J. W. PHELPS.

ELECTRIC SAD IRON.

APPLICATION FILED OCT. 21, 1909.

966,703.

Patented Aug. 9, 1910.

2 SHEETS—SHEET 1.

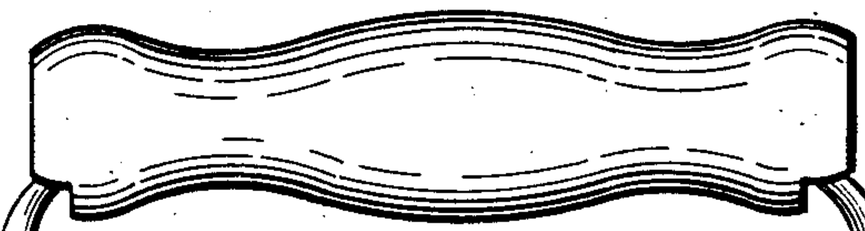

Fig. 1.

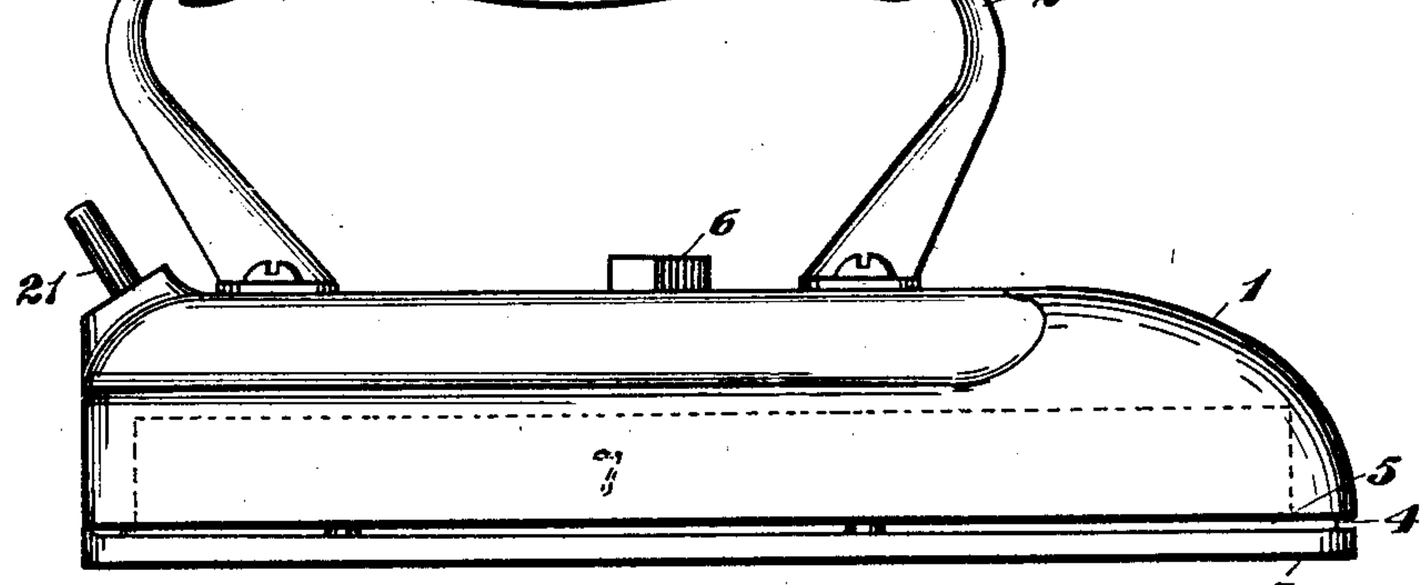

Fig. 8.

