H. A. RICE.

REPLACEABLE HEATING UNIT FOR ELECTRICAL APPARATUS.

APPLICATION FILED JUNE 5, 1917.

1,319,533. Patented Oct. 21, 1919.

3 SHEETS—SHEET 1.

Fig. 1

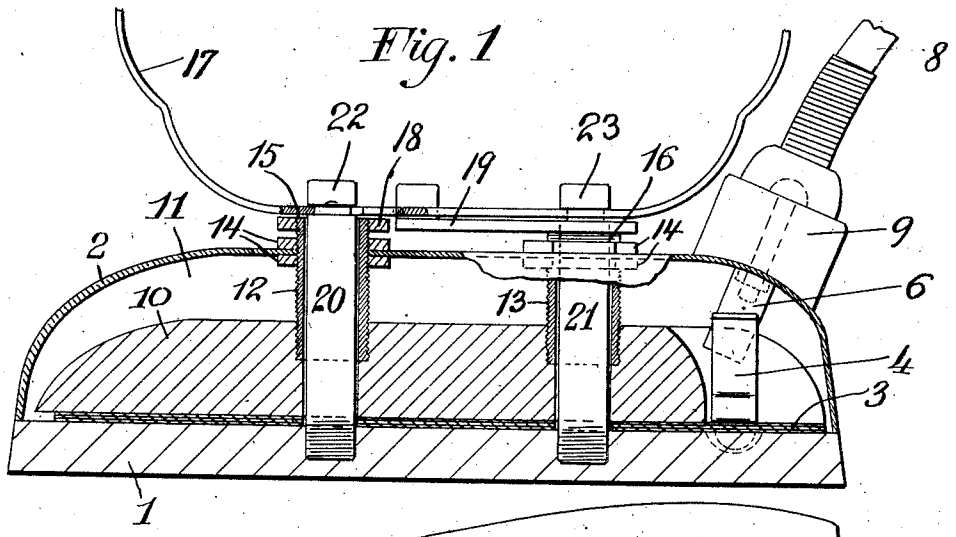


Fig. 2

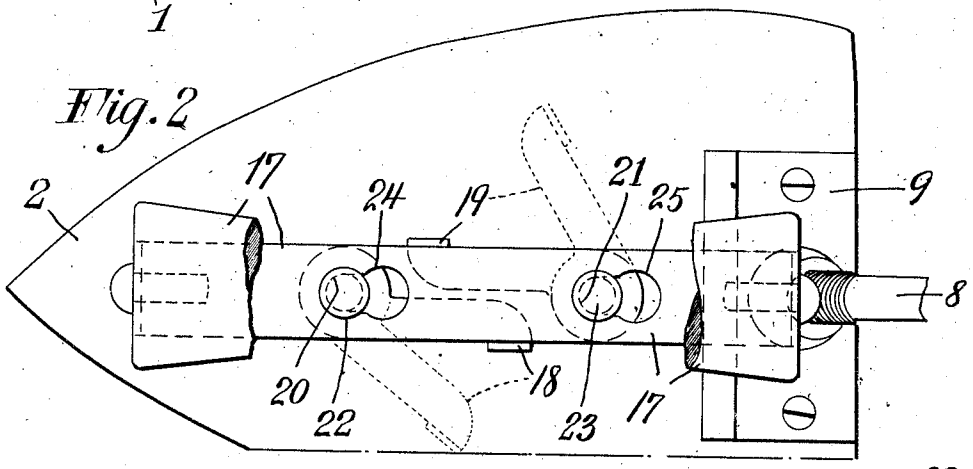
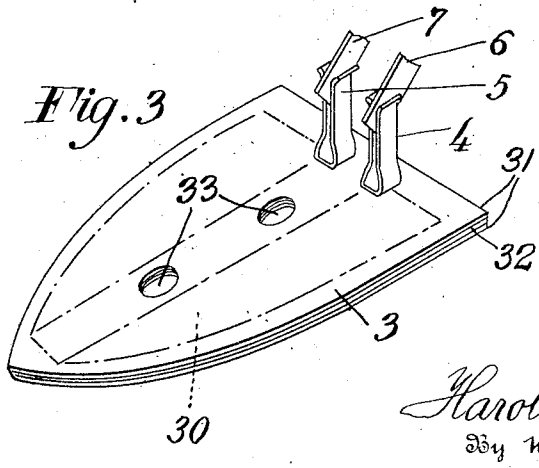


Fig. 3



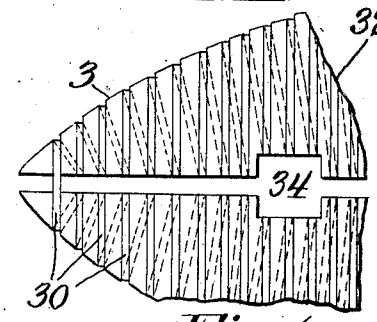


Fig. 4

Inventor

Harold A. Rice

By his Attorney

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3 SHEETS—SHEET 2.

