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REVOLVING FURNACE FOR VOLATILIZING ZINC ORES.

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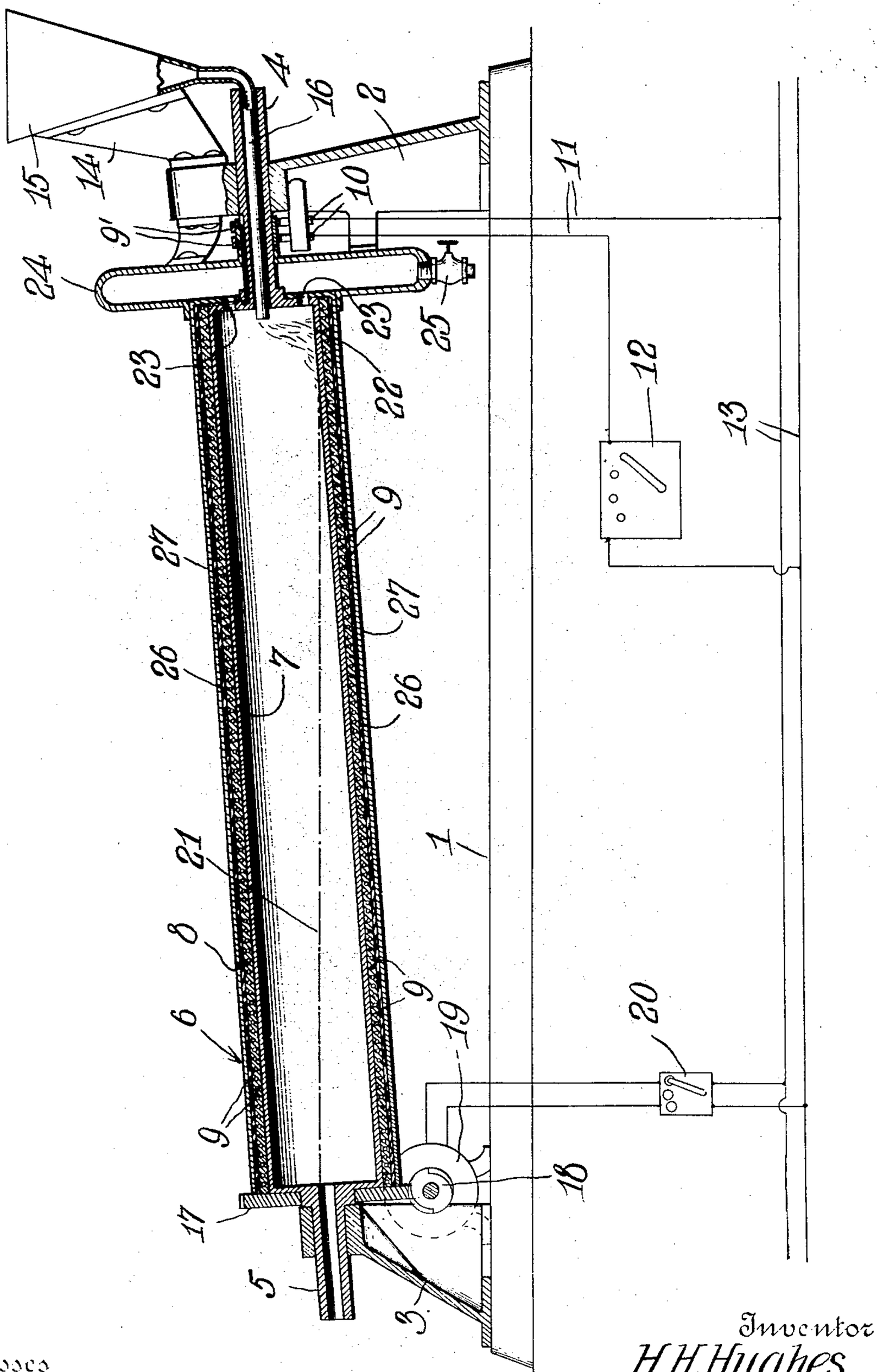
920,143. Patented May 4, 1909.



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UNITED STATES PATENT OFFICE.

HARRY H. HUGHES, OF SPRINGFIELD, MISSOURI.

REVOLVING FURNACE FOR VOLATILIZING ZINC ORES.

No. 920,143. Specification of Letters Patent. Patented May 4, 1909.

Application filed April 6, 1908. Serial No. 425,531.

