M. S. CLAWSON.

ELECTRIC FURNACE.

APPLICATION FILED JULY 13, 1920.

1,429,489.

Patented Sept. 19, 1922.

2 SHEETS—SHEET 1.

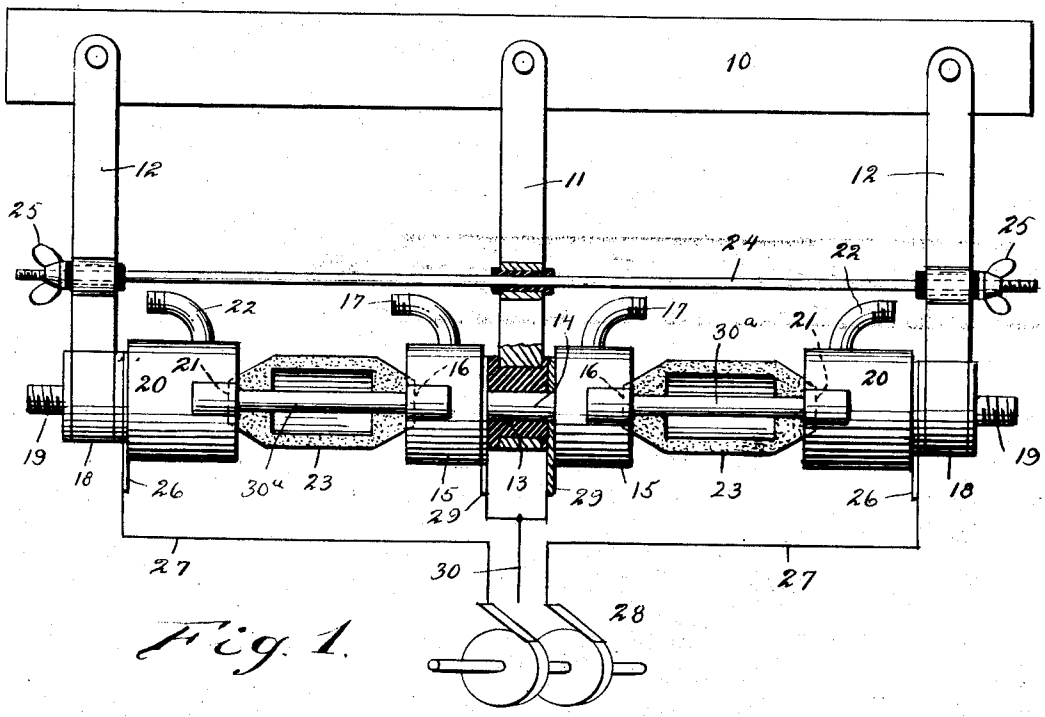


Fig. 1.

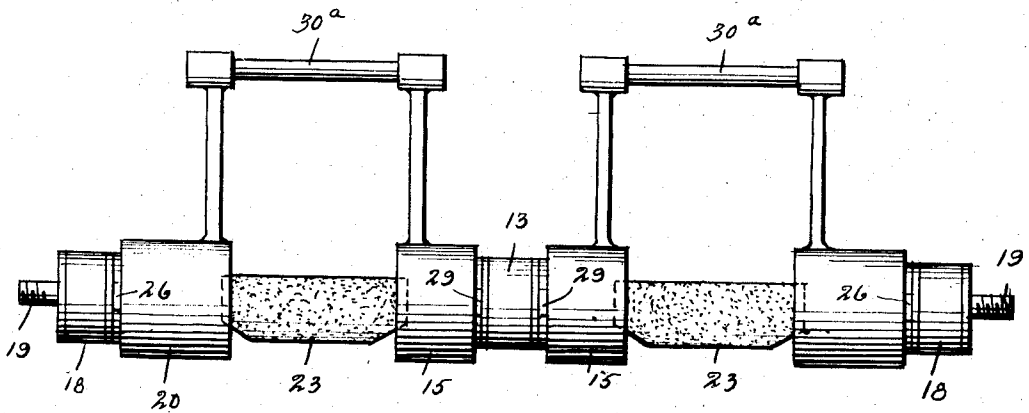


Fig. 2.

