(No Model.) 2 Sheets—Sheet 1.

W. S. HADAWAY, Jr.

ELECTRICALLY HEATED SAD IRON.

No. 574,536. Patented Jan. 5, 1897.

Fig. 1.

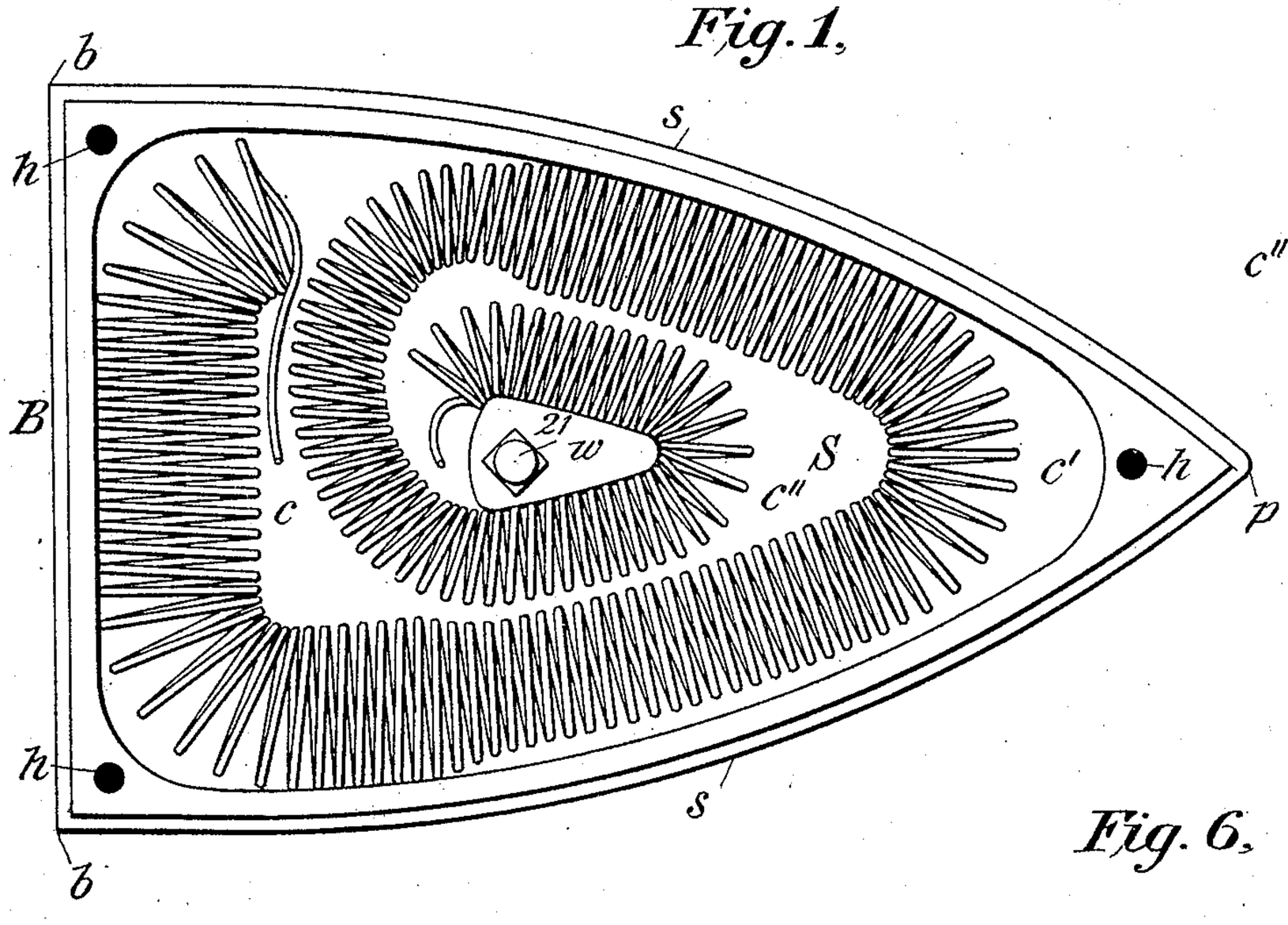


Fig. 6.