Fig. 5

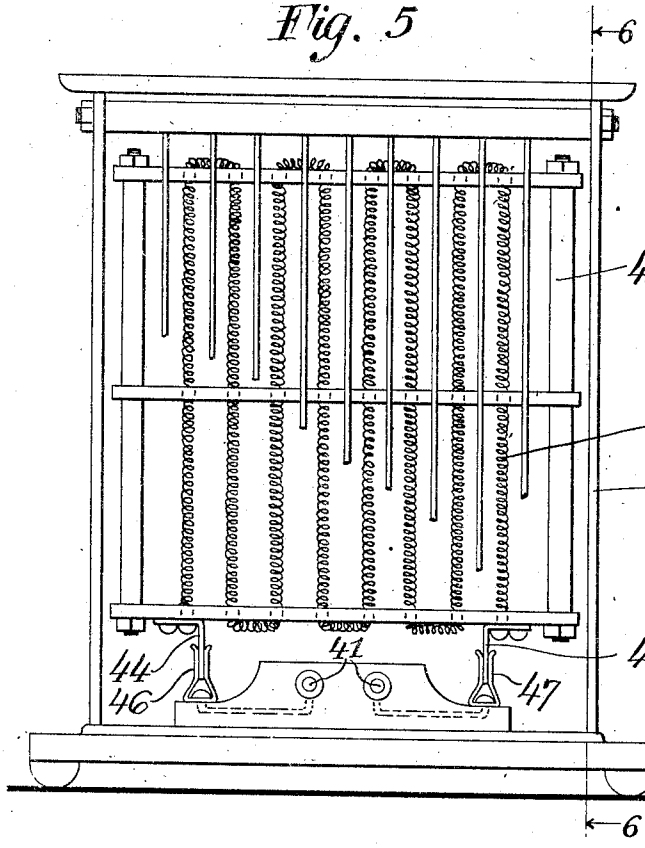
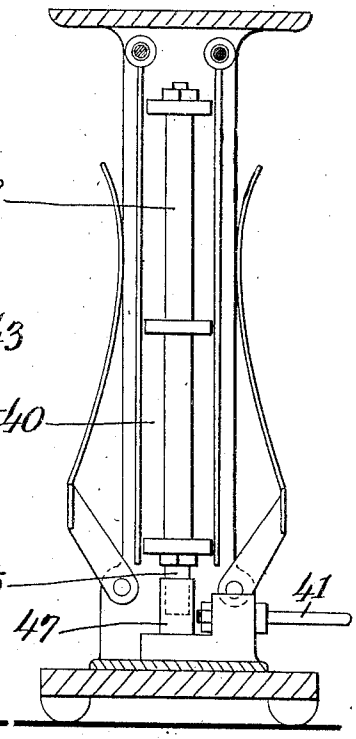


Fig. 6



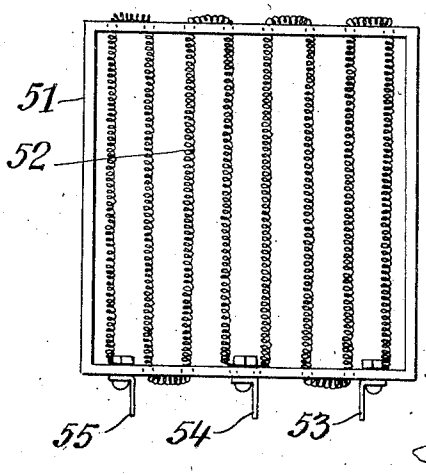


Fig. 7

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3 SHEETS—SHEET 3.

