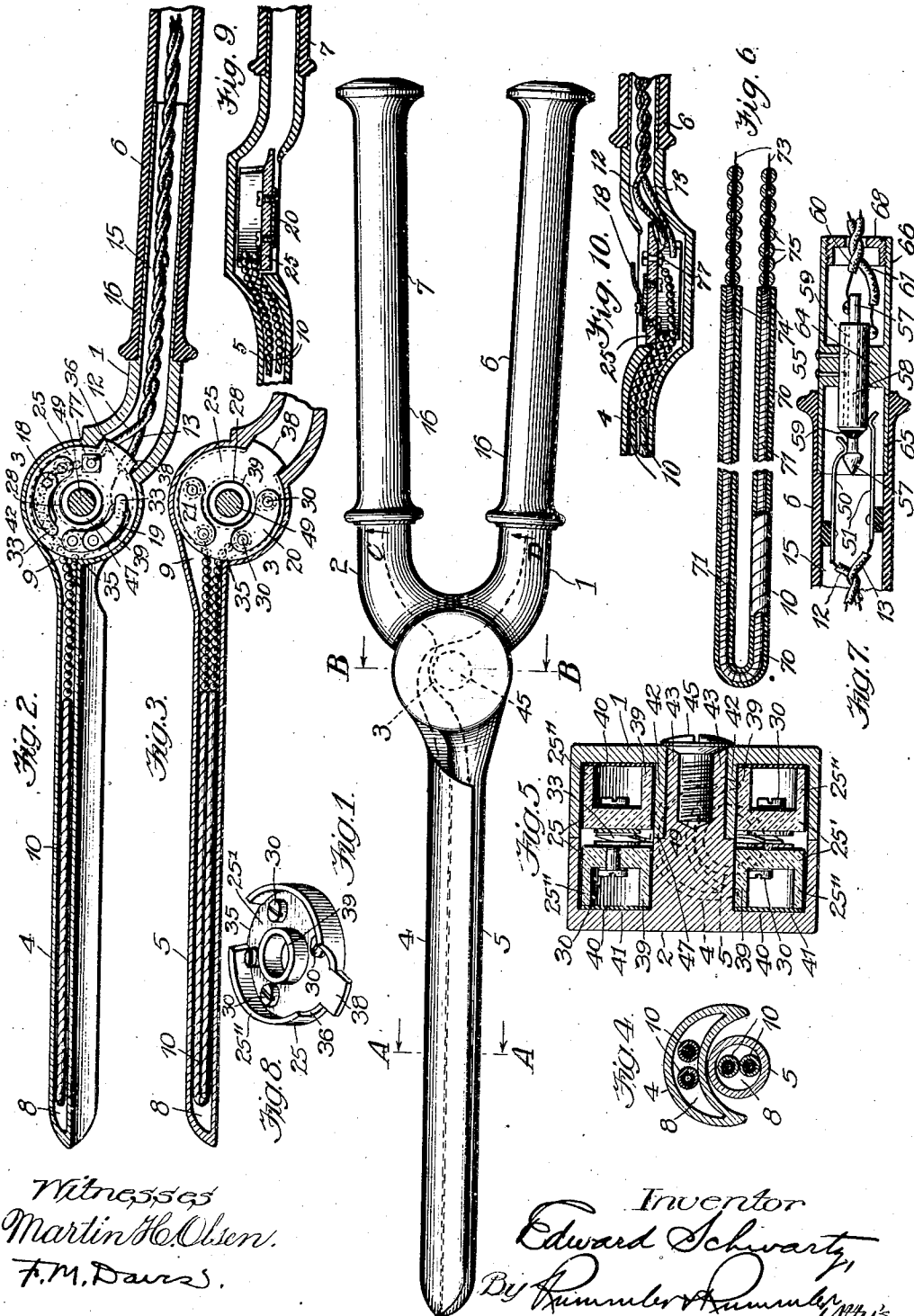


E. SCHWARTZ.
ELECTRIC CURLING IRON.
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1,178,029.

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ELECTRIC CURLING-IRON.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD SCHWARTZ, a citizen of the United States of America, and a resident of Racine, county of Racine, and State of Wisconsin, have invented certain new and useful Improvements in Electric Curling-Irons, of which the following is a specification.

