UNITED STATES PATENT OFFICE.

WESLEY GROFF NICHOLS, OF CHICAGO HEIGHTS, ILLINOIS.

METHOD OF CASTING METALS.

938,689. Specification of Letters Patent. Patented Nov. 2, 1909.

No Drawing. Application filed August 21, 1909. Serial No. 514,014.

To all whom it may concern:

Be it known that I, WESLEY GROFF NICHOLS, a citizen of the United States, and a resident of Chicago Heights, in the county of Cook and State of Illinois, have made and invented certain new and useful Improvements in Methods of Casting Metals, of which the following is a specification.

My invention relates to an improvement in the method of casting metals, the object sought to be accomplished being to devise a simple and economical method whereby the cast or finished article will be materially strengthened or otherwise rendered more efficient for the purpose or purposes for which it is intended.

In the manufacture of various articles, it has heretofore been the common practice to cast the metal around wrought iron cores, rods, bars, plates, etc., for the purpose of lending strength to the finished article, and in some instances, for the purpose of preventing the separation of the sections or fragments of the casting after the same has been broken or fractured. In those instances, however, where the embedded element or insert is of small dimensions, or contains but little metal, it has been found difficult to prevent its being burned or otherwise injured by the molten metal poured around it, or by the hot gases in the mold, and thereby partially and in many instances wholly destroyed. Furthermore, in the burning of the insert, a gas is formed, which becoming trapped in the cast metal, forms blow-holes, resulting in an imperfect casting.

The object of my improved method is to so treat the insert prior to the molten metal being poured around it, that all danger of its being burned is overcome, and the danger of formation of the gas and resulting blow-holes, obviated.

It will be understood that my invention is in nowise limited to the manufacture of castings of any particular form or contour, or dimensions, or to castings made for any particular use or purpose, nor to the particular size or form of the metal insert, nor its location in the casting, as the method hereinafter described is applicable to the manufacture of all articles cast from iron, steel or other metal or metals, and having wholly or partially embedded therein or applied to the surface or surfaces thereof, an insert or reinforcing element made from iron, steel, or other desired metal.

In practice, I prepare what I term the "dip" consisting of a liquid adhesive and a heat resisting or insulating material. The adhesive is preferably a quick-drying one, that which I have used with excellent results, being ordinary fish glue. With this adhesive I thoroughly mix the heat resisting substance or material, preferably in the form of a fine powder, and which may consist of one of the elemental minerals or substances, for example, graphite, or a metallic powder, as powdered aluminum; or a carbonaceous substance, such for example as powdered charcoal, coke breeze, or coal; or an oxid of metal, for example, mineral paint, red lead, bauxite, chromite, magnesia, lime, limestone, alumina, siloxicon; or I may use the silicates of the metals for example, silica, clay, slag or glass; I have also used the carbonates of the metals, for example, dolomite, magnesite, white lead; also the carbids, for example, the carbids of silicon; or a mixture of any two or more of these substances, for instance, powdered brick, ground ganister, clay, soapstone, sand, ground crucibles, mica schist, magnesite, ground slag, asbestos, cement, kaolin, china or porcelain. After preparing the mixture, the insert is then dipped into the same, and promptly dried in any of the well known ways, a complete coating, covering or envelop adhering thereto, which when dry acts as an efficient insulating or heat resisting barrier or wall to the heat of the molten metal when poured around the insert, it being essential, of course, to thoroughly protect each and every part of the insert or reinforcing member with which the molten metal might come in contact. The insert when thus protected, is placed in the mold and the molten metal poured around it in the usual way.

While I have above mentioned a number of insulating materials, yet I do not wish it understood that my invention shall be limited thereto, as the claim is intended to include any and all substances which when applied to the insert or reinforcing element as above described, will act as a barrier or wall to the heat of the molten metal to prevent the burning or destruction of said insert, and thus preserve its integrity for all uses and purposes for which it is employed.

Having fully described my invention,

what I claim as new and desire to secure by Letters Patent, is:—

1. The hereinbefore described method of permanently casting one metal into another, consisting in first applying to the member to be cast in, a heat insulating material consisting of a mixture of quick-drying liquid adhesive and a heat insulating material, drying the same, and finally pouring the molten metal around said member.

2. The hereinbefore described method of permanently casting one metal into another, consisting in first applying to the member to be cast in, a protective coating comprising a mixture of fish glue and a heat insulating substance, drying the same, and finally pouring the molten metal around said coated member.

3. The hereinbefore described method of permanently casting one metal into another, consisting in first applying to the metal to be cast in, a heat insulating mixture of fish glue and silica, and finally pouring the molten metal around said coated member.

Signed at Chicago Heights, in the county of Cook and State of Illinois, this 18th day of August A. D. 1909.

WESLEY GROFF NICHOLS.

Witnesses:
GEO. FRANCIS WOLFF,
RUSSELL WHITMAN.