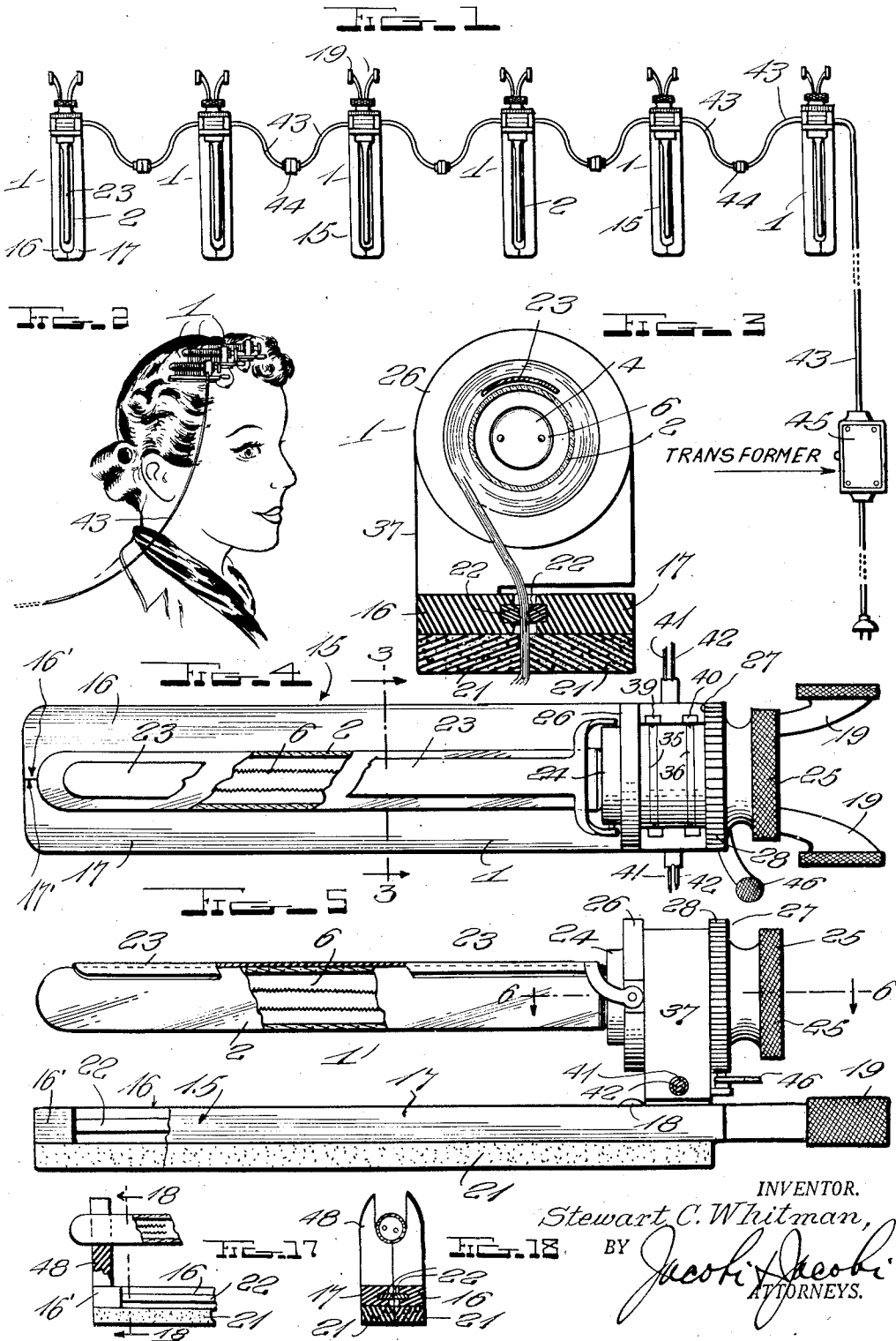


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