A. WHITNEY.

Tempering Car Wheels.

No. 5,531. Patented April 25, 1848.

Fig. 2

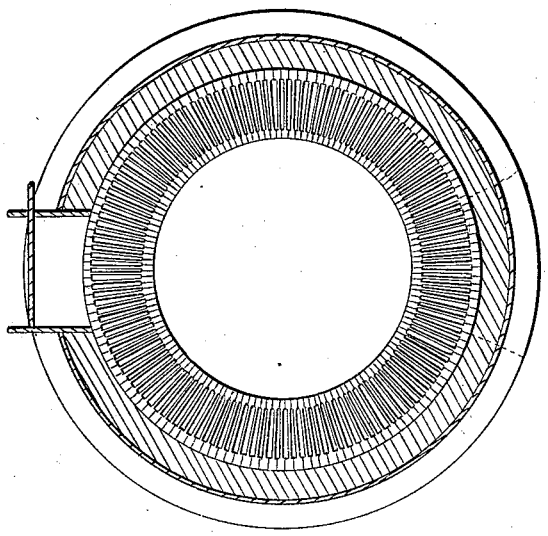
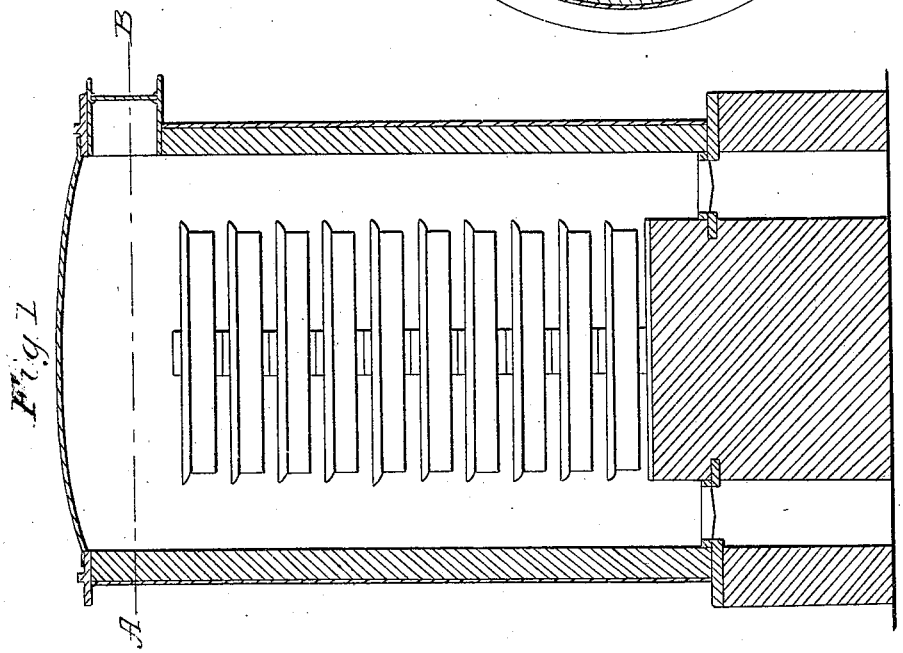


Fig. 1



UNITED STATES PATENT OFFICE.

ASA WHITNEY, OF PHILADELPHIA, PENNSYLVANIA.

ANNEALING AND COOLING CAST-IRON CAR-WHEELS.

Specification of Letters Patent No. 5,531, dated April 25, 1848.

To all whom it may concern:

Be it known that I, ASA WHITNEY, of the city of Philadelphia and State of Pennsylvania, have made a new and useful Improvement in Processes of Manufacturing Cast-Iron Railroad-Wheels; and I do hereby declare that the following is a full and exact description thereof.

My improvement consists in taking rail road wheels from the molds in which they are ordinarily cast, as soon after being cast, as they are sufficiently cool to be strong enough to move with safety, or before they have become so much cooled as to produce any considerable inherent strain between the thin and thick parts, and putting them in this state, into a furnace or chamber, that has been previously heated to a temperature as high as that of the wheels when taken from the molds. As soon as they are deposited in this furnace or chamber, the opening through which they have been passed is closed, and the temperature of the furnace or chamber and its contents gradually raised to a point a little below that at which fusion commences when all the avenues to and from the interior are closed, and the whole mass left to cool no faster than the heat it contains permeates through and radiates from the exterior surface of the materials of which it is composed.

By this process all parts of each wheel are raised to the same temperature, and the heat they contain can only pass off through the medium of the confined atmosphere, that intervenes between them and the walls of the furnace or chamber, consequently the thinnest and thickest parts cool and shrink simultaneously together, which relieves them from all inherent strain whatever, when cold.

The annexed drawings will show the form and size of the furnace or chamber which I have used to perform the process, above described.

Figure 1, represents a vertical cross section of the furnace or chamber, and Fig. 2, a horizontal cross section of the same, on the line A, B. In the former, is shown a pile of wheels as they are placed to be annealed. The cover to the furnace being movable is raised when the wheels are put in and is then closed and covered with earth to prevent the too rapid escape of the heat. The damper in the flue leading to the chimney is also closed, as shown in Fig. 2, after the wheels are put into the furnace, and the opening in the lower wall stopped by an iron plate, banked with earth, which prevents the escape of the heat in that direction. The explanations on the drawings sufficiently describe the other parts of the furnace.

To heat this furnace, I have used anthracite coal, it requiring less than one fourth of a ton to anneal two tons of wheels. The heat required to perform the process, may however, be obtained by the use of any other fuel that may be less expensive at the place where the process is to be performed; or, the requisite heat may be taken in a suitable conduit from the furnace in which the metal is melted, from which the wheels are made, after it has performed that office, to the chamber in which the annealing process is to be performed. In either case however the furnace or chamber must be made of such form, and have such appendages connected with it, as to enable the operator to control the quantity and intensity of the heat used by admitting more or less of it into the chamber and of excluding it entirely.

The advantages resulting from the process of prolonging the cooling and annealing as above described are, that the wheels may be made much stronger when made of the same weight, than they can be when cast and cooled in the ordinary manner and rail road wheels, having any form of spokes or disks connecting the rim and hub, if subjected to this process, will not require their hubs to be cast in sections and the spaces between the sections subsequently filled with some suitable metal and wrought bands put on to the hub. Wheels subjected to this process of cooling and annealing will be stronger without bands on their hubs than those of the same weight cast and cooled in the ordinary way, having the wrought iron bands on. In this way the original cost is diminished and the wheels rendered more durable than they would be when made in any of the ways heretofore employed.

I do not claim to be the inventor of annealing castings made of iron or other metal when done in the ordinary way, nor do I claim to be the inventor of any particular form or kind of furnace in which to perform the process. But

What I do claim as my invention and desire to secure by Letters Patent, is—

The process of prolonging the time of cooling, in connection with annealing rail road wheels in the manner above described—that is to say, the taking them from the molds in which they are cast, before they have become so much cooled as to produce such inherent strain on any part as to impair its ultimate strength, and immediately after being thus taken from the molds, depositing them in a previously heated furnace or chamber, so constructed, of such materials, and subject to such control that the temperature of all parts of the wheels deposited therein may be raised to the same point (say a little below that at which fusion commences), when they are allowed to cool so fast, and no faster than is necessary, for every part of each wheel to cool and shrink simultaneously together, and no one part before another.

A. WHITNEY.

Witnesses:
GEO. WHITNEY,
W. H. TALCOTT.