

Oct. 10, 1933.

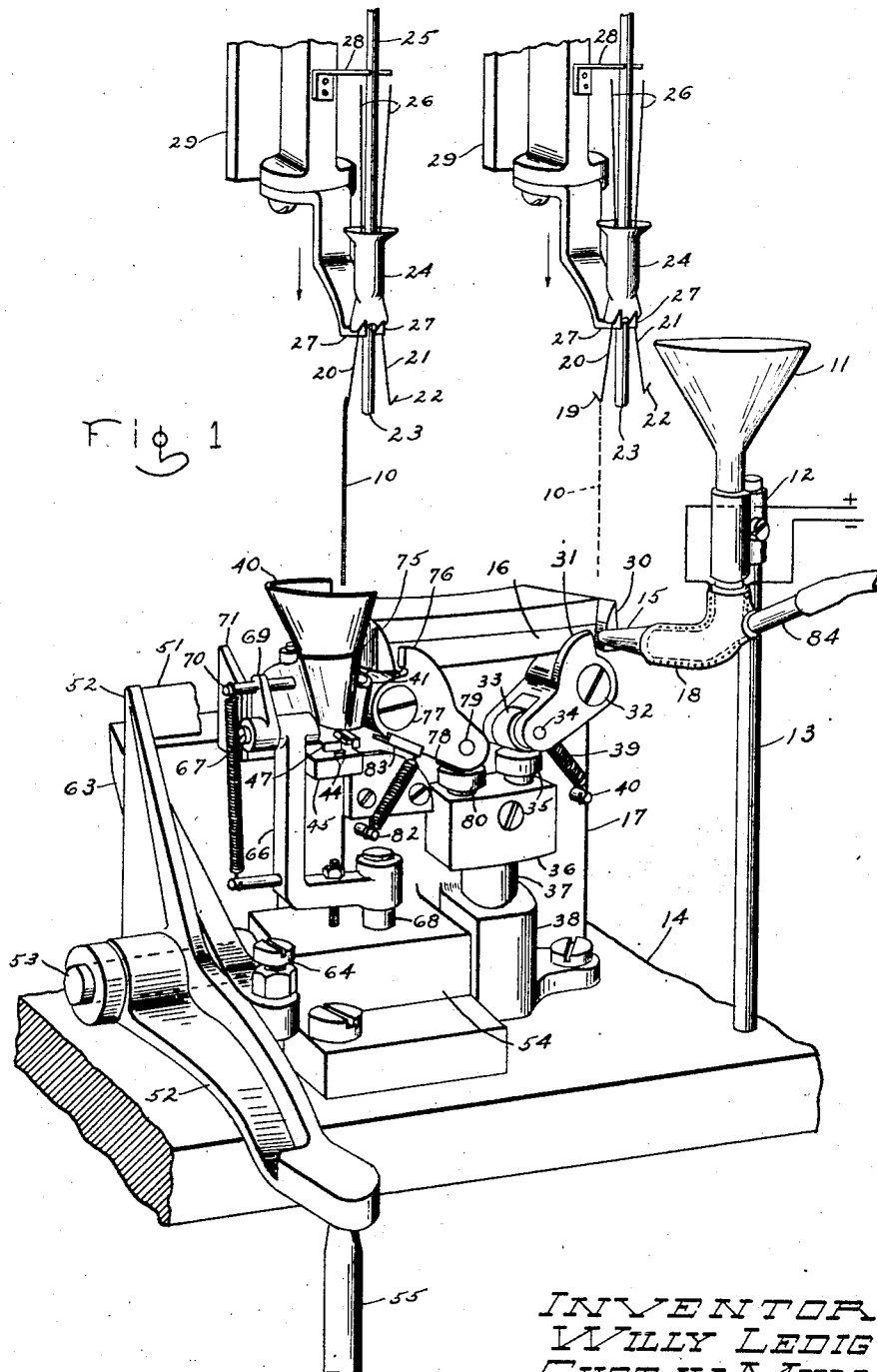
W. LEDIG ET AL

1,930,316

METHOD AND APPARATUS FOR MOUNTING FILAMENTS ON THE CONDUCTIVE
SUPPORTS OF ELECTRIC INCANDESCENT LAMPS

Filed Feb. 18, 1932

3 Sheets-Sheet 1



INVENTORS
WILLY LEDIG
GUSTAV MULLER
WILLI BREUNIG
BY *Charles E. Muller*
THEIR ATTORNEY

Oct. 10, 1933.

