

UNITED STATES PATENT OFFICE.

MARTIN COPPINGER, 2D, OF MILFORD, ASSIGNOR TO THE HOPEDALE MACHINE COMPANY, OF HOPEDALE, MASSACHUSETTS.

METHOD OF ANNEALING.

SPECIFICATION forming part of Letters Patent No. 495,930, dated April 18, 1893.

Application filed August 28, 1890. Serial No. 363,347. (No specimens.)

To all whom it may concern:

Be it known that I, MARTIN COPPINGER, 2d, of Milford, county of Worcester, State of Massachusetts, have invented an Improvement in
5 Methods of Annealing, of which the following description is a specification.

This invention relates to a novel method for annealing metal, and is especially adapted for annealing iron castings.

10 Prior to my invention I am aware that cast iron castings have been annealed by means of carbon, usually in the form of charcoal, and coke, but practical experience has demon-
15 strated that the results obtained by annealing with charcoal and coke are not always what is desired, and that certain classes of iron castings are not wholly annealed when
20 so treated but remain hard in spots or places, which renders the castings unfit for use, so that the said castings are rejected and are utilized only as scrap.

I have discovered that iron castings may be annealed uniformly and left free from hard spots and thus rendered easy of manipulation
25 by the employment of vegetable fiber in its natural state, and preferably in the form of wood fiber comminuted.

In practice the castings together with wood comminuted, or in form of shavings, are
30 packed in a suitable box or chamber which is then closed and subjected to a low red heat for a suitable length of time not exceeding eight hours, after which the heat is withdrawn and the castings allowed to cool. The cast-
35 ings thus treated are perfectly annealed, are free from hard spots and can be easily worked. This effect I ascribe to the constituents normally existing in the wood fiber, and which in the preparation of charcoal and coke are
40 driven off and consumed, and to the low degree of heat to which the castings are sub-
jected for a short time.

My improved process is also especially adapted to be used for annealing castings which have been treated in the ordinary man-
45 ner and condemned as worthless because of hardness, as castings which before treatment by my method were too hard to be worked have been rendered soft and put into condi-
50 tion to be easily worked.

I am aware that cast or wrought iron has been converted into steel by the employment of wood or charcoal in the presence of an in-
55 tense fire, and I am also aware that the surfaces of rails and wheel tires have been hardened by heating the same to a red heat for from thirty-six to forty-eight hours when packed in a chamber with peat or wood sawdust, and such methods I do not herein claim, as the
60 castings treated according to my process are not turned into steel nor are they surface hard-
ened.

I claim—

1. That improvement in the art or method of annealing castings, which consists in sub-
65 jecting the castings to a low red heat in a closed chamber for a period not exceeding eight hours in the presence of a vegetable fiber, substantially as described.

2. That improvement in the art or method
70 of annealing metals, which consists in subjecting the metal to a low red heat for a period not exceeding eight hours in a closed chamber in the presence of comminuted wood, substantially as described.
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In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MARTIN COPPINGER, 2ND.

Witnesses:

F. J. DUTCHER,
C. E. LONGFELLOW.