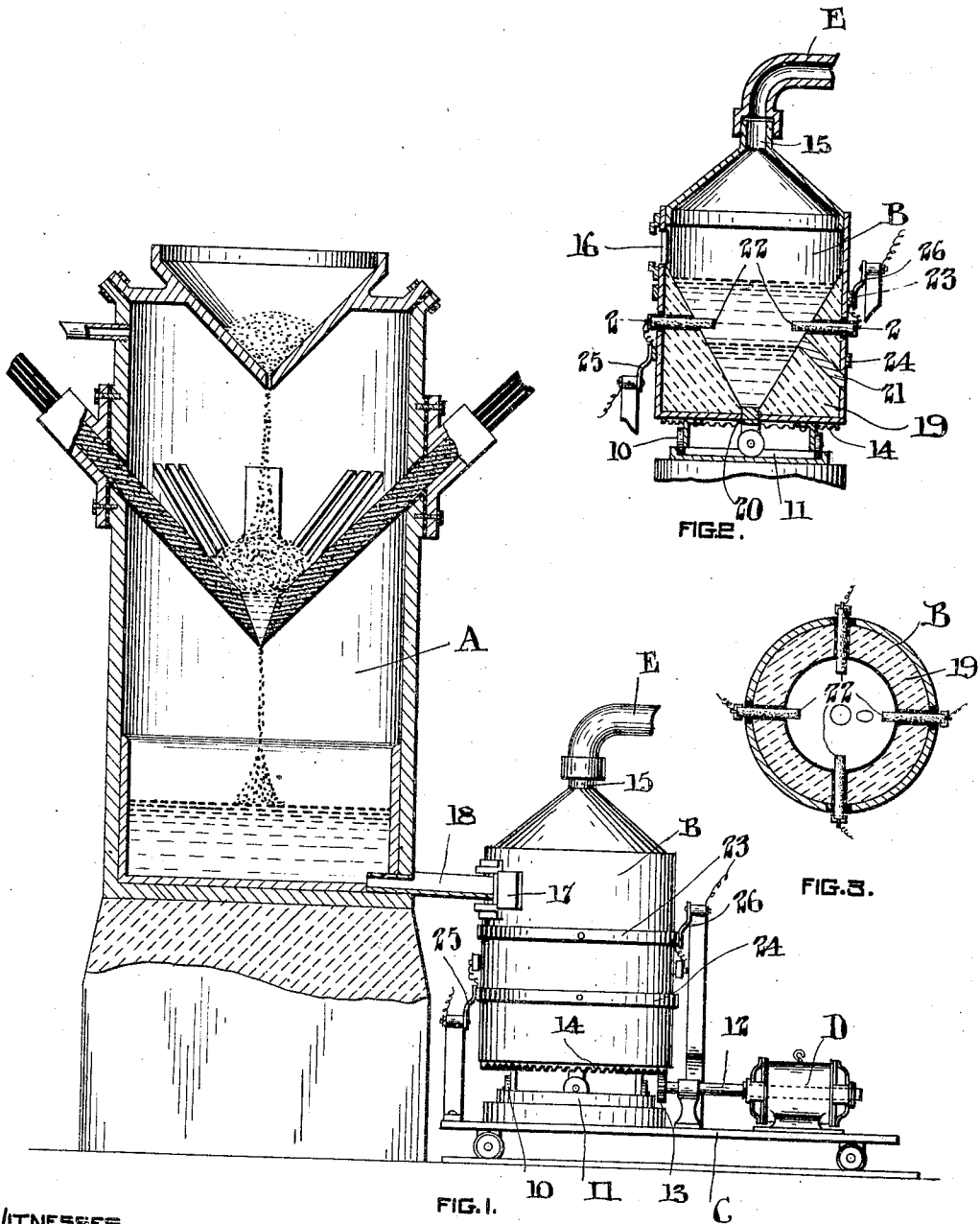


J. H. REID.
 APPARATUS FOR HEATING AND SEPARATING METALS.
 APPLICATION FILED MAY 5, 1909.

950,028.

Patented Feb. 22, 1910.



WITNESSES

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APPARATUS FOR HEATING AND SEPARATING METALS.

950,028.

Specification of Letters Patent.

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Application filed May 5, 1909. Serial No. 494,025.

To all whom it may concern:

Be it known that I, JAMES HENRY REID, of Newark, in the State of New Jersey, United States of America, have invented certain new and useful Improvements in Apparatus for Heating and Separating Metals, of which the following is a specification.