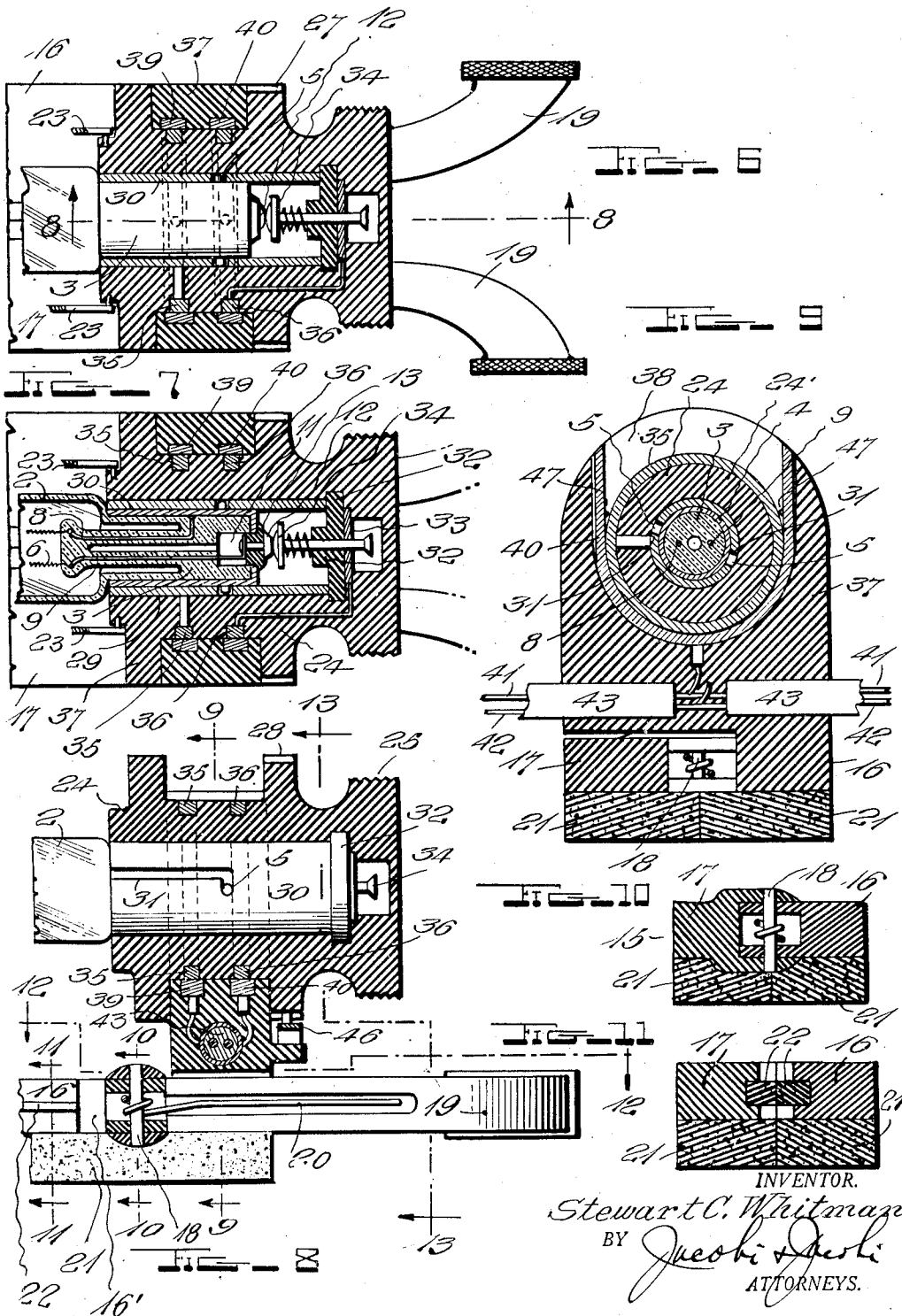
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ELECTRIC HAIR WAVING DEVICE