W. LEDIG ET AL
METHOD AND APPARATUS FOR MOUNTING FILAMENTS ON THE CONDUCTIVE
SUPPORTS OF ELECTRIC INCANDESCENT LAMPS

Filed Feb. 18, 1932

1,930,316

3 Sheets-Sheet 2

Fig 3

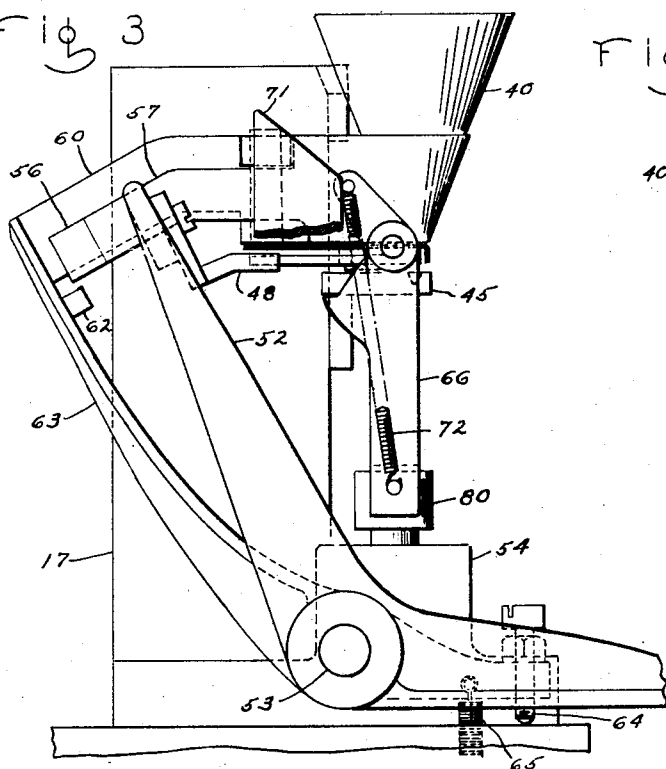


Fig 4

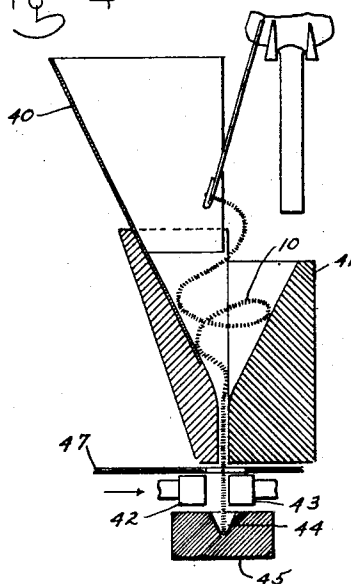
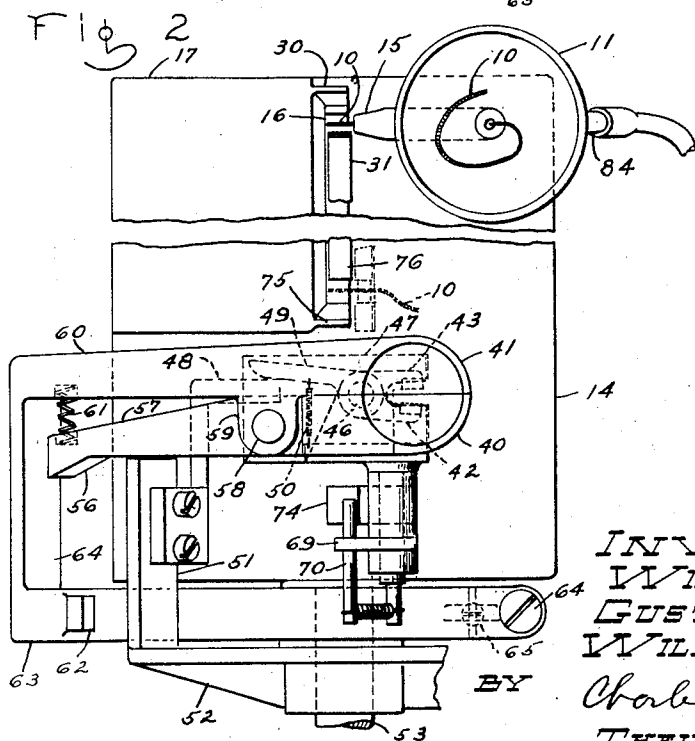


