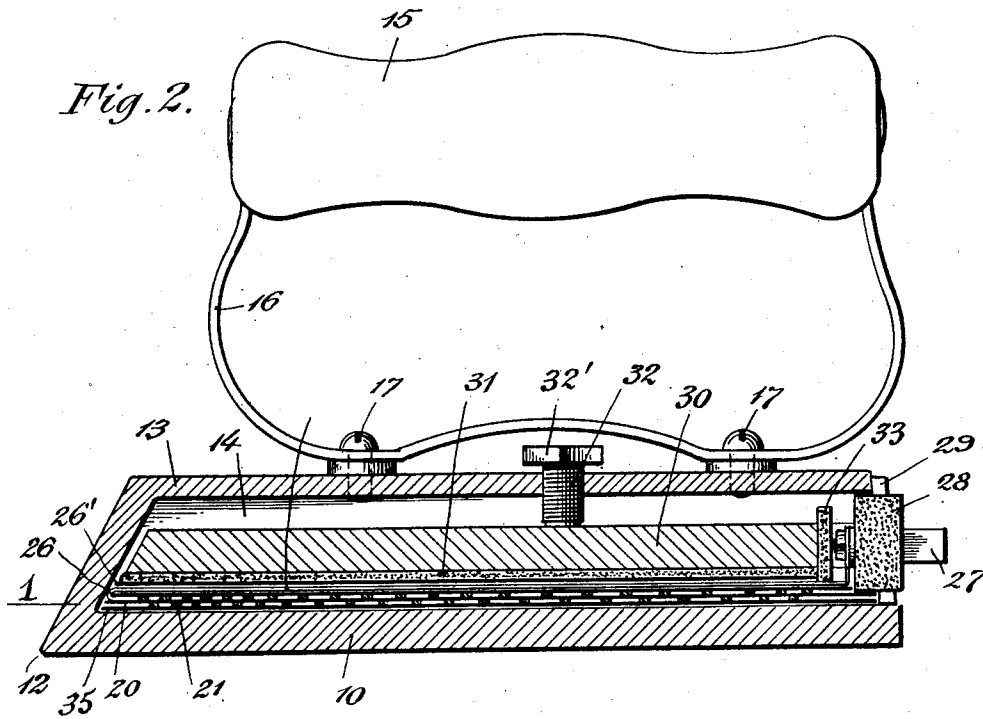
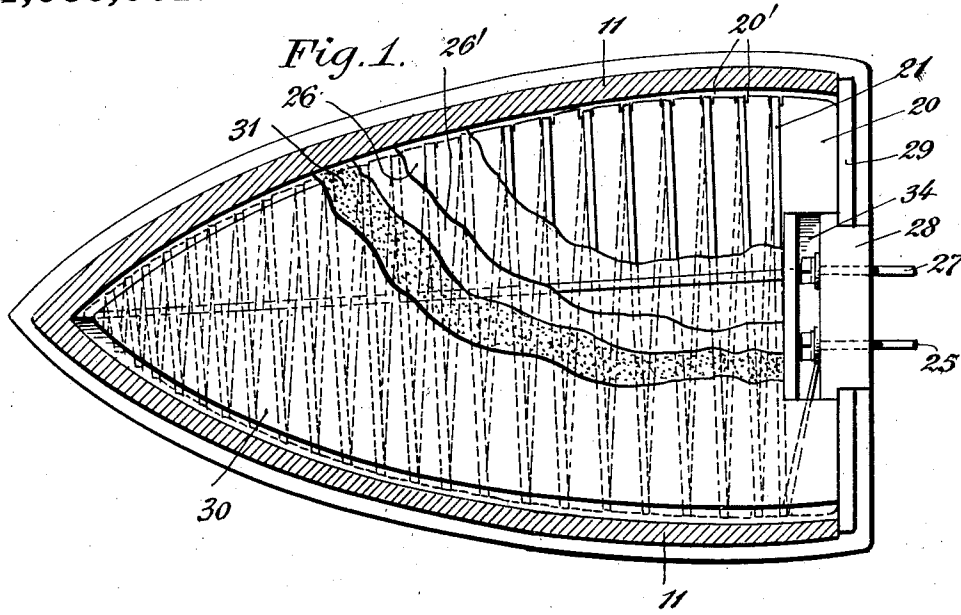


R. BOOMER.
ELECTRIC FLAT IRON.
APPLICATION FILED NOV. 11, 1912.

1,060,061.