The main objects of this invention are to provide an improved form of electric curling iron, the parts of which shall be few and of simple construction and arranged to be readily accessible for inspection and repairs; to provide an improved form of heater elements and apertured jaws for housing the same; to provide improved circuit means and a better arrangement of connections for supplying current to the separate heater elements contained in the jaws respectively; to provide an improved form of pivotal connection for the jaws together with protected electrical contacts associated therewith to close the circuit on both sides of the pivot from one jaw to the other; to provide an insulated refractory heater element of a flexible nature suitable for insertion longitudinally into, and withdrawal from, an elongated jaw chamber while connected by a short lead to the pivotal contacts; and to provide an improved form of handle and terminal means adapted for swivel connection to a source of current and having all contacts protected both when connected and when disconnected.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which—

Figure 1 is a side elevation of the curling iron assembled complete. Fig. 2 is a longitudinal vertical section through one of the members, and shows one of the heater elements, pivotal contacts, and the current supply conductors in side elevation. Fig. 3 is a similar view of the complementary member with the handle broken away. Fig. 4 is a cross-section on the line A—A of Fig. 1. Fig. 5 is a cross-section on the line B—B of Fig. 1. Fig. 6 is a side view of one of the heater elements partly in longitudinal section and partly in elevation and shows bead insulated connecting leads therefor. Fig. 7 is a longitudinal axial section through one of the handles and shows the swivel plug connection of the current supply conductors. Fig. 8 is a perspective view of the porcelain

mounting plate carried by the member shown in Fig. 3. Fig. 9 is a longitudinal section of one member on line C of Fig. 1. Fig. 10 is a longitudinal section of the complementary member on the line D of Fig. 1.

In the construction shown the curling iron comprises a pair of oblong rigid members or bars 1 and 2 each of integral character pivoted together intermediately of their ends, as at 3, said members at one end of the device being made in the form of jaws 4 and 5 arranged to coact with each other and at the opposite ends in the form of handles 6 and 7 for said jaws respectively, this being in accord with the usual form of construction for such devices.

Each jaw has an aperture 8 preferably in the form of a tubular cavity extending lengthwise through the jaw, the outer end or tip being closed and the inner end being open, as at 9, and somewhat tortuous as shown in Figs. 9 and 10. Each jaw aperture 8 contains and houses a heater element 10 hereinafter described.

One of the arms or handles 6 is formed to carry a pair of current-supply conductors 12 and 13. For this purpose an aperture or passageway 15 is provided in said handle preferably in the form of a tubular opening extending lengthwise thereof from end to end. Each handle preferably has an outer shell or grip 16 made of insulating material, such for instance as hard rubber.

Means for connecting electrically for a two-way circuit from one of said jaws to the other are provided adjacent to the pivot 3 preferably comprising a pair of metallic contacts 18 and 19 carried by one of the members, as on bar 1, and a pair of complementary contacts 20 and 21 carried by the other member, as on bar 2, the coacting contacts being slidable on each other.

The circuit connections are preferably arranged to connect the heater elements 10 to the supply circuit 12—13 in series arrangement. Referring to Figs. 2 and 3, the circuit in order is as follows: supply lead 12, post 77, heater element 10 of Fig. 2, contact 18, contact 20, heater element 10 of Fig. 3, contact 21, contact 19, and supply lead 13.

Insulating plates or mountings 25, preferably of porcelain, are provided for said pairs of contacts respectively, said mountings being in the form of protective housings of complementary character and com-

prising a pair of disks or wall members 25' having flanges 25'' on their outward sides respectively. Said plates are perforated centrally at 28 to receive the pivot means 3, and the opposing inner faces of the members 1 and 2 are hollowed to receive said mountings respectively. The said contacts 18 and 19 are fixed in suitable spaced relation on the inner face of one of said plates 25 so as to register with the complementary contacts 20 and 21 on the face of the adjacent plate, said contacts being secured by any suitable means, as screws 30, threaded into said contacts and disposed with their heads in the annular chambers on the outer sides of the plates respectively, said plates being perforated for attachment of the screws to said contacts. Preferably two screws are provided for each contact. One of each pair of co-acting contacts may to advantage be formed with or have attached thereto a spring portion 33 to coact with the adjacent contact. The circuit connecting means are attached preferably by securing the ends of the adjoining wires under the heads of said screws. The said flanges on the mounting plates are apertured on one side, as at 35, to provide a passageway for the leads running to the adjacent heater elements respectively. One of these plates on the bar 1 is also apertured on its opposite side as at 36 to admit the current supply leads 12 and 13 from the handle. Each of said plates is formed to prevent turning pivotally in its housing, shoulders 38 preferably being formed radially one on the outer edge of each plate to project somewhat into the aperture in the corresponding handle. Preferably an inner flange 39 is also provided on each plate surrounding the pivot means 3 in order to provide insulation between the contact terminals and said pivot means. Insulators preferably in the form of mica plates or washers 40 are placed in the bottom of the plate holding cavities 41 to protect the terminals from contact with members 1 and 2.

