

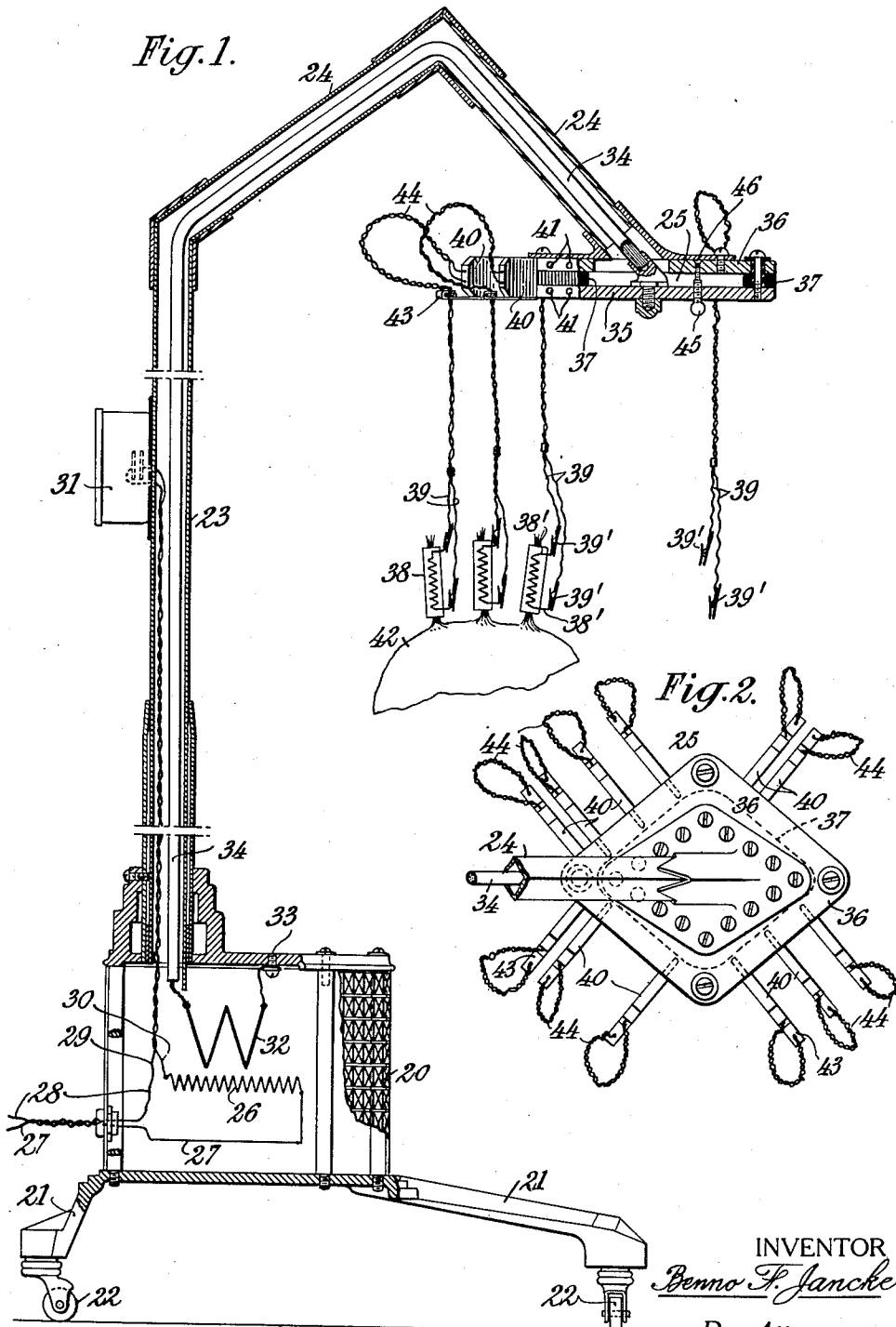
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HAIR WAVING DEVICE

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HAIR WAVING DEVICE

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5 Claims. Cl. 219—24)

This invention relates to an electrical device adapted for use in the heating of pads commonly employed in connection with the curling or waving of hair.

5 One object of the invention is to provide a readily accessible multiple socket or other outlet which may be located within convenient working range of the head of a person whose hair is to be treated, and used as a source of low potential current distribution to a plurality of hair-
10 waving attachments, the terminals of the outlet being connected with a source of energy in such manner as to be maintained at a substantially uniform potential irrespective of the number of
15 attachments in use.

