

UNITED STATES PATENT OFFICE

2,671,019

METHOD FOR ADDING METALLIC COMPONENTS TO MOLTEN METALS

Georges Levesque Du Rostu, Paris, France, assignor to Société Anonyme André Citroën, Paris, France

No Drawing. Application November 7, 1950,
Serial No. 194,571

Claims priority, application France
November 9, 1949

1 Claim. (Cl. 75—130)

1

Adding metal components to a molten metal bath is a difficult operation when conventional means are employed such as immersing a metallic fragment or forcing the metal into the bath by means of a bell.

These difficulties arise either from the high susceptibility to oxidation of the components introduced, or from the violent reaction between the bath and the added components, or by reason of the sudden volatilization of the added component when the temperature of the bath is higher than the volatilization point of the component.

The method according to the invention makes it possible to effect such additions of the components by immersing in the metal bath a refractory conglomerate obtained by mixing in suitable proportions:

- (a) A refractory thermo-insulating material;
- (b) The substance or substances to be added which have a melting or boiling point which is lower than the bath temperature;
- (c) A binding material.

The refractory material which is a component of the conglomerate is one which does not react either with the metal bath or with the metal components to be added, or at most reacts very slightly.

The same precautions must be taken in selecting the binding material, which must be appropriately chosen in order to prevent any undesired reaction such as the occlusion of gas in the metal. Binding materials conventional in the foundry art and methods generally followed in the manufacture of cores are advantageously used.

The substances to be added are used in the form of small pieces such as grains, metal shot, cuttings, filings, and the like and are admixed in suitable proportions with the refractory material, so that, due to the low conductivity and porosity of the conglomerate, the metal components exclude only as the temperature of the latter rises in the bath.

The conglomerate is shaped to provide a suitable relationship between its volume and its surface in order that the heating of the bulk will follow the desired processing procedure and in order that it will be easy to keep it immersed in the bath of molten metal by means of tapping irons, a common bell, or other conventional devices.

The method of the invention makes it possible to increase the period of time during which the added component comes into contact with the

2

metal bath. The conglomerate may consist of concentric layers of different kinds.

The method also prevents violent reactions of the added element or elements with the bath, avoids the necessity of making expensive and difficultly-fabricated alloys, eliminates the danger of accidents, and provides a better yield by reducing the losses of costly elements.

Moreover, this method makes it possible to produce in the core of the conglomerate itself the product of the reaction, as the components to be added come into contact with the bath. It also makes it possible to add non-miscible elements simultaneously or successively.

The method may be applied to the treating of ferrous and non-ferrous metals and alloys, e. g. cast iron, steels, alloys of copper, aluminum, magnesium, and the like.

The conglomerate does not corrode, with the result that there is no increase in the amount of slag nor is there formation of non-metallic occlusions in the bath.

Three examples of the method of the invention are given hereinafter.

Example 1: Cadmium

Cadmium is utilized in the form of shot having a diameter of 3 mm.

The briquettes or conglomerate are made from the following mixture:

Cadmium	100 g.
Sand	240 g.
Sodium silicate.....	7% of the total weight.

The briquettes, first dried in air, are then heated in a room at 100/150° C.

The briquettes, which are cylindrical, when immersed in cast iron at 1300/1350° C. have completely reacted after 3 or 4 minutes.

Example 2: Zinc

Zinc is utilized under the same conditions as described for cadmium in Example 1.

Example 3: Magnesium

Magnesium is used in the following mixture:

Cuttings of magnesium.....	100 g.
Alumina	320 g.
Glycol-polynol	4% of the total weight.
Linseed oil.....	4% of the total weight.

The briquettes are heated for 20 minutes at 225° C.

3

The cylindrical briquettes, when immersed in 50 kg. of cast iron at 1350° C., react in about 7 minutes.

Example 4: Magnesium

Briquettes having the same constituents as in Example 3, in the same proportions, but containing 1 kg. of magnesium, react in 9 to 10 minutes when immersed in 500 kg. of cast iron at 1350° C.

Example 5: Magnesium

Briquettes prepared as described in Examples 3 and 4 can be immersed in cast steel.

What I claim is:

A method of adding magnesium to a bath of molten metal without producing an exothermic

4

reaction of explosive strength which comprises introducing said magnesium in the form of magnesium chips in a briquette formed from alumina, linseed oil and glycol-polynol, wherein the constituents are in the relationship of 100 parts by weight of magnesium chips, 320 parts by weight of alumina, 18 parts by weight of linseed oil, and 18 parts by weight of glycol-polynol.

GEORGES LEVESQUE DU ROSTU.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,555,978	Hunt	Oct. 6, 1925
2,111,344	Weitzenkorn	Mar. 15, 1938