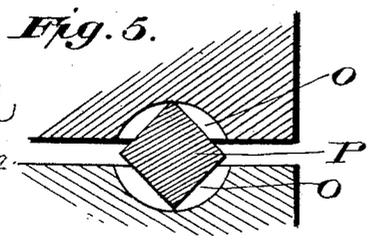
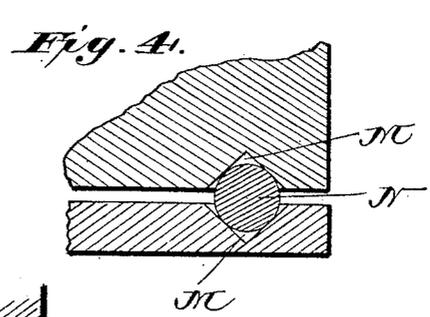
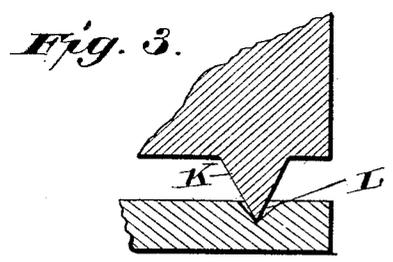
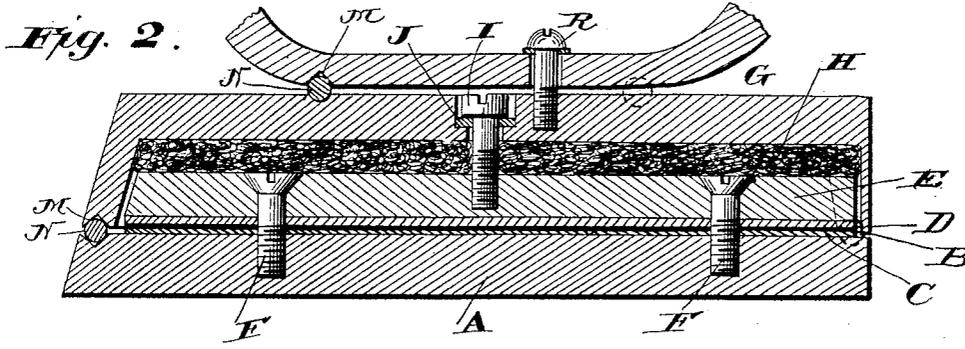
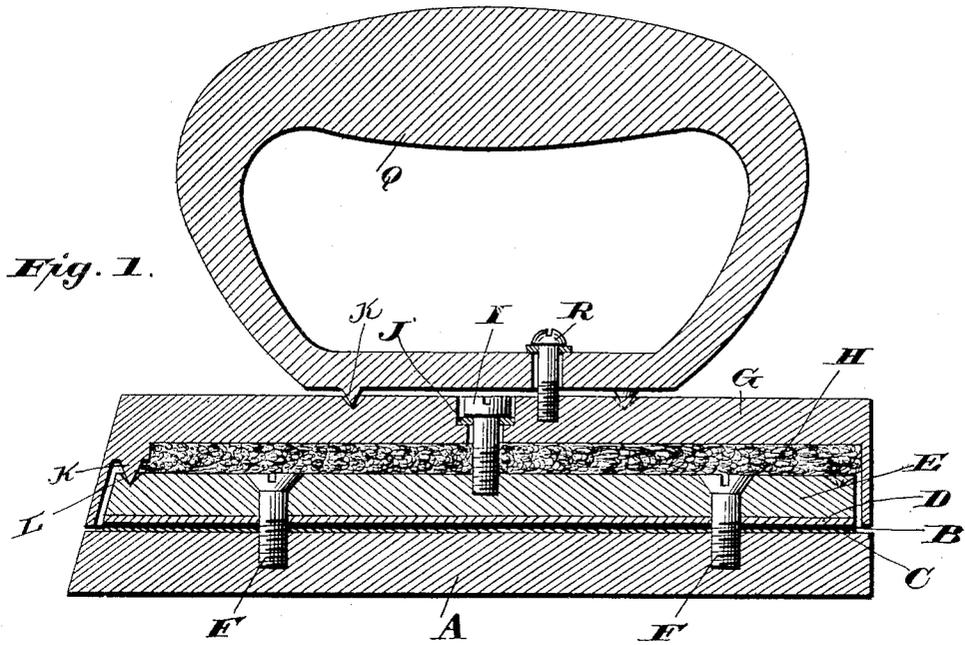


(No Model.)