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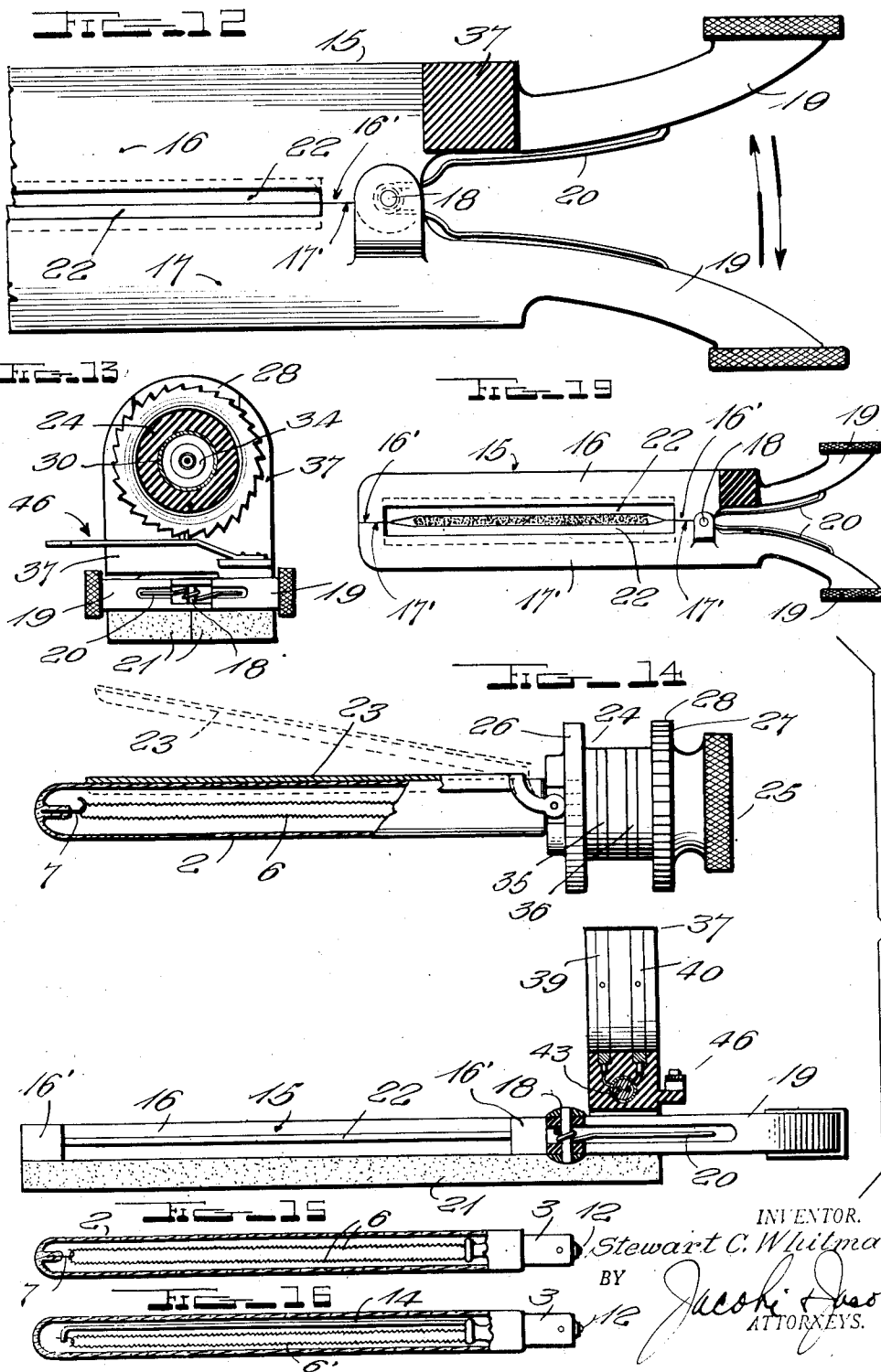
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ELECTRIC HAIR WAVING DEVICE

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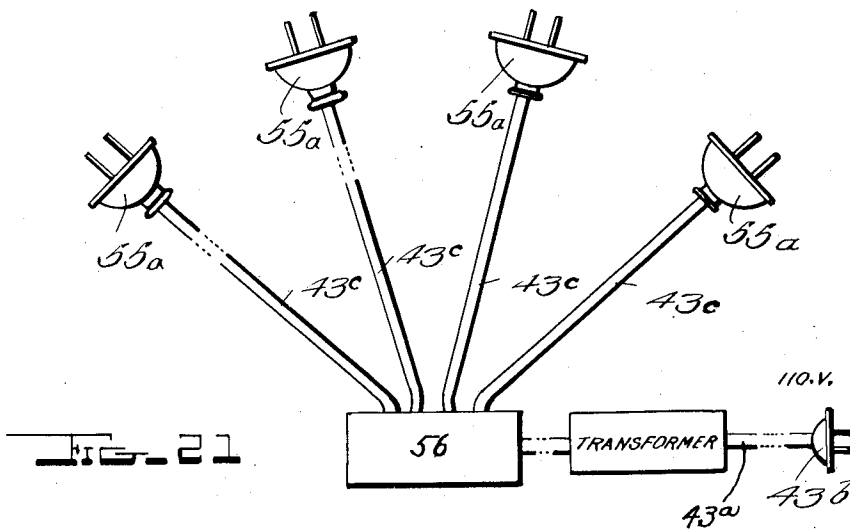
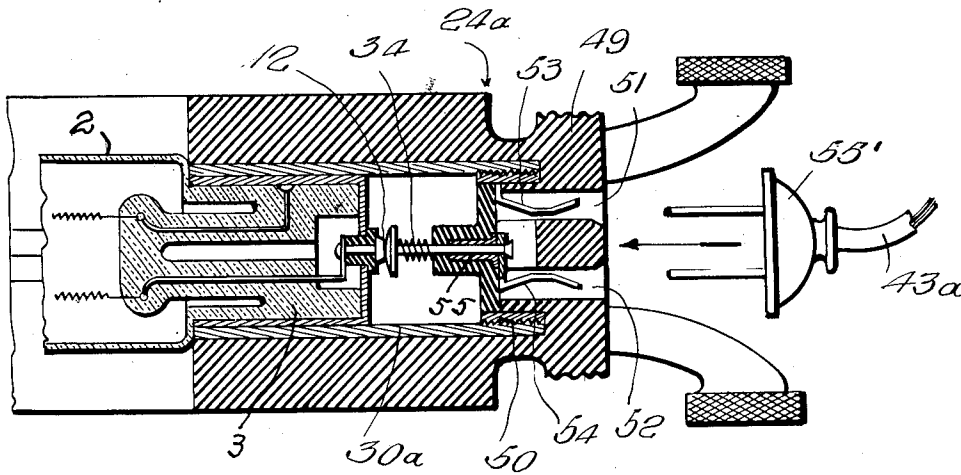
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FIG. 20



