

April 28, 1925.

1,535,307

R. C. HAWK

ELECTRIC MELTING POT

Filed Oct. 17, 1922

3 Sheets-Sheet 1

Fig. 2.

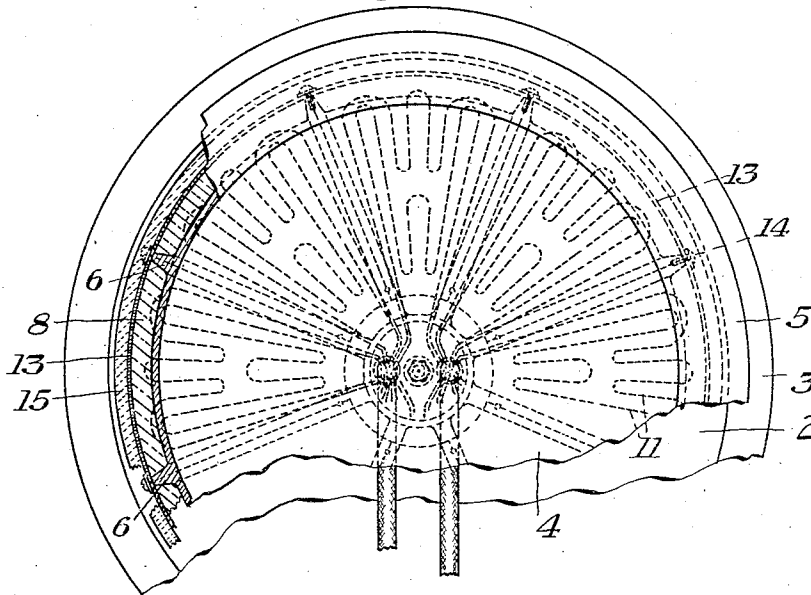
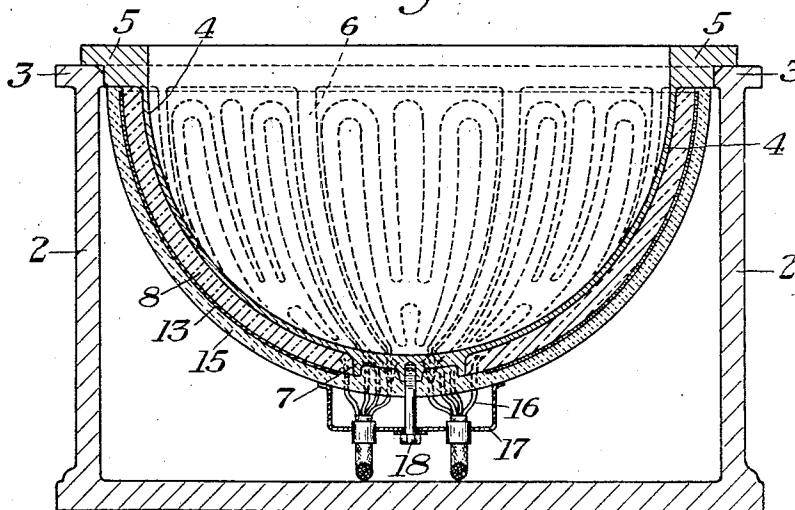


Fig. 1.



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Fig. 3.

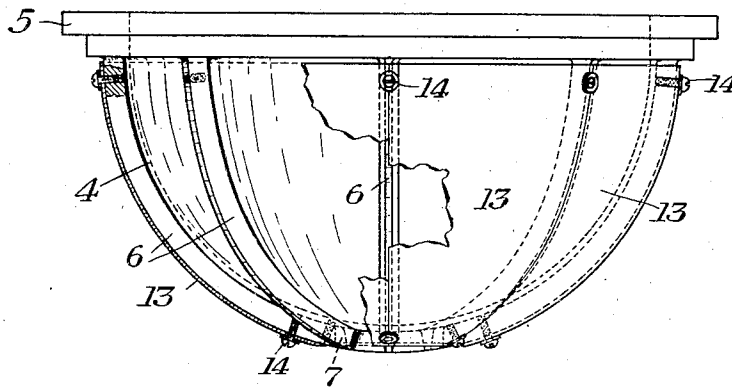


Fig. 4.

