March 19, 1929. J. F. BAKER 1,705,703

FURNACE

Filed May 27, 1926

Fig. 1.

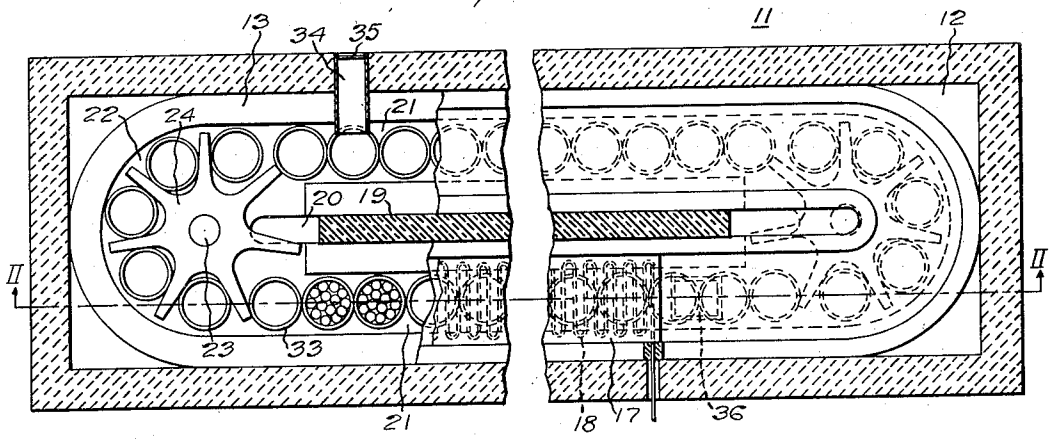


Fig. 2.

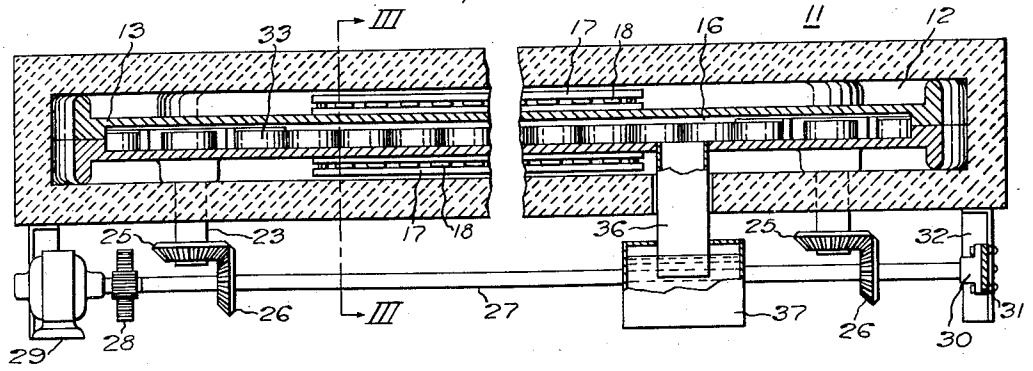
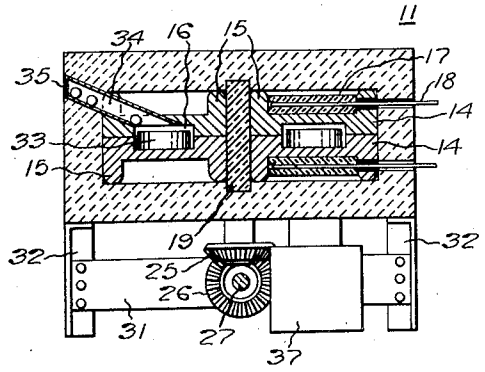


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN F. BAKER, OF MANSFIELD, OHIO, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

FURNACE.

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My invention relates to furnaces and especially to conveyors for use in furnaces.

An object of my invention is to provide a simple, efficient conveyor that may be manufactured at a relatively low cost.

Another object of my invention is to provide means to produce a more uniform annealing of material by causing it to be repeatedly turned.

Another object of my invention is to provide an efficient positively-acting driving means.

Further objects will be apparent from the drawing and the description which follows.

