F. H. FECHTIG.

METHOD OF AND APPARATUS FOR ANNEALING METALS.

APPLICATION FILED AUG. 27, 1913.

1,110,122. Patented Sept. 8, 1914

FIG. 2

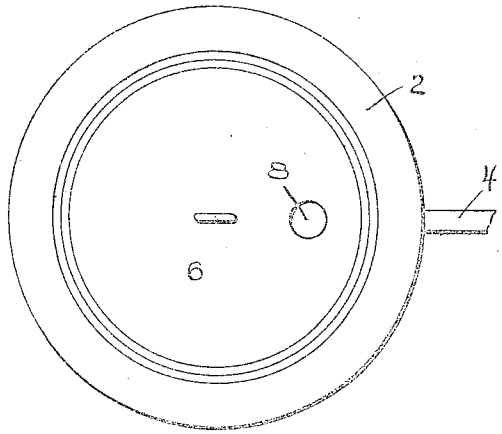
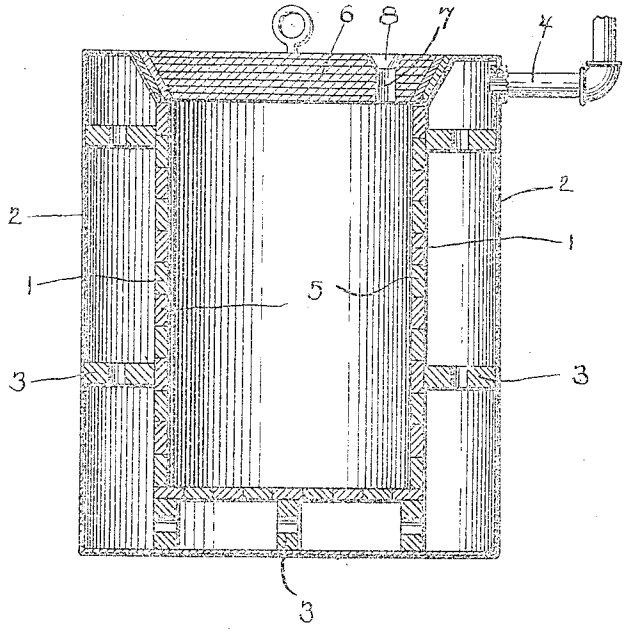


FIG. 1



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METHOD OF AND APPARATUS FOR ANNEALING METALS.

1,110,122. Specification of Letters Patent. Patented Sept. 8, 1914.

Application filed August 27, 1913. Serial No. 786,914.

To all whom it may concern:

Be it known that I, FREDERICK HART FECHTIG, a citizen of the United States, residing at Wilmington, in the county of New Hanover, State of North Carolina, have invented certain new and useful Improvements in Methods of and Apparatus for Annealing Metals, of which the following is a description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to a method of and apparatus for annealing metals of all kinds, and my invention has for its object to provide for the annealing of such metals by causing them to cool more slowly than has been heretofore possible with the method and apparatus commonly used with the result that the metals are annealed evenly throughout and are tougher and stronger than metals annealed by the methods commonly used.

With these objects in view my invention consists in the method and apparatus hereinafter described and particularly pointed out in the claims.

Referring to the drawing: Figure 1 is a vertical central sectional view of an apparatus adapted to carry out the method of my invention; and Fig. 2 is a plan view of the same.

In the drawings 1 indicates the inner wall and 2 indicates the outer wall of a chamber adapted to receive the metal to be annealed. The walls 1 and 2 are suitably spaced apart by braces 3.

4 indicates a tube leading from the space between the walls 1 and 2 to a suitable air exhausting device (not shown).

The inner wall 1 is preferably lined with fire brick 5 and is provided with a close fitting cover 6 which is preferably provided with an opening 7 which is normally closed by an outwardly opening valve 8.

In carrying out my method, I place the hot metal as it comes from the mold if sufficiently hot or reheated if it has cooled preferably at a heat of from 1200 to 1400 degrees, that is, at a bright cherry red, in the chamber, exhausting the air from between the walls 1 and 2 through tube 4, either before the metal is introduced or immediately upon its introduction. The chamber 6 is closed immediately upon the introduction of the metal into the chamber.

The heat of the metal and the gases generated by it expands the air within the chamber and drives out more or less of it through the opening 7, thus reducing the amount of oxygen in the chamber and lessening the amount of oxidation, and as the metal cools the air within the chamber will become more or less rarefied tending to reduce the rate of cooling. The main element relied on to reduce the rate of cooling is, however, the more or less complete vacuum created and maintained between the inner and the outer walls 1 and 2.

It will, of course, be understood that the shape and size of the annealing chamber will depend upon the size and shape and the metals to be annealed, it being desirable to have the chamber as near the size and shape of the metal as will be consistent with the ready introduction of the metal and its removal so as to leave as little air space about it as possible.

By the use of my method, the slow cooling of the metal and its uniform cooling throughout its mass is insured so that the internal strains resulting from cooling the exterior while the interior of the mass is still hot is avoided so that the metal when cooled, is tougher and stronger than if cooled in any other way.

While my method is particularly adapted to the treatment of iron and steel castings, it is also adapted to the treatment of articles formed from other metals, such as copper or brass, whether by casting or otherwise.

By my method as above described, the cooling process is one of weeks rather than days and not only are the strains from uneven cooling avoided, but opportunity is given for the burning out of any impurities which may be present.

The fire brick lining may, of course be dispensed with though it will ordinarily be found desirable.

Having thus described my invention what I claim is:

1. The herein described method of annealing metals which consists in introducing hot metal into a chamber having double walls and a pressure exhaust, exhausting the air from between the walls, closing the chamber and keeping the metal in the closed chamber until cooled.

2. The herein described apparatus for annealing metals, consisting of a double walled chamber adapted to contain the metal, means for relieving pressure in the metal

receiving chamber, and a cover for said chamber.

3. The herein described apparatus for annealing metals, a chamber having double walls adapted to contain the metal to be treated, means for relieving fluid pressure within the chamber, a cover for said chamber and having the air exhausted from between the walls of the chamber.

4. The herein described apparatus for annealing metals, a chamber having double walls adapted to contain the metal, a cover for said chamber, a valve to relieve pressure in the chamber and having the air exhausted from between the walls.

This specification signed and witnessed this 12th day of August A. D. 1913.

FREDERICK HART FECHTIG.

In the presence of—
O. L. BROWNE,
W. C. CRAFT.