The pivot means 3 may be of any desired form, but preferably comprises a pair of concentric cylindrical hub members or flanges 42 and 43 on the members 1 and 2 respectively, and a screw 45 threaded to fit the inner hub member and having a head overlapping the outer hub as shown in Fig. 5 so as to fasten the members 1 and 2 together in pivotal relation. The flange 42 abuts against an annular shoulder 47 on member 2, and the member 43 is solid at its inner end 49.

The handle 6 is formed and arranged to provide for an improved form of swivel circuit connection. For this purpose said handle preferably contains a pair of terminals in the form of spring contacts 50 and 51 mounted on the interior of the han-

dle wall somewhat inward from the outer end, and connected to the inwardly leading conductors 12 and 13 respectively. For co-action with said contacts a plug 55 is provided having a central tip contact 57 and a sleeve contact 58 insulated therefrom as by a fiber bushing 59 and disposed to the rear thereof. Conductors 60 and 61 leading to any suitable current source (not shown) are connected to the plug contacts 57 and 58. Said plug is provided with a protective sleeve in the form of an insulating bushing 64 secured thereto and having a forward flange 65 formed to project somewhat past the tip of contact 57 and to coact telescopically with the outer end of the handle 6, and a rearward flange 66 formed to project over and protect the connection of the supply conductors 60 and 61 to the said contacts 57 and 58. Preferably a threaded plug or cap 68 having a central aperture for the supply conductors is provided for closing the outer end of the plug flange 66. By this construction the curling iron may be rotated freely with respect to the supply conductor and plug when in use, and when disconnected the terminals of said connecting means are all protected by overhanging insulating flanges.

Each heater element 10 is flexible throughout its length and is preferably limp and yielding in character in order to facilitate handling, and particularly to permit of its insertion into the corresponding jaw cavity and withdrawal therefrom without disconnecting such element from its terminal plate 25. Each element 10 comprises a long narrow thread-like core 70 of yielding refractory material, preferably asbestos fiber formed as a cord, on which is wound in spiral arrangement a fine resistance conductor 71 of "nichrome" wire or the like, and a covering of insulation preferably consisting of a layer of asbestos fiber in the form of a string or cord wound over the core and conductor. Terminal leads 73 of good conducting material are preferably provided, copper wires being suitable, which leads are connected to the ends of the resistance wire in any suitable manner, as for instance by winding the terminal wire 73 about the end of the heater element in contact with the resistance wire as at 74. The joint is then covered with insulation. The said terminal leads are provided with durable insulation 75 adapted to withstand great heat, for which purpose a series of glass beads are preferably strung upon the terminal wires. This construction provides for flexibility of the leads 73 and provides a durable insulation which is reliable and thoroughly protects the wires contained therein. The opposite ends of the terminal wires are fastened to the said sliding contacts on the adjacent mounting plates, ex-

cept that one of the leads carried by jaw 1 is connected directly to one of the supply conductors 12, a separate terminal 77 being provided therefor on the corresponding terminal plate.

5 The operation of the device is as follows: The supply leads are first connected to a source of current, as by insertion of the plug 55 in the socket formed in the handle, where-
 10 upon the heater elements will soon be heated to their normal working temperature. The curling iron may then be operated in the usual way, both jaws being heated from within respectively, and the circuit from one
 15 jaw to the other being maintained at all times through the insulated pivotal contacts and for all positions of the jaws.

Although but one specific embodiment of this invention has been herein shown and
 20 described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

25 I claim:

1. An electric curling iron of simple construction comprising a pair of tortuously apertured jaws of small mass and light weight having handles respectively, in combination with conducting means arranged
 30 in an electric circuit carried by said members and including a pair of slender insulated resistance heater elements, somewhat flexible but stiff enough for threading

readily into the crooked jaw apertures when 35 pushed inward longitudinally, current supply leads, and connecting means for said elements and leads.

2. In a curling iron a tortuously apertured crooked frame member containing a 40 flexible heater element of yielding character adapted for threading into the tortuous aperture of said frame and comprising a threadlike insulating core of refractory fibrous material, a fine wirelike resistance 45 conductor disposed spirally upon said core with its terminals at opposite ends of said core, and an insulating covering of refractory fibrous material overlying said core and conductor. 50

3. An electrically heated device, comprising in combination a unitary hollow casing member of irregular shape and having a tortuous narrow entrance passage, and an interchangeable flexible heater element 55 housed in the casing aperture, said element having a substantial degree of resilience adapting it for threading into said aperture through said passage, and including a fibrous core and a fibrous insulation of refractory character. 60

Signed at Racine this 10th day of September, 1914.

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Witnesses:

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