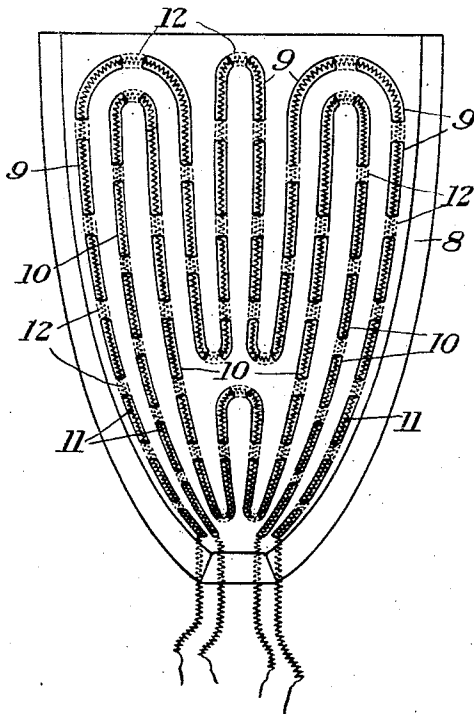
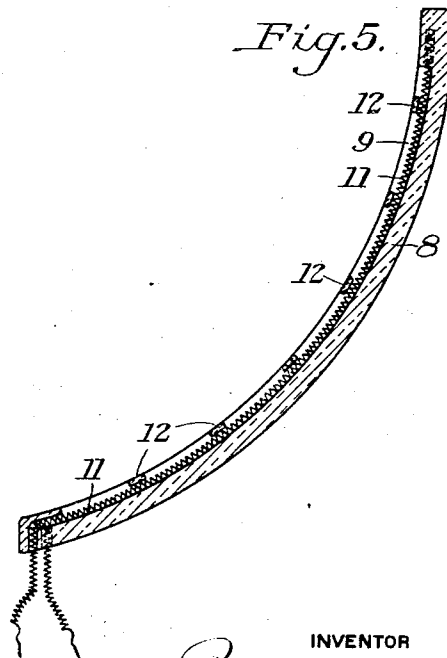


Fig. 5.



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Fig. 7.

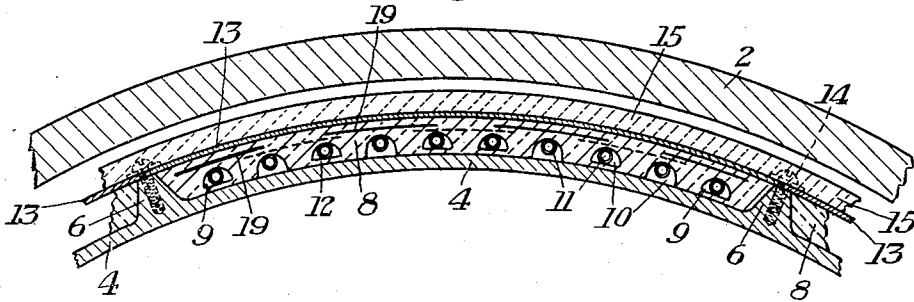


Fig. 6.

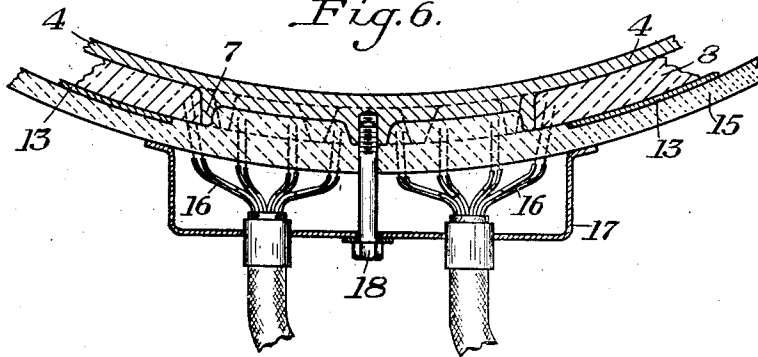
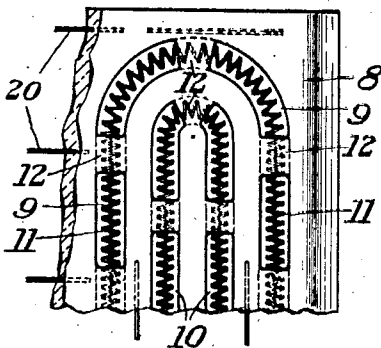


Fig. 8.