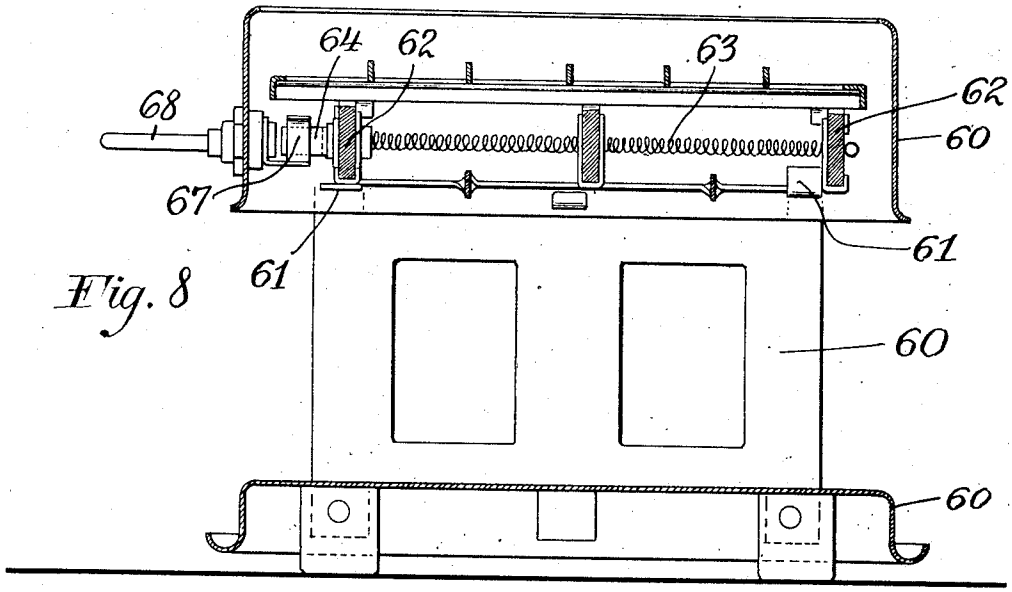


Fig. 8

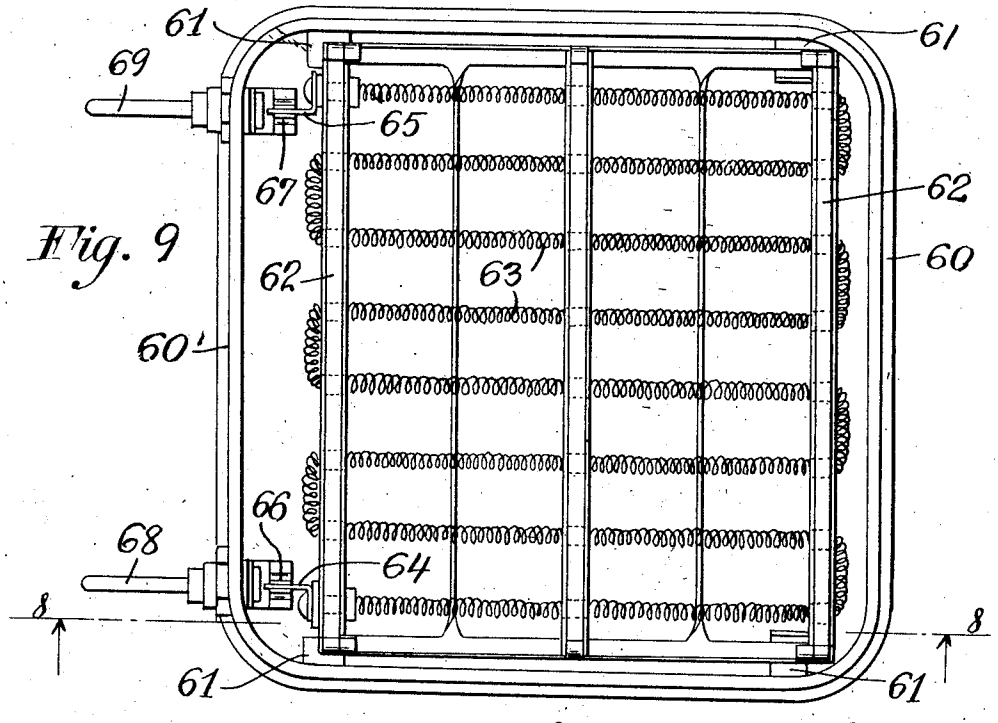


Fig. 9

Harold A. Rice Inventor

By his Attorney

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UNITED STATES PATENT OFFICE.

HAROLD ALBERT RICE, OF NEW YORK, N. Y., ASSIGNOR TO REDTOP ELECTRIC COMPANY, INC., A CORPORATION OF NEW YORK.

REPLACEABLE HEATING UNIT FOR ELECTRICAL APPARATUS.

1,319,533. Specification of Letters Patent. Patented Oct. 21, 1919.

Application filed June 5, 1917. Serial No. 172,890.