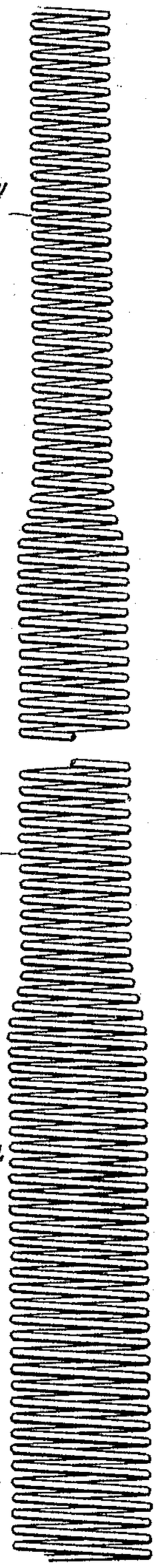
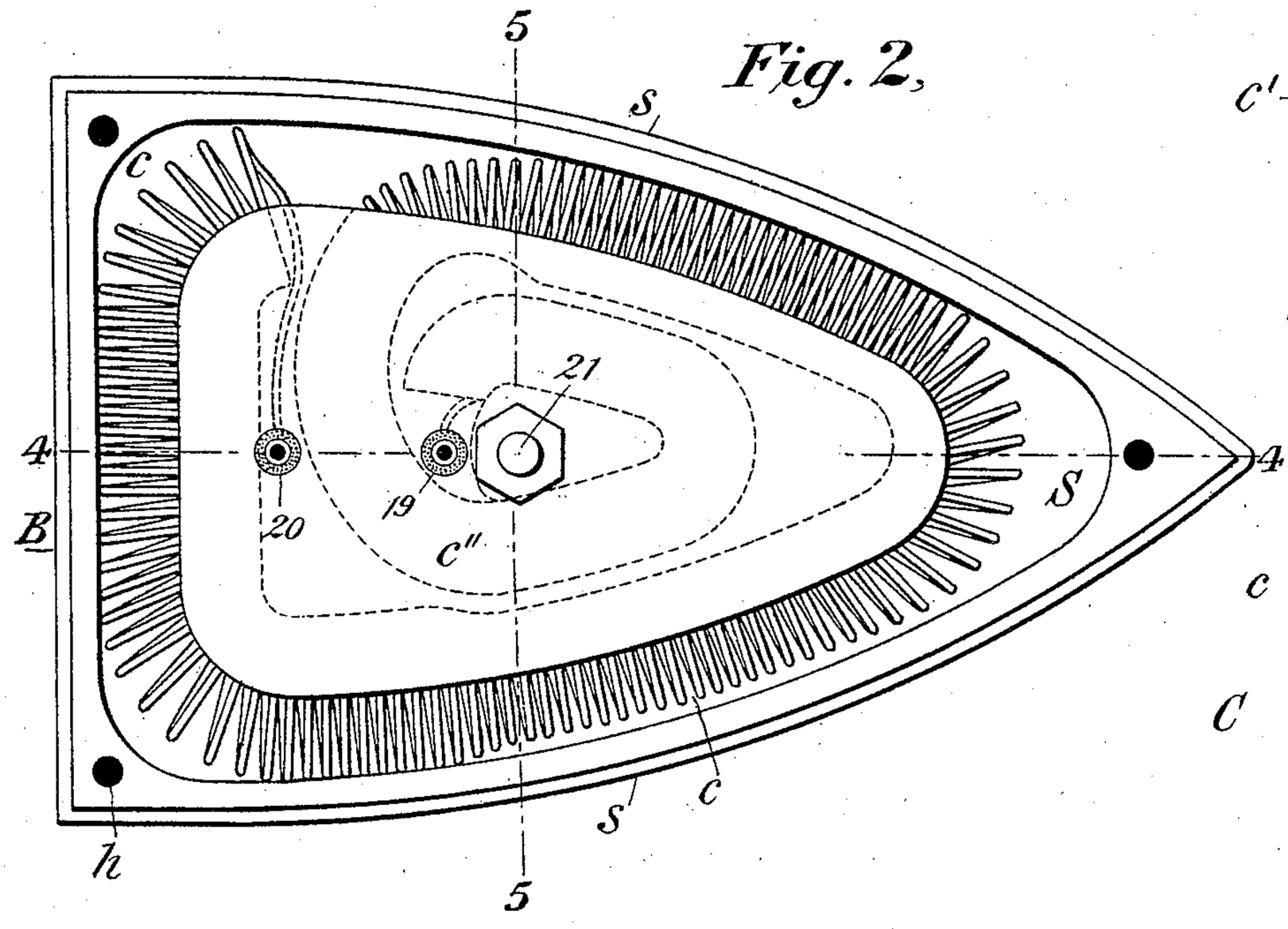