Fig 2



INVENTORS
WILLY LEDIG
GUSTAV MÜLLER
WILLI BREUNIG
BY *Charles V. Muller*
THEIR ATTORNEY

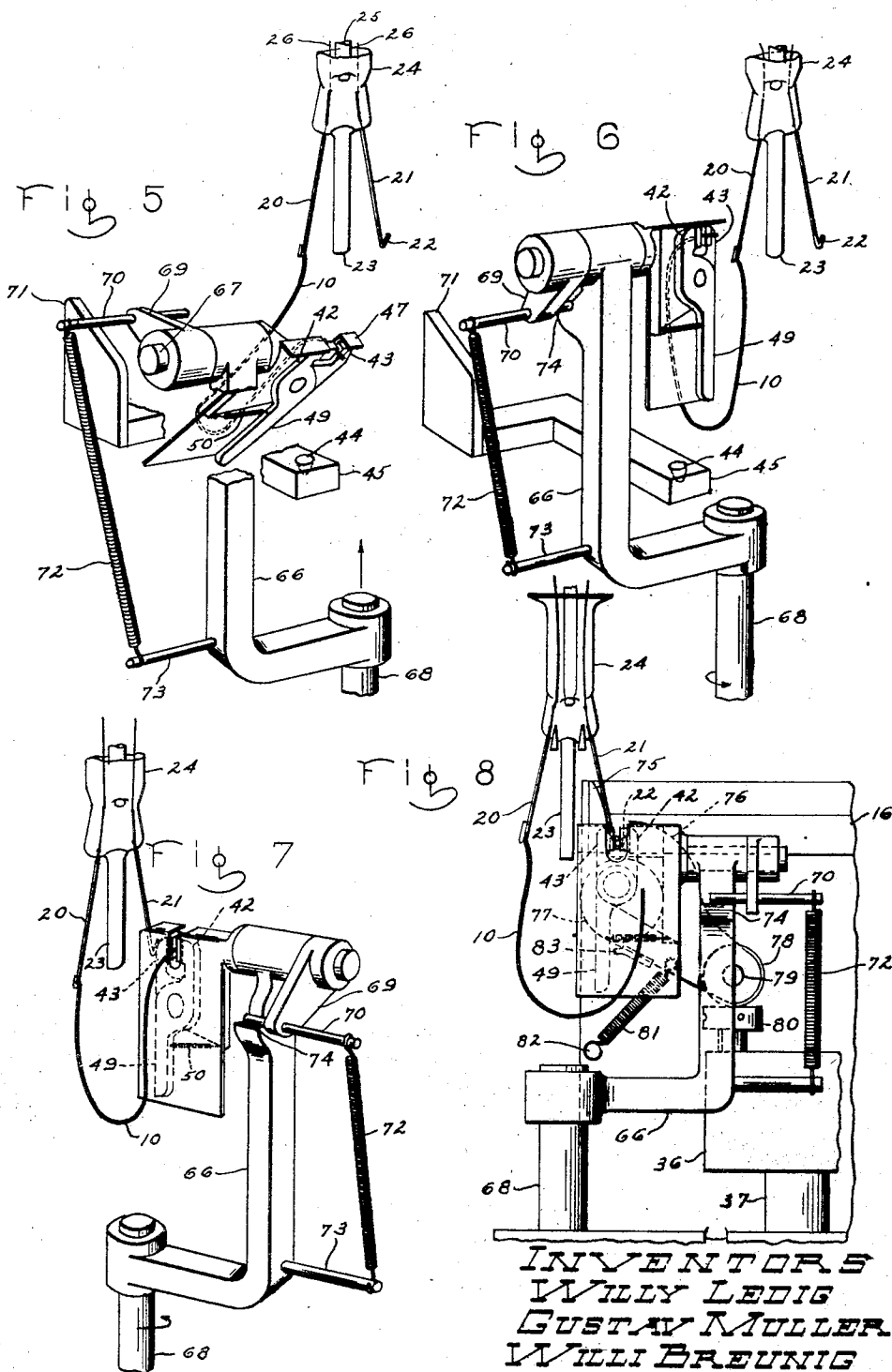
Oct. 10, 1933.