It is a further object of the invention to provide means whereby the low potential working circuit for the exposed terminals of the outlet and heating attachments may derive its energy from a
20 relatively high potential circuit adapted for connection with the feed wires of a commercial service system, all parts of the high potential energizing circuit and apparatus being thoroughly insulated and physically isolated from the working
25 zone to be occupied by the customer whose hair is to be treated.

It is also an object of the invention to provide a device the heating attachments of which are connected with the low potential outlet by
30 means of conductors of limited current-carrying capacity, the length, cross-sectional area, specific resistance, and heat-radiating surfaces of which are so proportioned with respect to the electrical characteristics of the heating element and the
35 potential of the outlet terminals as to secure the degree of temperature desired in the heater and prevent the overheating of the insulation of the conductors or dangerous sparking or arcing at their terminals should they become short-cir-
40 cuited.

In the claims of this case the limitation of the mechanism to one having parts maintained at a difference of potential such as to be scarcely perceptible when short-circuited by a part of the
45 human body, or at a voltage such as to be substantially imperceptible when bridged by a part of the human body, is intended to mean that the difference of potential between such parts is not such as would shock or would even result in a
50 sensation which would be uncomfortable to a person who might put his hand or other part of the body in direct contact with the terminals of the machine or with any parts of the machine which are accessible. The limitation to cord con-
55 ductors of a resistance such that they might be short-circuited without damaging consequences is intended to mean that they are so designed that when short-circuited the current which will be transmitted through the conductors will not be
60 such as to char the insulation or otherwise im-

pair them even though the short-circuited condition may be permitted to exist for a material interval of time. The limitation of the device to one having a heater of a resistance not many times greater than that of a pair of connectors is
65 intended to mean that the resistance of the heater and the resistance of the cord circuit are so apportioned that if the cord circuit were short-circuited the resulting current strength would be not more than from two or three to eight or ten
70 times the normal current strength, corresponding with what would ordinarily be regarded as a reasonable factor of safety, as distinguished from the usual apportionment of resistance between an electrical translating device and the conductors
75 by which it is supplied with current in which the object is to reduce the resistance of the cord circuit to a minimum as a matter of economy, in which case if the cord circuit is short-circuited, the resulting current strength is anywhere from
80 one hundred to several hundred times the normal current strength, that is, a strength such as to almost immediately damage the apparatus unless protected by a fuse which may be relied upon to open the circuit.
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A machine of the above-described character shields the operative and the customer against any harm since the high potential energizing circuit is thoroughly insulated and completely isolated from the working zone. On the other hand,
90 the working circuit may be of a potential so low that it could not be detected if passed directly through parts of the body of either the customer or of the operative, although amply sufficient to raise the heating element to the desired temperature as determined by the characteristics of the element itself and the cord conductors by which it is connected with the multiple outlet.
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In the accompany drawing illustrating the preferred form of the invention,—

Figure 1 is a vertical sectional view of the device, parts of the upright tubular support being cut
100 out so as to reduce the effective height and permit the remaining portions to be represented on a larger scale.

Fig. 2 is a top view of a multiple outlet with a number of heating attachments connected.

Referring first to Fig. 1 of the drawing, 20 represents a housing which may be supported in any suitable manner as by legs 21 provided with
110 rollers 22. Extending upwardly from this housing is a vertical tubular shaft or pillar 23 terminating in a forwardly-extending branch or arm 24 of any appropriate form adapted to serve as a support for a multiple electric outlet 25 of a construction to be hereinafter described in detail.
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Within the housing 20 is a transformer of any suitable character adapted to receive energy from a commercial source of supply at a relatively high voltage delivering a relatively small current and
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to convert such energy so that it may be supplied to a working circuit in which it is desired to consume relatively large quantities of current at a relatively small potential. Preferably this will be accomplished by the use of an ordinary inductive transformer adapted to be energized by connection with an alternating current circuit and to supply alternating current to the working circuit.

As conventionally represented in Fig. 1, the transformer may comprise a primary winding 26, one terminal of which may be connected directly with a conductor 27 and the other terminal of which may be connected with a conductor 28 through the intermediary of conductors 29, 30, by means of which a time-switch 31 may be connected in series with the coil. This time-switch may comprise any appropriate means whereby the circuit may be closed and automatically opened at the end of a predetermined interval of time. Time-switches of this general character are well known in the prior art, and, of themselves, constitute no part of the subject-matter to be covered by the claims of this case.

The transformer may also comprise a secondary winding 32, one terminal of which may be grounded upon any conveniently located part of the metal structure of the device, as indicated at 33. The other terminal of the secondary winding 32 may be connected by means of an insulated cable 34 with one plate 35 of the multiple outlet 25. The plate 35 may be connected to a parallel plate 36, from which it may be separated by insulation 37. The plate 36 may be connected with the first-mentioned terminal of the secondary coil 32 by means of the tubular pillar 23, arm 24 and walls of the housing 20, all of which may be constructed of electrically conductive material for the purpose.

