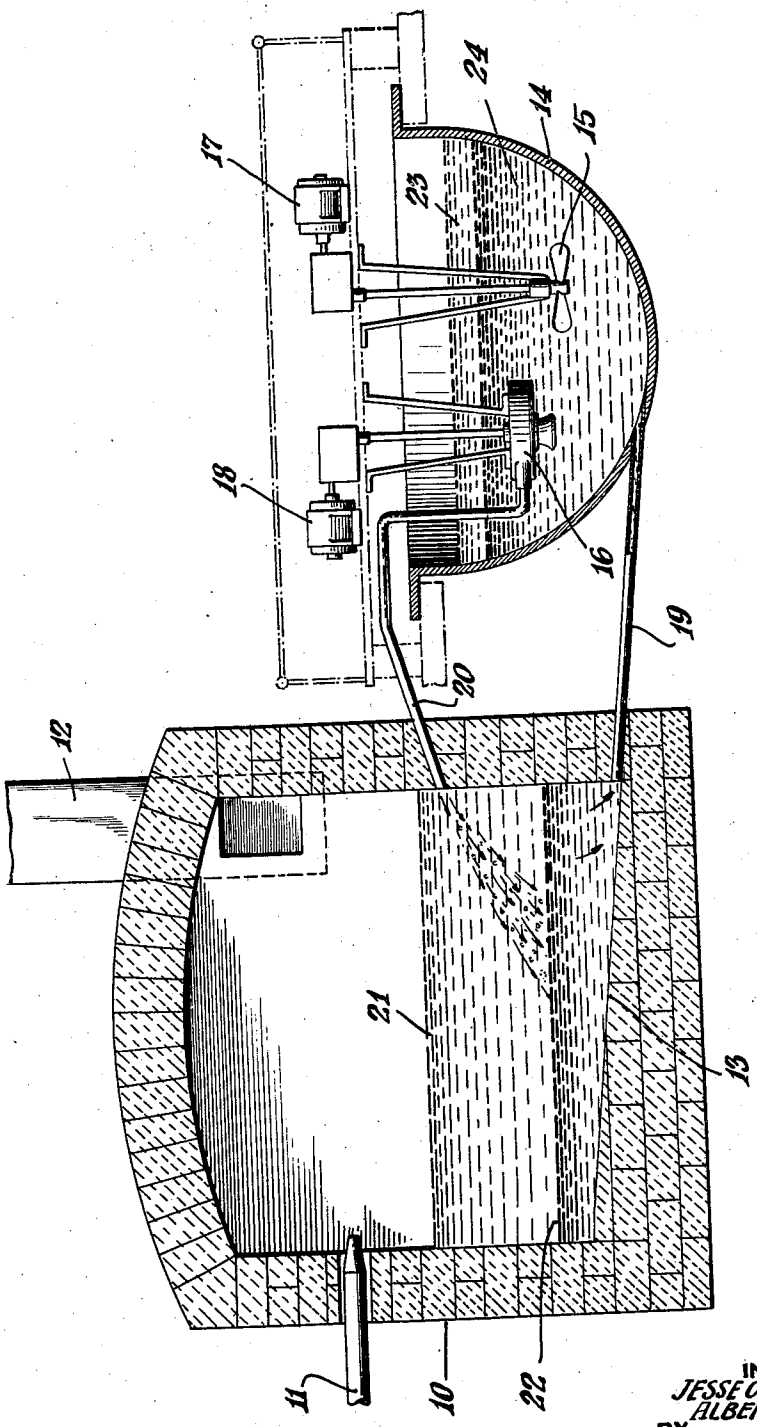
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PROCESS FOR DEZINCING ALUMINUM

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PROCESS FOR DEZINCING ALUMINUM

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1 Claim. (Cl. 75—58)

This invention relates to the separation and removal of zinc from aluminum.

The invention provides a process for treating zinc-bearing aluminum by which the zinc is readily and economically removed from aluminum without the loss of any appreciable amounts of the latter element. In accordance with the invention the impure aluminum, for example, any of various aluminum scrap materials, is treated in the molten state with a liquid metal capable of preferentially dissolving the zinc from the aluminum but which is itself insoluble in aluminum. The liquid metal containing the zinc is then itself dezinced out of contact with the molten aluminum and recirculated in the system where it dissolves further amounts of zinc, the cycle being repeated until the zinc content of the aluminum is sufficiently depleted.

Although the novel features which are believed to be characteristic of this invention will be particularly pointed out in the claim appended hereto, the invention itself, as to its objects and advantages, and the manner in which it may be carried out may be better understood by referring to the following description taken in connection with the accompanying drawing forming a part thereof, in which the single figure is a section through apparatus suitable for practising the process of the invention.

In the drawing, 10 is a furnace equipped with burner 11, flue 12 and sloping hearth 13. Adjacent the furnace is an iron refining kettle 14 equipped with stirrer 15 and pump 16 each driven by motors 17 and 18 respectively. A pipe 19 leads from the lowest point of hearth 13 to the bottom of kettle 14 while another pipe 20 leads from pump 16 to furnace 10 at approximately the bath level of the latter.

Employing such apparatus, the invention may be practised as follows: the aluminum to be dezinced is melted in the furnace 10 over a layer of liquid lead which is only sparingly soluble in aluminum but in which zinc will readily dissolve. (In the drawing 21 indicates the level of the aluminum bath and 22 the level of the liquid lead.) By operating the pump 16, lead is circulated from the kettle 14 to the furnace 10 thus allowing lead containing zinc to automatically enter the kettle 14 via pipe 19. The lead is dezinced in kettle 14 as by reaction with lead chloride indicated by 23 on top of the lead bath 24 which reaction is facilitated by operation of stirrer 15. The purified lead is recirculated to the furnace where it dissolves further quantities of zinc. The cycle is continued until the zinc content of the aluminum has been decreased the requisite amount.

The efficiency of the process of the invention is illustrated by the following examples. Scrap aluminum containing 1.66% zinc was melted over lead, the lead dezinced with chlorine gas out of contact with the aluminum and the dezinced lead recirculated as contemplated by the invention. In this manner the zinc content of the aluminum was readily reduced to 0.07% with practically no loss of lead or aluminum.

The present invention provides an extremely satisfactory solution to a problem which has become exceedingly acute due to the constantly increasing zinc content of aluminum products accompanying the repeated reclamation and reuse of that metal. In fact, prior to the invention, considerable care had to be exercised in selecting aluminum scrap for treatment as much of it contained such large quantities of zinc that the reclaimed metal was unsatisfactory or totally unfit for many purposes.

While certain novel features of the invention have been disclosed and are pointed out in the annexed claim, it will be understood that various omissions, substitutions and changes may be made by those skilled in the art without departing from the spirit of the invention. For example, cadmium, bismuth or other metals which are relatively insoluble in aluminum but in which zinc readily dissolves may be used instead of lead as the liquid metal. Also, the liquid metal may, if desired, be dezinced by utilizing oxidation or other methods instead of by chlorine or its salts.

What is claimed is:

The process for refining aluminum with respect to zinc as a contaminant which comprises circulating a solvent metal selected from the group consisting of bismuth, cadmium and lead through the body of a bath of aluminum thereby dissolving zinc, separating the solvent metal containing zinc from the aluminum bath, dezincing the solvent metal, and recirculating the dezinced solvent metal through said bath to further decrease the zinc content of the latter.

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