No. 822,213. PATENTED MAY 29, 1906.

N. MARSHALL.

ASSEMBLING APPARATUS.

APPLICATION FILED SEPT. 20, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

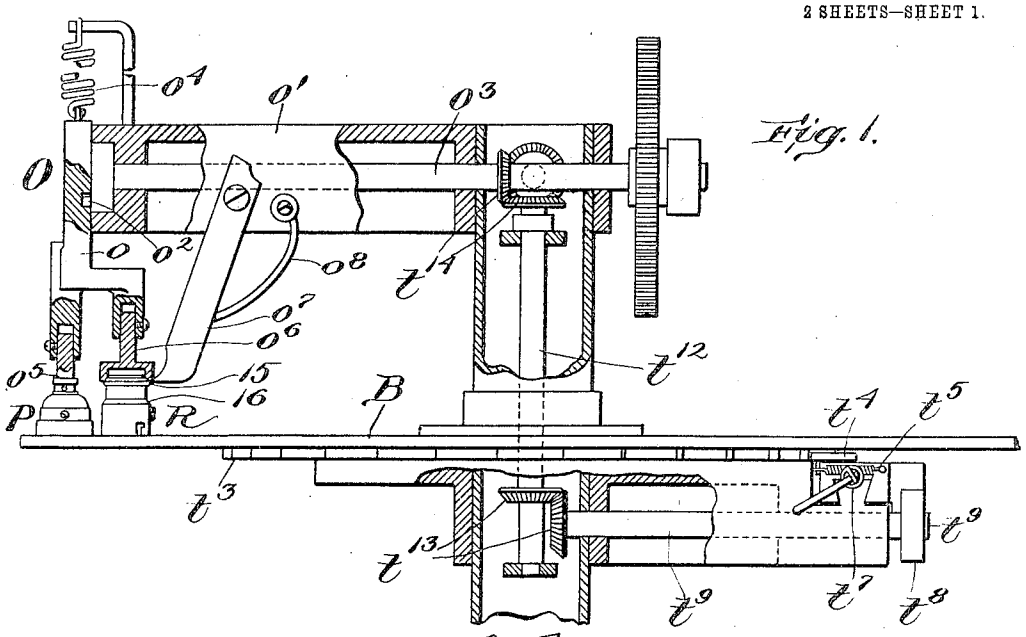
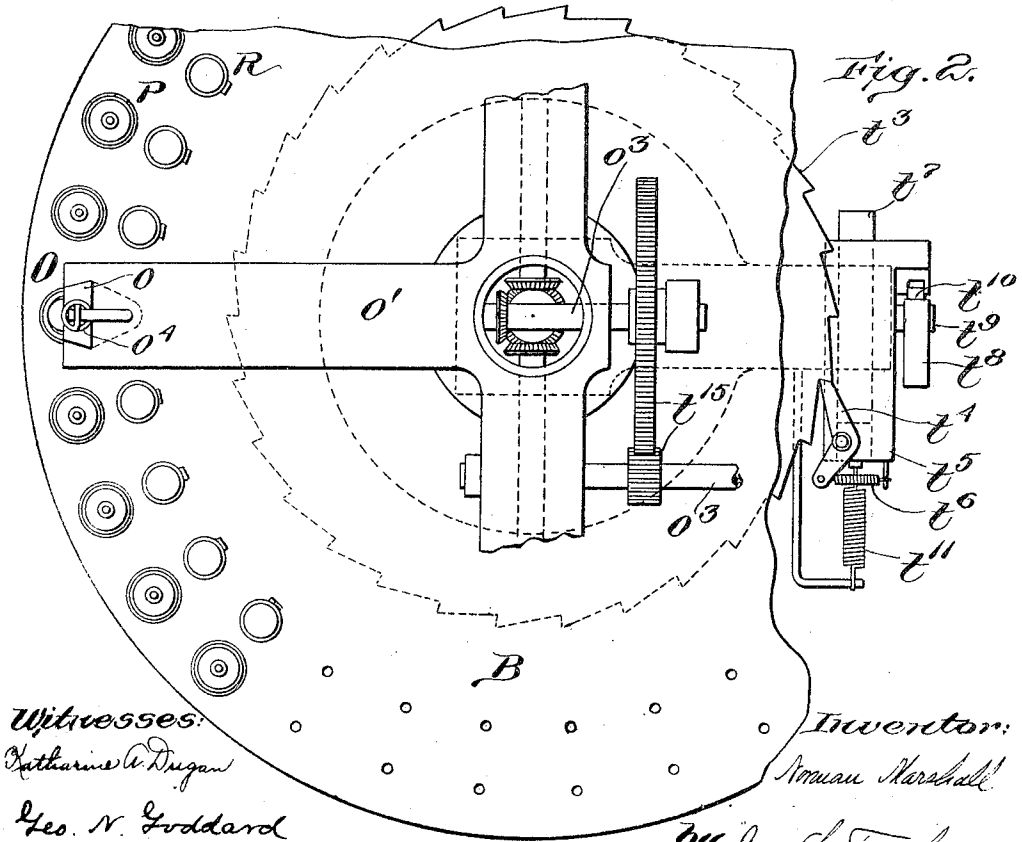



Fig. 2.




