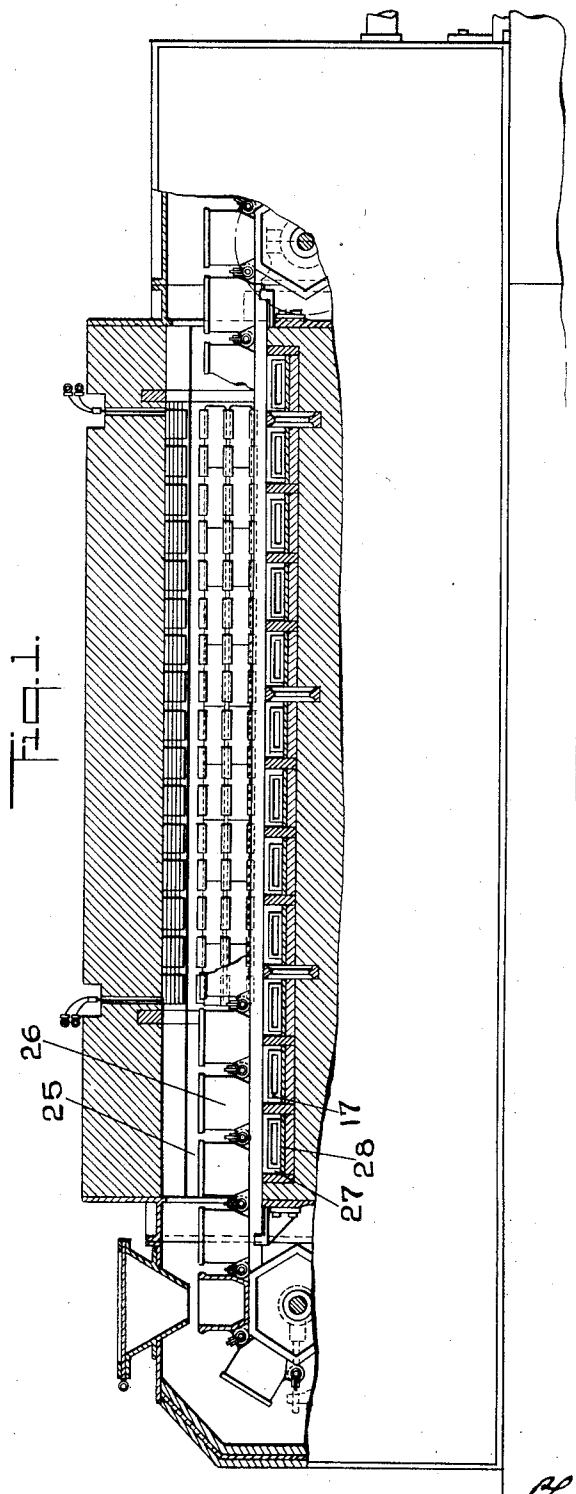
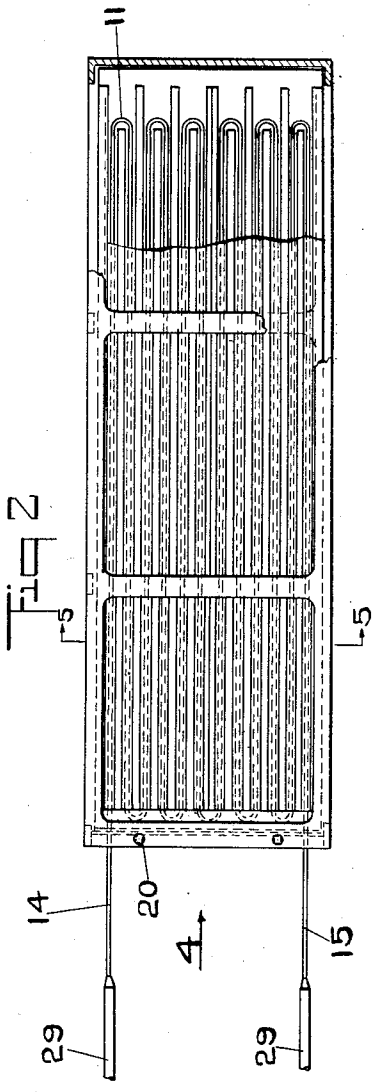
Sept. 30, 1930. D. L. SUMMEY 1,776,845