W. LEDIG ET AL
METHOD AND APPARATUS FOR MOUNTING FILAMENTS ON THE CONDUCTIVE
SUPPORTS OF ELECTRIC INCANDESCENT LAMPS

1,930,316

Filed Feb. 18, 1932

3 Sheets-Sheet 3



INVENTORS
WILLY LEDIG
GUSTAV MÜLLER
WILLI BREUNIG

BY

Charles E. Tuller
THEIR ATTORNEY

UNITED STATES PATENT OFFICE

1,930,316

METHOD AND APPARATUS FOR MOUNTING
FILAMENTS ON THE CONDUCTIVE SUP-
PORTS OF ELECTRIC INCANDESCENT
LAMPS

Willy Ledig, Berlin-Lichtenrade, Gustav Müller,
Berlin-Steglitz, and Willi Breunig, Berlin,
Germany, assignors to General Electric Com-
pany, a corporation of New York

Application February 18, 1932, Serial No. 593,888,
and in Germany March 3, 1931

5 Claims. (Cl. 176-4)

Our invention relates to a method and appa-
ratus for mounting filaments on the conductive
supports of electric incandescent lamps and sim-
ilar articles.

One of the features of our invention is a
method of mounting filaments on the conduc-
tive supports or inner lead wires of electric lamps
whereby filaments of different lengths may be
mounted on said supports without in any way
altering the set-up of the apparatus. This is
accomplished according to our invention by drop-
ping a filament into a funnel or hopper which
directs one end of said filament into the hooked
end of a support wire of a lamp mount. The
end of said support wire is closed about the fila-
ment and then the lamp mount is transferred to
another position at which the freely hanging
end of the filament is guided into a pair of mov-
able transferring jaws which carry said free end
of the filament into a hook at the end of a sec-
ond support wire of said mount. After closing
said second hook the filament then hangs from
the support wires and may be mounted on anchor
wires to support it in a substantially horizontal
plane by means of apparatus disclosed in U. S.
Patent No. 1,816,683, Ledig et al. Said patent
discloses a device in which an air jet blows the
filament from its hanging position to a hori-
zontal position where it is held by a number of
fingers. A notched roller turning on an axis
parallel to the filament then forms the anchor
loops about the filament, thus completing the
stem. Other features and advantages of our
invention will appear from the following descrip-
tion of species thereof and from the drawings.

In the drawings Fig. 1 is a perspective view
of the device comprising our invention; Fig. 2
is a plan view of the device; Fig. 3 is a side ele-
vation thereof; Fig. 4 is a detailed sectioned
view of filament guiding means; Figs. 5, 6 and 7
are detailed views in perspective; and Fig. 8 is
a detailed elevation of successive positions of
transferring jaws comprised therein.

Referring to Figs. 1 and 2, a filament 10 is
dropped into a funnel 11 mounted through
bracket 12 on a standard 13 which is mounted
on a base 14. Said filament falls through a tube
or nozzle 15 mounted at the bottom of said fun-
nel 11, which nozzle 15 has its axis slanting
slightly downward from the horizontal. Said
filament 10 issues from the mouth of said nozzle
until one end abuts against a ledge 16 at the
top of a block 17 which is mounted on the base
14. A heating coil 18 surrounds the passage
through the nozzle 15 so as to remove moisture

therefrom and prevent sticking of filaments
therein.

Previous to the dropping of a filament in the
funnel 11 a hooked end 19 of a leading-in wire
20 is lowered into the path of discharge of said
filament from the nozzle 15. Said lead wire 20
is part of a lamp mount comprising another lead
wire 21 with a hooked end 22, a button rod 23,
a stem tube 24, exhaust tube 25 and outer lead
wires 26. Said mount is supported by prongs
27 and a notched finger 28 of a holding head 29
which is mounted on an indexing table (not
shown). After the end of a filament 10 has en-
tered the hook 19, said hook is closed by clamp-
ing between a stationary jaw 30, mounted on
the block 17 or forming a part thereof, and a
jaw 31 pivotally mounted on a pin 32 in the
block 17. Said jaw 31 is actuated through a
roller 33 mounted on a pin 34 in said jaw by
an adjustable screw 35 mounted in a head 36
affixed to a rod 37 which moves in a sleeve 38
forming a part of the block 17. After said rod
37 has been raised (by means not shown) so as
to close said hook 19 by the pivoting of the jaw
31, it is retracted and the jaw 31 retracts also
due to the pull of a spring 39 which is mounted
on said jaw at one end and on a pin 40 in the
block 17 at the other end.