My invention relates to improvements in apparatus for heating and separating metals, and the objects of my invention are to provide an improved form of apparatus in which the metals of different specific gravities may be separated by rotation of the containing vessel and in which certain of the metals may, during rotation, be subjected to additional heat, electrically produced for the purpose of refining the same or volatilizing undesirable elements therein.

In an earlier application Serial No. 475,907, filed February 3rd, 1909, I have disclosed a process of treating metals with a scorifier, and afterward separating the scorifier therefrom. I have found that if means are provided to heat the slag in the rotary converter employed in the completion of the process, a more effective result is attained, and certain elements, such as any lead in the slag, may be volatilized.

While the present apparatus is particularly useful, in connection with this process, yet, it will be apparent that its use is not limited thereto, as it could be used in any case where it is desired to at once rotate and heat a molten mass of metal or other substances.

In the drawings, Figure 1 is an elevation partially in section of the apparatus shown in connection with an electric furnace, of a type which I have invented. Fig. 2 is a vertical section through the rotary converter. Fig. 3 is a section on the line 2-2, Fig. 2.

In the drawings, like characters of reference indicate corresponding parts in each figure.

Referring to the drawings, A represents an electric furnace of the type such as that disclosed in my United States Patent No. 910,581, granted January 26th, 1909.

B represents a vessel rotatable about a vertical axis, this being accomplished, in the embodiment illustrated by providing a series of rollers 10 which run on a track 11 on a truck C, the said truck also carrying an electric motor D, the shaft 12 of which is connected by a pinion 13 with an annular

gear 14, on the underside of the vessel. In this manner, the vessel may be rotated at any desired rate of speed.

Provision is made for exhausting the surface of the metal in the vessel, and the means which I have illustrated, for accomplishing this, comprise a conducting pipe E, which fits over an outlet pipe 15 on the vessel. The material to be treated is introduced into the interior of the vessel through an opening 16 in the sides thereof adapted to be closed by a door 17 of suitable construction. In practice, the spout 18 of the furnace A may be inserted through the opening 16, and then when the vessel B has received a determined charge, it may be withdrawn on the truck C and rotated. The vessel is provided with a lining 19 of refractory material, and the interior is preferably conical and provided with a tap hole 20 at the bottom and a second tap hole 21 a distance up the side, the second tap hole being preferably used for the outlet of slag, while the lower one 20 is for the withdrawal of the precious metal.

To provide for heating the slag or, in fact, of any material within the vessel, a plurality of electrodes 22 are provided extending through the walls of the vessel and suitably insulated therefrom.

To supply the electrodes with current during rotation of the vessel, conducting rings 23 and 24 are provided on the exterior of the vessel adapted to be engaged by suitable fixed brushes 25 and 26 which are connected to a source of power. The electrodes are suitably connected to the rings 23 and 24 so that opposite electrodes will be connected to different rings.

In using the apparatus, assuming that it is employed in connection with the process described in my aforesaid application No. 475,907, the mixture of ore and scorifier is passed through the furnace A, and is then in a molten condition, run into the vessel B. This is then withdrawn from the furnace, and rotated at a predetermined rate of speed, and at the same time, the electric current is passed through the electrodes.

Preferably, the electrodes are so located that they will be above the slag line and from this, it results that during rotation, the passage of the current through the slag, will heat the same, and will volatilize the elements therein, which have a low volatilization point. The elements volatilized will

be withdrawn through the conducting pipe E.

After rotation, and volatilization, the slag is withdrawn through the tap hole 21, and finally the metal is withdrawn through the tap hole 20.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention, within the scope of the claims, could be made without departing from the spirit or scope thereof, it is intended that all matter contained in these specifications and drawings, shall be interpreted as illustrative and not in a limiting sense.

What I claim as my invention is:—

1. An apparatus for the purpose specified comprising a vessel rotatable about a vertical axis and adapted to retain the entire charge through heating and means for electrically heating the charge in the interior of the vessel during rotation.

2. An apparatus for the purpose specified,

comprising a vessel rotatable about a vertical axis and having a suitable tap hole in the lower part thereof, means for rotating the vessel and means for exhausting the interior of the vessel during rotation.

3. An apparatus for the purpose specified, including a rotary vessel and means for electrically heating the upper portion only of the charge therein, during rotation of the vessel.

4. An apparatus for the purpose specified, including a rotary vessel having tap holes at different levels therein, and electrodes extending through the walls of the vessel above the upper tap hole, and means for supplying the electrodes with current during rotation of the vessel.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JAMES HENRY REID.

Witnesses:

RUSSEL S. SMART,
M. GILBERTSON.