The outlet 25 may be of any suitable character adapted to serve as a source of electrical distribution to a number of heating attachments each comprising a heating element, conventionally represented in Fig. 1 and designated 38, connected by means of pairs of cord conductors 39 having plugs or other detachable coupling devices 40 by which the terminals of each pair of cords may be electrically connected with the terminals of the outlet 25.

In the form of the invention herein disclosed the outlet may consist of two parallel plates which may be completely exposed. In the edges of the plates are a series of holes 41, the holes being disposed in pairs, one hole in the edge of each plate having its mating hole in the edge of the other so that terminal connections of the plug attachment of any pair of cords may be inserted in any pair of holes and thus connect its heating element 38 with the terminals 35, 36. It is, of course, only essential that so much of the outlet 25 be exposed as may be necessary to permit the various plugs or other form of attaching element for the cords to be connected therewith, and it will also be obvious that any suitable means of detachably connecting the ends of the cords with the terminals of the outlet may be used. Unless the heating attachments are of the type in which the heater element 38 is permanently connected with the cords 39, the heating device may be provided with exposed terminals 38' with which the ends of the cords may be detachably connected by means of clips 39' of any appropriate character.

It is of importance that the plates 35, 36 of the outlet 25 shall be maintained at a substantially constant potential irrespective of the number of

heating elements 38 which may be in use at any time. This may be readily effected by constructing the housing 20, pillar 23, and arm 24 of copper or other metal of relatively high electrical conductivity, and by using a highly conductive cable 34 of large cross-sectional area. In this manner the resistance of the part of the working circuit comprising the secondary coil 32 and its connections with the outlet 25 may be kept so low that there will be no appreciable drop in potential between the plates 35, 36 when all the heating attachments are in use as compared with the potential between said plates when all the attachments have been removed.

It is also important that the primary winding 26 and all parts electrically connected therewith be thoroughly insulated from the low potential work circuit as well as from all parts of the metal structure, and that the primary winding and its connections be securely enclosed and protected by the housing and tubing in such manner as to cause the high potential connections to be thoroughly isolated from the work zone to be occupied by the operative and the person whose hair is being treated.

It will be obvious that the primary winding may have a number of turns and be otherwise of such electrical characteristics as to adapt it for connection with an energizing circuit of either 110 volts or 220 volts, or any other commercial voltage which may be available.

The characteristics of the secondary winding 32 and all parts of the work circuit will preferably be designed to supply current at a potential so low as to be harmless. It has been found in practice that a potential of substantially 2 volts at the plates 35, 36 of the outlet 25 is perfectly satisfactory as a source of current distribution to the heating elements 38 and is so low that it would not be detected by the operative or the customer if they were to grasp the plates 35, 36 between the thumb and fingers of the hand. No harm can possibly be experienced therefore as a result of personal contact between any part of the device and parts of the human body.

The temperature to which the heating elements 38 will be raised when the heating attachments are connected to the outlet may be very nicely adjusted by properly apportioning the electrical characteristics of the cord circuits 39. The amount of current which will pass through any connected heater and its cord connectors will be dependent upon the potential of the plates 35, 36 and the combined resistance of the heater and its connectors. The heating element may be constructed of a suitable alloy of copper and zinc or of any other appropriate material of the desired conductivity, dependent upon the amount of current to be used, and this current may be accurately adjusted to the heater by properly apportioning the lengths and cross-sectional areas of the connecting wires 39. These wires should be of sufficient length to permit the heater to be applied to the hair on any part of the head, represented in outline at 42, Fig. 1. The length of each connector may be adjusted by passing it through any suitable frictional clamp or take-up device 43 which may be secured to the plug 40. The surplus wire of the connector may be looper, as indicated at 44, between the take-up device and the plug.

The electrical characteristics of the connector wires 39 may be so related to the characteristics of the heating elements 38 that the wires 39 will not be appreciably heated during a curling operation, and they may also be so apportioned that

no dangerous arcing or sparking would result, or their insulation injuriously heated, should their terminals be accidentally short-circuited.

If desired, the device may be provided with a pilot lamp 45, which may be inserted in a threaded opening in the plate 35, as indicated in Fig. 1, with its end terminal in contact with a contact element 46 extending downwardly from the plate 36. This telltale lamp will glow whenever the terminals of the outlet 25 are energized. When the circuit is broken by the switch 31 the lamp will cease to glow, thus indicating that the terminals are dead.

