Oct. 13, 1925. 1,557,074

A. M. MacFARLAND

ELECTRIC RIVET FURNACE

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Fig. 1.

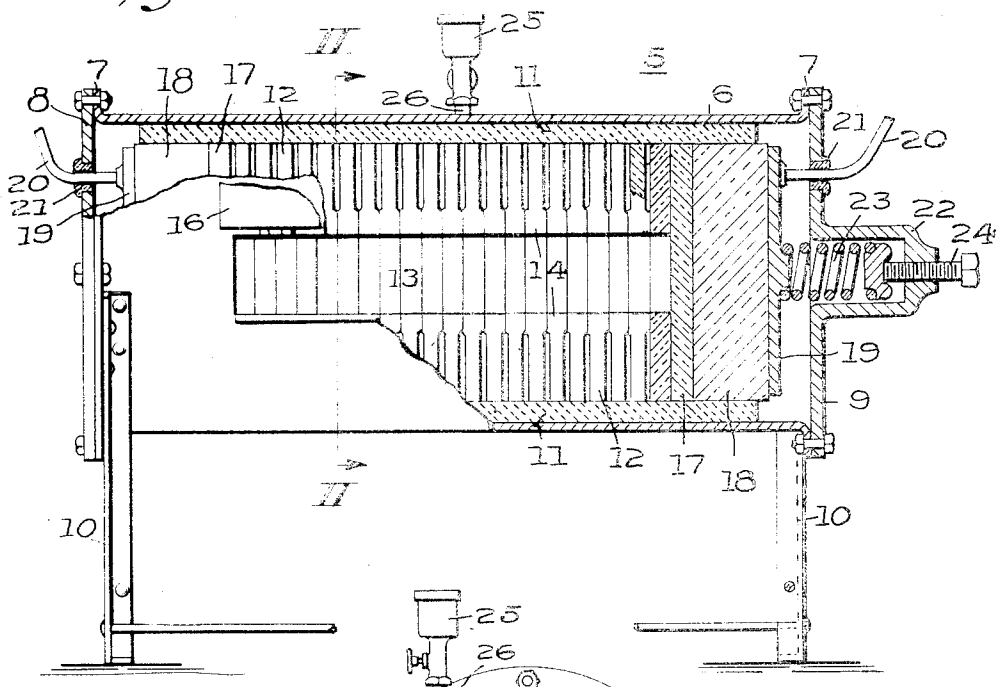
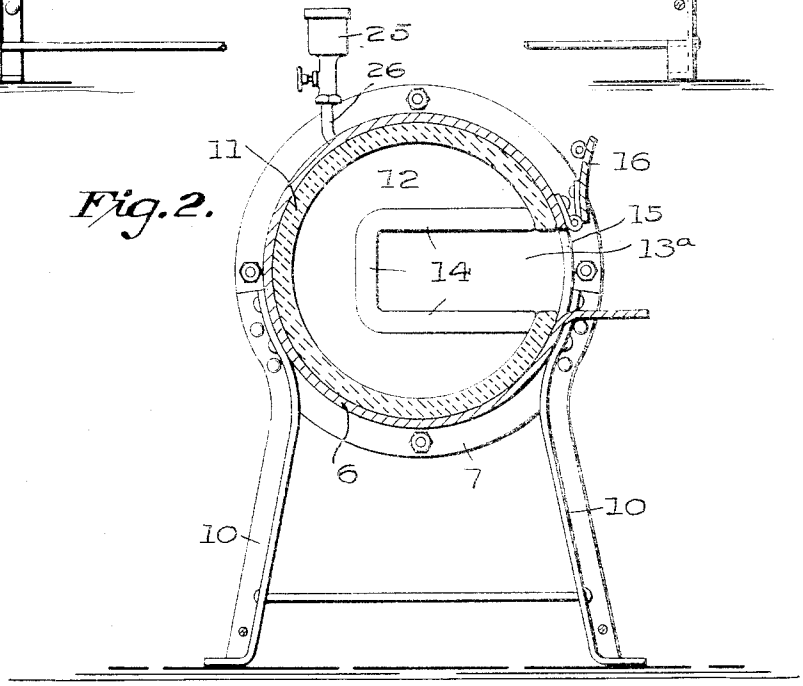


Fig. 2.