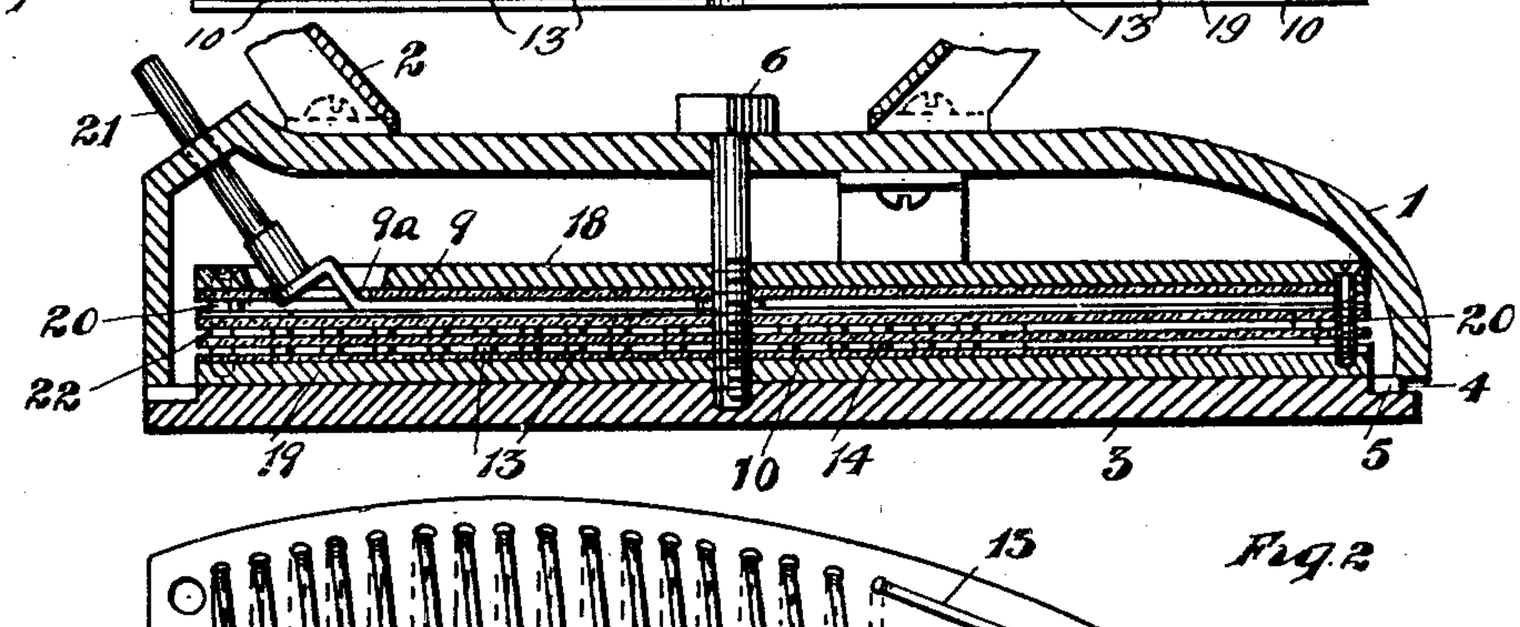

Fig. 2

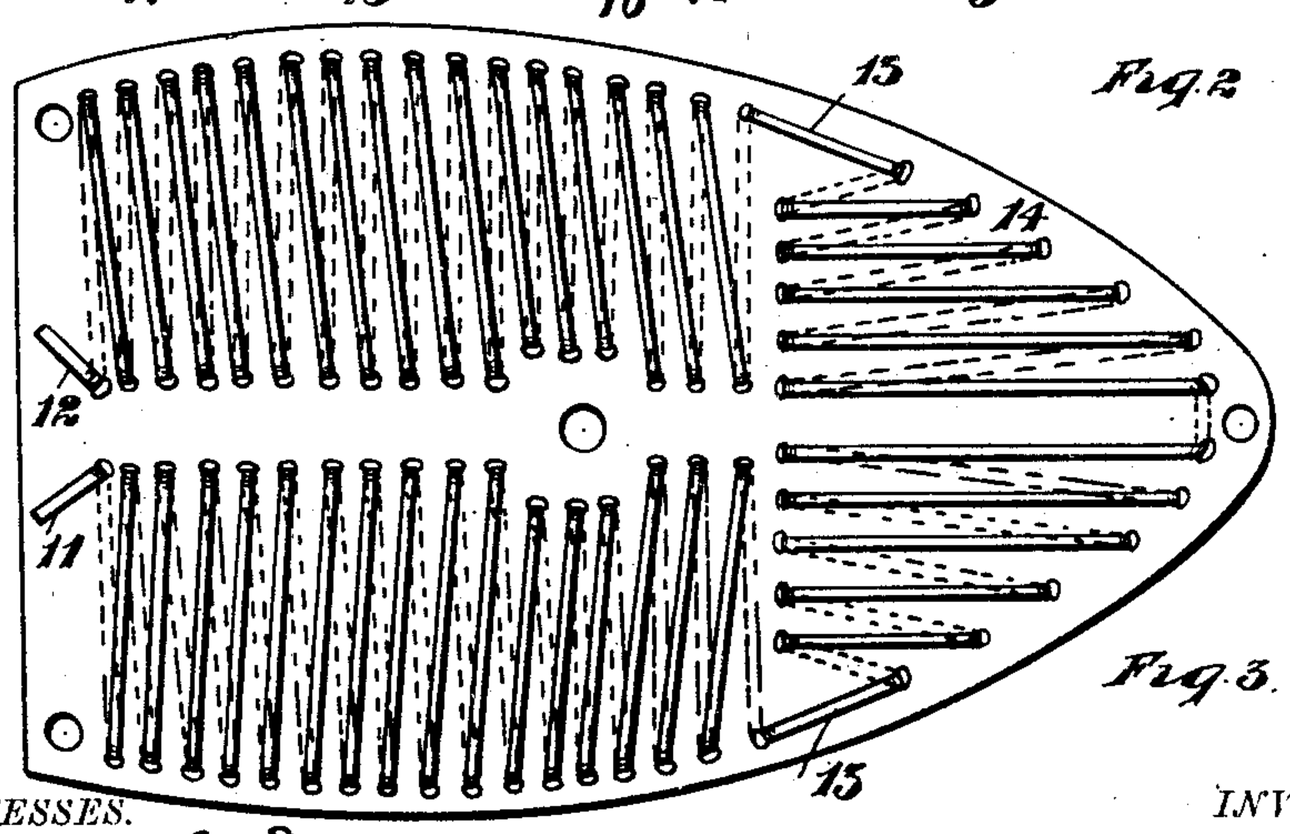

Fig. 3.