From the foregoing description it will be apparent that a heating device embodying the invention is designed to combine a maximum degree of safety with an equal degree of simplicity and convenience of operation.

The invention is not intended to be limited to the preferred form herein disclosed for purposes of illustration, but should be regarded as covering modifications and variations thereof within the scope of the appended claims.

What is claimed is:

1. An electric hair-waving device comprising a readily accessible multiple outlet adapted to be located within convenient working range of a work zone, a transformer physically isolated from said outlet, said transformer comprising a primary winding of characteristics adapting it to be connected in an energizing circuit of relatively high potential corresponding with that of a commercial, municipal service system and a secondary winding of characteristics adapting it for use as a source of electromotive force for a working circuit of a relatively low potential, such as to be scarcely perceptible when short-circuited by a part of the human body conductors of negligible resistance connecting the terminals of said outlet with the secondary winding of the transformer, and cord connectors each comprising a pair of conductors of a resistance such that they might be short-circuited without damaging consequences, said connectors having means at one end for detachable connection with the respective terminals of an electric heating element and means at the other end for detachable connection with the multiple outlet, the respective conductors connecting the terminals of the secondary winding of the transformer with the terminals of the multiple outlet being of such current-carrying capacity as to be capable of carrying the combined load of all of the cord connectors without appreciable voltage drop between the transformer and the outlet.

2. An electric hair-waving device comprising a readily accessible multiple outlet adapted to be located within convenient working range of a work zone, a transformer physically isolated from said outlet, said transformer comprising a primary winding of characteristics adapting it to be connected in an energizing circuit of relatively high potential corresponding with that of a commercial, municipal service system and a secondary winding of characteristics adapting it for use as a source of electromotive force for a working circuit of a relatively low potential, such as to be scarcely perceptible when short-circuited by a part of the human body, conductors of negligible resistance connecting the terminals of said outlet with the secondary winding of the transformer, and a plurality of hair-waving attachments each comprising a pair of conductive connectors of a resistance such that they might be

short-circuited without damaging consequences, a heater, of a resistance not many times greater than that of a pair of connectors, having its opposite terminals connected respectively with one end of each of said conductors, and means for detachably connecting the other ends of said connectors with the multiple outlet, the respective conductors connecting the terminals of the secondary winding of the transformer with the terminals of the multiple outlet being of such current-carrying capacity as to be capable of carrying the combined load of all of the hair-waving attachments without appreciable voltage drop between the transformer and the outlet.

3. An electric hair-waving device comprising a pair of insulated plates of electro-conductive material having their edges exposed and provided with holes, said holes being disposed in pairs, each hole in the edge of one plate having its mating hole in the edge of the other plate, conductors of negligible resistance connecting said plates with a source of low potential energy of a voltage such as to be substantially imperceptible when short-circuited by a part of the human body, and a plurality of cord connectors each having an attachment plug provided with spaced terminals adapted for insertion in any one of the pairs of oppositely-disposed holes in the edges of said insulated plates, the resistance of said connectors being such that they might be short-circuited without damaging consequences.

4. An electric hair-waving device comprising an electric heating element, a source of electromotive force comprising a pair of electric terminals, and electrical connections between said terminals and said heating element, comprising a pair of conductors, the combined resistance of said heater and conductors being such that the heater may receive its normal energizing current when the difference of electric potential at the terminals of the source of electromotive force is such as to be scarcely perceptible when short-circuited by a part of the human body, and the resistances of the heater and conductors being so apportioned that the heater connecting ends of the conductors might be short-circuited without damaging consequences.

5. An electric hair-waving device comprising a readily accessible multiple outlet adapted to be located within convenient working range of a work zone, a transformer physically isolated from said outlet, said transformer comprising a primary winding of characteristics adapting it to be connected to an energizing circuit of relatively high potential corresponding with that of a commercial municipal service system and a secondary winding of characteristics adapting it for use as a source of electromotive force for a working circuit of a relatively low potential, such as to be scarcely perceptible when short-circuited by a part of the human body, conductors of negligible resistance connecting the terminals of said outlet with the secondary winding of the transformer, and cord connectors each comprising a pair of conductors respectively connected at one end with terminals of the multiple outlet and having at their opposite ends means for connection with the respective terminals of an electric heating element, the resistance of said cord connectors being such that they might be short-circuited at their heater connecting terminals without damaging consequences.

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CERTIFICATE OF CORRECTION.

Patent No. 1,924,040.

August 22, 1933.

**BENNO F. JANCKE, whose Executrix
is CHRISTINE ANNA JANCKE.**

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 80, claim 2, for "conductors" read "connectors"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of October, A. D. 1933.

(Seal)

Acting Commissioner of Patents.