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C. VOS

METHOD OF TREATING MOLTEN METALS

Filed Oct. 6, 1920

Fig. 1.

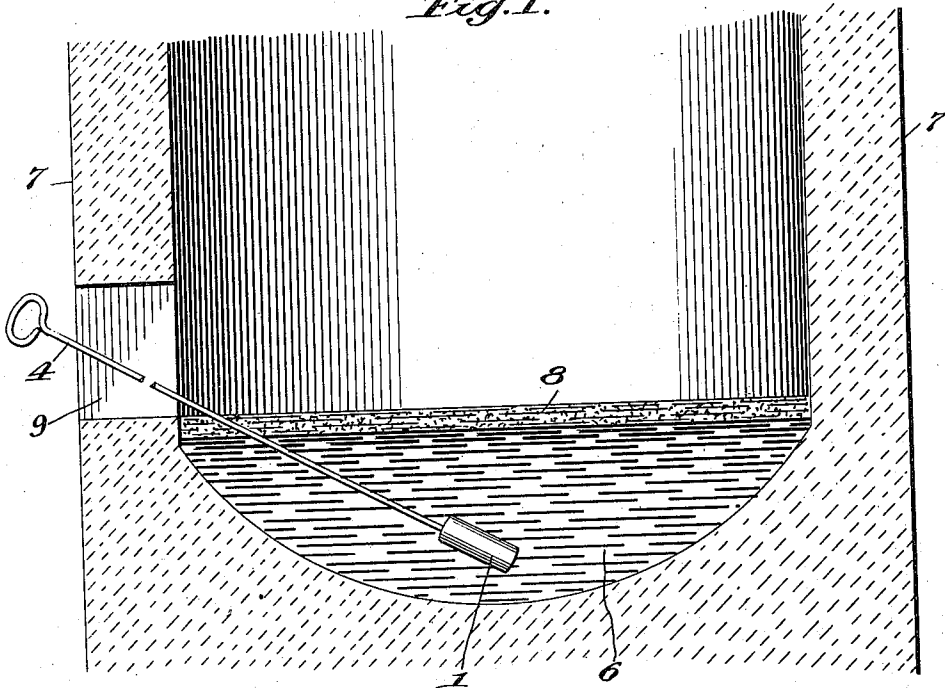


Fig. 2.

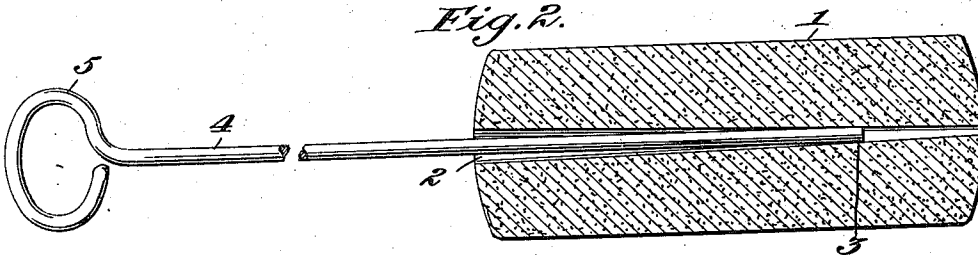


Fig. 3.

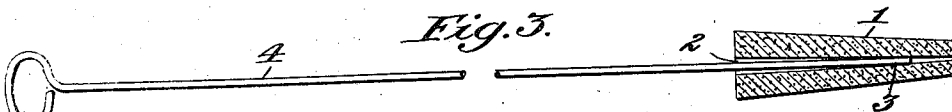


Fig. 4.



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UNITED STATES PATENT OFFICE.

CALVIN VOS, OF NEW YORK, N. Y.

METHOD OF TREATING MOLTEN METALS.

Application filed October 6, 1920. Serial No. 414,947.

To all whom it may concern:

Be it known that I, CALVIN VOS, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Methods of Treating Molten Metals, of which the following is a specification.

This invention relates to a new and novel method of introducing metallic alloys formed into solid bodies into a mass of molten steel and the ferrous groups of molten metal contained within a suitable melting furnace by manually operated means, for the purpose of producing a high grade product from which the last vestige of oxides, gases, etc., have been eliminated, thereby forming a more dense and homogeneous product possessing unusual tensile strength and density. The main object of this invention is to provide a simple, economical and efficient method of feeding metallic alloys into a mass of hot molten metal beneath the slag, so that the alloy will be readily dissolved, absorbed and assimilated by the molten metal throughout its mass, thereby producing a high grade product of special value in structural work, for castings of various kinds and for numerous other desirable purposes.