C. E. CARPENTER.  
ELECTRIC SAD IRON.

No. 448,317.

Patented Mar. 17, 1891.



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# UNITED STATES PATENT OFFICE.

CHARLES E. CARPENTER, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE CARPENTER-NEVENS ELECTRO-HEATING COMPANY, OF SAME PLACE.

## ELECTRIC SAD-IRON.

SPECIFICATION forming part of Letters Patent No. 448,317, dated March 17, 1891.

Application filed June 21, 1890. Serial No. 356,201. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. CARPENTER, a citizen of the United States, and a resident of the city of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Electric Sad-Irons, of which the following is a specification.

This invention relates to improvements in electric sad-irons, in which an inclosed resistance or electrical conductor is employed as a means for heating the surface or working-plate of the iron, but is more especially designed as an improvement upon the invention set forth in United States Letters Patent Nos. 415,856 and 429,859, granted me on the 26th day of November, 1889, and 3d of June, 1890, respectively.

The prime object of this invention is to reduce to the minimum the wastage of energy due to conduction or radiation of the heat evolved from the resistance by confining the heat to the surface or working-plate by which the heat is to be used.

Another object is to prevent as far as practicable the conduction of heat from the heated portion of the iron to the top or cover and the handle thereof, and thereby not only effect economy in the use of the iron, but at the same time avoid all disagreeable consequences of accidental contact between the hand of the user and the top or handle of the iron, as well as injury to goods with which the iron may be accidentally brought in contact.

These objects are attained by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a central vertical section through a sad-iron involving my invention; Fig. 2, a similar view showing a modified form of connection between the heated and non-heated portions of the iron; and Figs. 3, 4, and 5, enlarged views of several forms of connections between the heated and non-heated portions of the iron for reducing the contact-area between said members.

Similar letters of reference indicate the same parts in the several figures of the drawings.

So far as relates to the means employed for

heating the iron those shown in the drawings are substantially the same as in my aforesaid patent; but in this invention are included elements capable of use in connection with other forms of electric-heating apparatus, either similar in structure or differing materially in the mode of heating.

Referring by letter to the accompanying drawings, A indicates a heated surface-plate; B, an electrical conductor or resistance, preferably composed of reflex iron wire; C, an electrical insulation interposed between the resistance and the heated surface-plate, which should, however, be a fairly good conductor of heat; D, an electrical insulation, which should preferably be a non-conductor of heat, in the shape of a card of asbestos, to which the resistance is secured, and interposed between the resistance and a pressure-plate E, secured by screws F or in any other suitable manner to the surface-plates A, thus serving to bind the resistance and the respective insulations upon the heated surface-plate.

So much of the iron as has been described is similar to that illustrated in my aforesaid application and could, if desired, be employed as an iron by attaching a handle directly to the compressing-plate, but such a structure would be wasteful of energy, because the compressing-plate lies so close to the heated resistance that its temperature will be very high when in use, notwithstanding the insulation interposed therebetween, and with so much surface exposed much heat would be lost by dissipation or radiation into the atmosphere. To avoid this objection I provide a cover or body G, recessed upon the inner or under side thereof, as shown, leaving thin walls around the sides and ends of just sufficient thickness to withstand mechanical injury and still form a rigid structure. This recess is partly filled with some heat-non-conducting material H—such as loose asbestos or mineral wool—to prevent the radiation and conduction of heat from the compressing-plate to the body of the iron.

The body or non-heated portion of the iron is attached to the heated portion of the iron, but preferably has contact with the compressing-plate alone by means of a screw I working loosely through a perforation in the body

of greater dimensions than the screw, the head of which latter rests upon a washer J of some suitable insulating material, while the end thereof has a screw-thread connection with the compressing-plate. It is desirable, however, to have the filling H of asbestos or mineral wool free from compression, or to even dispense with its employment, and therefore in order to reduce the contacting surface between the body and the compressing-plate I provide several equivalent forms of connection therebetween. The first of these, illustrated in detail in Fig. 3, consists of a conical projection K upon the body, fitting into a conical depression L in the compressing-plate, the sides of the cone K being of sufficiently greater degree than the sides of the recess to avoid contact therewith except at the point or apex of the cone.