Witness:
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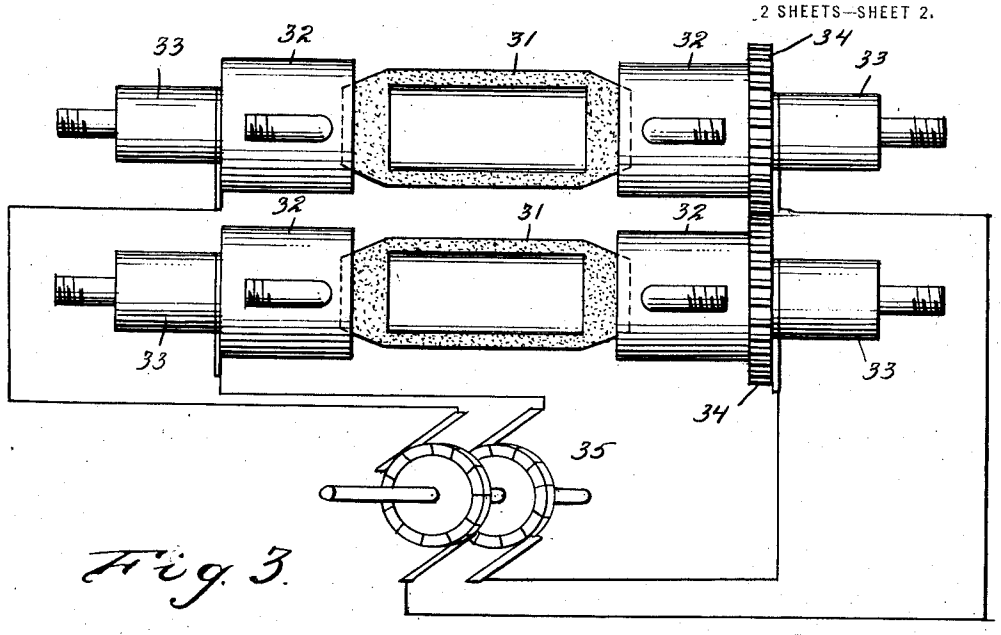


Fig. 3.

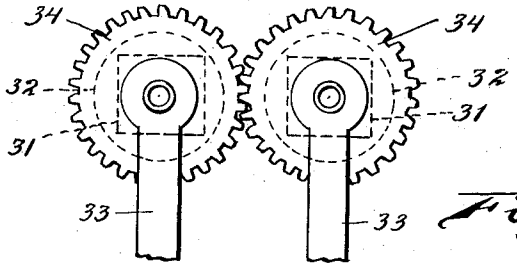


Fig. 4.

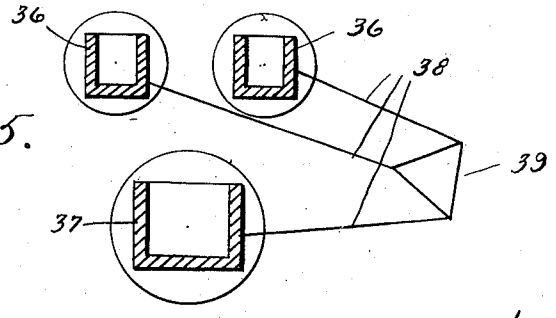


Fig. 5.

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UNITED STATES PATENT OFFICE.

MONROE S. CLAWSON, OF UPPER MONTCLAIR, NEW JERSEY.

ELECTRIC FURNACE.

Application filed July 13, 1920. Serial No. 395,872.

To all whom it may concern:

Be it known that I, MONROE S. CLAWSON, a citizen of the United States, residing at Upper Montclair, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Electric Furnaces, of which the following is a specification.

This invention relates to electric furnaces, particularly to those of the resistance type, and has for its object the provision of a furnace by means of which two or three phase currents may be utilized.

The present invention more specifically relates to an improvement over or adaptation of my prior Patent No. 1,306,948, issued June 17, 1919, the structure varying from that shown in the patent in the respect that a plurality of crucibles are used, arranged either in tandem or in parallel relation.

An additional object is the provision of a furnace of this character which will be simple and inexpensive, highly efficient, which may be easily discharged, and a general improvement in the art.

With the above and other objects and advantages in view, the invention consists in the details of construction to be hereinafter more fully described and claimed and illustrated in the accompanying drawings in which—

Figure 1 is a plan view showing one form of the device,

Figure 2 is a front elevation thereof,

Figure 3 is a plan view of a modified form,

Figure 4 is a fragmentary end elevation thereof, and

Figure 5 is a diagrammatic cross sectional view through a still further modification.

Referring more particularly to the drawings, the numeral 10 designates a supporting base from which extend arms 11 and 12 and the arms 12 must be pivoted with respect to the base so as to be capable of movement toward or from each other. Carried by the outer end of the central arm 11 is a bearing structure 13 within which is rotatable a stem 14 carrying hollow heads 15 which have their outermost faces recessed, as indicated at 16. The numeral 17 designates tubes for the passage of water for cooling these heads. Carried by the outer ends of the arms 12 are bearing members 18 within which are rotatable stems 19 carrying hollow water cooled heads 20 having their confronting faces recessed, as indicated at 21. 22 designates the water conducting tubes for cooling these heads. The numeral 23 designates the crucibles which are disposed between the heads 15 and 20 with their ends seating within the recesses 16 and 21.

