper assembly 38, i. e., the shaper cylinder 32 and the shaper cone 5, move up together and engage the mount 51. The end of the first phase of the stroke is defined by the stop 6. Thus when the spring-loaded lever 7 has moved up to a point where it engages the screw 6, the first phase of the stroke has been completed. The relative position of the cylinder 32 and the cone 5, and the disposition of the mount 51 at the end of the first phase of the stroke is shown in Figure 7. The lead wires 56 and 57 and the filament support wires 62, 63 and 64 have been moved inwardly by their engagement with the inside wall of the shaper cone 5. Filament support wire 63 is in register with an elongated slot 68, thus preventing deformation thereof by the tongues 41. The tongues 41 have moved into position to engage and deform filament support wires 62 and 64 which will serve as the lower filament supports of the mount of Figure 11.

The second phase of the upward stroke of the first shaper assembly 38 consists of a further upward movement of the shaper cone 5 while the shaper cylinder 32 remains stationary. The length of this phase of the stroke is equal to the distance between the pin 34 and the top of the elongated slot 33 as these parts are shown in Figure 1. Thus the upward movement of the shaper cone 5, while the shaper cylinder 32 remains stationary, is made possible by the manner in which the cone 5 is mounted on the cylinder 32. The relative position of the cylinder 32 and the cone 5, and the disposition of the mount 51 at the end of the second phase of the stroke is shown in Figure 8. The cone 5 has moved up to further encompass the mount, and effect a further inward displacement of lead-wires 56 and 57, and filament support wires 62, 63 and 64.

The third phase of the upward stroke of the first shaper assembly 38 consists of an upward movement of both the shaper cone 5 and the shaper cylinder 32. The pin 34 (Figure 1), which moved up to the top of the elongated slot 33 in cylinder 32 during the second phase of the stroke, serves as the cylinder drive pin during the third phase of the stroke, urging the cylinder 32 upwardly with the cone 5. The upward movement of the cylinder 32 during this phase of the stroke is made possible by reason of the fact that the link 10 slidably fits into the base thereof. Figure 9 shows the relative position of the cylinder 32 and the cone 5, and the disposition of the mount 51 at the end of the third and final phase of the stroke of the first shaper assembly.

The third phase of the stroke effects a further gathering of the mount and the shaping of filament supports 62 and 64 to form the lower filament supports. As the cone 5 and the cylinder 32 move upwardly the ends of the lead wires 56 and 57 on which the filament 65 is mounted are

engaged by the lead wire separator 37 and are guided thereby to insure the proper alignment and disposition thereof. Further gathering of the mount is accomplished by the upward movement of the cone 5 thereby encompassing a greater portion thereof than was encompassed by the second phase of the stroke. Shaping of the filament supports 62 and 64 is effected when the tongues 41 move into engagement therewith and continue their upward movement. Engagement of the filament supports 62 and 64 by the tongues 41 causes the supports to bend at the points of engagement. Further upward movement of the tongues 41 deforms the filament supports 62 and 64, causing them to bend back on themselves, and form the lower filament supports as shown in Figure 11.

After the third and final phase of the stroke of the first shaper assembly 38 and its action on the mount 51 has been completed, the actuating means 50 effects a return of the first shaper assembly to its position shown in Figures 1, 2 and 3. The spring loaded telescoping rod 3, drawn downwardly by the primary drive lever 43, draws with it the actuating lever 2 to which it is connected through the bearing stud 24 (Figures 3 and 4). The downward movement of the lever 2 effects the return stroke of the shaper cone 5 and the shaper cylinder 32. The downward movement of the lever 2 effects the return stroke of the shaper cone 5 through the bearing shaft 25, the universal joints 26, the drive links 27, the universal joints 28, and the block 4 in which the shaper cone is mounted (Figure 1).

Since the shaper cylinder 32 is freely mounted on the shank portion of the link 10 (Figures 1 and 3), gravity effects the first phase of the return stroke thereof. This phase of the return stroke is completed when the base of the cylinder 32 engages the base portion of the link 10. Further downward movement of the cylinder 32 does not take place again until the lever 2 has moved down sufficiently to engage the positive return arm 67 on the spring-loaded lever.

During this dwell period, the cylinder drive pin 34 has been drawn downwardly through the elongated slot 33 to the bottom thereof by the shaper cone 5. In the event that gravity did not effect the first phase of the return stroke of cylinder 32, the cylinder drive pin 34 will effect the complete return stroke of the cylinder.