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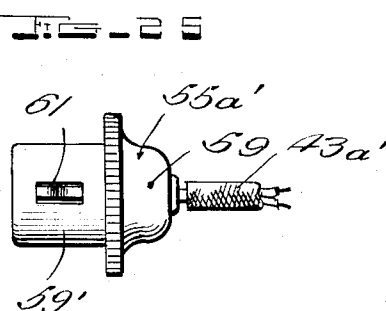
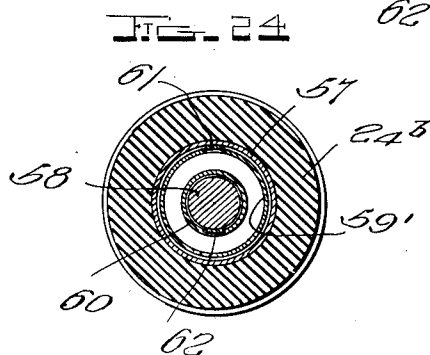
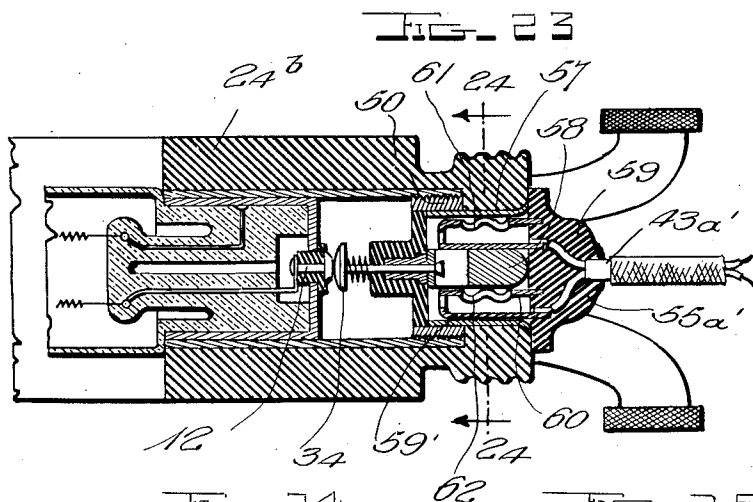
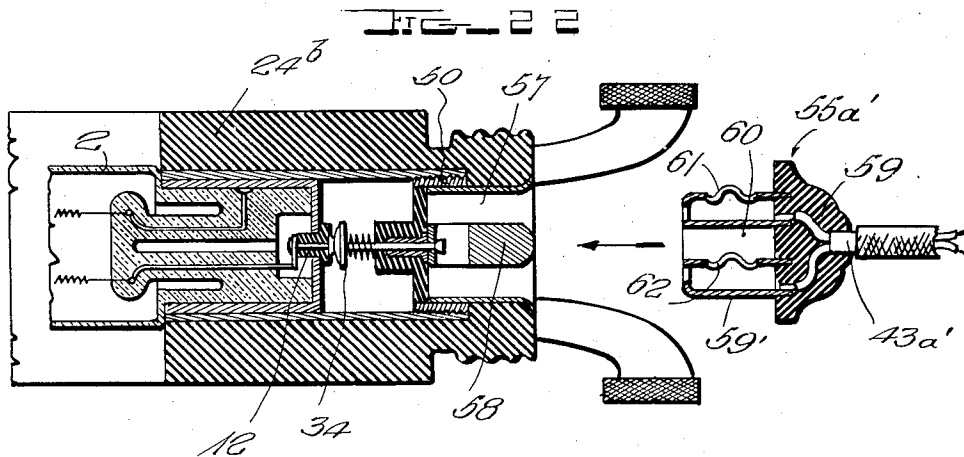
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ELECTRIC HAIR WAVING DEVICE