In Fig. 4 the body and the compressing-plate are shown as provided with conical recesses M, into which fits a ball N of some suitable material, while in Fig. 5 the depressions or recesses O in the body and compressing-plate are preferably concave and have fitted therein a cube P of bone or some other insulating material. In all these forms of connection while the body is rigidly supported against the pressure of the screw I and at three or more points, as may be desirable, the contacting surfaces are reduced to the minimum and likewise the conduction of heat from the compressing-plate to the body. The connection illustrated in Figs. 1 and 3, however, is preferred, because it avoids the employment of loose or detachable parts and provides the least possible contacting area between the parts; but the other forms shown have proved to be practically successful. The same form of connections may also be interposed between the handle Q and the body, to which it is secured by the screw R in substantially the same manner as the body is secured to the compressing-plate, for the purpose of reducing the temperature of the handle to the minimum.

From the foregoing it will be readily seen that with this structure the two parts of the iron—that is, the heated and the non-heated parts—may be held firmly together, but still separated, excepting the very small surface of contact through the cones or other devices just described, thus leaving the utensil practically as firm and solid as if no such connections were employed.

While the cone connection represented in Fig. 1 possesses the advantage of economy, because the cones and cavities may be cast and the parts put together without tools, the other forms—that is, the balls and cubes—may have the advantage of being composed of some hard non-conducting material which will greatly impair the conduction of heat thereby.

In either of the structures described when the cones or balls or cubes are once in place and drawn together by the fastening-screws

all motion, either horizontal or otherwise, of the heated and non-heated portions of the body with relation to each other is prevented, since the parts cannot move until the screws have been loosened up and the points or cubes removed from their normal position.

Obviously the location of the cone and recess in the preferred connection (illustrated in Figs. 1 and 3) may be reversed—that is, the cone may be placed upon the compressing-plate and the cavity be formed in the body or covering-plate—without departing from the spirit of my invention.

The number of joints in this structure of iron as well as the small surface of contact between the various portions thereof proves most economical in the use of the iron, for they serve to so impair the conduction of heat from the heated to the non-heated portions of the iron and the consequent dissipation thereof by radiation as to reduce the amount of energy required in heating the iron and maintaining it at a uniform heat to the minimum.

In the claims in referring to the "heated portion" of the iron is meant that portion to which the heat is directly applied—that is, the heated surface or working-plate thereof and such other portions of the iron as are connected therewith or related thereto so intimately as to be heated by conduction from the surface-plate.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an electric sad-iron, the combination, with the heated surface-plate and a compressing-plate secured thereto, of an electrical resistance or conductor interposed between said plates and an insulation interposed between said resistance and each of said plates, substantially as described.

2. In an electric sad-iron, the combination, with the heated surface-plate, the compressing-plate secured thereto, an electrical conductor or resistance located between said plates, and an insulation interposed between said resistance and each of said plates, of a body secured to the compressing-plate and a filling of heat-insulating material between said body and plates, substantially as described.

3. In an electric sad-iron, the combination, with the heated surface-plate, the compressing-plate secured thereto, an electrical conductor or resistance located between said plates, and an insulation interposed between said resistance and each of said plates, of a cover or body secured to the compressing-plate and a cone-and-socket connection or its equivalent between said body and plate, substantially as described.

4. In an electric sad-iron, the combination, with the heated surface-plate, the compressing-plate secured thereto, an electrical conductor or resistance located between said plates, and an insulation interposed between

said resistance and each of said plates, of a cover or body secured to the compressing-plate, a cone-and-socket connection or its equivalent between said body and plate, and a heat-insulation interposed between said body and plate, substantially as described.

5 5. In an electric sad-iron, the combination, with the heated portion thereof, of the body or cover secured thereto and a cone-and-socket connection or its equivalent between said body and the heated portion, substantially as described.

15 6. In an electric sad-iron, the combination, with the heated portion thereof, of a cover or body secured thereto, a cone-and-socket connection or its equivalent between said body and the heated portion, and a filling of heat-insulation between said body and the heated portion, substantially as described.

20 7. In an electric sad-iron, the combination, with the heated portion thereof, of a cover or body secured to said heated portion, a handle secured to said body, and a cone-and-socket

connection or its equivalent between said body and the heated portion of the iron and between said body and handle, substantially as described. 25

8. In an electric sad-iron, the combination, with the heated portion of the iron, the body, a screw working loosely through the body and engaging the heated portion, a heat-insulation between said screw and body, the handle, a screw working loosely through said handle and engaging the body, and a heat-insulation between said screw and handle, of a cone-and-socket connection or its equivalent between said body and the heated portion of the iron and between said body and the handle, substantially as described. 30 35

In testimony whereof I affix my signature in presence of two witnesses. 40

CHARLES E. CARPENTER.

Witnesses:

W. F. USTICK,  
ROBT. T. LANG.