Patented Apr. 29, 1913.



WITNESSES:

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ELECTRIC FLAT-IRON.

1,060,061.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed November 11, 1912. Serial No. 730,659.

To all whom it may concern:

Be it known that I, RICHARD BOOMER, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electric Flat-Irons, of which the following is a specification.

This invention relates to flat-irons heated by means of electric current, and its object is to provide a device of this character with a novel heating element which is so constructed that it shall not burn out, even if the electric current should be accidentally left on to heat the iron as a whole beyond the limit of utility.

The invention has furthermore for its object the provision of a flat iron in which the base plate is heated substantially uniformly over its entire surface so that in this manner the heel as well as the toe portions will be at the same temperature as the center portion of the iron, due to the construction of the heating element in such a manner that the loss of radiation at the heel and toe portions will be compensated for by increasing the heat producing qualities of the heating unit at those points when compared with the center or intermediate portion of the iron.

The invention has also for its object a flat-iron, so constructed that the shell may contain different thicknesses of metallic weight plates which are interchangeable so that the same iron may be decreased or increased in weight according to the work to be performed.

Further objects of the invention will hereinafter appear and be defined in the claims.

The invention has been clearly illustrated in the accompanying drawings, in which similar characters denote similar parts, and in which—

Figure 1 is a top view of the base of the iron broken away to show the several layers of the unit. Fig. 2 is a central longitudinal vertical section of the same.

Briefly stated, my improved iron comprises a shell having a base plate 10 and side walls 11 which converge toward the point 12 and a top plate 13, thus forming a chamber 14 which is open at the rear or heel of the iron so that the heat unit may be read-

ily placed therein or removed therefrom. Preferably all these parts are cast integrally, the chamber 14 being cored.

A handle 15 is supported on a strap 16 which in turn may be firmly secured to the top plate 13 of the iron, as by means of screws 17.

The heat unit which constitutes a part of the present invention is formed by a central plate 20 of mica or other heat-resisting and insulating material around which a heat resistance wire or tape 21 is wound into convolutions the spaces between which increase progressively toward the center portion of the plate 20 from the ends. This fact is important for the reason that by this construction I am enabled to distribute the heat produced by the electric current in the resistance wire 21, substantially uniformly throughout the entire surface plate 10 of the iron, a desirable quality very often lost sight of for in most cases the heel or toe portions of the iron are less hot than the center portion, due to the greater radiation of heat at those points than in the center. For this reason the convolutions in my present iron are nearer together in these portions than in the center. In other words I generate more heat at those points so that consequently, if more heat is lost by radiation, yet the increased number of convolutions of the conductor will compensate for this loss in proportion. This loss by radiation varies with the shape of the iron, but in all irons having the same shape of base this loss will be substantially the same, and in order to preserve the standard of the convolutions or winding of the conductor, the mica plates are stamped out so as to have notches at their edges so that the conductor may be readily wound thereon, and all the heating units therefore be of uniform capacity. Inasmuch as the resistance wire is preferably in the form of a flat tape, and the central sheet 21 is comparatively thin, the tape will, although it may have only a very short bend at the edges of the plate, yet be loose in the notches. The winding itself is a comparatively easy process, and after the tape has been wound onto the plate, its short bends at the edges of the plate can readily be flattened with a hammer so that

then the tape will lie flat against both sides of the plate. This flattening process will also result in establishing a certain amount of space between the edge of the plate and the inside bend of the tape, a feature which is advantageous for the reason that experience has demonstrated that when such tape is heated and then allowed to cool, a certain amount of shrinkage in the tape will result, or in other words the length of each convolution will, after its first heating, be a trifle shorter than it was originally. The looseness or leeway above mentioned will therefore allow for the shrinkage without breaking or buckling the edge of the mica plate, or straining of the tape. Subsequent heatings and coolings of the tape will have no further effect as far as further shrinkage is concerned.