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

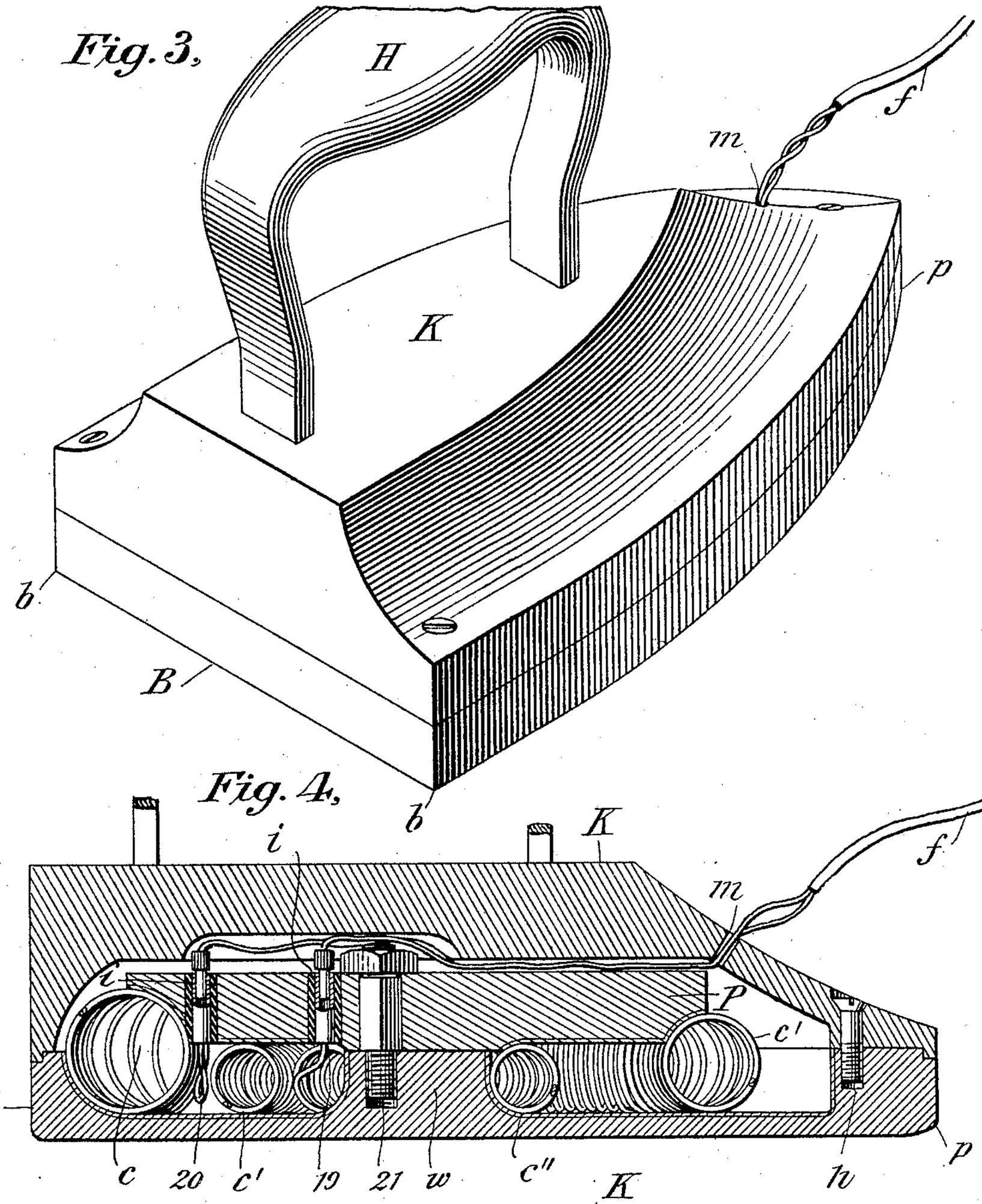
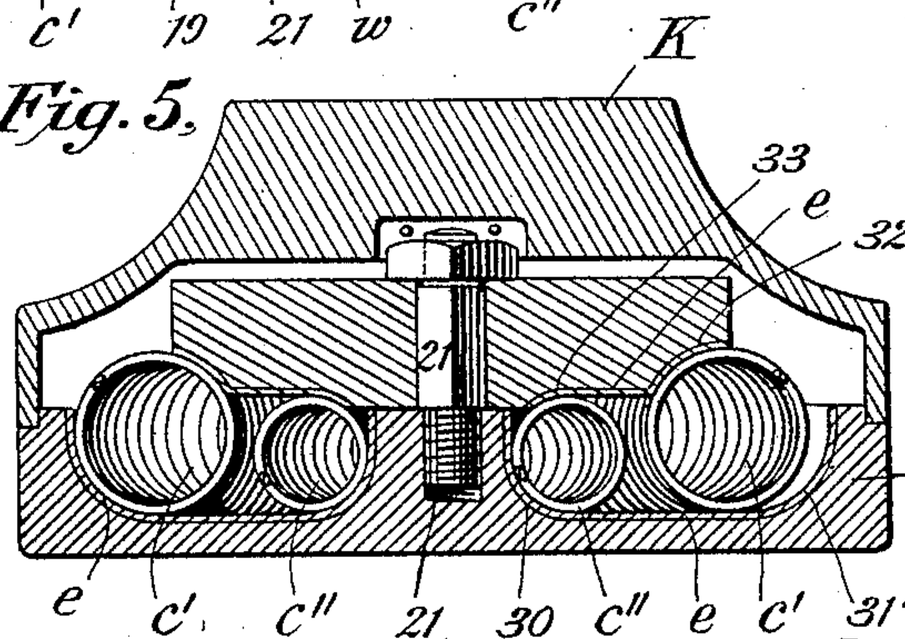