Filed March 18, 1940

5 Sheets-Sheet 5



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2,344,908

ELECTRIC HAIR-WAVING DEVICE

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Application March 18, 1940, Serial No. 324,675

5 Claims. (Cl. 219—24)

This invention relates to an electrically heated waving device for permanently waving hair.

One object of the invention is to provide a device of this character which will heat the hair quickly and uniformly, beginning with the ends of the hair first wound about a waving mandrel, so as to produce a fine wave without injury to even the most delicate hair; which is free from liability of arcing or short circuiting and will insulate the hair from all current carrying parts to prevent passage of electric current to the hair or scalp of the person receiving treatment or the transmission of electrical shocks to such person; which is simple, reliable and efficient in construction and adapted to be used with ease and without annoyance or discomfort to the person.

Another object of the invention is to provide a hair waving device comprising units adapted to be coupled for simultaneously producing a plurality of waves.

Still another object of the invention is to provide a waving mandrel of novel type and novel means for uniting the same and supplying current thereto whereby certainty of current supply in any position of the mandrel is ensured and whereby greater efficiency in conducting waving operations is obtained.

With these and other objects in view, which will appear in the course of the subjoined description, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, and as illustrated in the accompanying drawings, in which—

Fig. 1 is a top plan view showing a number of hair waving units embodying my invention and manner of coupling the same together for simultaneously producing a plurality of waves in a head of hair.

Fig. 2 is a perspective view showing a string of units of the character disclosed in Fig. 1 as applied for use on a patient's head.

Fig. 3 is a cross-section through one of the waving devices taken on line 3—3 of Fig. 4.

Fig. 4 is a plan view of a waving device constituting one of the units.

Fig. 5 is a side elevation of the same.

Fig. 6 is a horizontal transverse section on an enlarged scale taken substantially on line 6—6 of Fig. 5 and showing in plan the socket shell which receives the stem of the mandrel.

Fig. 7 is a view similar to Fig. 6, showing the stem end of the mandrel in longitudinal section.

Fig. 8 is a vertical longitudinal section on line 8—8 of Fig. 6.

Fig. 9 is a vertical transverse section on line 9—9 of Fig. 8.

Fig. 10 is a vertical transverse section on line 10—10 of Fig. 8.

Fig. 11 is a vertical transverse section on line 11—11 of Fig. 8.

Fig. 12 is a plan view of the base support or clamp.

Fig. 13 is a cross section on line 13—13 of Fig. 8.

Fig. 14 is a central longitudinal section through the base support or clamp and a side elevation of the mandrel and holder showing the mandrel partially in section, and with the mandrel and holder disposed in proper position for application to the base support.

Fig. 15 is a view of the mandrel showing the body portion thereof in longitudinal section.

Fig. 16 is a similar view of a mandrel having a modified form of means for supporting the heating element.

Fig. 17 is a detail view illustrating a modification in the construction of the supporting base or clamp.

Fig. 18 is a cross-section on line 18—18 of Fig. 17.

Fig. 19 is a plan view, similar to Fig. 12, of the jaws showing how a tress of hair is extended therethrough.

Fig. 20 is a sectional view showing a construction for an electrical plug-in connection of a conductor to a waving device.

Fig. 21 is a view showing a manifold type of connector for connecting a plurality of waving devices to a common electric supply conductor.

Fig. 22 is a longitudinal sectional view similar to Fig. 20 showing another form of plug-in connection with the plug disconnected from the socket.

Fig. 23 is a similar view of the plug shown in Fig. 22 with the plug inserted in the socket.

Fig. 24 is a cross-section on line 24—24 of Fig. 23.

Fig. 25 is a side view of the plug shown in Figs. 22, 23 and 24.