WITNESSES.

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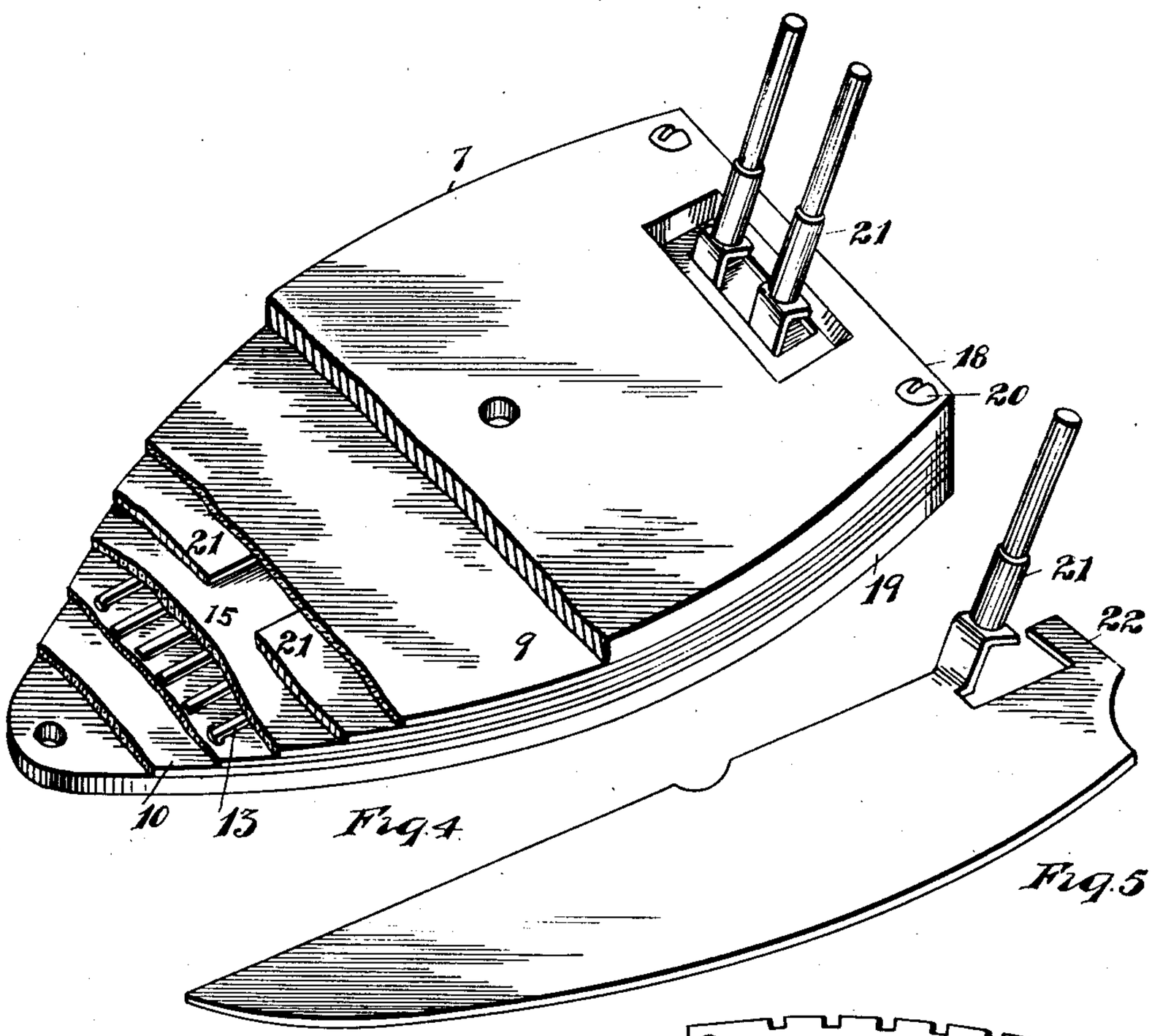