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM S. HADAWAY, JR., OF NEW YORK, N. Y.

ELECTRICALLY-HEATED SAD-IRON.

SPECIFICATION forming part of Letters Patent No. 574,536, dated January 5, 1897.

Application filed April 7, 1896. Serial No. 586,484. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. HADAWAY, Jr., a citizen of the United States, and a resident of New York, in the county and State of New York, have made certain new and useful Improvements in Electrically-Heated Sad-Irons, of which the following is a specification.

My invention is an improvement in the form and arrangement of the conductor employed in electrically-heated flat or sad irons, such as are employed for laundry purposes.

Prior to my invention no attempt had been made to distribute the heat in an economical manner, but all parts of the surface of the sad-iron had been electrically heated more or less, and it often happened that the part or section of the surface which imparted its heat slowly as compared with another part or section was overheated, and the efforts to maintain that section imparting or conducting heat most rapidly at the required temperature resulted in a waste of energy and damage to the first-named section.

Sad-irons by custom and habit are almost universally of one general form or outline, resembling a section of a cone cut on its major axis. In the process of use the base-line (the straight blunt end) is employed to do the greater part of the useful work, while the point and sides are employed only as auxiliary means to the desired end. It results from this that the iron loses heat most rapidly at or near the blunt end or base-line. Of course it would be possible to make a sad-iron circular and uniformly heat such a surface, but the arc-shaped point or apex, the side lines, and the square corners all have important functions in the process of the laundry, and I have so improved the arrangement for electrically heating an iron of this irregular outline that heat will be maintained and economically delivered at the point of maximum and minimum consumption. I have demonstrated that the base-line is the region or section of maximum heat conduction, that the side lines are next in rapidity of heat conduction, and that a central section or strip is least affected in the process of use or loses heat the slowest.

My invention consists in providing a helically-disposed electrical conductor of nickel steel or tungsten steel, which is composed of two or more continuous sections. Each section consists of a series of equal convolutions. The convolutions of adjacent sections differ in their diameter, and each section in linear extent is practically coextensive with the extent of the smoothing-surface section in proximity to which it is placed. The section of conductor in proximity to the surface-section losing heat most rapidly is so proportioned that it most rapidly develops heat, that is, it has the greater diameter. The surface-section losing heat next less rapidly is practically continuous in extent and is of respectively smaller diameter, so as to develop heat in due proportion to the rate of loss at the section of the surface in proximity to which it is placed, while third or additional sections of surface and conductor are in the corresponding proportion and extent.

I provide an improved sad-iron in which the smoothing-surface is a shell with thin walls, and there are arc-shaped grooves or channels upon the interior of its contact-surface. A plate having arc-shaped grooves or channels registering with the grooves on the interior of the smoothing-surface is provided with means for clamping or fixing it in position upon the upper side of the smoothing-surface. The convoluted conductor is included between these two surfaces and removably held in the grooves. The contact-surfaces of the plates are coated with a vitreous enamel which is an insulator of electricity and a conductor of heat. I provide a cap or cover, to which is fixed the handle, and at or near its center there is an additional mass of iron, to add gravity and absorb heat.

The accompanying drawings illustrate my invention.