To all whom it may concern:

Be it known that I, HARRY H. HUGHES, a citizen of the United States, residing at Springfield, in the county of Greene and State of Missouri, have invented certain new and useful Improvements in Revolving Furnaces for Volatilizing Zinc Ore; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to furnaces for volatilizing zinc ore, and has for its object to provide a furnace of this kind in which the temperature can be controlled with certainty.

Another object is to provide a device of this kind in which the degree of heat is automatically applied to that portion of the furnace where it is most needed.

Another object is to provide a furnace which will automatically agitate the residue from the ore in order that all of the zinc thereof may be evaporated.

For these and still other objects which will appear as the description proceeds the invention consists of certain novel features, arrangements and combinations of parts of which the herein described furnace is one of many possible embodiments.

While herein the description refers to minute details of the invention, the invention is not limited to these as the details of construction and combination may be greatly varied without departing from the spirit and scope of the invention.

In the annexed drawing forming a part of this specification which is for illustrative purposes only and therefore not drawn to any particular scale, the figure is a longitudinal vertical sectional view of the furnace.

The furnace is supported on a suitable base 1, having a forward standard 2, and a rear standard 3, carrying suitable bearings in which are supported the upper and lower trunnions 4 and 5, of the revolving furnace 6. The furnace is lined with an inner layer 7, of refractory material, for instance magnesium oxid. Next to the lining 7 is a layer of enamel or the like 8, in which are embedded heating wires 9, passing up through the trunnions 4 to the collector rings 9′, contacted by suitable brushes 10, having conductors 11, connecting the same through an adjustable resistance 12, to the line wires 13. The amount of current passing through the collector rings 9′ is regulated by means of the resistance 12, so that the exact desired temperature in the furnace may be obtained.

Brackets 14, on the standard 2 support a hopper 15, having a lower tube 16, passing through the trunnion 4 into the furnace 6. The powdered zinc ore is fed down through this hopper and tube into the furnace. The lower end of the furnace is provided with a gear 17, adapted to be rotated by a worm 18, on a suitable motor, or other source of power 19, connected to a suitable starter 20.

It will be noticed that the furnace 6 is placed in such a slanting position that when the melted residue 21 fills said furnace enough for the same to pass out through the trunnion 5, a space 22 is left free of the melted material, or the material lies thereon in a very thin layer. This is the material newly introduced into the furnace, and because this material lies thinnest at this point the temperature at this point is hottest and serves to more effectually and quickly raise the ore to the desired temperature. Openings 23 permit the zinc vapor to pass out of the furnace where they are condensed. The zinc may be collected in any suitable manner, and herein I illustrate a hood 24 covering the upper end of the furnace and provided with an opening 25, at the lower side thereof. It is, however, understood that I do not limit myself to any particular arrangement of this kind.

The furnace 6 is provided on the outside with a layer 26, of suitable heat insulating material, which may be held in place by a metal sheet 27.

The operation of the device is obvious. The powdered zinc ore is fed down through the hopper 15 and tube 16 into the furnace and falls upon the highly incandescent lining 7, the heat being such that the zinc is easily volatilized but is not oxidized, the furnace being air tight and air being thus excluded. The melted material is passed on toward the trunnion 5, and is continually stirred up by the revolving furnace and all of the residue passes out from the trunnion 5, when the zinc is fully extracted from the ore.

Having thus described my invention what I claim and desire to secure by Letters Patent is:—

1. In combination with a cylindrical furnace provided at one end with a central longitudinal tubular trunnion bearing, an annular hood of greater diameter than the furnace rigidly mounted upon said trunnion

bearing and communicating with the interior of the furnace, means for rotating the cylinder, means for heating the cylinder and a hopper supported at one end of the furnace above said trunnion bearing and provided with a cylindrical feed tube which extends through said bearing and said hood and projects into the furnace.

2. In combination with a cylindrical furnace provided at one end with a central longitudinal tubular trunnion bearing, and a plurality of openings in its adjacent end wall around said bearing, an annular hood of greater diameter than the furnace to collect the volatilized ore, rigidly mounted upon said bearing and having a plurality of openings to register with those of the furnace, a hopper supported at one end of the furnace and provided at its bottom with a cylindrical feed tube which extends through and fits closely within said trunnion bearing and projects into one end of the furnace, and means for withdrawing the volatilized ore from the hood.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HARRY H. HUGHES.

Witnesses:
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