ELECTRIC RESISTANCE UNIT

Original Filed July 28, 1923 2 Sheets-Sheet 1





INVENTOR
David L. Summey
BY
Philip Lawyer Rice Kenny
ATTORNEYS

Sept. 30, 1930. D. L. SUMMEY 1,776,845

ELECTRIC RESISTANCE UNIT

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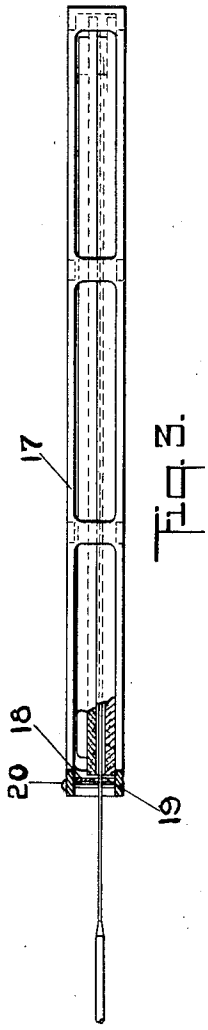


Fig. 3.

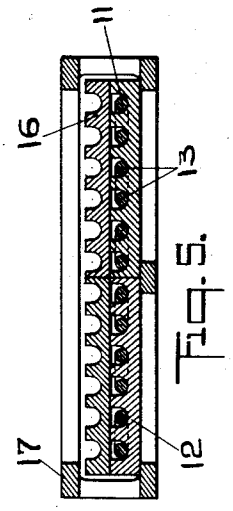


Fig. 5.

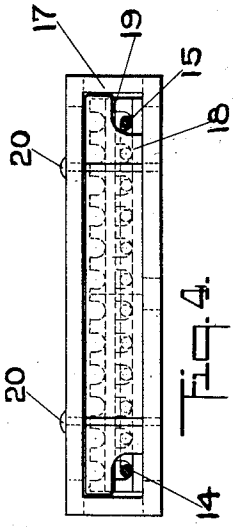


Fig. 4.

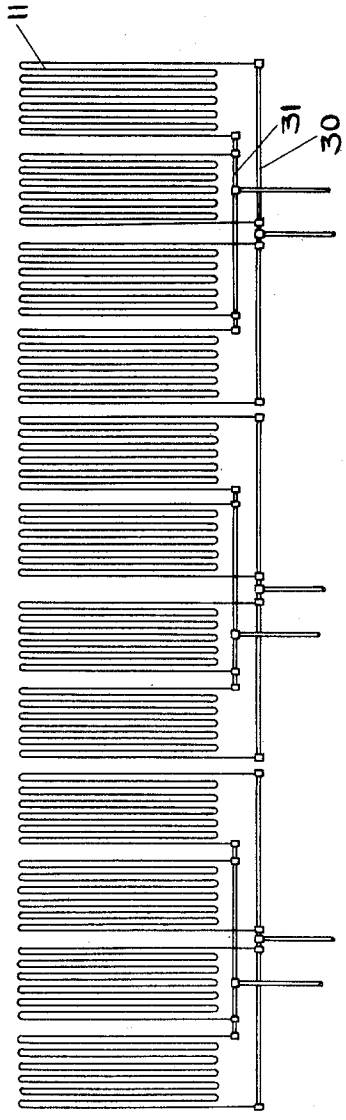


Fig. 6.

INVENTOR
David L Summey
BY
Philip Taylor Rice & Kenney
ATTORNEYS

Patented Sept. 30, 1930 1,776,845

UNITED STATES PATENT OFFICE

DAVID L. SUMMEY, OF WATERBURY, CONNECTICUT, ASSIGNOR TO SCOVILL MANUFACTURING COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT

ELECTRIC RESISTANCE UNIT

Original application filed July 28, 1923, Serial No. 654,295. Divided and this application filed March 26, 1927. Serial No. 178,648.

This invention relates to electric resistance units. The present application is a division from an application filed July 28, 1923, Serial No. 654,295.

It is an object of the invention to provide an effective electric resistance unit capable of being manipulated as a unit to facilitate assembly in and disassembly from its heating location.

With this general object, and other objects in view, the invention consists in the features, combinations, details of construction and arrangements of parts which will first be described in connection with the accompanying drawings and then more particularly pointed out.

