H. HERTZBERG, A. A. LOW & M. J. WOHL.

ELECTRICALLY HEATED TOOL.

APPLICATION FILED NOV. 4, 1907.

990,265.

Patented Apr. 25, 1911.

Fig. 2.

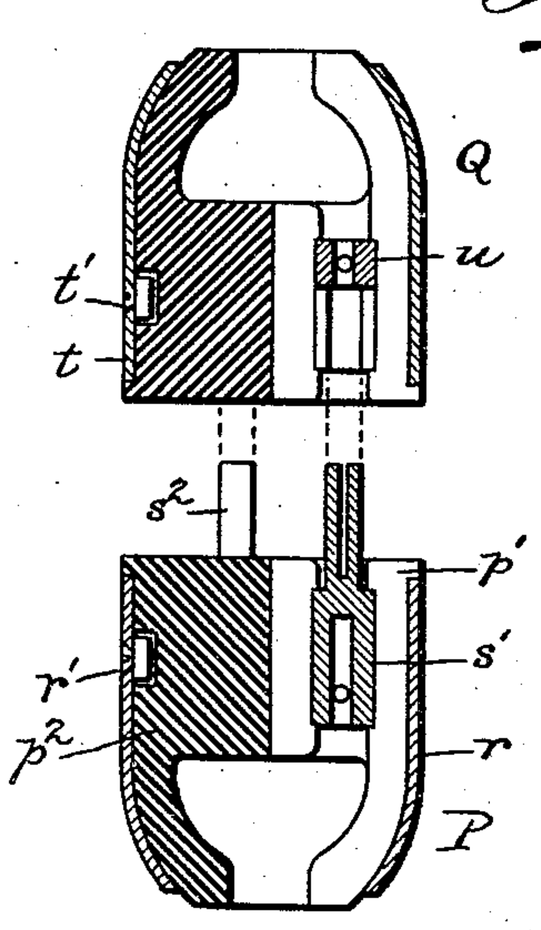


Fig. 1.

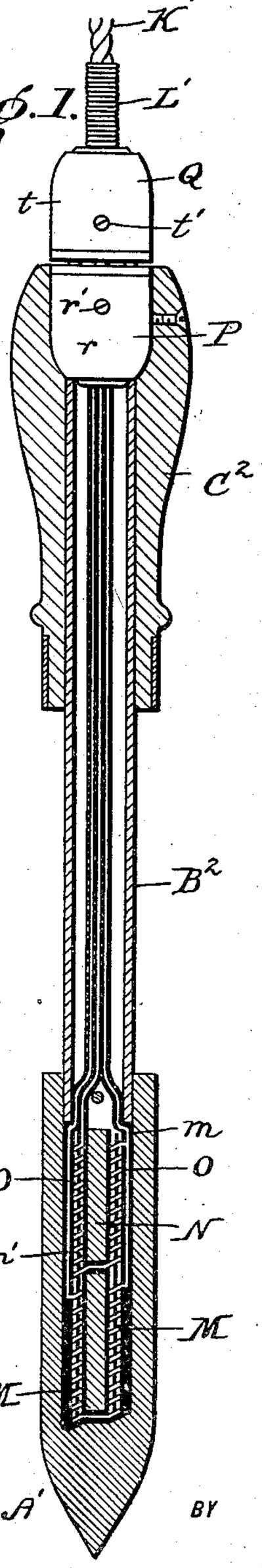


Fig. 4.

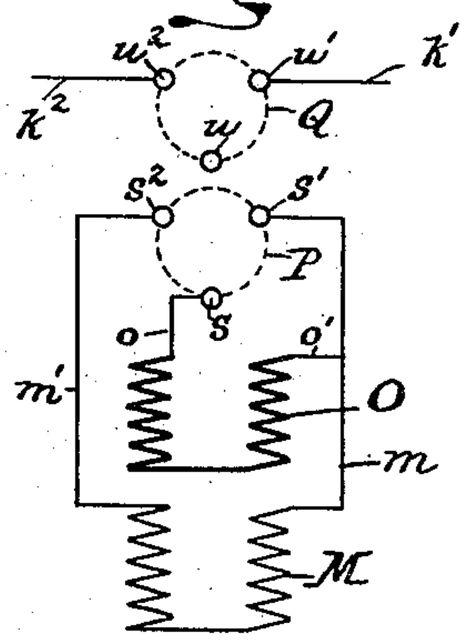


Fig. 5.