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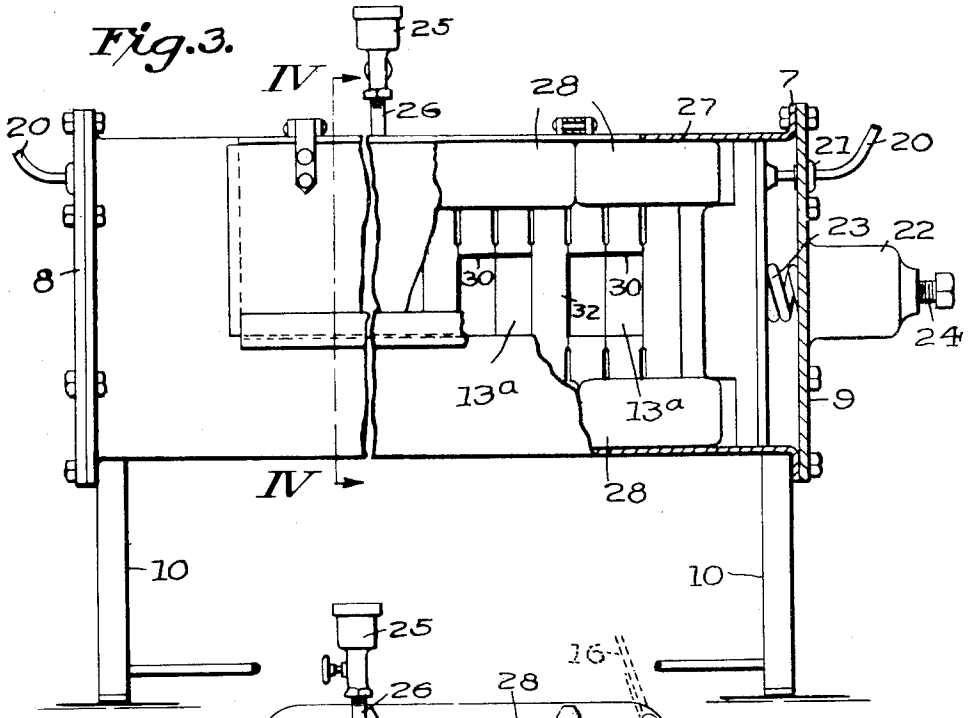
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Fig. 3.



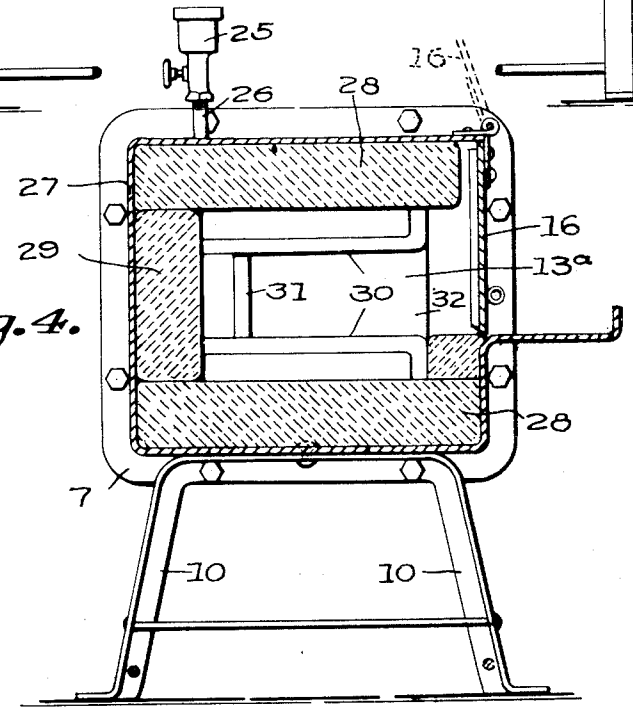


Fig. 4.

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UNITED STATES PATENT OFFICE.

ALLIS M. MacFARLAND, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

ELECTRIC RIVET FURNACE.

Application filed August 3, 1921. Serial No. 489,428.

To all whom it may concern:

Be it known that I, ALLIS M. MacFARLAND, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electric Rivet Furnaces, of which the following is a specification.

My invention relates to electric furnaces and particularly to electrically heated rivet furnaces, and it has for its object to provide a relatively simple and easily operated furnace adapted to heat simultaneously a relatively large number of rivets.

In practising my invention, I provide a metallic drum or casing inside of which is located a plurality of flat carbonaceous plates operatively engaging each other over only a portion of their surfaces. The carbonaceous plates may be integral and substantially circular in contour, and be provided with a substantially radial slot or opening constituting a furnace chamber within which the rivets are located while being heated, or the carbonaceous plates may be divided and so shaped and located relatively to each other as to form a furnace chamber within which the rivets may be located while being heated. Resilient means is provided to compress the carbonaceous plates, and suitable contact terminals are provided to permit of conducting the current to and from the resistor.

In the drawings,

Figure 1 is a view, partly in side elevation and partly in longitudinal section, of an electric rivet-heating furnace embodying my invention;

Fig. 2 is a view, in vertical lateral section, on the line II—II of Fig. 1;

Fig. 3 is a view, in side elevation of a modified form of the device embodying my invention, certain portions being cut away, and

Fig. 4 is a view, in vertical lateral section, of the furnace illustrated in Fig. 3, the section being taken on the line IV—IV thereof.

A furnace 5 comprises a cylindrical metallic drum or casing 6, radially extending integral flanges 7 being provided against which heads 8 and 9 may be bolted. Suitable supporting members 10 are provided and secured to the casing 6 in any desired manner.