In order that the heads 20 may be urged into clamping engagement with the crucibles, I provide a rod 24 which extends through insulating bushings in the arms 11 and 12 and which has its ends threaded and provided with wing nuts 25 by means of which the tension may be varied for holding the heads firmly against the crucibles.

Associated with the heads 20 are conducting strips 26 which are connected by wires 27 with the source of electric energy designated at 28. Associated with the heads 15 are strips 29 both connected with a single return wire 30 leading to the electrical device. Suitable handles 30^a are provided for effecting tilting of the heads and consequently the crucibles.

In the operation it will of course be seen that current passing through the wires 27 will be conducted to the separate crucibles and as these crucibles are made of resistance material it is obvious that a high degree of heat will be obtained which will result in melting the metals placed within the crucibles.

In the form shown in Figures 3 and 4, the crucibles 31 are arranged in parallel relation and are engaged between hollow water-cooled heads 32 suitably mounted for rotatable movement within bearings 33. The means for urging the bearings toward each other is not shown as this might be the same as in the previously described form. Two adjacent heads 32 carry gears 34 which intermesh so that when one of the units formed by a pair of heads and the crucible therebetween is rotated, the other will also be rotated. No handle structure is shown but the same construction might be provided as shown in Figures 1 and 2. The heads are connected, as shown, with a two-phase electric generator indicated at 35. In this way it will be seen that both phases may be utilized for operating the furnace.

Referring to the form shown in Figure 5 an arrangement will be seen by means of which a three-phase current is used. In this form the numeral 36 designates upper spaced parallel crucibles which may be tipped by any suitable means either simulta-

neously or separately and 37 designates a lower crucible or ladle into which the contents of the crucibles 36 are poured. The crucibles are connected by wires 38 with a three-phase source of current indicated by the triangle 39. In some places the three-phase current is the only supply available and this form of the device permits its ready use. In this type of apparatus this ladle 37 must be kept hot the same as the crucibles themselves. It is of course apparent that in this form each crucible and the ladle takes one phase of the current.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a simply constructed and easily operated furnace in which an alternating current may be used having more than a single phase.

While I have shown and described the preferred embodiments of my invention it is of course to be understood that I reserve the right to make such changes in the form, construction, and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. An electric furnace comprising a main supporting member, a central member carried thereby, side members pivotally mounted on said supporting member and movable toward or from said central member, revoluble heads mounted in said central member, other heads revolubly mounted within said side members, and resistance members engaged between said heads and adapted to hold the material to be heated.

2. An electric furnace comprising a main supporting member, a central member carried thereby, side members pivotally mounted on said supporting member and movable toward or from said central member, revoluble heads mounted in said central member, other heads revolubly mounted within said side members, resistance members engaged between said heads and adapted to hold the material to be heated, and means for moving said side members toward said central member.

3. An electric furnace comprising a support, a central member extending therefrom, side members pivotally mounted upon said support, a pair of heads rotatably mounted on said central member and connected with the common return wire of a three-wire current outfit, heads rotatably mounted upon said side members and connected separately with the remaining wires of the current supply, and crucibles arranged between said first and second named heads.

4. An electric furnace comprising a support, a central member extending therefrom, side members pivotally mounted upon said support, a pair of heads rotatably mounted on said central member and connected with the common return wire of a three-wire current outfit, heads rotatably mounted upon said side members and connected separately with the remaining wires of the current supply, crucibles arranged between said first and second named heads, and means for moving said side members toward said central member whereby said crucibles will be clampingly engaged between the heads.

5. An electric furnace comprising a plurality of heads arranged in pairs, and crucibles engaged between the heads of each pair, the heads of each pair being connected with one phase of a polyphase current machine.

6. An electric furnace comprising a plurality of rotatably mounted heads, crucibles clamped between said heads, means for simultaneously rotating the heads, and said crucibles being connected individually each with a phase of a polyphase source of current.

7. An electric furnace comprising a plurality of rotatably mounted heads arranged in pairs, crucibles clampingly engaged between the respective pairs of heads and each connected with one phase of a two-phase source of current, and means for simultaneously rotating said heads.

8. An electric furnace comprising two pairs of heads, and crucibles secured between the heads of each pair, each crucible being connected with one phase of a polyphase current machine.

In testimony whereof I affix my signature.

MONROE S. CLAWSON.