Fig. 4

Fig. 5

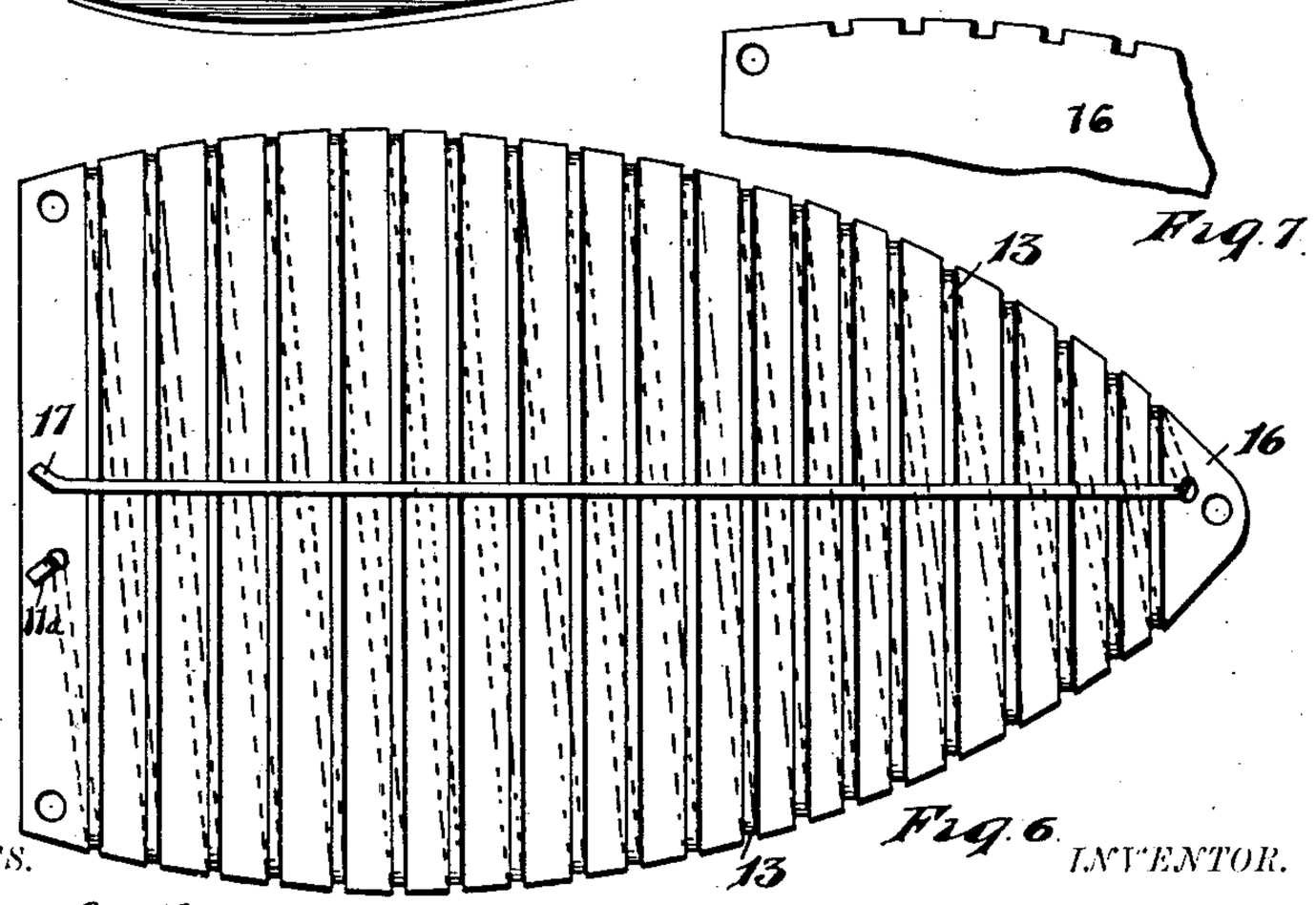

Fig. 7

Fig. 6

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UNITED STATES PATENT OFFICE.

JAMES W. PHELPS, OF DETROIT, MICHIGAN.

ELECTRIC SAD-IRON.

966,703. Specification of Letters Patent. Patented Aug. 9, 1910.

Application filed October 21, 1909. Serial No. 523,769.

To all whom it may concern:

Be it known that I, JAMES W. PHELPS, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Electric Sad-Irons, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to heating elements for electric sad irons.

It has for its object an improved device of this type adapted to be easily inserted in and removed from the hollow iron member of the familiar shape against whose bottom polishing plate it lies closely, thus communicating the desired degree of heat thereto.

In the drawings:—Figure 1, is a side elevation of the entire iron. Fig. 2, is a sectional elevation of the same through the center. Fig. 3, is a plan view of the center or core section of the heating element, showing the method of winding the resistance member thereupon. Fig. 4, is a perspective of the heating member disassociated from the other parts, and with a portion of its top plate broken away to show the relative position of the various parts. Fig. 5, is a detailed perspective of one of the contact plates. Fig. 6, is a plan of a modified form of the heating element. Fig. 7, is an enlarged plan view of a fragmentary portion of the non-conducting center member upon which the resistance element is wound. Fig. 8, is a vertical sectional elevation, somewhat exaggerated as to thickness of the parts, of the alternative form of the central heating element illustrated in plan in Fig. 6.

1 represents the hollow dome or body of the iron, which is of well-known outline, to which is secured a handle 2. The base plate or polishing plate 3 has its top portion 4 cut away so that the shell of the top piece 1 engages over the upper portion 5 thereof in an interlocking manner. The top 1 is held to the bottom 3 by means of screw 6, which engages through the central portion of the top, and through the heating element hereinafter to be described, and engages the body of the base plate.

