

UNITED STATES PATENT OFFICE.

WESLEY GROFF NICHOLS, OF CHICAGO HEIGHTS, ILLINOIS.

METHOD OF CASTING METALS.

938,688.

Specification of Letters Patent.

Patented Nov. 2, 1909.

No Drawing.

Application filed August 21, 1909. Serial No. 514,013.

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 no wise 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 herein-after 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 re-

inforcing element made from iron, steel, or 55 other desired metal.

In practice, I apply to the outer side or surface of the insert an adhesive, preferably an animal, mineral or vegetable oil, that which I have used with excellent results be- 60 ing common black oil, the insert being preferably dipped into the oil, the surplus of the latter being allowed to drip or drain off. The insert is then covered or coated with a refractory material, or with a heat-insulat- 65 ing or resisting substance to act as a barrier or wall to the heat of the molten metal poured around the insert. This substance or material is preferably used in the form of a fine powder, and may be one of the elemental 70 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 ex- 75 ample, mineral paint, red lead, bauxite, chromite, magnesia, lime, lime stone, alumina, siloxicon; or I may use the silicates of the metals, for example, silica, clay, slag, glass; I have also used the carbonates of the 80 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, soap- 85 stone, sand, ground crucibles, mica schist, magnesite, ground slag, asbestos, cement, kaolin, china, porcelain, glass.

After the insert has been drained of the surplus oil, or other adhesive, it is placed in 90 a barrel, box, or other receptacle containing the powdered insulating substance, and which for the sake of convenience, I have termed the "flour". The insert is covered with the flour, and so manipulated that a 95 complete coating, covering or envelop will adhere thereto in order to provide an efficient insulating or heat resisting barrier or wall, it being essential to thoroughly protect each and every part of the insert or rein- 100 forcing member with which the molten metal might come in contact. The insert is then slightly rapped in order to separate the surplus amount of flour, after which it is ready to be inserted into the mold into which the 105 molten metal is to be poured.

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 claims are intended to include any and all substances which when applied to the insert or reinforcing element
 5 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.
 10 Having fully described by invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The hereinbefore described method of preserving the integrity of a metal to which
 15 cast metal is to be attached, consisting in first applying a heat insulating material to the first mentioned metal, and finally pouring the molten metal around the same.

2. The hereinbefore described method of
 20 permanently casting one metal into another, consisting in first applying to the member to be cast in, a heat insulating material to preserve its integrity, and finally pouring the molten metal around said member.

25 3. The hereinbefore described method of casting one metal into another, consisting in first applying to the member to be inserted an adhesive heat insulating material, caused to adhere thereto to preserve its integrity,
 30 and finally pouring the molten metal around said member.

4. The hereinbefore described method of
 35 casting one metal into another, consisting in first applying to the member to be inserted an adhesive substance, then applying there-

to a heat insulating material, and finally pouring the molten metal around said member.

5. The process hereinbefore described, which consists in first applying to the cast-in
 40 member an adhesive, secondly, applying a powdered heat insulating material thereto, and finally surrounding said member with molten metal.

6. The process hereinbefore described, 45 which consists in first coating the cast-in member with oil, secondly, applying a heat insulating substance thereto in the form of a dry powder, and finally casting the metal around said member. 50

7. The herein described method of casting
 50 one metal into another, the cast-in metal being small in section, which consists in first applying to the cast-in member a heat insulating material to preserve its integrity, and
 55 finally pouring the molten metal around said member.

8. The herein described method of permanently casting one metal into another, which consists in first coating the cast-in
 60 member with oil, secondly, applying powdered silica thereto, and finally, casting the metal around said member.

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

WESLEY GROFF NICHOLS.

Witnesses:

GEO. FRANCIS WOLFF,
 RUSSELL WHITMAN.