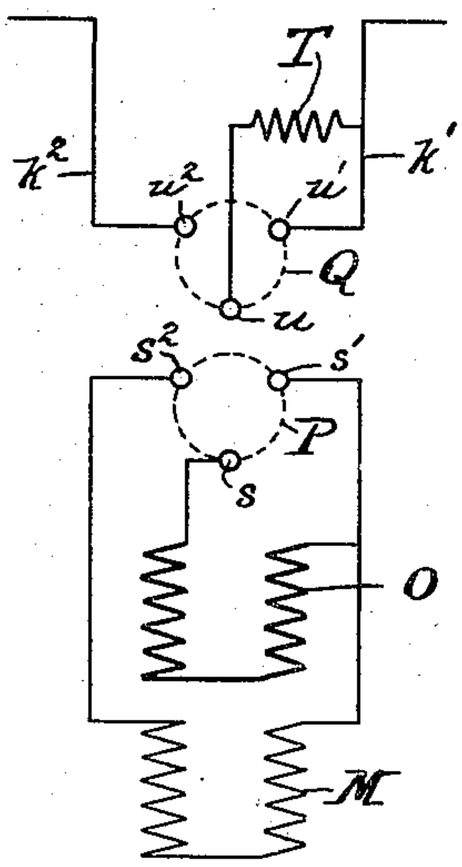
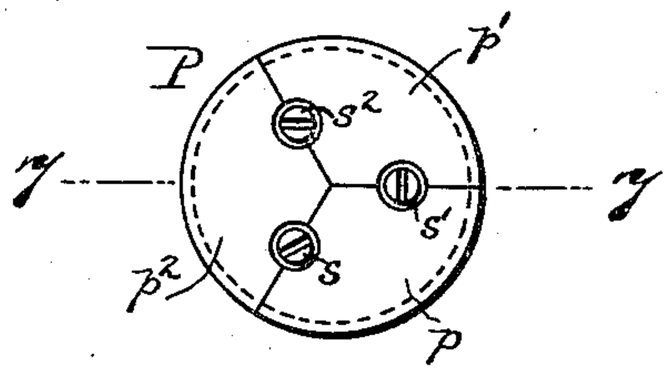


Fig. 3.



WITNESSES

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HARRY HERTZBERG, OF NEW YORK, ABBOT A. LOW, OF HORSESHOE, AND MAURICE J. WOHL, OF NEW YORK, N. Y., ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO ECONOMY ELECTRIC COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

ELECTRICALLY-HEATED TOOL.

990,265. Specification of Letters Patent. Patented Apr. 25, 1911.

Application filed November 4, 1907. Serial No. 400,725.

To all whom it may concern:

Be it known that we, HARRY HERTZBERG, ABBOT A. LOW, and MAURICE J. WOHL, citizens of the United States, residing, respectively, in the city of New York, borough of Brooklyn, county of Kings, and State of New York; Horseshoe, county of St. Lawrence, and State of New York, and city of New York, borough of Manhattan, county and State of New York, have invented certain new and useful Electrically-Heated Tools, of which the following is a specification.

This invention appertains to electrically heated tools, and, more particularly, to portable tools such as soldering irons, sad irons, branding irons, and analogous devices.

In electrically heated tools of the prior art, of the types specified, various disadvantages are inherent, among which may be particularly mentioned the inability to regulate the temperature of the heated element, consisting, usually of a metallic body. The result is that the efficiency of such tools is materially decreased due, mainly, to the temperature of the heated element becoming too high, thereby melting, charring, scorching or burning the material operated upon. A serious disadvantage incident to this high temperature results from the fact that the electrical insulation is burned away in a comparatively short time, making it necessary to frequently renew the heating element, with attendant trouble, delay and expense.

The present invention overcomes the difficulties specified, as well as others, in that it embodies means whereby the temperature of the heated element may be effectually controlled within the limits of temperature usually required in devices of the character under consideration.

In a practical embodiment of the invention, we provide means whereby the current may be caused to flow simultaneously through a plurality of heating units adapted to be connected in series, or separately through heating units of high and low resistance. This enables at least three heats to be secured, first, a low heat by causing the current to pass through the two heating units in series; second, a higher temperature by directing all the current to flow through the high resistance unit, and, third, the maximum heating effect by causing all the current to flow through the low resistance heating unit.

In the accompanying drawing, we have illustrated different practical embodiments of the invention, but the construction shown therein is to be understood as illustrative, only, and not as defining the limits of invention.

Figure 1 is a longitudinal section, with parts in elevation, illustrating the invention wherein a plurality of heating units are incased within the body or mass of metal. Fig. 2 is a sectional elevation through an electrical connection adapted to be adjusted to direct a current through the heating units individually or collectively, the plane of the section being indicated by the dotted line 7—7 of Fig. 3. Fig. 3 is a detail view in end elevation of one member of the separable coupling shown in Fig. 2, and employed in the tool of Fig. 1. Fig. 4 is a diagram illustrating a plurality of heating units and the separable coupling adapted to switch the current through said heating units collectively or separately. Fig. 5 is a diagram illustrating a plurality of heating units with an external resistance and the combined coupling and switch.

The metallic mass or body, A′, in Fig. 1 is provided with a chamber for the reception of the two heating units, M, O, each composed of a resistance wire or ribbon wound on a thin flat core of insulating material. The heating units are spaced so as to have contact with the respective walls of the chamber in the body, A′, and they are held in close contact with said walls by an interposed metallic member, N, the latter having mechanical engagement with respective heating units and also with a body, A′. To the body, A′, is united a hollow stock, B^2, which is provided with the handle, C^2. It is preferred, however, to provide the handle, C^2, with the member, P, of a coupling, and this member is adapted for engagement with the complemental member, Q, of said coupling.

