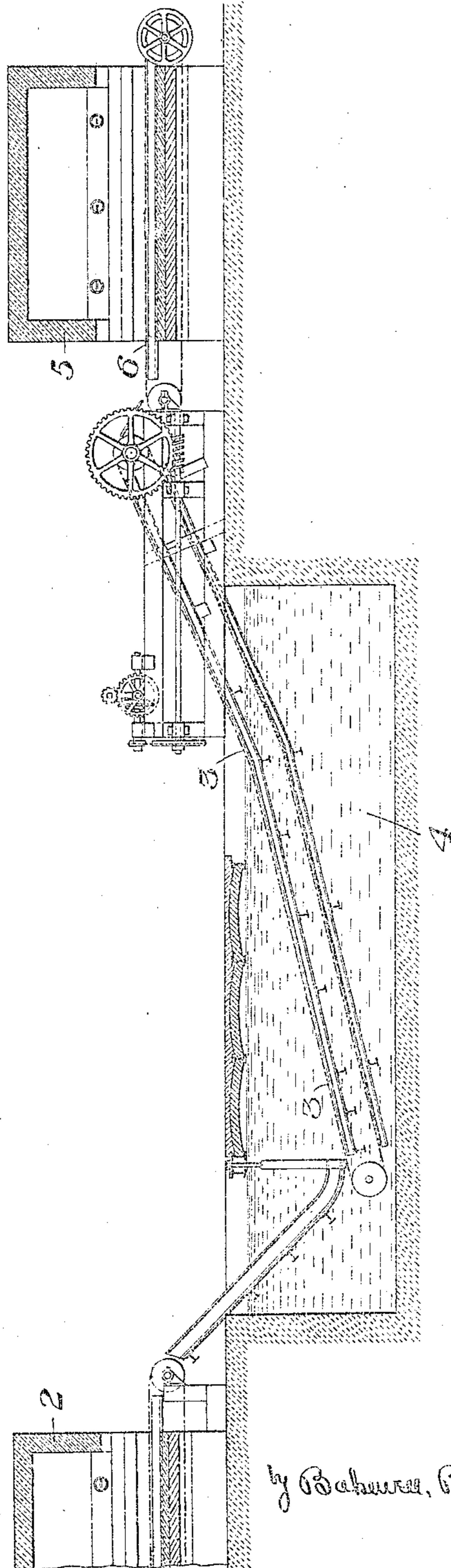


W. G. KRANZ.
METHOD OF HEAT TREATING STEEL CASTINGS.
APPLICATION FILED NOV. 7, 1902.

951,768.

Patented Mar. 8, 1910.



WITNESSES

R. A. Baldwin
C. B. Blumling

INVENTOR

W. G. Kranz,
by Dehner, Rogers & Parnell,
his Atty.

UNITED STATES PATENT OFFICE.

WILLIAM G. KRANZ, OF SHARON, PENNSYLVANIA, ASSIGNOR TO THE NATIONAL MALLEABLE CASTINGS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

METHOD OF HEAT-TREATING STEEL CASTINGS.

951,768.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed November 7, 1908. Serial No. 461,512.

To all whom it may concern:

Be it known that I, WILLIAM G. KRANZ, of Sharon, Mercer county, Pennsylvania, have invented a new and useful Method of Heat-Treating Steel Castings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, which shows in longitudinal section apparatus suitable for the practice of my invention.

I have found that low carbon steel castings particularly cast steel coupler knuckles and coupler heads and shanks which contain less than five-tenths of one per cent. carbon, can be greatly improved in quality and made to stand more rigid tests than heretofore, if they are subjected to a heat treatment, in which the castings are first heated to about a cherry red heat namely, to about 1300°-1400° F., then carried at a uniform rate through boiling water, in which they remain for a uniform and specific time, and are then carried at a uniform rate and for a uniform time through a heating chamber, in which they are reheated to about 700° or 800° Fahrenheit, the heat communicated to the castings in the reheating chamber being less than a red heat. When treated in this way, the product of the steel foundry is made uniform and its quality is greatly improved.

In the practice of my invention, I employ a vessel or tank containing water, which is rapidly brought to a boiling condition in any suitable manner, and is maintained in a boiling condition by the passage of the hot castings through it, so as to be of uniform temperature, and I employ, in conjunction with such tank or vessel, a reheating furnace. A conveyer leads through the vessel of water and through the reheating furnace and carries the castings there-through at a uniform rate so that the duration of the cooling and reheating operations upon the castings can be accurately determined and uniform results produced.

It is easy for the operator to time the travel of the castings through the water to the desired rate, the purpose being to cool the castings therein to a temperature less than 700° F., preferably less than 400° F. It is not necessary, however, that the castings should be cooled down to the tempera-

ture of the water through which they pass. The rate of travel will, of course, vary with the shape and size of the castings. A casting having a large surface area in proportion to its weight will cool more rapidly when in contact with the water than a casting whose surface area in proportion to its weight is less.

In the drawings, 2 represents a furnace in which the castings having been taken from the molds are placed and brought to a cherry red heat. They are then removed from this furnace and dropped or otherwise placed on a conveyer 3, which may be an ordinary chain conveyer, and leads down and into an open tank of water 4, carrying the castings through the water and immersing them therein during their passage through the tank. The conveyer passes up from the tank and, as shown, is arranged to discharge onto a second conveyer 6, which passes through a reheating furnace 5, in which the castings are reheated to the degree above specified, and at the end of the furnace they are discharged and after cooling are ready for use.

Instead of water, oil or other liquid may be employed, water being preferred, however, from the standpoint of cost.

I claim:

1. The method herein described, which consists in treating low carbon steel castings by heating the same to or about a cherry red heat, namely, about 1300°-1400° F., then subjecting them to a boiling liquid for a regulated time, and then reheating them to a degree less than red heat.

2. The method herein described of treating low carbon steel castings, which consists in heating them to or about a cherry red heat, namely, about 1300°-1400° F., then carrying them at a regulated speed successively through a liquid and through a reheating chamber wherein they are reheated to a temperature below red heat.

3. The method herein described of treating low carbon steel castings, which consists in heating them to or about a cherry red heat, then carrying them at a regulated speed successively through boiling liquid and through a reheating chamber wherein they are reheated to a temperature below a red heat.

4. The method herein described of treat-

ing low carbon steel castings, which consists in heating them to or about a cherry red heat, namely, about 1300°-1400° F., then cooling them to a temperature below 700° F. by subjecting them to a liquid for a regulated time, and then reheating them to a degree less than red heat.

In testimony whereof, I have hereunto set my hand.

WILLIAM G. KRANZ.

Witnesses:

THOMAS W. BAKEWELL,
H. M. CORWIN.