Lying flat on the top surface of the base plate 3 and of the same outline and dimensions as the upper portion 5 thereof, is the removable heating element 7. This consists of a pair of inclosing metal plate members 18 and 19 perforated at their center for the passage therethrough of the holding screw 6, and at a point in the forward and rear corners with holes for holding screws 20, lying next adjacent to the inner face of each of which are sheets of mica 9 and 10, or other non-conducting material, of the same outline as the plates. The top sheet 9 is apertured at 9^a for the passage therethrough of a pair of terminal plates 21, by which communication between the heating or resistance elements and the external sources of electric energy is had. The heel portions 22 of these plates engage against the ends 11 and 12 of the resistance element 13, which is strung or wound upon a perforated or apertured sheet of mica 14 of the same outline as the sheets 9 and 10. As shown in Fig. 3, the preferred form of stringing of the resistance element 13, preferably a strip of very thin flat metal, is back and forth along one side of the mica center until a point somewhat in advance of the middle point from front to rear, when the stringing is made to assume a lengthwise instead of a crosswise direction until the entire forward portion of the mica center is covered, after which the crosswise stringing is resumed until the point at which the end 12 emerges is reached. This arrangement is advantageous in that it brings both terminals out on the same side or face of the mica center, so that it is easy to slip these ends through very small apertures in the mica layer 9, so that these ends are the only parts other than the non-conducting mica surface which are engaged by the heel portions 22 of the contacting plates 21, when these are interposed next thereabove. This arrangement of parts when properly drawn together by the holding screws 20 makes an arrangement of the parts that is not only very compact and easy to handle when the substitution of a new heating element for a worn-out one is desired, but it brings the sheet of mica bearing the resistance element so close to the lower cover 19 that it receives the maximum possible degree of heat, only one layer of mica 10 being interposed therebetween, and that being of course necessary to prevent the flow of electric energy into the plate 19.