Witnesses:
Katharine A. Dugan
Geo. N. Goddard

Inventor:
Norman Marshall
by Dora L. Fish
Attorney.

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS WASHINGTON, D. C.

No. 822,213. PATENTED MAY 29, 1906.

N. MARSHALL.

ASSEMBLING APPARATUS.

APPLICATION FILED SEPT. 20, 1905.

2 SHEETS—SHEET 2.

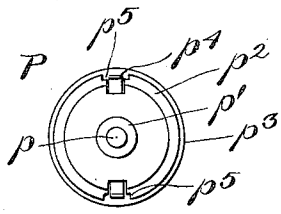



Fig. 3.

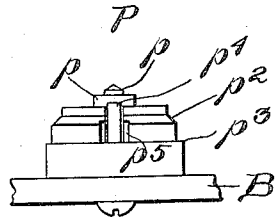



Fig. 4.

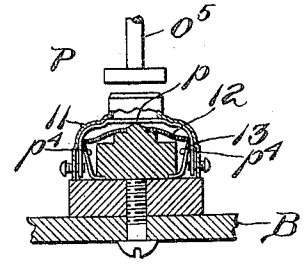



Fig. 5.

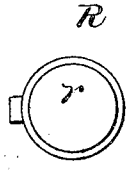



Fig. 6.

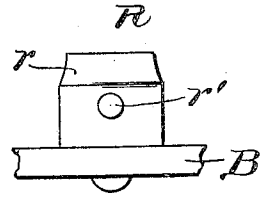



Fig. 7.

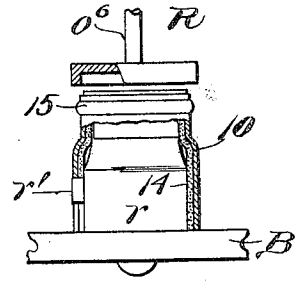



Fig. 8.

Witnesses:
Katharine A. Dugan
Geo. N. Goddard

Inventor:
Norman Marshall
by
Ira L. Fisk Attorney.

# UNITED STATES PATENT OFFICE.

NORMAN MARSHALL, OF NEWTON, MASSACHUSETTS.

## ASSEMBLING APPARATUS.

No. 822,213. Specification of Letters Patent. Patented May 29, 1906.

Original application filed January 19, 1905, Serial No. 241,884. Divided and this application filed September 20, 1905. Serial No. 279,287.

*To all whom it may concern:*

Be it known that I, NORMAN MARSHALL, a citizen of the United States, and a resident of Newton, in the county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Assembling Apparatus, of which the following is a specification.

The invention relates to mechanism especially designed for facilitating the assembling of the parts of an incandescent-lamp socket, and more especially the introduction of the insulating-linings into the external shells and of the insulating-disks into the caps of the sockets. Heretofore these parts have been assembled and forced together manually and have required considerable exertion as well as dexterity on the part of the operator.

In practicing my invention the forcing of the parts together is performed automatically, thus relieving the operator of the exertion incident to the performance of this operation and enabling the parts to be more rapidly and uniformly assembled. The parts to be forced together are positioned upon jigs, by which they are maintained in the proper relative positions, and are presented by these jigs to mechanism which forces the parts together. The jigs for supporting the caps and disks and the jigs for supporting the shells and linings are arranged in two circular series upon a carrying-table and are brought successively into position beneath two plungers, which force the caps down over the disk and the shell down over the linings. These devices may be embodied in and form part of an apparatus for assembling the various parts of a socket or may be embodied in a separate machine.

The various features of the invention will be understood from the following detailed description of a mechanism in which I have embodied them and which forms a part of an assembling-machine in which other operations incident to the assembling of the parts of a socket are performed.

In the drawings, Figure 1 is a sectional elevation of so much of the machine as is required to illustrate the present invention. Fig. 2 is a plan view. Figs. 3, 4, and 5 are views of the cap and disk carrying jig. Figs. 6, 7, and 8 are views of the shell and lining carrying jig.

In the machine shown in the drawings the parts are forced together, so that they remain frictionally connected, by means of a mechanism O, the parts being held in position to be operated upon by two series of jigs P and R, the jigs P holding the cap 12 and disk 11 and the jigs R holding the shell 10 and lining 14 in proper relation as they are forced together. The jigs are arranged in two circular series upon a carrying-table B, which is intermittently rotated to bring the jigs successively to the mechanism O.

