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PROCESS OF HEAT TREATMENT FOR CASTINGS.

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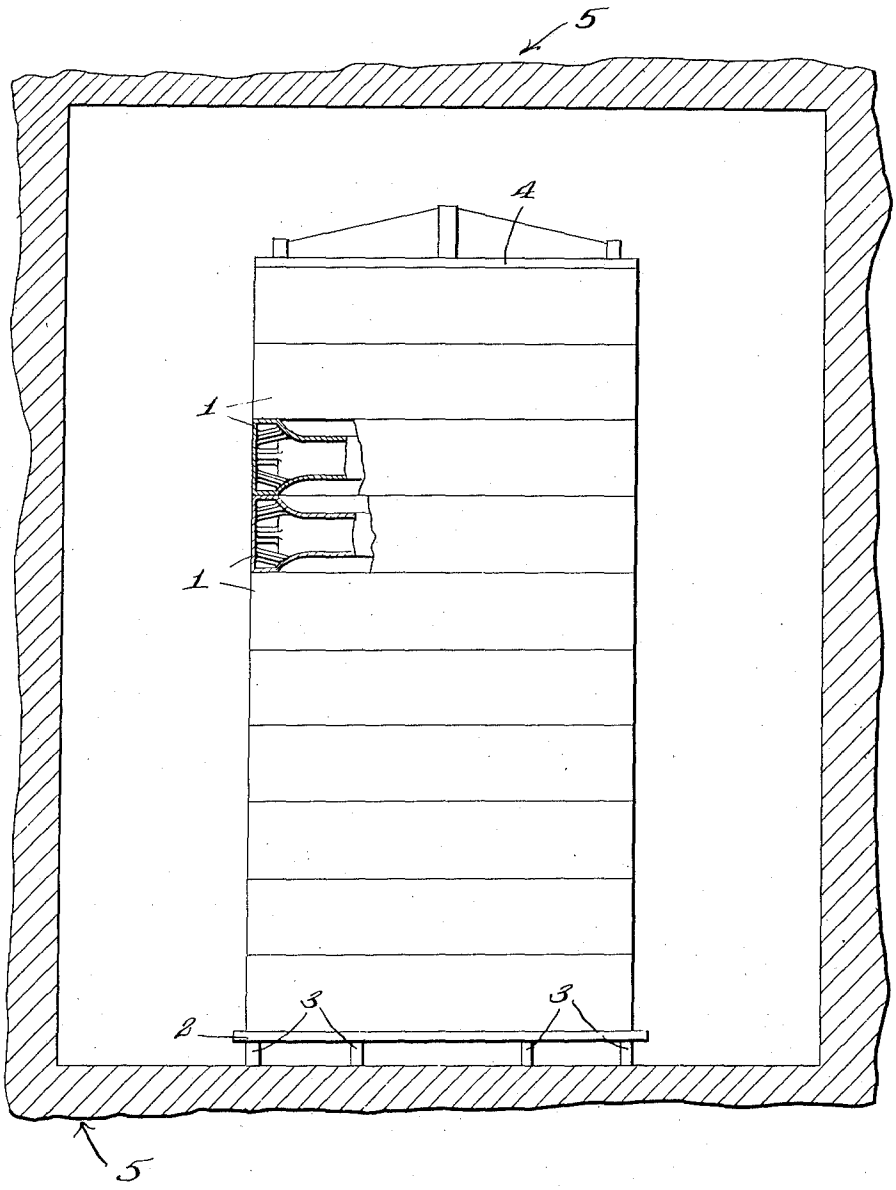
1,328,851. Patented Jan. 27, 1920.



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PROCESS OF HEAT TREATMENT FOR CASTINGS.

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Application filed January 12, 1917. Serial No. 142,103.

To all whom it may concern:

Be it known that I, BURNS LYMAN SMITH, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Process of Heat Treatment for Castings, of which the following is a specification.

My invention has for its object an especially efficient and simple process for the heat treatment of castings and particularly for rendering castings uniformly soft and entirely free from casting strains in the finished product, and to this end it consists in the manipulations and steps of treatment hereinafter fully described and pointed out in the claims.

In describing this invention, reference is had to the accompanying drawing which is an elevation, partly in section illustrating a stack of castings arranged for heat treatment in accordance with my process.

As is well known to those skilled in the art, it has heretofore been customary in certain of the heat treatments of castings to incase them in one or more jackets containing suitable packing material arranged around the castings.

By my invention I dispense with such jackets and packing material.