In the alternative type of resistance element shown in Fig. 6, the stringing or

mounting of the flat resistance strip upon the mica center 16 is transverse of the entire sheet, the length of each section gradually diminishing as the forward point is reached. In this type, since there is no provision for bringing the end of the strip terminating at the forward point of the center member back to a point adjacent to the entering portion of the strip, it is necessary to either employ a much shorter contacting plate whose bottom portion consists of little more than the heel portion 22 and to bring the end 17 back to the rear of the iron on the other side of an extra sheet of mica 18[a], which is laid against one face of the center member, as thus completed, for this purpose, or it is necessary to duplicate this member, leading the stringing of the resistance element on the second member from front to rear instead of from rear to front so as to bring the terminal adjacent to the entering terminal on the first sheet, a plain mica sheet being also interposed in this case to keep the metal strips on the two sheets of mica properly insulated. In many instances, however, this produces too high a degree of heat for use in the iron, and I therefore prefer the type of resistance element illustrated in Fig. 3, although not confining myself thereto.

I desire it to be understood as within the scope of my invention to omit the lower inclosing metal member 19, when it may prove desirable to attach the remaining parts of the heating element directly to the adjacent top surface of the polishing plate 3.

What I claim is:—

1. In an electric heating iron, in combination with an outer holding member, a removable heating unit adapted to engage the bottom of the holding member, said unit comprising a pair of inclosing plates, a perforated central member of non-conducting material, a resistance element passed about, and through the perforations in, said central member, the various lengths of said element being thereby held from undesired contact with one another, non-conducting plates interposed between each face of said central member and the resistance element wound thereon and the adjacent inclosing plate, one of said plates being perforated for the engagement therethrough of the terminals of said resistance element, removable terminal contacting plates lying upon the outer surface of that one of said non-conducting plates through which the terminals of the resistance element engage therewith, and an additional non-conducting plate interposed between said contacting plates and the adjacent inclosing plate, whereby said members are insulated the one from the other, substantially as described.

2. An electrical heating element, comprising a pair of inclosing plate members, a plurality of perforated layers of non-conducting material interposed therebetween, a perforated non-conducting center member, a resistance element passed thereabout and through the perforations both transversely and lengthwise thereof in a way to insulate its component parts, as thus arranged, from one another, the end portions thereof engaging through perforated portions of one of the adjacent non-conducting layers, externally extending terminal members in contact with said ends of the resistance element and in turn insulated from the remaining portion thereof and from the adjacent one of said inclosing plate members by said layers of non-conducting material, and correlating screw members for holding the parts in closely assembled relation to one another, substantially as described.

3. An electrical heating element, comprising a perforated center member of non-conducting material, a resistance element wound thereupon and thereover, said element starting from the center of the rear portion of the center member and winding transversely thereof wholly on one side of the center of the member until the forward portion thereof is reached, thence crossing the same in a direction generally lengthwise thereof, and thence resuming its crosswise extent, on the opposite side of the center member from that whereon it extended forward, to a point in the rear portion adjacent its point of starting, though suitably spaced therefrom, non-conducting sheets protecting the exposed faces of said center member and the resistance wound thereon, one of said sheets being perforated for the engagement therethrough of the ends of the resistance, removable contacting plate members laid thereupon in contact with said ends, a supplemental non-conducting sheet laid over said contacting plate members, the outer ends thereof projecting therethrough, inclosing plate members, and screw members engaging through said plate members and the several non-conducting sheets, whereby they are held in closely assembled relation, substantially as described.

4. A removable heating member for an electric sad iron, having, in combination with a pair of inclosing metal plates, a plurality of layers of non-conducting material therewithin, a perforated central core of non-conducting material, a resistance element extending along the rear and central portions of said central core transversely thereof, and extending lengthwise thereof on its forward portion, the faces of said central member being alternately traversed by the serial windings of said resistance member in its extent from one perforation to another, and means for holding the several members in closely assembled position with respect to one another, substantially as described.

5. An electric heating iron, having, in

combination with a casing portion, a removable heating element, comprising a pair of inclosing plates, a pair of contacting plate members, a resistance element arranged in serial windings therewithin, a plurality of sheets of non-conducting material interposed between said several parts and between oppositely located lengths of said resistance member, means for holding said parts in close relation to one another, and means for removably holding said parts as thus assembled in desired position with respect to said casing portion, substantially as described.

In testimony whereof, I sign this specification in the presence of two witnesses.

JAMES W. PHELPS.

Witnesses:
WILLIAM M. SWAN,
ELLIOTT J. STODDARD.