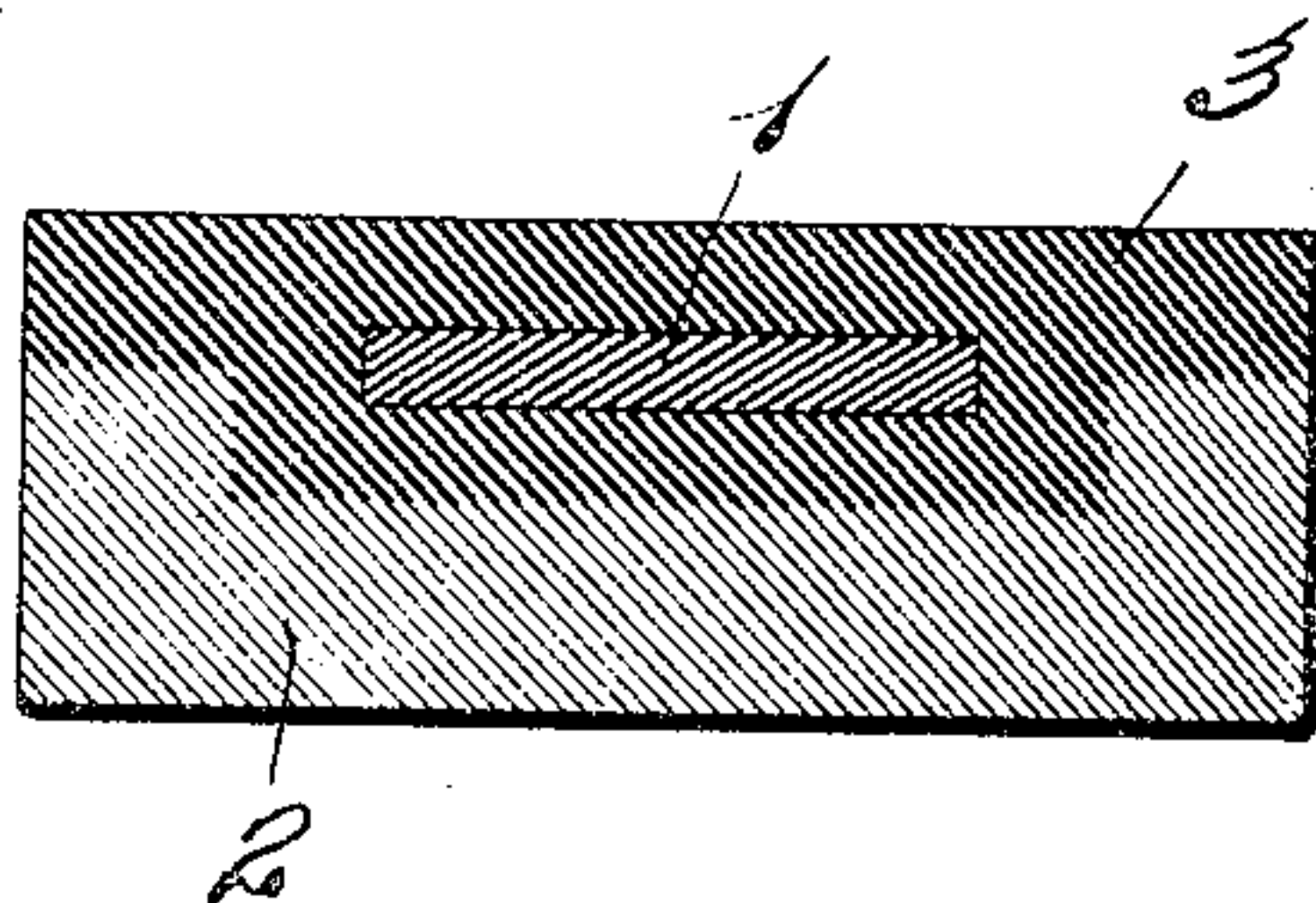


C. T. WESTLAKE.  
ART OF CASTING.  
APPLICATION FILED JAN. 7, 1910.

980,719.

Patented Jan. 3, 1911.



WITNESSES:  
E. M. Harrington.  
H. M. Janus.

INVENTOR.  
CHARLES T. WESTLAKE.  
BY F. R. Ginnally, ATTORNEY.

# UNITED STATES PATENT OFFICE.

CHARLES T. WESTLAKE, OF ST. LOUIS, MISSOURI.

## ART OF CASTING.

980,719.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed January 7, 1910. Serial No. 536,844.