In carrying my invention into practice I provide an electrical waving device 1 embodying an internally heated mandrel 2 about which the tress of hair to be waved is wound. This mandrel is in the form of a cylindrical glass tube of suitable diameter, which tube is integrally closed and hermetically sealed at its outer end and provided at its other end with a reduced stem portion 3 formed integrally therewith and hermetically sealing the tube at that end, and which is enclosed

by a metallic cap or shell 4 provided at diametrically opposite sides with locking studs 5. Extending longitudinally within the tube is a resistance heating element 6 which may be of any approved type, but is herein shown in the form of a looped resistance wire secured at its bight portion to a support 7 at the outer end of the tube and connected at its ends to conductors 8 and 9 embedded in a core 10 of insulating material sealed within the stem of the tube. The core 10 is preferably of glass molded integrally with the tube end and having a socket or recess 11 at its outer end in alignment with a bushing receiving opening formed in the head of the shell 4. The conductor 8 is electrically connected to the shell 4, while the conductor 9 is electrically connected within the socket 11 to a contact terminal 12 carried by a non-conducting bushing 13 fitting in the aforesaid opening in the head of the shell 4. In place of a looped resistance wire any other suitable form of heating element may be used and the resistance element, whether of looped or other form, may be supported at any suitable number of points in the length of the tube. In Fig. 16 I have shown a modified mode of supporting a looped resistance wire 6' which is connected at its bight portion to one end of a rod 14 of glass or other insulating material fixed at its opposite end to the core 10. The resistance of whatever form used is designed to heat the tube to a sufficiently high temperature for an effective waving action and without heating the tube to such a degree as to cause injury to the hair.

The mandrel tube is adapted to be mounted on a base support 15 whereby it is clamped in service to the hair. This base support comprises a pair of clamping jaws 16, 17 arranged side by side and pivotally connected, as at 18, adjacent one end for relative opening and closing actions, said jaws having handle extensions 19 beyond their pivoted end whereby they may be opened and their closing movement controlled. A spring 20 is provided for normally holding the jaws closed and adapting them to clamp the hair with the desired force. Each jaw is formed of a body of electric and heat non-conducting material, such as Bakelite, and provided on its underside with a cushioning pad 21 of an electric and heat non-conducting material, such as soft rubber, felt or the like. The tress of hair to be waved is extended upwardly between and may be engaged and clamped by the opposed faces of the pads at a point adjacent to the patient's scalp and clamping strips 22 may also be provided on the opposed faces of the jaws to also engage and clamp the tress to further ensure firm and secure engagement of the device with the hair and the holding of the latter against slippage. As shown, the inner faces of the jaws are preferably provided with inset portions between their ends cooperatively forming a longitudinally extending recess in the closed condition of the jaws and the clamping strips 22 extend inwardly from the inset portions into said recess, the ends of the jaws being provided with abutment surfaces 16', 17' to close the ends of the recess when the jaws are closed to retain the hair clamped between the strips and prevent the hair from slipping out from between the jaws at either end of the recess. This construction of the base support in connection with the described type of electric non-conducting mandrel, as well as the character of the current transmitting connections used, as hereinafter described, also ensures pre-

venting of arcing or short circuiting and the protection of both the operator and patient from electrical shocks or the passage of electric current to the hair or scalp of the patient. A clasp 23 of suitable type may be used to hold the wound tress in contact with the mandrel during treatment.

The stem of the mandrel is adapted to be fitted within a holder 24 carrying the clasp 23 and which is made of Bakelite, hard rubber or other suitable electric non-conducting material. This holder is provided at its outer end with a milled or serrated manipulating knob 25 and is formed in advance thereof with a pair of spaced circumferential flanges 26 and 27 providing an annular channel between them, the flange 27 being provided with ratchet teeth 28. The holder is also formed with an axial base or recess 29 in which is fitted a conducting shell or socket 30 adapted to receive the shell of the mandrel and provided with bayonet slots 31 for the engagement therewith of the studs 5 on the mandrel stem, whereby the mandrel is detachably connected with the holder. The shell 30 opens through the forward end of the holder but is closed at its rear end by a disk or head 32 of non-conducting material clamped with a conducting plate 33 by the shell against a shoulder at the rear end of the bore 29. Mounted for sliding movement in said disk and plate and electrically connected with the latter is a spring-pressed contact plunger 34 adapted to engage the contact terminal 12 when the mandrel is seated in the holder. The socket shell 30, with which the shell 4 of the mandrel is electrically connected when the mandrel is applied to the holder, and the plate 33 are respectively connected by suitable conductors with collector rings 35 and 36 embedded in the base of the channeled portion of the holder, whereby a circuit is established for the passage of current through the heating element 6.