To all whom it may concern:

Be it known that I, HAROLD A. RICE, a subject of the King of Great Britain, residing at borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Replaceable Heating Units for Electrical Apparatus, of which the following is a specification.

This invention relates to replaceable heating units for electrical apparatus.

More particularly the invention relates to the construction and arrangement of the electrical heating unit or units in electrical apparatus and to the construction of the coöperating parts of such electrical apparatus whereby such unit or units are separable from such coöperating parts to permit the heating unit or units to be readily removed for the purpose of repair or a new heating unit substituted for the old heating unit if seriously impaired, while not disarranging such coöperating parts.

The invention is designed more particularly for use in electrical apparatus such as soldering irons, heating irons, chafing stoves, toasters, and the like, and has as a principal object a construction obviating the necessity inherent in the construction of electrical apparatus heretofore proposed of forwarding the whole electrical apparatus by the user to the manufacturer, either directly or indirectly through the dealer, for the purpose of repair or replacement of the heating unit.

My invention is applicable in many forms and I have indicated but a few such forms which I have found to be advantageous. The invention is capable of use in other types of electrical apparatus and the above reference to particular types is merely for the purpose of citing specific instances of uses where the average user is not conversant with the principles of electricity. My invention attains also advantages to the dealers in that it enables the dealers to have a stock of heating units at hand for sale and also expedites the restoral of the electrical apparatus to the user. If desired, the electrical heating unit may be constructed in one or more common or universal sizes for several different types of electrical apparatus, thereby simplifying the manufacture of the heating unit, the assembly of the same in the several types of electrical apparatus, decreasing the necessary stock held by the dealers, etc.

The invention is directed also to simplifying and improving the construction of such electrical apparatus in parts other than the electrical heating units, as will appear more fully hereinafter.

Other features and objects of the invention will be more fully understood from the following description and the accompanying drawings, in which—

Figures 1 to 3 and 4 show a form of my invention as applied to an electrical flat-iron; Fig. 1 being a longitudinal central section; Fig. 2 a plan of same, Fig. 3 a detail plan of the heating unit, and Fig. 4 a detail plan of a part of the heating wire and supporting base.

Figs. 5 and 6 show another form of the invention as applied to an electrical toaster, the former being a side elevation and the latter an end elevation;

Fig. 7 is a plan view of another form of heating unit showing my invention; and

Figs. 8 and 9 are respectively a central elevational section and a top plan view of a stove embodying my invention.

In the heating-iron form of the invention shown in Figs. 1, 2, 3 and 4 as a flat-iron, the ironing base 1 is constructed separable from the shell 2 and in such manner that the heating unit 3 is readily removed and replaced by a new heating unit, if desired. For such purpose, as shown in greater detail in Fig. 3, the heating unit terminals 4, 5, may be of the clip type adapted to be respectively connected to the lead terminals 6, 7, which may be of the knife-edge type. If desired, the terminals proper 4, 5, may be of the knife-edge type and conversely the line terminals 6, 7, of the clip type. The lead wires 8 are mounted in the bushing 9 and connected to the lead terminals 6, 7, and properly protected, as will be understood by the art.

The ironing base 1 is mechanically connected to the shell 2 by suitable means for attaining proper electrical insulation of the heating unit 3 from the shell or other parts capable of being touched by the user and

also heat losses due to possible non-sealed mechanical connections eliminated. As shown in Fig. 1, I arrange the sub-base 10 to be insulatedly suspended within the casing 2 to provide the heat insulating air space 11, preferably completely surrounding the heating unit 3 within the casing 2. Such suspension may be attained by means of a pair of screw threaded bushings 12, 13, tapped at one end into the sub-base 10 and adjustably suspended from the casing 2 by means of the positioning nuts 14. The respective exterior ends 15, 16, of said bushings 12, 13, may also be screw threaded to afford suitable locking of the said bushings 12, 13,—and therewith of the casing 2—with the handle 17 of the iron, as by means of the locking levers 18, 19, respectively.

As one form of suitable means for positioning the ironing base 1 on the casing 2, I have shown the lugs 20, 21, respectively tapped at their lower ends in the ironing base 1 and projecting through the respective bushings 12, 13 and having the heads 22, 23, projecting a suitable distance beyond said bushings 12, 13, respectively. As one form of attaining ready attachment of the handle 17 to and removal from the casing 2, I have shown the key slots 24, 25, disposed in said handle 17 and said lugs 20, 21, peripherally slotted whereby upon passing said heads 22, 23, respectively through the enlarged portions of said key slots 24, 25, and upon longitudinal movement of said handle 17, said slotted portions of said heads 22, 23, will be closely seated within the narrow portion of said slots 24, 25, and the seal completed by turning the respective clamping levers 18, 19 toward said handle 17, as indicated by the dotted and full lines in Fig. 2.

