Krieder et al.

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[54] **VACUUM ELECTRIC FURNACES**

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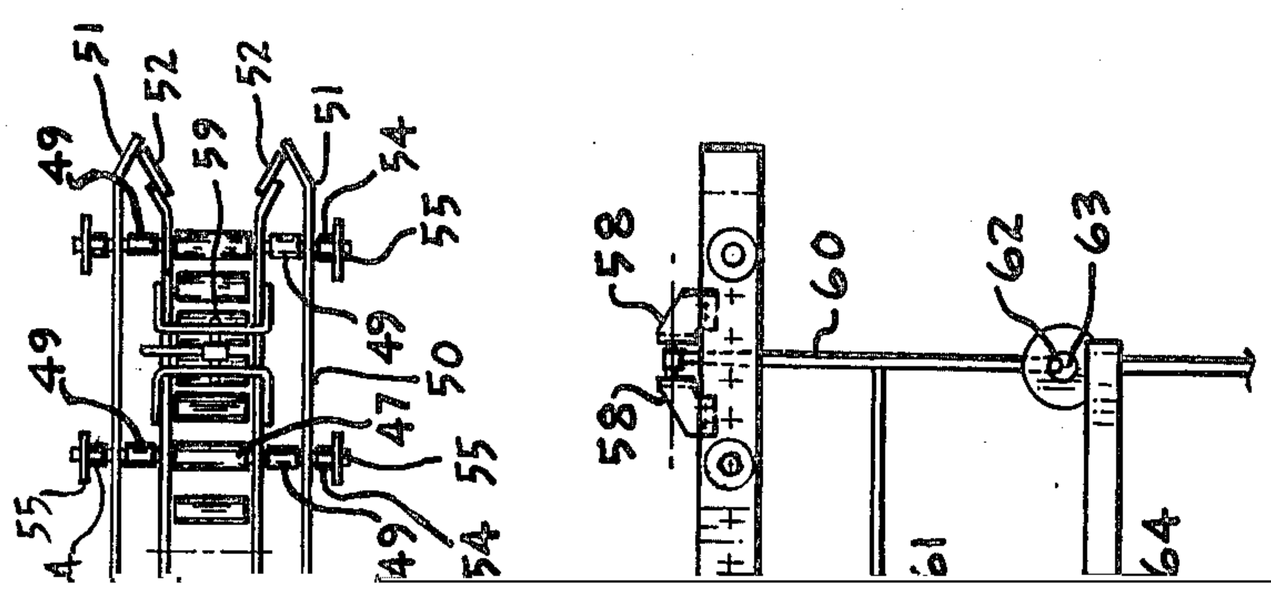
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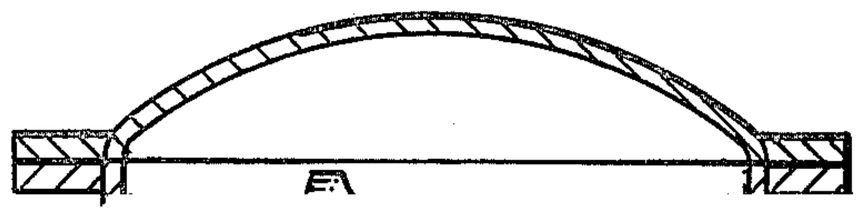

VACUUM ELECTRIC FURNACES

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to vacuum electric furnaces having a plurality of aligned treating zones and more particularly to apparatus for moving work pieces

process.

The structures heretofore available for moving work pieces within a vacuum furnace have various shortcomings, do not make adequate provision to accommodate the growth of both the supporting rails and carrier oc-

FIG. 8 is a sectional view, enlarged, taken approximately on the line 8—8 of FIG. 5; and

FIG. 9 is a sectional view, enlarged, taken approximately on the line 9—9 of FIG. 5.

It should, of course, be understood that the description and drawings herein are illustrative merely and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawings, a vacuum electric furnace is there illustrated which includes a plurality of aligned vessels constituting a preheating section A, a treating section B and a cooling section C. An entrance door **15** is provided supported in any desired manner for movement to an open position for access to the interior of the section A. The entrance door **15** in closed position seals the interior of the furnace against fluid or vacuum leakage.

An isolating valve **16** is interposed between the furnace sections A and B to prevent fluid or vacuum leak-

placement by nuts **34** which are not however tightened to the extent to impose any restraint on expansion or contraction.

Intermediate track rails **35** are also provided mounted and supported in the same manner as the end track rails **32.** The rails **32** and **35** are of any suitable metallic material.

The supports thus provided for the rails **32** and **35** accommodate the growth in length of the track rails **32** and **35** upon increase in temperature attendant upon the heating thereof over the wide range of temperatures which occur within the furnace section A from ambient temperature at shut down to operating temperature for heating, as well as the shrinkage thereof upon cooling.

The rails **32** at their terminal ends **36** in the furnace section A, at the entrance and exit of the furnace section A, are preferably relieved to guide the carriers as hereinafter explained.

In order to operate the carriers hereinafter to be described a plurality of operating sprockets **40** on shafts **41** are provided preferably with mounting mechanism **42** activated from outside the furnace section A, two being utilized on each side in a specific embodiment of furnace section A.

outer frame bars **50** parallel to the frame bars **46** for substantial portions of their length but interrupted to avoid stress transmission to the bars **46.** The outer frame bars **50** also have inturned end portions **53.** The shafts **48** at predetermined locations are extended outwardly through the frame bars **50** through fixed and elongated openings **48***a* and **48***b* to allow for expansion and contraction and for the reception of track engaging rollers **54** with outer washers **55.** The rollers **54**

and heating elements disposed within the reflective shield, the improvement which comprises

spaced parallel longitudinal track rails within the chamber and interiorly of the heating elements,

members for supporting said longitudinal track rails,

said connecting members between supporting members and said track rails accommodating longitudinal expansion and contraction of said track rails

work supporting members are carried in pendant relation on said carrier brackets.

12. The combination defined in claim 11 in which said work supporting members are pivotally carried in

section for accommodating said gate means between the ends of the rails of each chamber section.

said gate means being movable in the space between