The base support includes a pedestal or upright 37 of the same material as and extending from one of its jaws and arranged to overhang both of its jaws. This upright or pedestal forms the support proper for the mandrel and its holder. Said upright or pedestal is channeled or forked to provide a keeper or seat recess 38 to receive the channeled body part of the holder 24, the flanges 26 and 27 of which engage the front and rear sides of the fork arms of the pedestal to stably support the holder and mandrel in position. Set in the bottom wall of the recess 38 are partially circular or U-shaped conductors 39 and 40, the upper portions of which are free to provide resilient arms. These conductors 39 and 40 are arranged to be engaged by the collector rings 35 and 36 of the holder to form electrical conducting connections between the support and holder. The conductors 39 and 40 are respectively connected with supply conductors 41 and 42 extending transversely through the pedestal and beyond each side thereof to provide flexible terminals 43 having suitable coupling members 44 at the free ends thereof. The construction of the conducting connections above described is such that in any position of the mandrel and holder in their rotary path of movement an electric conducting connection between the heating element and the source of current supply will be provided. Also conducting connections are provided whereby a single waving unit 1 of the construction set forth may be connected with a step-down transformer 45 and source of current sup-

ply and whereby any number of waving units 1 may be coupled together and supplied with current and used to simultaneously form a plurality of waves in the hair as shown in Figs. 1 and 2, the flexible terminals 43 allowing the units 1 to be easily adjusted over the head and to be engaged with the hair for this purpose. The knob 25 adapts the holder and mandrel to be rotated to wind the tress of hair on the mandrel, and on the base support is a spring locking dog or pawl 46 engageable with the ratchet teeth 28 to lock the holder and mandrel against rotation when the hair is wound to the desired degree on the mandrel. The free ends or resilient arms of the conductors 39 and 40 may be provided with teeth or projections 47 to bite into or frictionally engage the holder 24 to prevent casual upward movement of the holder in the pedestal recess, or other suitable means for this purpose may be employed.

In the operation of the device it will be readily understood that the portion or tress of hair to be waved is separated from the remainder of the hair and clamped between the jaws of the base of the device and the hair wound upon the mandrel, which, when the hair is wound to the exact degree, is locked against rotation. Assuming that the device is plugged into a source of supply of current the heating element will be energized to heat the mandrel through which heat is applied to the wound hair. Since the hair is properly shielded and wound upon a mandrel heated from within and which is a conductor of heat but not of electricity, heat will be transmitted to the hair to heat the same from the inside outwardly, thus giving the most effective action for a wave, since the free end of the hair is first wound about the mandrel. As the mandrel and parts of the current supply connections are properly insulated and the patient properly shielded no current may pass through the hair or electrical shocks be transmitted to injure the hair or cause annoyance or inconvenience to the patient. It will, of course, be understood that the current voltage or amperage used may vary and be regulated as desired and that the degree of heat used may also be varied as desired to suit varying conditions of service. As a number of the units may be coupled together and supplied with current through the same connections, and as these are flexibly coupled together, it will be evident that any number of waves desired may be simultaneously made with a saving of time and without causing discomfort to the patient. It will be observed that as the mandrel, its holder and the support are detachably coupled, these parts may be readily assembled for use and disassembled for cleaning, repairs and other purposes.

The free ends of the jaws of the base of the support may be provided with projections cooperating to form a forked support 48 for the free end of the mandrel, should the use of such be found necessary or desirable.

In practice, the interior of the hollow glass tube or mandrel may be filled with a gas confined within the hermetically sealed tube and acting when heated to promote transmission of the heat from the filament to the tube walls, depending upon the nature of the glass and gas used. As an example, the tube may contain mercury which will be vaporized by the heat of the heating element and promote transmission of heat to the walls of the tube.

In Fig. 20 I have shown the holder 24a as

formed at its outer end to provide a socket member 49 carrying a metallic shell 50 which is threaded into and electrically engages the shell 30a, and which socket member also carries the contact plunger 34 which engages the contact terminal 12 of the mandrel. In said socket member are formed recesses 51 and 52 in which are disposed spring contacts 53 and 54, the former electrically connected with shell 50 and the latter with a metallic bushing 55 through which the stem of plunger 34 slides, through which electrical connection with the terminals of the resistance element may be made. The recesses 51 and 52 are adapted to receive the contact prongs of a plug 55' connected to a conductor 43a whereby an electric connection between an individual waver and a source of electric supply may be made through a plug-in connector of ordinary commercial type.