Figure 1 is a plan view showing the graduated and proportioned helical conductor in position on the interior of the smoothing shell or surface. Fig. 2 is a similar view with the holding or clamping plate in position. Fig. 3 is a complete perspective view of my improved sad-iron with flexible conducting-cord connection. Fig. 4 is a longitudinal cross-section on the line 4 4, Fig. 2. Fig. 5 is a transverse section on the line 5 5, Fig. 2; and Fig. 6 is a view of my improved sad-iron-heating conductor, helical in form and composed of

a series of continuous sections differing from each other in the diameter of their convolutions.

In Fig. 1, S is the smoothing surface or shell, of irregular outline, having the form of a cone-section. B is the base-line, which is chiefly employed in operation. This section does the greatest amount of useful work and loses its heat most rapidly. *s s* are the side lines, which are the next in point of utility and rapidity of heat loss, and the section at or near the center is next in order of heat loss. This part S is a shell having comparatively thin walls. There are corners at the base-line *b* and at the apex *p*, which, as is well known, are employed for use in corners, plaits, and folds of the fabric to be smoothed. The interior surface is grooved or channeled, as at 30 and 31, Fig. 5, and this surface is coated with a vitreous enamel *e*.

In Figs. 4 and 5, P is a metal plate, the lower surface of which is channeled or grooved, as at 32 33, and this surface is coated with a vitreous enamel *e*. A central projecton *w*, integral with the section or part S, is tapped and screw-threaded to receive the screw 21, which operates to firmly clamp or unite the part or plate P to the part or section S. In the plate P there are two holes having an insulating-bushing *i*, and within each bushing *i* there is a metal tube-section. These serve for connecting the tips of the flexible cord *f*, which enters the hole *m* in the top or cap section K, with the terminals of my improved heating-conductor next referred to.

In Fig. 6 is shown a plan of the heating-conductor consisting of a helically-disposed conducting-wire, preferably of nickel steel or tungsten steel. The sad-iron is conveniently divided for practical purposes into three heat-consuming sections, (shown at B, *s*, and *w*,) and I show my heating-conductor C in three sections *c*, *c'*, and *c''*, each section consisting of a series of convolutions of predetermined diameter, in linear extent having due proportion to the base and side lines B and *s* and the central section in the vicinity of the part *w*. The section of conductor *c* having convolutions of greatest diameter, and therefore greatest heat-generating power, is placed in proximity to the base-line B. The conductor-section *c'*, of lesser heating power, is in linear extent equal to the two side lines *s s*, which are next in heat-consuming capacity, and *c'* is placed in proximity thereto. The third section *c''* is placed in the vicinity of the contact-section *w*, where heat loss is lowest.

In placing the conductor C in position the free end of the smallest section *c''* is placed in the hole 19 in plate P, the plate P is placed in position, the screw 21 is caught in the thread in the section *w*, and then the conductor C is wound into position in the grooved or channeled bed prepared for it by the registering grooves. The second terminal of C is now placed in the hole 20 and the screw 21 made fast to clamp the conductor firmly in position between plate P and section S. This arrangement provides means for readily replacing a damaged conductor, and such conductors are supplied in quantities as a new article of manufacture. The conductor C, bearing a designating-number, is employed also for the corresponding size of sad-iron.

The cap or cover K is provided with a mass of metal at or near its central section to increase the gravity and accumulate or retain or absorb heat, and there is a handle H, fixed to K, of known form and construction. The cover or cap K is fixed in position by three screws entering the holes *h* at the angles *b* and *p*.

The cord *f* is connected to a source of constant electromotive force, and the electric current flowing in the conductor C is transformed into heat at respectively different rates at the lines B and *s* and in the vicinity of the center *w*, and this development of heat is in proportion to the heat loss or consumption at the points designated.

What I claim, and desire to secure by Letters Patent, is—

1. A flat or sad iron having a plane smoothing-surface bounded by two side lines and a base-line, said surface, in outline, approximating the form of a triangle, combined with an electric heating-conductor in proximity thereto but insulated therefrom, said conductor being helically disposed in two or more continuous sections each section composed of a series of convolutions, the convolutions of the section located at or near the base-line being greater than the convolutions at or near the side lines whereby the greater heating capacity is located along said base-line, substantially as described.

2. A flat or sad iron having a plane smoothing-surface bounded by a base-line and two side lines, in outline approximating a triangle, combined with insulating material, and an electric heating-conductor composed of helical convolutions arranged in three or more graduated sections, the section of greatest diameter being at or near the base-line; the section of smallest diameter being at or near the center and the sections of intermediate diameter at or near the side lines, substantially as described.

WILLIAM S. HADAWAY, JR.

Witnesses:
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WM. B. VANSIZE.