*To all whom it may concern:*

Be it known that I, CHARLES T. WESTLAKE, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in the Art of Casting, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which, the figure is a conventional illustration of a piece of cast iron made in accordance with my improvement.

This invention relates to a new and useful improvement in the art of casting, being designed particularly as an improvement in the art of casting iron, steel, brass, etc.

Inserts have been arranged in the matrices of molds around which the molten metal has been poured, the object of these inserts being to strengthen the casting or to provide a metal having different physical properties from the metal which is cast around the insert. Illustrations in the first class may be found in the inserts which are arranged in car wheels to strengthen them, and in the latter class in brake shoes where steel and cast iron are combined to offer wearing faces having different physical properties. In all of these instances, so far as I am aware, the metal composing the insert is affected by the molten metal poured around it. This is particularly true of car wheels where the molten metal will heat the inserts and then when the wheel is put in the soaking pit where it remains, say 120 hours, the gradual reduction of temperature anneals the wheel and the insert, drawing the temper of the insert. The same action is true, but to a smaller degree, in the manufacture of brake shoes where the insert is a metal having a different physical property from the molten metal poured around it to form the casting. In all these instances, however, the hot molten metal coming in contact with the insert, changes some of the physical properties of the insert and this change is sometimes detrimental to the object in view. For instance, where a metal possessing a certain physical property is selected for an insert, it is desirable that that physical property be retained in the insert up to its full value.

I have discovered a metal which can be used for inserts in castings and whose

physical properties will not be changed in such use.

My invention, therefore, broadly stated, is an improvement in the art of casting which consists in arranging an insert in the casting, the physical properties of which insert will not be changed from contact with the molten metal.

In the drawings, 1 indicates the insert, which is an alloy of iron having a manganese content of such percentage as is desirable or necessary to give it the requisite physical properties of tensile strength, hardness, ductility, etc. I have found that this alloy when subjected to the high temperature incident to contact with the molten metal which surrounds it, will not have its physical properties changed, but, on the contrary, the same physical properties of tensile strength, hardness, ductility, flexibility, elasticity, etc., which it possessed and because of which attributes renders it desirable for use as an insert, will remain unchanged and all of such physical properties will be possessed by the insert, to their full value, when the metal composing the casting cools to normal temperature. The fixed properties in this insert thus enable the metal composing the casting 2 to be treated in any of the well known ways, as, for instance, chilling the face 3 of said casting, in which event the insert 1 acts to deepen the chilling as indicated by the heavier cross section lines.

The metal composing the casting 2 may be tempered or reheated, etc., without in the least affecting the physical properties possessed by the insert 1. Hence the insert 1, if used as a reinforcing or strengthening medium, or for any other purpose on account of its physical properties, responds fully at all times to the requirements exacted of it.

I find that the best proportion of iron and manganese for this purpose range from about 85% to 96% iron and from about 13% to 3% manganese, but I do not confine myself to any particular percentage of either element, except that the iron should be the preponderating element, for the reason that if more than 13% of manganese is used the tensile strength of the alloy is affected and brittleness results.

The quantity of manganese used must be sufficient to render the insert immutable to varying temperatures. By burying the in-



sert beneath the surface, it is possible for the surface of the casting to be continuous and unbroken and of the same substance of which the casting is composed. The insert  
5 is rendered inaccessible and this strengthens the casting without disturbing the metal of the casting on the surface.

Although I have mentioned this alloy as consisting of iron and manganese, the pres-  
10 ence of other ingredients which are practically inseparable from iron in its commercial form, would not be a departure from the spirit of my invention, so long as such other ingredients do not detract from the  
15 desired qualities of the alloy.

It is, of course, obvious that the metal alloy of which the insert is made can be rolled or treated in any desired manner to  
20 give it the requisite physical properties before it is placed in the mold cavity. In using the expression "iron", it is, of course,

understood that cast iron, if it possesses the requisite physical properties, can be used, or wrought iron may be employed, or iron mixed with various ingredients, and  
25 treated as in the manufacture of rolled products, providing, of course, that such other ingredients do not detract from the desired qualities of the alloy.

I claim:

30

A casting having an insert buried beneath the surface thereof and containing a sufficient quantity of manganese to render it im-  
mutable to varying temperatures.

In testimony whereof I hereunto affix my  
35 signature in the presence of two witnesses, this 5th day of January, 1910.

CHARLES T. WESTLAKE.

Witnesses:

M. P. SMITH,  
L. CORRAO.