In the drawings—

Figure 1 is a more or less diagrammatic sectional view of a heating furnace having mounted therein several electric resistance units constructed in accordance with the invention;

Figure 2 is a plan view (enlarged) with parts broken away and in section, of one of the units;

Figure 3 is a side edge view of the same with parts broken away and in section;

Figure 4 is an end view, with parts in section, looking in the direction of the arrow 4 in Fig. 2;

Figure 5 is a sectional view taken on the line 5—5 of Fig. 2; and

Figure 6 is a wiring diagram.

Referring to the drawings, there is provided a resistance unit comprising an electric resistor and means for linking the parts together as a manipulable unit. While the resistor and its support may vary in construction, in the embodiment here illustrated as an example, a nickle-chromium wire 11 is preformed into a series of reverse hair-pin bends. This wire is supported by block 12 of refractory insulating material, such as fire brick, having a series of parallel grooves 13 in which the respective strands of the zig-zag wire are seated. As indicated in Fig. 5 the block 12 is formed in two parts for convenience of manufacture but they may be considered as a single element. In the embodiment shown, the wire is so arranged that two parallel straight ends or leads 14, 15 are provided at adjacent corners of the unit (Fig. 2).

Covering the seated wire 11 is a refractory insulating cover block 16 which may conveniently be a duplicate of the supporting block 12. The grooves of the cover block give a large heat radiating surface and by using duplicates manufacturing cost is reduced.

While the means for linking the parts together as a manipulable unit may vary, in the embodiment here illustrated as an example, the blocks and the enclosed wire are carried by a skeleton metal frame 17 of an inside capacity to freely but firmly fit the superposed blocks. This frame has one end closed (the right end in Figs. 2 and 3) and the other end open for reception of the blocks. The blocks are inserted with the leads 14, 15 of the wire trailing and are slid into the frame until they engage the closed end thereof.

There is provided, as part of the frame, a closure for the open end thereof. As here shown as an example, the end closure is a plate 18 of a size to fit within the frame and having its corners cut away, as at 19, to clear the lead ends 14, 15 of the wire. After the blocks and the enclosed wire are assembled in the frame, plate 18 is inserted in the open end of the frame and is locked in place by two headed pins 20 which are dropped through suitable alined holes in the top and bottom of the frame, outside the plate 18.

In the best constructions embodying the invention the frame parts will be made of a metal having substantially the same heat resisting qualities as the wire, e. g. nickel-chromium alloy.

With the construction described the blocks and the supported wire are held in place in the frame and the unit may be readily moved about and manipulated as a unit without breakage of the insulating blocks or disarrangement of the parts.

The drawings illustrate one use of these units. A furnace chamber 25 has running therethrough an endless conveyor chain of buckets 26. Below the top strand of the con-

veyor are a series of parallel transverse passages 27 having bottom bearing plates 28. One of the assembled units above described is located in each of these passages. The lead ends 14, 15 of the wire are integral with or connected to connectors 29. In assembly, the resistance unit, including the connectors, is inserted in a chamber with the closed end of the frame foremost and is slid along the bearing plate to the desired position. The passage may be closed, as described in the parent application referred to, by a number of plug bricks perforated for the connectors 29. The joints may be luted with fire clay. Outside the furnace wall the various connectors are connected to bus bars 30, 31, as indicated in the wiring diagram of Fig. 6. Should it become necessary to repair or renew a resistor wire, the unit may be readily pulled out of its passage upon removal of the plug bricks and disconnection from the bus bars. The unit itself is readily disassembled by removing the pins 20 and plate 18. The unit can be manipulated and moved about without damage and its assembly in and disassembly from its heating location can be easily carried out.

What I claim is:

1. An electric resistance heating unit comprising a grooved refractory insulating supporting block, a resistor arranged in a number of reverse hair-pin bends laid in said grooves, a skeleton metal frame for carrying said block having one closed side end and one open side end through which the insulating block is insertible lengthwise, and a closure for the open end insertible after the blocks are in place.

2. An electric resistance heating unit comprising a skeleton metal frame having one closed side end and one open side end, a closure for the open end, a refractory insulating supporting block insertible lengthwise through the open end, said block having grooves extending longitudinally between the open and closed ends, and a resistor wire arranged in a number of reverse hair-pin bends laid in said grooves.

In testimony whereof, I have hereunto set my hand.

DAVID L. SUMMEY.