A lining 11 of refractory insulating material is placed inside of the casing 6. A plurality of relatively thin carbonaceous plates 12, substantially circular in contour, are placed inside of the refractory lining 11 adjacent to each other. Each of the plates 12 is provided with a substantially radial opening or slot 13, an elongated furnace chamber 13^a being formed by the plurality of slots. Each of the plates 12 has a thickened portion 14 immediately adjacent to the slot 13 so that the adjacent plates will operatively engage each other over only a relatively small area immediately adjacent to the chamber 13^a. An opening 15 is provided in the casing 6 which registers with the open side of the chamber 13^a, and a suitable hinged door 16 may be provided to close the opening 15 when the furnace is not in use or is being heated.

A plurality of carbonaceous blocks 17 and 18 and a metallic terminal plate 19 are provided at each end of the assembled group of plates 12. Current-conducting leads 20 are suitably secured to the terminal plates 19 and extend outwardly through insulating bushings 21 in the heads 8 and 9.

The head 9 has an integral hollow extension 22, in which is located a compression spring 23 and an adjusting screw 24 which permits of adjusting the pressure upon the removable resistor plates 12.

While the temperature at which the resistor plates are operated to heat rivets which may be placed in the chamber 13 is not high enough to cause destructive oxidation by the surrounding air, there is, nevertheless, some oxidation and provision may be made for counteracting such action. A container 25 is located above the casing 6 in which may be placed any suitable hydrocarbonaceous oil which is permitted to drip through a tube 26 upon the heated resistor plates and become volatilized thereby. The sooty vapor produced by this action is effective to neutralize the oxidizing effect of the air by substantially preventing its coming in contact with the plates. A device to produce such sooty vapors is described and claimed in a copending application, Serial No. 454,776, filed March 23, 1921, by G. M.

Little and assigned to the Westinghouse Electric & Mfg. Company.

In the modification illustrated in Figs. 3 and 4, a casing 27, illustrated as substantially rectangular in lateral section, is provided with suitable supporting members 10. Heads 8 and 9 are bolted to the flanged portions 7 at the respective ends of the casing.

A plurality of refractory bricks or blocks 28 and 29 are located inside of the casing 27 in side-by-side relation to provide a chamber in which may be located a plurality of carbonaceous resistor plates 30 and 31. The plates 31 are located between the parallel extending plates 30 and constitute the back wall of the furnace chamber. Intermediate plates 32, substantially coextensive horizontally with the plates 30, may be provided to form a plurality of small heating chambers 13^a. The thickness of the plates 30 and 31 is greater over a small portion of the cross section of the plates immediately adjacent the chamber 13^a so that the adjacent plates engage each other over only a small portion of their total area. This reduces the area traversed by the current, whereby the resistance of the current path is increased.

Means for compressing the resistor may comprise substantially the same elements as those described in connection with the device illustrated in Figs. 1 and 2. Similar current-conducting means are also provided.

It may be noted that the device embodying my invention provides a relatively simple, easily assembled and easily maintained furnace for heating a plurality of rivets, the resistor of which is formed of a plurality of carbonaceous plates, portions only of the surfaces of the adjacent plates being in operative engagement with each other.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof and I desire that only such limitations shall be placed thereon as are imposed by the prior art or are specifically set forth in the appended claims.

I claim as my invention:

1. An electric furnace comprising a plurality of relatively thin refractory resistor members having substantially radial slots therein to form a furnace chamber.

2. An electric furnace comprising a plurality of relatively thin refractory resistor members having substantially radial slots therein to form a furnace chamber, the adjacent resistor members operatively engaging each other adjacent to said radial slots only.

3. An electric furnace comprising a plurality of relatively thin carbonaceous plates placed in side-by-side relation, and having substantially radially extending slots to form a furnace chamber, the adjacent plates having operative engagement with each other over only a narrow portion adjacent said slots, and means for permitting a current to traverse the engaging portions of the plates.

4. An electric furnace comprising a casing, a plurality of relatively thin carbonaceous plates located in side-by-side relation and having substantially radial slots therein to form a furnace chamber and the adjacent plates operatively engaging each other over a narrow strip portion adjacent said slots, means for conducting current to and from said plurality of plates, and heat-insulating material located between said casing and said plurality of plates.

5. An electric furnace comprising a casing, a furnace chamber formed by a plurality of relatively thin carbonaceous plates provided with slots and having their flat sides operatively engaging each other over a narrow strip portion adjacent to the chamber formed by said slots, means for conducting current to and from said plates, means for resiliently compressing said plates, and heat-insulating material located between said casing and said plates.

6. An electric furnace comprising a heat-insulating casing, a plurality of relatively thin carbonaceous plates located in said casing and so shaped and disposed as to provide a furnace chamber extending transversely of said casing, the flat sides of adjacent plates operatively engaging each other over a narrow strip portion adjacent to the chamber, resilient compressing means for said plates and means for conducting current to and from said plates.

In testimony whereof, I have hereunto subscribed my name this 28th day of July 1921.

ALLIS M. MacFARLAND.