The second phase of the return stroke is effected when the downward movement of the lever 2 depresses the lever 7 through the arm 67 (Figures 1 and 2). Since the link 10 is fixedly connected through the universal joint to the lever 7, it is drawn downwardly therewith, thus permitting the cylinder drive pin 34 to effect the remainder of the return stroke of cylinder 32.

The mount machine with which the apparatus of our invention is associated indexes and effects movement of the head thereof in which the mount 51 is supported from a position where the mount was in register with the first shaper assembly 38 to a position where it is in register with the second shaper assembly 39.

As was mentioned above, both the first shaper assembly 38 and the second shaper assembly 39 have a common primary actuating means 56. Effectuation of the upward stroke of the second shaper assembly 39 is accomplished through the upward movement of its actuating lever 13, one end of which is fixedly mounted on the same shaft 12 on which one end of the actuating lever 2 is mounted. Thus the upward movement of the actuating lever 2 effects the upward stroke

of the second shaper assembly 39 through the shaft 12, the actuating lever 13, and the adjustable drive link 36. The return stroke of the second shaper assembly 39 is similarly effected.

We have found that the use of a second shaper mechanism is not absolutely necessary. The advisability of its use will be determined in large part by the outside mount diameter desired. For example, if one desired to effect a further inward displacement of the mount 52 of Figure 11, one would use a second shaper mechanism, in which the diameter of the shaping cone thereof is smaller than the diameter of the first shaping cone. The second shaper assembly 39 (Figures 1, 5 and 6) is an auxiliary shaping mechanism of this type.

Although we have described the method and apparatus of our invention with reference to specific mount structures (Figures 10 and 11), it will be readily apparent to those skilled in the art that it can be readily employed to re-shape mounts of designs different from the one shown in Figure 10 to provide mounts of designs different from the one shown in Figure 11. It may be used to re-shape mounts which have but one or two filament supports, or it may be used to re-shape mounts having more than three filament supports. The tongue or tongues 41 would, of course, then be designed to properly effect the deformation of the desired filament supports. Although in the specific example described above we have deformed alternate filament supports, adjacent filament supports may also be deformed without departing from the spirit of our invention, by changing the configuration and/or relative disposition of the tongues 41 which effect the deformation.

In some cases, depending on the initial relative disposition and configuration of the lead wires, the tongues 41 may also serve as lead wire separators, positioning and guiding the lead wires before they are engaged by the lead wire separators 37 and/or 45. In still other applications, the initial disposition and configuration of the lead wires may be such that lead wire separators 37 and/or 45 are not necessary.

What we claim is:

1. Apparatus for shaping a lamp filament mount having at least two lead wires sealed intermediate their ends in the stem press and extending beyond the arbor button, and at least one filament support wire mounted on and extending beyond the arbor button, the adjacent ends of said lead wires and filament support wire lying in substantially the same plane and having a filament mounted thereon, said apparatus comprising: a hollow, truncated shaper cone terminating into a tube depending therefrom; a cylinder, concentric with said tube, disposed therein, and spaced from the inner wall thereof a distance sufficient to freely admit the lead wires and filament support wire therebetween, said cylinder having a tongue on an end thereof normally extending into said cone; and means for sequentially moving firstly said cone into encompassing relationship with respect to the mount to draw the adjacent free ends of the lead wires and the filament support wire on which the filament is mounted toward one another and said tongue into engagement with the filament support wire intermediate the ends thereof, secondly said cone into further encompassing relationship with respect to the mount to bring the tube depending from said cone into encompassing relationship with respect to the lead wires and the

filament support wire whereby the lead wires and the filament support wire lie within the space between said cylinder and said tube, and thirdly said cone and the tube depending therefrom into further encompassing relationship with respect to the mount, and means for moving said tongue, in proper timed relationship with respect to the movement of said cone and the tube depending therefrom, against the filament support wire to bend it back on itself and thereby move the end of the filament support wire on which the filament is mounted out of the plane in which the ends of the lead wires on which the filament is mounted lies and locate it in a different plane.