One of the approved methods of carrying out my process is as follows:—

The castings 1 are arranged one above the other upon a suitable base, as a disk 2, having an upper flat face and also provided with suitable projections 3 on its lower face for enabling carrier arms to enter beneath a lower surface of the base and the floor or other support on which the base rests.

A suitable cap 4, as a disk having a lower flat face is mounted upon the top casting.

The spaces between contiguous castings and between the bottom and top castings and the base and the cap are then closed. A suitable fire-proof cement is a very desirable means for closing these spaces. When these spaces are closed the entire column of castings has a substantially gas tight exterior.

The column of castings with its base and cap, if not assembled within a suitable oven at 5, or other heating chamber is then lifted by any desirable conveying means having carrier arms for entering between a lower surface of the base and the floor supporting the base, and said column is then transported into the oven or other heating chamber.

The heating medium, as a gaseous fluid, is admitted to the oven or heating chamber containing one or more of the columns of castings and directly engages the exterior of the castings. This medium gradually raises the temperature of the castings to a predetermined point, then maintains the castings at such temperature and thereafter allows the temperature of the castings to gradually lower.

In one method of carrying out my process the temperature of the castings is gradually raised for approximately 48 hours more or less until approximately 1600° F. more or less; the temperature of the castings is then maintained at this maximum point for approximately 54 hours more or less and is then allowed to gradually lower for about 24 hours more or less until the castings assume their normal dark color, after which the temperature of the castings may be decreased more rapidly if desired until they are at atmospheric temperature.

It will be understood, however, that the temperature to which the castings may be heated and also the time during which their temperature is raised to, or maintained at or lowered from, the maximum point may be varied as desired.

My process is particularly applicable for the heat treatment of the well known Smith wheels for motor vehicles and trailers, since these wheels are formed with unbroken treads or peripheral walls of a width substantially equal to or exceeding the axial length of their hubs, and consequently as the wheels are laid axially one above the other, the contiguous edges of their treads or peripheral walls are either in contact or in close proximity to each other, and when cement is interposed between the edges of the contiguous treads and between the edges of the treads of the bottom and top wheels and the base and the cap, the entire column of wheels constitutes an unbroken cylindrical column, and the entire inner surfaces of the wheels are protected from direct contact with the heating medium.

My process may be used for annealing steel or malleabilizing iron of various formulas.

As is apparent to those skilled in the art, my process has certain marked advantages including the following:—

The expense of providing and handling the jackets and the packings heretofore used is obviated.

A maximum number of castings can be treated in the same space, thus attaining an important economy.

The necessary machining of the external surfaces of the castings subjected to the heating medium is reduced because the direct contact of the heating medium with the external surfaces produces a scale which falls, or is readily detached, from said surfaces.

As no packing is used the internal surfaces of the castings which are protected from contact with the heating medium are bright and clean when the treated castings are separated from each other, and consequently a minimum expense is incurred in cleaning the castings.

The castings are more homogeneous or uniform in hardness and texture than if treated within jackets containing packing.

Also there is a minimum amount of breakage during the heat treatment, because the heat is applied uniformly direct to the entire exterior surface of the casting and is uniformly and quickly conducted by the fiber of the metal to all parts of the casting and there is no material contiguous to the casting which in any way retards the uniform and quick transmission of the heat.

What I claim is:—

1. The herein described process of heat treatment for hollow spoke wheels having hollow fellies, the same consisting in arranging the wheels one above the other in a column with the edge of the felly of one wheel resting on the edge of the felly of the next lower wheel closing the top and bottom of the column and applying a gaseous heating medium direct to the peripheries of the wheels and gradually raising the temperature of the medium to a predetermined maximum temperature, maintaining such maximum temperature for a predetermined time, then gradually lowering the temperature, substantially as and for the purpose described.

2. The herein described process of heat treatment for hollow spoke wheels having hollow fellies formed with continuous peripheral walls, the same consisting in arranging the wheels axially in a column, one above the other, closing the space at the top and bottom of the column and then applying a heating fluid direct to the peripheries of the wheels, substantially as and for the purpose specified.

3. The herein described process of heat treatment for castings, the same consisting in arranging the castings one above the other in a column, closing the spaces between contiguous castings and then applying a heating gaseous fluid direct to the exterior of the castings and thereby gradually raising the temperature of the column of castings during approximately 48 hours more or less to approximately 1600° F. more or less, maintaining the column of castings at substantially said maximum temperature for approximately 54 hours more or less, and then gradually lowering the temperature of said column of castings for approximately 24 hours more or less, substantially as and for the purpose specified.

In testimony whereof, I have hereunto signed my name, at Syracuse, in the county of Onondaga, and State of New York, this 8th day of January, 1917.

BURNS LYMAN SMITH.