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UNITED STATES PATENT OFFICE.

ROSCOE C. HAWK, OF PITTSBURGH, PENNSYLVANIA.

ELECTRIC MELTING POT.

Application filed October 17, 1922. Serial No. 595,083.

To all whom it may concern:

Be it known that I, ROSCOE C. HAWK, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Melting Pots, of which the following is a full, clear, and exact description.

The present invention relates broadly to electrically heated apparatus for metal working purposes, and more particularly to a melting pot especially adapted for use with type metals, although its use in this respect is not limited. It has heretofore been proposed to construct electric melting pots of this general nature and for this general purpose, but the operating experiences with such pots have shown that the cost of upkeep and operation has been such as to materially limit, and in some cases substantially prohibit their use on a large scale.

By this invention there is provided a melting pot so constructed as to secure high thermal efficiency with a correspondingly decreased power consumption and operating cost, and of such nature that repairs may be expeditiously and inexpensively made as required.

In the accompanying drawings there are shown for purposes of illustration only, certain embodiments of the present invention, it being understood that these drawings do not define the limits of this invention, as changes may obviously be made in the construction and operation without departing from the spirit or scope of my broader claims.

In the drawings,—

Figure 1 is a vertical sectional view through one form of apparatus constructed in accordance with the present invention;

Figure 2 is a top plan view, partly broken away, of the construction illustrated in Figure 1.

Figure 3 is a side elevation, partly broken away, of a portion of the apparatus;

Figure 4 is a front elevation of one of the heating units;

Figure 5 is a vertical sectional view through the construction shown in Figure 4.

Figure 6 is a detail sectional view of a portion of the bottom of the melting pot;

Figure 7 is a transverse sectional view illustrating a slightly modified construction; and

Figure 8 is a detail view showing another form of heating unit.

An electric melting pot constructed in accordance with the present invention may comprise a supporting frame or standard of any desired construction. This may conveniently be formed of metal to provide a substantially enclosed chamber whereby heat radiation from the interior thereof is restricted. This frame, where the same is constructed as a metallic casing, is preferably provided with an upper flange 3. Adapted to cooperate with the flange 3 and to be supported thereon is a melting pot 4. This melting pot preferably has thin walls whereby heat applied to the exterior thereof may rapidly penetrate the walls and communicate with the contents of the pot. At its upper edge the pot may be formed with a heavy flange 5 adapted to engage and rest upon the flange 3. In this manner the upper portion of the frame 2 is substantially sealed when the parts are in assembled position.

I have found it desirable to divide the outer surface of the melting pot into a plurality of individual areas. While this may be accomplished in a number of different ways, it may conveniently be carried out by forming the pot with a series of vertically extending ribs 6, which ribs at their upper ends join with the flange 5 and at their lower ends with a base flange 7. These ribs not only provide the individual areas as desired, but materially reinforce and strengthen the pot structure.

The heating means for the pot may comprise a series of heating units, each of the construction illustrated in detail in Figures 4 and 5. Each of these units comprises a main body portion 8 which may be constructed of cement, such for example as asbestos cement, having high resisting and heat insulating properties. Formed in one face of each of the units is an outer channel 9 and an inner channel 10. Each of these channels is adapted to have placed therein a coiled conductor 11 having suitable resistance properties, as is well understood in the

art. After the coils have been placed in position, they may be held in place by providing a series of connecting bridges 12. This may be accomplished by simply cementing small sections across the channels.

The ends of the coils may be extended through suitable openings in the units whereby electrical connection may be made therewith as required.