For this purpose my invention consists in a novel method and in novel parts and combination of parts in carrying such method into effect, as I will now proceed to describe, and to particularly point out in the claims appended hereto.

It is understood to be quite common in this art to treat metal, especially iron and steel, in the molten condition by adding thereto certain alloys or reagents, but the manner of doing it has been oftentimes wasteful or difficult to carry into effect.

In my invention the treatment and slight agitation of the hot molten metal occur simultaneously and takes place without loss of metal or the treating elements. The desired results can therefore be obtained with the utmost precision and uniformity in the product obtained and successive heats or castings is insured. In order to accomplish this I form a mold or compact the ingredients constituting my metallic alloy with which the molten metal is to be treated into solid bodies of any suitable or desirable dimensions, preferably of cylindrical or cone shape contour, provided with a

central longitudinal opening formed there-through, said opening being of slightly greater area at one end than at the other, and gradually tapering from one end to the other, which opening is adapted for the reception of a suitable tool for the purpose of properly manipulating and handling the solid metallic bodies in the manner herein-after described.

For carrying out my invention and effecting the results stated, I have illustrated in the accompanying drawings one form by which the solid body of metallic alloy is fed into the molten metal within a suitable furnace beneath the slag which usually forms on the surface of the molten metal. It will, however, be understood that my invention is not limited to any specific form of tool for handling and manipulating the solid body of alloy, since any desirable form of tool may be employed, so long as the solid alloy is rigidly secured to the tool and is properly fed and suspended within the molten mass of metal as a dissolving body for the purpose herein stated.

By reference to the drawings it will be seen that:

Figure 1 is a vertical section of a suitable melting furnace, showing a mass of hot molten metal therein, and a single tool or carrier for feeding, suspending and operating the solid body of alloy beneath the slag within the molten body of metal, to dissolve and assimilate the ingredients therewith.

Figures 2 and 3 show sectional elevations of different forms of bodies into which the ingredients of the alloy may be compacted or molded with a suitable tool fixedly secured thereto, and

Figure 4 is a side elevation of the tool removed from the solid metallic alloy.

The ingredients comprising my metallic alloy 1, having been properly mixed in plastic condition, are molded or compacted in any suitable size, and preferably in cylindrical or conical contour, provided with a central longitudinal and slightly tapering orifice 2, extending entirely therethrough, adapted to receive the outer end portion 3 of a suitable tool 4, provided at one end with a handle 5.

It will be readily perceived that when it is desired to feed or charge the solid alloy within the molten mass of metal 6 within the furnace 7, and beneath the slag 8, it is simply necessary to insert the outer end 3

of the tool 4 into the orifice 2 formed within the alloy, and wedge the solid alloy around the end of the tool by striking the outer edge of the body of alloy, one or more sharp blows with a hammer or other convenient tool sufficiently to cause the said alloy body to become wedged and fixedly secured to the end of the tool, when it is conveyed by manual labor to an opening 9, formed in one of the walls of the furnace, thence passed through said opening and through and beneath the slag within the furnace, and into the hot molten mass of metal when the coaction of the hot metal with the cool metallic alloy will cause a pulsation or slight vibration of the alloy and tool, thus causing a slight agitation of the molten mass until the entire solid body of alloy has been dissolved, absorbed and assimilated by the mass of molten metal, and it being evident, at once, to the attendant when the solid body of alloy is entirely dissolved the tool is removed from the furnace, for the reception of another charge to be supplied thereto.

It will be understood that my invention provides a metallic alloy composed of ingredients especially suited for the desired treatment of molten metal in the proportions required for such treatment, said alloy being specifically described and claimed in a sep-

arate application filed by me under date of April 10, 1920, and bearing Serial No. 372,954, and having means whereby it can be properly fed or charged into the molten mass so that its entire surface is exposed to the dissolving action of the molten metal.

The treatment of the molten steel and the ferrous groups of metal in the manner and by the means herein stated is admirably adapted for use in degasifying and deoxidizing said molten metal, resulting in the production of a high grade product, since the metallic alloy is thereby uniformly mixed and assimilated with the metal producing the desired effect and giving it an unusual homogeneous character and tensile strength.

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

The method herein described of treating molten metal with suitable alloys within a furnace, consisting in forming the alloys into a cylindrical body with a central tapered opening therein, fixedly wedging a suitable tool in said opening, submerging said alloy into the molten metal below the surface of the metal and supporting it therein by means of said tool until the alloy is entirely dissolved, and finally withdrawing the tool from the furnace.

CALVIN VOS.