Thus, in the event that a heating unit becomes impaired, the same may be removed from the remaining elements of the flat-iron by unlocking the levers 18, 19, slipping the handle 17 out of engagement with the lugs 20, 21, then grasping the ironing base 1 and withdrawing the same and therewith said lugs 20, 21, whereupon the heating unit 3 may be grasped and disconnected by merely pulling the heating unit to disconnect its terminals 4, 5, from the line terminals 6, 7.

It will be noted that in the form of the invention shown in the drawings, the terminals serve to retain the heating unit mechanically in position as well as to effect the electrical connections of the heating wire 30 of the heating unit 3 with the line. I have indicated layers 31 of sheet mica surrounding the heating wire 30 and the grooved base 32 supporting the heating wire 30, as the electrical insulating medium, although other forms or material of electrical insulation may be employed.

It will be noted that said insulating layers 31 are provided with the openings 33 and the base 32 with the corresponding opening 34 for insulatingly receiving the lugs 20, 21.

In Figs. 5 and 6, I have shown another form of my invention as applied to toasters or toasting racks. As indicated, the frame 40 of the rack is of any approved construction and provided with the lead terminals 41. The heating unit 42 in this instance is shown as of the frame type and comprising the insulatedly supported heating unit 43. The heating unit terminals 44, 45, are adapted to be connected and disconnected relatively to the respective lead terminals 46, 47. To effect such function, I have shown the terminals 44, 45, of the knife-edge type and the terminals 46, 47 of the clip type, which arrangement may be modified by reversing the said types, or by the use of other forms of correlative electrical contacts separable by mere movement relative to one another.

In Fig. 7 I have shown another form of heating unit comprising the frame 51 insulatingly supporting the multiple heating unit 52, provided with the multiple terminals 53, 54, 55, etc., adapted to coact with a set of suitable correlative terminals for obtaining multiple heats as desired, by means of a single heating unit. In the embodiment illustrated, the heating unit terminals 53, 54, 55 are shown as of the knife-edge type and accordingly the correlative lead terminals may be of the clip type. The line terminals are connected to the proper lead terminals for attaining the desired heats, as will be understood.

In Figs. 8 and 9, I have shown the invention in a form as applied to a stove. The frame 60 is of any approved form and provided with a shelf or with suitable lugs 61 for supporting the frame 62 of the heating unit comprising the heating wiring 63. In this instance, the heating wiring 63 is shown as having two terminals 64, 65, of the knife-edge type adapted to respectively coact with the lead terminals 66, 67, respectively connected to the line terminals 68, 69. A greater number of terminals may be employed, if desired, for attaining multiple heats similar to the construction indicated in Fig. 7, and the particular types of correlative terminals or contacts may be reversed, or other suitable form of correlative contacts employed to effect connection and disconnection preferably by mere relative movement.

From the above it will be apparent that my invention enables the user even though not conversant with the principles of electricity or experienced with the construction of electrical apparatus to remove the electrical unit in the event of breakage or out of repair and to forward solely the heating unit to the manufacturer or dealer or to ob-

tain a new heating unit and replace the same in the electrical apparatus. Also, the user may keep one or more heating units on hand and replace an impaired unit without delay.

It will also be observed that the manufacture of the heating unit and the assembly of new electrical apparatus are greatly simplified and that a particular type or set of types of heating units may be manufactured interchangeably for different types of electrical apparatus.

Whereas I have illustrated my invention by referring to specific forms thereof, it will be understood that many changes and modifications may be made without departing from the invention as defined by the appended claim.

I claim:

As an article of manufacture, an electrical apparatus comprising a base, electrical terminals insulatedly supported by said base, said base being provided with a recess, an electrical heating unit comprising a flat body of insulating material, heating wire wholly supported by said insulating material, means for supporting said heating unit within said recess, said supporting means being constructed to permit the removal of said heating unit bodily in a plurality of directions relative to said recess, contacts wholly carried by said insulating material and contacts carried by said base and constructed to make effectual electrical contact with said first named contacts respectively upon relative movement of said base and said insulating material in any one of said plurality of directions.

In testimony whereof I have signed this specification this 26th day of May 1917.

HAROLD ALBERT RICE.