Each of the units is formed with a curvature of such nature that it will conform to the outer surface of the melting pot and is of such dimensions that it will fit between adjacent ribs 6 and substantially cover the entire individual area defined thereby. The bridges 12 of refractory material maintain the heating units out of direct contact with the metallic wall of the pot such as would serve to short circuit the same, while the open channels permit substantially unrestricted heat radiation. Preferably the channels do not extend but a small fraction of the distance through the body of the units so that the major portion of the body is available as heat insulation. This construction combined with the thin walls of the melting pot, insures high thermal efficiency.

As each heating unit is placed in position on the pot, it may be held in place by mounting thereover a metallic plate 13. Each of these plates is preferably dimensioned to extend to the middle line of adjacent ribs 6 and the adjacent edges of the plates are held by fastening devices 14 passing therebetween and into the ribs. After all of the units and plates have been assembled the entire exterior may be covered to any desired thickness with a body of heat insulating material 15.

The ends of the heating coils are permitted to extend through this covering to enable the connection therewith of conductors 16 for supplying the desired electric current. For minimizing the strain on the connections, the conductors may be held in a casing 17 which is maintained in operative position by a screw 18 entering a threaded recess in the base of the melting pot.

In some cases it may be deemed advisable to provide additional reinforcing means for each of the heating units. This may be conveniently accomplished by molding the same with plates 19 as illustrated in Figure 7, or with small rods or bars 20 as illustrated in Figure 8. In this manner additional strength may be imparted to the heating units.

The advantages of the present invention arise from the provision of a melting pot so constructed that rapid and efficient heat transfer is insured while permitting easy repair and renewal of the heating means as may be required.

I claim:

1. In an electric melting apparatus, a pot,

means dividing the outer surface of the pot into a plurality of individual areas, a separate heating means cooperating with each of said areas, and means for holding said heating means in operative position, substantially as described.

2. In an electric melting apparatus, a melting pot having thin walls, means dividing the outer surface of the pot into a plurality of individual areas, said means serving to reinforce the pot walls, a separate heating means cooperating with each of said areas, and means for holding said heating means in operative position, substantially as described.

3. In an electric melting apparatus, a melting pot having thin walls, means dividing the outer surface of the pot into a plurality of individual areas, said means serving to reinforce the pot walls, a separate heating means cooperating with each of said areas, and sectional means for holding said heating means in operative position, substantially as described.

4. In an electric melting apparatus, a metallic melting pot, and a plurality of individually renewable heating units operatively associated with said pot, each of said units having open channels formed therein and having heating means located in said channels, substantially as described.

5. In an electric melting apparatus, a melting pot having its outer surface formed with a series of ribs, and a separate heating unit mounted between each pair of adjacent ribs, substantially as described.

6. In an electric melting apparatus, a melting pot having its outer surface formed with a series of ribs, a separate heating unit mounted between each pair of adjacent ribs, and means secured to said pot for holding the heating units in operative position, substantially as described.

7. In an electric melting apparatus, a melting pot having its outer surface formed with a series of ribs, a separate heating unit mounted between each pair of adjacent ribs, and sectional means secured to said ribs for holding the units in operative position, substantially as described.

8. In an electric melting apparatus, a supporting means, a melting pot having a flange resting on said means, means dividing the outer surface of said pot into a series of individual areas, and an electric heating unit separately cooperating with each of said areas, substantially as described.

9. In an electric melting apparatus, a supporting means, a melting pot having a flange resting on said means, means dividing the outer surface of said pot into a series of individual areas, an electric heating unit separately cooperating with each of said areas, and additional means for heat insulating said units, substantially as described.

10. In an electric melting apparatus, a melting pot, a series of heating units adapted to substantially cover the outer surface of said pot, and an enclosing shell comprising a series of metallic sections adapted to cooperate with said units for maintaining the same in position, substantially as described. 10

vidual heating unit for melting pots comprising a body portion having an open channel formed in one surface thereof and a heating means located in said channel, substantially as described. 15

In testimony whereof I have hereunto set my hand.

11. As an article of manufacture, an indi-

ROSCOE C. HAWK.