In the present embodiment of my invention, hoops or other suitable containers are slidably positioned in a furnace muffle. Motor-driven star wheels or other actuating means are provided to drive the hoops along the track in the muffle. The objects to be annealed are fed in at an inlet, and an outlet, preferably in the floor of the muffle, is provided at a distant point from the inlet through which the annealed objects are discharged.

In the drawings,

Figure 1 is a horizontal sectional view of the furnace embodying my invention,

Figure 2 is a longitudinal vertical section of the furnace and muffle taken on the line II—II, of Fig. 1, and

Figure 3 is a transverse section taken on the line III—III of Figure 2.

A furnace 11 has a chamber 12 in which is placed a muffle 13. The muffle 13 is here shown as made in two horizontal sections 14. Each section is provided with flanges 15 for spacing and strengthening purposes. Each section has a recess portion 16 and these recesses, when the muffle sections are assembled, register to form a longitudinal continuous track or passageway.

Suitable heating means 17, preferably electrical, are provided on each muffle section. Each of these heating means is provided with a heating coil 18 which is, of course, properly insulated.

A partition or insulating wall 19 may be placed within the hollow portion 20 of the muffle. The muffle passage preferably comprises two longitudinal portions 21 which are connected, at their ends, by enlarged portions 22.

Rotatably mounted on a shaft 23 in each of these enlarged portions is a star wheel 24. At the other end of the shaft 23 is a bevel gear wheel 25 which meshes with a bevel gear wheel 26. The gear wheels 26 are mounted on a shaft 27 that is operatively connected, by suitable gearing 28, to a motor 29.

The shaft 27 is mounted in bearings 30 which are supported by cross bars 31. The cross bars 31 may be conveniently secured to furnace supports 32.

Resting on the floor of the muffle passage are suitable conveying means which are here shown as containers or hoops 33. These hoops are in substantial contact with each other, except in the enlarged end portions where they engage with the star wheels. These containers preferably have no top and no bottom.

An inclined inlet 34, for the purpose of feeding material to the conveying means, is provided. This inlet may have a flap valve 35 to close the inlet except when material is being fed through. An outlet 36, preferably opening through the floor of the muffle passage, has its lower end extending into a fluid-containing tank 37.

In the operation of the furnace, after it has reached the proper temperature, the motor may be started and, as is apparent, the star wheels, when rotated will drive the hoops along the floor of the muffle passage. Material may be fed in at the inlet either intermittently or continuously and will fall into the hoops and be carried along, being gradually annealed. Of course the time of passage between the inlet and the outlet may be so determined as to properly anneal the material.

As each hoop passes over the outlet, the annealed material will drop through it into the fluid-containing tank to quench the same. The tank, with its contents, also serves as a liquid seal. This furnace, while obviously of general utility, is especially adapted for use as a bright-annealing furnace.

In such furnaces the muffle is filled with a gas which will not chemically combine with the material to be annealed. Since such gases are expensive, it is desirable to have muffle passages of small volume. It is also desirable to have the passage of very low height as compared with its length. Such a passage I am enabled to provide by the use of my novel conveying means.

My furnace is especially adapted for the bright annealing of balls for bearings or other rotatable objects. Since the hoops have

no bottoms, the balls rest on the floor of the passage and, as the hoops are driven along the floor of the passage, the balls will roll thereon. They will thus be turned over and over, and a uniform annealing of the balls will be insured.

It, of course, will be obvious that this invention may be practiced in other ways and by other means than those herein illustrated and, therefore, I do not wish to be limited to the forms shown.

I claim as my invention:

1. A conveying apparatus comprising a continuous track, said track being provided with an outlet, a plurality of containers open at their tops and bottoms adapted to travel on said track, and means to drive said containers whereby each container is caused to periodically register with said outlet.

2. A conveying apparatus comprising a continuous track, said track being provided with a discharge opening, a plurality of hoops adapted to slide on said track, each hoop being in operative contact with adjacent hoops, and means to cause the hoops to progress along said track.

3. A conveying apparatus comprising a continuous track, said track being provided with a discharge opening, a plurality of hoops adapted to receive material and to slide on said track, each hoop being in operative contact with adjacent hoops, and a star wheel to successively engage the hoops to drive them along said track, whereby each hoop is caused to periodically register with said opening to have its contents discharged therethrough.

In testimony whereof, I have hereunto subscribed my name this 20th day of May, 1926.

JOHN F. BAKER.