The wire composing the heating unit, M, is of high resistance, whereas the wire composing heating unit, O, is of low resistance. As shown in Fig. 1, the high resistance heating unit, M, is positioned adjacent to the point of the soldering iron. Furthermore, the two heating units are spaced along the

length of the metallic mass composing the body of the soldering iron, and said units cooperate with the interposed metallic member, N, so as to be retained in close contact with said metallic mass.

The member P is shown as consisting of a plurality of sections p, p', p^2, which are held together by an external sleeve r, said members being fastened to the sleeve individually by suitable screws r'. The coupling is divided lengthwise so as to produce the aforesaid sections, and said sections clamp the posts s, s', s^2, in said coupling member P. The section Q of the coupling is similar in construction to the section P, that is to say, it is divided so as to form a series of sections which are inclosed by a sleeve t, and are fastened in place by screws t'. Said coupling member Q is provided with a plurailty of socket sleeves u, u', u^2, indicated more clearly in Fig. 4. The posts of the member P, are adapted for engagement with the sleeves of the member Q in a variety of ways according to the temperature desired to be imparted to the body A′, whereby the separable coupling is adapted to serve as a switch for controlling the admission of current to the heating units M, O. The member Q is provided with a bushing L′, and through this bushing is adapted to pass the conducting cord K′, the wires of which are attached to the sleeves u', u^2, as indicated in Fig. 5. The electrical connections from the posts of the member P to the heating units are shown diagrammatically in Fig. 4, in which it will be seen that the resistance M is provided with conductors m, m', which are attached to the posts s', s^2, respectively, whereas the heating unit O is connected at one end by a conductor o with the post s, whereas the other end of said unit O, is branched by the conductor o' to the wire m, of the heating unit M.

The member Q of the coupling is adapted to be placed in a variety of positions with respect to the complemental member P, said member Q being capable of rotary or axial adjustment so as to change the relation of the sleeves to the posts. The member Q when placed opposite to the member P for the posts s, s', s^2, to enter the sleeves u, u', u^2, respectively, the current passes from the post s', through the conductor m, to the high resistance of the heating unit M, and thence back by the conductor m', to the post s^2, and the sleeve u^2, whereby the current is directed to the high resistance unit M, the low resistance heating unit O being cut out of circuit. The metallic body A′ is thus adapted to be heated to a medium temperature by the heating unit M. By changing the position of the member Q relative to the member P so as to bring the sleeve u', into engagement with the post s, the sleeve u^2, into engagement with the post s', and the sleeve u, into engagement with the post s^2, the current is set through the low resistance heater O, the high resistance M being cut out of circuit, whereby the metallic body is adapted to be heated to a higher temperature.

The relation of the member Q to the member P may be still further changed by turning said member Q to a position where the socket u^2, will receive the post s, the sleeve u, will engage with the post s', and the sleeve u' will engage with the post s^2 whereby the two heaters will be connected in series, thus including the two heating units in the circuit for the current to flow through them simultaneously, thereby securing a minimum heating effect on the body, A′.

By reference to Fig. 1 it will be noted that the high resistance M is next to the pointed end of the iron, whereas the low resistance heater O is next to the middle portion of the iron.

In Fig. 5 of the drawings, we have shown a plurality of heating units, and the multiple connection and switch, adapted for use in connection with an external resistance T which may be carried in the stock or handle of the tool. The member Q of the connection is adapted to be shifted with relation to the member P for the purpose of bringing the heating units M, O, individually into service, or said member Q may be shifted so as to also include the external resistance T in series with one of the heating units.

Having thus fully described the invention, what we claim as new, and desire to secure by Letters Patent is:

1. In an electrically heated tool of the class described, a body composed of a mass of metal, said body being provided with a longitudinal chamber closed at one end and open at the other end, a hollow stock rigidly fastened to said body and extending outwardly therefrom, a metal member positioned within the chamber and extending lengthwise of the body, said metal member being in contact at its side and end edges with the body and having its faces spaced relative to the walls of the chamber, a high resistance heating unit positioned between the walls of said chamber and the metal member, a low resistance heating unit also positioned in the spaces between the walls of said chamber and the metal member, the respective heating units being positioned at different portions of the body intermediate the ends thereof, a coupling member attached to the hollow stock, said coupling member having electrical terminals connected to the heating units, and a second coupling member having similar electrical terminals, the second coupling member and its terminals being adjustable relative to the

first named coupling member for controlling the flow of current through the separate heating units or through said units collectively.

2. In an electrically heated tool of the class described, a body composed of a chambered mass of metal solid and closed at one portion and substantially open at another portion, a plurality of heating units positioned within the body, said heating units being of different electrical resistances, means whereby said heating units are confined in close contact with the walls of said chambered body, a coupling member provided with terminals connected to said heating units, and a second coupling member provided with similar terminals, said second coupling member being adjustable relative to the first coupling member for controlling the flow of current separately through the heating units or through said units collectively.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HARRY HERTZBERG.
ABBOT A. LOW.
MAURICE J. WOHL.

Witnesses:
M. A. WARREN,
GEO. WELLING GIDDINGS.