The holding head carrying the lamp mount is
then raised, thereby pulling the filament 10 out
of the nozzle 15, and indexed to the position
shown at the left in Fig. 1 where it is again low-
ered with the filament 10 depending from the
support wire 20. The filament enters a guide,
specifically a split funnel comprising two halves
40, 41, through which it is guided between a pair
of jaws 42, 43 (Figs. 2 and 4) to the bottom of
an indentation 44 in a fixed plate 45 mounted on
the block 17. The jaw 42, which is pivotally
mounted on a pin 46 (Fig. 2) in a plate 47, is then
closed against the jaw 43 which is fixedly mount-
ed on the plate 47, by the withdrawal of a finger
48 which bears against extension 49 of jaw 42.
A spring 50 draws the extension 49 over, thereby
causing the jaw 42 to close against the jaw 43 and
grip the end of the filament 10. The finger 48
is mounted on an arm 51 of a lever 52 pivotally
mounted on a shaft 53 which is mounted in a
block 54 (Fig. 1). Said finger 48 is caused to with-
draw from the leg 49 of jaw 42 by the upward
movement of a bar 55 which is attached to the
lower end of the lever 52. The end of the arm
51, in its retractive movement, slides across the
slanting face 56 of a lever 57, the opposite end of
which is fixed to the funnel half 40 and which is

pivotally mounted on a pin 58 in a lug 59 on an arm 60 on the end of which is mounted the other funnel half 41. Said sliding of the arm 51 across the surface 56 causes the lever 57 to pivot against the action of a spring 61, thereby swinging open the funnel 40, 41. As the arm 51 continues to move down it strikes a lug 62 on a lever 63 which is connected through a leg 64 to the arm 60. Said lever 63 is pivotally mounted on the shaft 53 so that the funnel 40, 41 is swung away from its position over the jaws 42, 43. An adjustable bolt 64 (Fig. 3) is mounted at the lower end of the lever 63 and rests on the base 14 when the funnel 40, 41 is in its normal position over jaws 42, 43, being held there by a spring 65 fixed to the lower end of said lever 63.

The sequence of operations shown in Figs. 5, 6, 7 and 8 next takes place. The jaws 42, 43 are raised by an upright 66 which carries a pin 67 on which is mounted the plate 47 carrying the jaws 42, 43. Said upright 66 is mounted on a shaft 68 which is reciprocated through the block 54 by means not shown. Simultaneously with their upward movement, the jaws 42, 43 are rotated from their horizontal position to a vertical position by an arm 69 which is mounted on the pin 67. A pin 70 mounted on the end of said arm 69 rides down the inclined edge of a plate 71, mounted on the plate 45, due to the pull of a spring 72 which is fastened to said pin 70 and a pin 73 in the upright 66. In Fig. 6 the jaws 42, 43 are at the top of their rise and in a vertical position since the pin 70 has slid off the plate 71 onto a ledge 74 on the upright 66. At this point the shaft 68 is rotated as shown in Fig. 7, thereby rotating jaws 42, 43 through an angle of 180° so that the end of the filament 10 held therebetween is introduced into the open hook 22 in the support wire 21 (Fig. 8). (Filament 10 has been broken in Fig. 8 for clearness.) The jaws 42, 43 are then very slightly lowered so that the end of the filament rests in the bottom of the hook 22. Immediately thereafter said hook 22 is closed between a fixed jaw 75, which is mounted at the end of the ledge 16 opposite to jaw 30, and a jaw 76 pivotally mounted on a pin 77 in the block 17. Said jaw is pivoted through a roller 78 (Figs. 1 and 8) mounted on a pin 79 in said jaw, by an adjustable screw 80 mounted in the head 36. After closing of the hook 22 the jaw 76 pivots away due to retraction of the head 36 and the pull of a spring 81 which is fastened to a pin 82 in the block 17. As said jaw 76 pivots away a finger 83 mounted thereon strikes the leg 49 of jaw 42 and thus releases the filament 10, after which the lamp mount is withdrawn from the device by the rise of the holding head 29. Immediately thereafter the transfer jaws 42, 43 are slightly raised through the upright 66 and then swung back to their original position. Then the rod 55 is pulled down, thereby releasing arm 60 with lever 63 which allows the funnel 40, 41 to move back to its position over the jaws 42, 43 (Fig. 2) due to the pull of spring 65, while the finger 48 again engages the leg 49 and thus opens the jaws 42, 43. It will be apparent from Fig. 1 that hooks 19 and 22 of two different lamp mounts will be simultaneously closed in each of the pairs of jaws 30, 31 and 75, 76 respectively. A compressed air line 84 communicating with the passage in nozzle 15 delivers a blast of air after the head 29 is raised from its position over the jaws 30, 31, so that if for some reason there had been no mount in said head or the filament had not been clamped in the lead wire, said filament would be blown out of the nozzle.