The winding of the tape begins at the terminal 25, and the several convolutions are laid into the notches 20' above mentioned until the toe portion is reached whereupon the tape is returned to the heel portion over a plate 26 placed above the several convolutions so that no short circuit may exist between the return stretch of the tape and the convolutions, the end of the return stretch being connected to a terminal 27, and both terminals 25 and 27 being secured in a block 28 of insulating material, which in turn is firmly held in place by a back-plate 29 which constitutes a part of a presser or weight plate 30 extending into the chamber 14 and covering the entire surface of the unit and the protecting mica plate 26 above referred to. A plate 35 of mica or other insulating material is interposed between the bottom of the heating unit and the upper face of the base of iron.

In order to establish a close contact between the unit and the base of the iron, and also to still further increase the insulation of the unit from the weight plate 30, I employ a protecting sheet 26' of mica or similar material and also a thick sheet of absorbent paper 31 which is thoroughly impregnated with cement and in soft condition when placed into the iron when it is first built up. On the other hand this paper may be dispensed with, if desired, and a layer of cement substituted therefor, the function of the paper simply being that of holding the cement together and against crumbling. As soon as heat is given to the unit, the cement will naturally dry out and become stone-like in its nature, and it will have its lower surface in full surface contact with the mica sheet regardless of its undulations. At the same time its upper surface will be flat against the plain under face of the weight plate 30 above mentioned.

In order to produce the desired result just described, it will of course be necessary to exert pressure upon the weight plate, in the

first place, and I accomplish this result by a force screw 32 in threaded engagement with the top plate 13 and having a head 32' disposed within the space beneath the handle strap 16 and adapted to be operated by a wrench which can be inserted from either side.

As a further precaution against short circuiting the terminals 25 and 27, a plate 33 of insulating material may be placed within the notch 34 provided in the heel portion of the weight plate for that purpose.

From the above it will be obvious that, according to the size of the chamber 14, weight plates of different thicknesses may be substituted for the one shown, and the weight of the iron be therefore increased or decreased accordingly. Furthermore, inasmuch as the heat generated depends entirely upon the number of convolutions of the resistance tape, units containing differently spaced windings may be used in conjunction with these different weight plates so that all the desired conditions may be met without substituting a new shell for the one employed and which the operator is used to, it being furthermore obvious that the expense of supplying these interchangeable parts in connection with the same case, will be comparatively low when compared with the cost of supplying a new iron for each particular purpose needed.

I claim:—

1. The combination of a heating unit comprising a plate of insulating material having notched edges, a flat metal tape loosely wound around the plate and having its bends flattened so as to permit movement in said notches, guard plates of insulating material above and below said tape, and a cast iron plate in contact with one of said guard plates and provided with a pocket in one end, a block of insulating material in said pocket, and electric conductors mounted in said block and connected to the ends of said tape.

2. The combination of a heating unit comprising a notched plate of insulating material, a resistance wire loosely wound around the same, guard plates of insulating material disposed above and below the convolutions of the resistance wire, an independent and interchangeable weight plate disposed above the unit and having a pocket in its rear end, a block of insulating material mounted on the rear end of the heating unit in said pocket, and contact members mounted in said block and connected to the resistance wire.

3. The combination with a heating unit adapted to be placed within the chamber of a flat-iron and having the ends of the resistance wire extending from its rear end, a block of insulating material mounted on the rear end of the heating unit, contact mem-

bers mounted in said block and connected to
said ends of the resistance wire, a presser
plate extending over said heating unit and
having a pocket in its rear end to receive
5 and hold said block, and adapted to be held
in position by a screw mounted in the top of
the flat-iron whereby the heating unit, the
block of insulating material and the contact

members will be held in position in the flat-
iron.

In testimony whereof I affix my signature
in presence of two witnesses.

RICHARD BOOMER.

Witnesses:

FLORENCE L. CROMBIE,

CHAS. F. SCHMELZ.