The construction of the jigs P is shown in Figs. 3, 4, and 5. As shown in these views, the jig is provided with a central pin $p$, over which the central opening in the disk 12 fits, and with a supporting-ledge $p'$ for supporting the disk about the central opening. The jig is also provided with a supporting-surface $p^2$, on which the outer edge of the disk 12 rests, and is provided with a ledge $p^3$ for limiting the downward movement of the cap 11. The disk is positioned upon the jig by means of two spring-fingers $p^4$, arranged to engage the notches which are formed in the disk for embracing the screw-lugs 13 of the cap. In the body of the jig, between the supporting-surface $p^2$ and the ledge $p^3$, there are two diametrically opposite recesses $p^5$ for receiving the screw-lugs 13, and thus positioning the lugs with relation to the notches in the insulating-disk.

When the caps are forced down upon the jigs, the lugs strike the fingers $p^4$, which yield radially inward as the lugs enter the notches in the disk.

The construction of the jigs R is shown in Figs. 6, 7, and 8. This jig consists of a central post $r$, arranged to fit within the insulating-lining 14 and provided with a laterally-projecting pin $r'$ for engaging the key-slot which is formed in the lining and also in the outer shell 10. This pin $r'$ by engaging the key-slots in the shell and lining determines the position of the parts upon the jig and insures their proper relative position when forced together.

After the parts have been placed upon the jigs P and R the movements of the table B bring the jigs successively into position to present the parts to the mechanism O. The mechanism O consists of a slide $o$, mounted to reciprocate in an arm $o'$, projecting from the central standard for the table B and operated by a crank-pin $o^2$, carried by a constantly-running shaft $o^3$ and engaging a transverse slot in the slide, the lower side of the slot being held in engagement with the crank-

pin by a spring $o^4$, secured to the upper end of the slide. Mounted in the lower end of the slide are two plungers $o^5$ $o^6$, the plunger $o^5$ being arranged to engage the upper end of the cap 11 and force it downward and the plunger $o^6$ being arranged to engage the shell 10 and force it downward, so that by the downward movement of the slide $o$ the cap and shell are forced firmly into position on the jigs which carry them. The downward movement of the cap forces the screw-lugs 13 into the notches in the disk 12, so that the disk and cap are connected together, and the downward movement of the shell 10 forces the shell onto the insulating-lining, so that the lining is properly positioned in the shell. The shell 10 is of thin metal, and the insulating-sleeve should project slightly beyond the end of the shell, and consequently the plunger $o^6$ is recessed, so that it will pass down over the end of the shell and engage the beading 15 on the shell. In order to prevent any accidental removal of the shell and lining from the jig by the upward movement of the plunger $o^6$, a stripping-finger $o^7$ is provided for engaging the shell in case it should rise with the plunger $o^6$ and arrest its upward movement. This stripping-finger is pivoted to the arm $o'$ and is pressed yieldingly forward by a spring $o^8$. The front edge of the finger is so shaped that the finger will be pressed backward as the plunger $o^6$ descends, but will move forward ready to engage the shoulder 16 on the shell as soon as the plunger rises.

The table B is moved intermittently through a ratchet-wheel $t^3$, secured to the under side of the table and engaged by a pawl $t^4$. The pawl is pivoted upon a slide $t^5$ and is held in engagement with the ratchet-wheel by a spring $t^6$. The slide is guided on a bar $t^7$, carried on the outer end of an arm which projects from the standard for the table B The slide is reciprocated by a cam $t^8$, engaged by a roll $t^{10}$ on the slide, which is held in engagement with the cam by a spring $t^{11}$. The cam is secured to a shaft $t^9$, which is continuously rotated through gearing $t^{13}$, connecting it with a vertical shaft $t^{12}$. The shaft $t^{12}$ is driven through the gears $t^{14}$ $t^{15}$, which connect it with the shaft $o^3$.

Without attempting to describe in detail the various changes and modifications which may be made in the specific construction and arrangement of the devices embodying my invention, what I claim, and desire to secure by Letters Patent, is—

1. An assembling apparatus comprising a rotary carrier, two series of work-carrying jigs thereon, two reciprocating plungers arranged to register with the two series of jigs, and mechanism for intermittently rotating the carrier.

2. An assembling apparatus comprising a rotary carrier, two series of jigs carried thereon, a reciprocating slide mounted above the table, two plungers on the slide, and mechanism for intermittently rotating the table.

3. A jig for an assembling apparatus provided with recesses for receiving the screw-lugs of a socket-shell cap, and with fingers for engaging the notches in the insulating-disk and holding them in register with the screw-lugs.

4. A jig for an assembling apparatus provided with recesses for receiving the screw-lugs of a socket-shell cap, radially-yielding fingers in line with said recesses for engaging the notches in the insulating-disk for the cap.

In witness whereof I have hereunto set my hand this 5th day of September, 1905.

NORMAN MARSHALL.

Witnesses:
IRA L. FISH,
KATHARINE A. DUGAN.