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

1. The method of mounting filaments on leads carried by stems for incandescent electric lamps and similar devices which comprises supporting said stem with a pair of leads having hooked ends depending therefrom, feeding a filament through a guide so that one end thereof projects into one of said hook ends, clamping said hooked end around said filament end, withdrawing said stem with said filament depending therefrom, feeding said depending filament through a guide between clamping jaws, so that its free end projects beyond said jaws, closing said jaws, moving said jaws to position said free filament end in the other of said lead hook ends and finally clamping said second hook end.

2. In an apparatus of the class described, the combination of a filament feeding and guiding means, a support for a stem having lead wires with hooked ends extending therefrom mounted adjacent thereto, a clamping mechanism to which said filament feeding means leads, means for moving said stem support to position a hooked lead end in operative relation to said clamping mechanism, means for operating said clamping mechanism to close said hooked lead end about said filament, a pair of clamping jaws, a guide leading thereto, means for withdrawing said stem from the said clamping mechanism and moving said stem having said filament depending therefrom so as to feed the free end of said filament through said guide between said clamping jaws so that said free ends projects beyond said jaws, a second clamping mechanism disposed adjacent another hooked lead end, means for moving said jaws so as to position said free end of the filament in said hooked lead end, and means for thereafter operating said second clamping mechanism to close said hooked end around said filament.

3. In an apparatus of the class described, the combination of a filament feeding and guiding means, a support for a stem having lead wires with hooked ends extending therefrom mounted adjacent to said feeding means, a clamping mechanism to which said filament feeding means leads, means for moving said stem support downward to position a hooked lead end in operative relation to said clamping mechanism, means for thereafter operating said clamping mechanism to close said hooked end around said filament, a pair of clamping jaws, a guide leading thereto, means for raising the stem support, moving it horizontally and lowering it with the filament depending from the hooked lead end of said stem so as to feed the free end of said filament through said guide between said clamping jaws so that said free end projects beyond said jaws, a second clamping mechanism disposed adjacent another hooked lead end in its lowered position, means for removing said guide from said clamping jaws, means for tilting and rotating said jaws so as to position said free end of the filament in said hooked lead end, and means for thereafter operating said second clamping mechanism to close said hooked end around said filament.

4. In an apparatus of the class described, a support for a stem having lead wires with hooked ends extending therefrom, a filament transfer mechanism comprising a pair of clamping jaws, a guide disposed in juxtaposition with said jaws, means for introducing a filament into said guide so that the end thereof projects beyond said jaws, a clamping mechanism disposed adjacent a hooked lead end, means for moving said jaws so

as to position said end of said filament in said hooked lead end, and means for thereafter operating said clamping mechanism to close said hooked end around said filament.

- 5 5. In an apparatus of the class described, a support for a stem having lead wires with hooked ends extending therefrom, a filament transfer mechanism comprising a pair of clamping jaws, a guide comprising a split funnel consisting of
- 10 two halves disposed above said jaws, means for introducing a filament into said guide so that the end thereof projects beyond said jaws, a clamping

mechanism disposed adjacent a hooked lead end, means for causing said halves of said funnel to be separated and then drawn away from said jaws, means for moving said jaws so as to position said end of said filament in said hooked lead end, and means for thereafter operating said clamping mechanism to close said hooked end around said filament.

WILLY LEDIG.
GUSTAV MÜLLER. 85
WILLI BREUNIG.

15

90

20

95

25

100

30

105

35

110

40

115

45

120

50

125

55

130

60

135

65

140

70

145

75

150