In Fig. 21 I have shown a mode of connecting a plurality of individual wavers provided with socket member 49 of the type shown in Fig. 20 with a common conductor 43a having a transformer 45a therein and provided at its induction end with a plug 43b for connection with a current supply socket. At its eduction end the conductor is provided with a desired number of distributor branches 43c terminating in plugs 55a for connection with the socket members 49 of the wavers. In the conductor 43a may be arranged a distributor box 56 enclosing the connections between the conductor and its branches and which may be provided, if desired, with suitable switching means for throwing any of the branches into and out of circuit. The branches may each have a detachable plug-in connection with this distributor box if desired.

In Figs. 22, 23, 24 and 25 I have shown a construction somewhat similar to that shown in Fig. 20 in which the holder 24b is formed with a cylindrical socket in which fits a metal ring or ferrule 57 in conducting connection with the shell 50 and in which is received a metal contact stud 58 in conducting connection with the contact plunger 34 which engages the contact terminal 12 of the mandrel. A plug 55a' comprising a body 59 of non-conducting material carries a metal contact ring 59' to fit within the ferrule 57 and a metal contact ring 60 to guidingly engage the stud 58. The rings 59' and 60 are provided with spring contacts 61 and 62 bent or struck up therefrom to electrically engage the ferrule 57 and stud 58 respectively and to hold the plug securely in the socket. This construction allows quick connection of the plug with the socket without the necessity of feeling for socket openings or accurately aligning parts together and the parts will make electrical connection in any relative positions in which they are fitted together. The conductor wires 43a' are suitably connected to the contact rings 59' and 60.

From the foregoing description, taken in connection with the drawings, the construction, mode of use and advantages of my improved electrical hair waver will be readily understood by those versed in the art, without a further and extended description. While the construction of the device as disclosed is preferred, it is to be understood that changes in the form, construction and arrangement of the parts, other than those specified, may be made within the scope of the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim is:

1. In a hair waving device, a support, a holder detachably and rotatably mounted in the support, coaxing electrical conducting connections between the support and holder, a hollow mandrel carried by the holder and having a stem portion detachably mounted therein, a heating element in the mandrel, and electrical conducting connections between the holder and stem of the mandrel and between the latter and the heating element.
2. In a hair waving device, a hair engaging clamp having a mandrel support, a holder rotatably and detachably mounted in said support and provided with a socket, an electrically heated mandrel having a stem portion for detachable engagement with said socket, electrical conducting connections between the holder and the mandrel, and electrical conducting connections between the holder and support in constant engagement at all points in the orbit of rotation of the holder.
3. In a hair waving device, a hair engaging clamp having a mandrel support, a socketed mandrel holder detachably and rotatably mounted in the support, a hollow mandrel formed of a vitreous heat conducting but electrical insulating material having a stem portion adapted to fit in the socket of the holder, said holder and stem portion of the mandrel being provided with electric conducting connections engageable on insertion of the stem in the socket, a heating element in the mandrel connected with the conducting connections on the mandrel stem, and electrical conducting connections between the holder and support in constant engagement at all points in the orbit of rotation of the holder.
4. In a hair waving device, a hair engaging clamp provided with a mandrel holder receiving seat forming an open bearing, a socketed mandrel holder adapted to detachably fit and rotate within said seat and having flanges for holding it against endwise movement therein, a hollow mandrel formed of a vitreous heat conducting but electrical insulating material having a stem portion adapted to fit in the socket of the holder, said holder and stem portion of the mandrel being provided with electric conducting connections engageable on insertion of the stem in the socket, a heating element in the mandrel connected with the conducting connections on the mandrel stem, and electrical conducting connections between the holder and support in constant engagement at all points in the orbit of rotation of the holder.
5. In a hair waving device, a support having a recess, a holder adapted to be detachably fitted in the recess of the support and to be rotated therein, said holder having a socket, a hollow mandrel having an electrical heating element enclosed therein and provided at one end with a stem for detachable engagement with the socket in the holder, conducting connections carried by the socket and stem adapted for engagement when the stem is fitted in the socket for conducting current to the heating element, and conductors of partly circular form in the recess of the support for contact with the conducting connections carried by the socket in any position of rotation of the holder, said conductors having free portions forming gripping elements to retain the holder in the recess with freedom for ready release therefrom.

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