2. Apparatus for shaping a lamp filament mount having at least two lead wires sealed intermediate their ends in the stem press and extending beyond the arbor button, and at least one filament support wire mounted on and extending beyond the arbor button, the adjacent ends of said lead wires and filament support wire lying in substantially the same plane and having a filament mounted thereon, said apparatus comprising: a hollow, truncated shaper cone terminating into a tube depending therefrom; a cylinder, concentric with said tube, disposed therein, and spaced from the inner wall thereof a distance sufficient to freely admit the lead wires and filament support wire therebetween, said cylinder having at one end thereof a tongue projecting therefrom and normally extending into said cone, and a lead wire separator depending therefrom and lying along the wall thereof; and means for sequentially moving firstly said cone into encompassing relationship with respect to the mount to draw the adjacent free ends of the lead wires and the filament support wire on which the filament is mounted toward one another and said tongue into engagement with the filament support wire intermediate the ends thereof, secondly said cone into further encompassing relationship with respect to the mount to bring the tube depending from said cone into encompassing relationship with respect to the lead wires and the filament support wire whereby the lead wires and the filament support wire lie within the space between said cylinder and said tube, and thirdly said cone and the tube depending therefrom into further encompassing relationship with respect to the mount, and means for moving said cylinder in proper timed relationship with respect to the movement of said cone and the tube depending therefrom, to advance said tongue on said cylinder against the filament support wire to bend it back on itself and thereby move the end of the filament support wire on which the filament is mounted out of the plane in which the ends of the lead wires on which the filament is mounted lies and locate it in a different plane, and to advance said lead wire separator on said cylinder into engagement with the lead wires lying within the space between said cylinder and said tube to thereby position the lead wires a predetermined distance from each other.

3. Apparatus for shaping a lamp filament mount having at least two lead wires sealed intermediate their ends in the stem press and extending beyond the arbor button, and a plurality of filament support wires mounted on and extending beyond the arbor button, the adjacent ends of said lead wires and filament support wires lying in substantially the same plane and having a filament mounted thereon, said apparatus comprising: a hollow, truncated shaper cone terminating into a tube depending therefrom; a cylinder

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der, concentric with said tube, disposed therein, and spaced from the inner wall thereof a distance sufficient to freely admit the lead wires and filament support wires therebetween, said cylinder having a plurality of tongues on an end thereof normally extending into said cone; and means for sequentially moving firstly said cone into encompassing relationship with respect to the mount to draw the adjacent free ends of the lead wires and the filament support wires on which the filament is mounted toward one another and said tongues into engagement with the filament support wires intermediate the ends thereof, secondly said cone into further encompassing relationship with respect to the mount to bring the tube depending from said cone into encompassing relationship with respect to the lead wires and the filament support wires whereby the lead wires and the filament support wires lie within the space between said cylinder and said tube, and thirdly said cone and the tube depending therefrom into further encompassing relationship with respect to the mount, and means for moving said tongues, in proper timed relationship with respect to the movement of said cone and the tube depending therefrom, against the filament support wires to bend them back on themselves and thereby move the ends of the filament support wires on which the filament is mounted out of the plane in which the ends of the lead wires on which the filament is mounted lies and locate them in a different plane.

4. Apparatus for shaping a lamp filament mount having at least two lead wires sealed intermediate their ends in the stem press and extending beyond the arbor button, and a plurality of filament support wires mounted on and extending beyond the arbor button, the adjacent ends of said lead wires and filament support wires lying in substantially the same plane and having a filament mounted thereon, said apparatus comprising: a hollow, truncated shaper cone terminating into a tube depending therefrom; a cylinder, concentric with said tube, disposed therein, and spaced from the inner wall thereof a distance sufficient to freely admit the lead wires and filament support wires therebetween, said cylinder having at one end thereof a plurality of tongues projecting therefrom and normally extending into said cone, and a lead wire separator depending therefrom and lying along the wall thereof; and means for sequentially moving firstly said

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cone into encompassing relationship with respect to the mount to draw the adjacent free ends of the lead wires and the filament support wires on which the filament is mounted toward one another and said tongues into engagement with the filament support wires intermediate the ends thereof, secondly said cone into further encompassing relationship with respect to the mount to bring the tube depending from said cone into encompassing relationship with respect to the lead wires and the filament support wires whereby the lead wires and the filament support wires lie within the space between said cylinder and said tube, and thirdly said cone and the tube depending therefrom into further encompassing relationship with respect to the mount, and means for moving said cylinder in proper timed relationship with respect to the movement of said cone and the tube depending therefrom, to advance said tongues on said cylinder against the filament support wires to bend them back on themselves and thereby move the ends of the filament support wires on which the filament is mounted out of the plane in which the ends of the lead wires on which the filament is mounted lies and locate them in a different plane, and to advance said lead wire separator on said cylinder into engagement with the lead wires lying within the space between said cylinder and said tube to thereby position the lead wires a predetermined distance from each other.

GERALD S. QUINN.
MAZEPPA D. BETTS.

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