April 14, 1925. 1,533,885

J. S. MORGAN

METHOD OF REMOVING A LIQUID FROM THE SURFACE OF MOLTEN METAL

Filed June 1, 1922

Fig. 2.

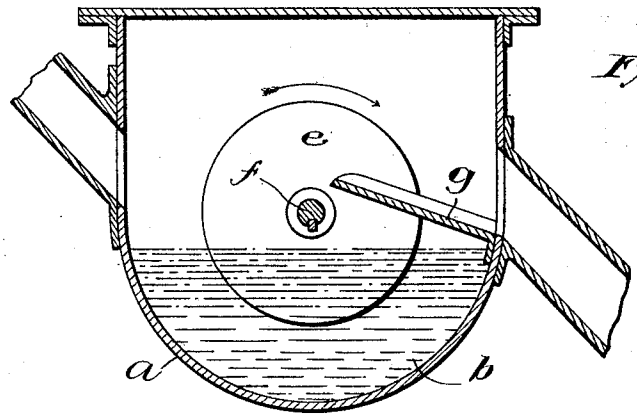


Fig. 1.

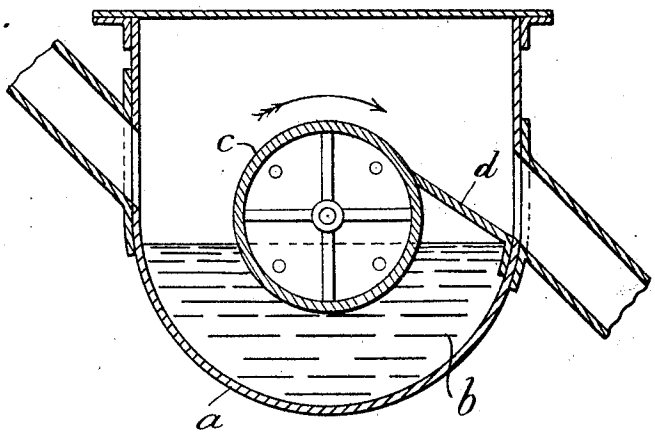
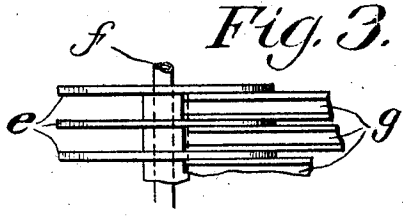


Fig. 3.



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Patented Apr. 14, 1925. 1,533,885

UNITED STATES PATENT OFFICE.

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METHOD OF REMOVING A LIQUID FROM THE SURFACE OF MOLTEN METAL.

Application filed June 1, 1922. Serial No. 565,105.

To all whom it may concern:

Be it known that I, JOHN STANLEY MORGAN, a subject of the King of Great Britain, residing in London, England, have invented a certain new and useful Method of Removing a Liquid from the Surface of Molten Metal, of which the following is a specification.

In processes of heat treatment by means of a bath of molten metal, such as the distillation of liquids or the drying of fusible solids, it is often desirable to remove completely and rapidly the residual liquid from the surface of the molten metal.

To do this without at the same time removing metal also, is not easy.

The usual method of removing a liquid is to let it flow over a weir. This necessitates a definite depth of liquid on the molten bath. In some cases it is necessary to pass only a thin film of the liquid through the bath of metal and in these cases the use of a weir is not practicable. By the present invention even a thin film of liquid may be removed from the surface of the metal without at the same time removing the latter.

According to this invention, the liquid is picked up from the surface of the molten metal by a revolving drum, disc or the like from which it is scraped so as to flow or fall into a discharge pipe or gutter.

The drum or disc may be partially immersed in the molten metal or it may be supported at such a level that the revolving surface just clears the surface of the molten metal while dipping into the liquid which is to be removed.

That a rotating drum or disc will pick up liquid in contact with which it revolves is of course known, but the removal of liquid from the molten metal in this manner could not be foreseen. The present invention applies the tendency which the revolving surface has to retain the liquid and to reject the metal globules which are mixed with the liquid, or, if the surface is immersed, to reject the metal which adheres to the surface as it emerges from the molten metal. It is not a matter of indifference in all cases what is the nature of the revolving surface. Thus in the case of molten lead or lead alloy, to which the invention is more particularly applicable, a non-metallic surface, especially a silica surface, is best.

In the accompanying drawings, Fig. 1 is a vertical section through apparatus comprising that embodiment of my invention in which the revolving body is in the form of a drum; Fig. 2 is a like section through that embodiment in which the revolving body is in the form of a number of discs mounted on a common axle, and Fig. 3 is a part plan of Fig. 2.

Referring to Fig. 1, the trough *a* contains molten lead *b* on the surface of which is a liquid that it is desired to remove. The drum *c* rotates on its axis in the direction indicated by the arrow and is partially immersed in the molten lead. The liquid which adheres to the drum is scraped from the surface by the edge of the inclined plane *d* which constitutes the bottom of a trough for discharging the liquid. The drum is preferably made of steel having a silica sheathing.

Referring to Figs. 2 and 3, the discs *e* are keyed to the shaft *f*. The scrapers *g* are placed between the discs and are of such width that each scrapes two faces, namely one face of one disc and the opposed face of the next disc.

Having thus described the nature of the said invention and the best means I know of carrying the same into practical effect, I claim:—

1. A method of completely and rapidly removing a liquid material from the surface of a molten metal, such as lead, so as to avoid or minimize the simultaneous removal of metal, which consists in revolving a body having a surface which is a figure of revolution, with part of the said surface immersed beneath the level of the liquid and removing the material from the surface of the said body at a part thereof which is not immersed.

2. Apparatus for removing a liquid from the surface of a molten metal comprising a body having a non-metallic surface which is a figure of revolution, an axle on which the said body is mounted to revolve and which is so placed that a part of the said surface is immersed in the molten metal, and a scraper in contact with the said surface on

that side thereof which is the descending side when the body revolves.

3. Apparatus for removing a liquid from the surface of molten lead comprising a body having a silica surface which is a figure of revolution, an axle on which the said body is mounted to revolve and which is so placed that a part of the said surface is immersed in the molten lead, and a scraper in contact with the said surface on that side thereof which is the descending side when the body revolves.

In testimony whereof I have signed my name to this specification.

JOHN STANLEY MORGAN.