

# UNITED STATES PATENT OFFICE.

NATHAN WASHBURN, OF BOSTON, MASSACHUSETTS.

## CAST-IRON CAR-WHEEL AND PROCESS OF MAKING THE SAME.

SPECIFICATION forming part of Letters Patent No. 452,817, dated May 26, 1891.

Application filed January 8, 1891. Serial No. 377,135. (No specimens.)

*To all whom it may concern:*

Be it known that I, NATHAN WASHBURN, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Methods of Manufacturing Cast-Iron Car-Wheels and Methods of Making the Same, of which the following description is a specification.

This invention has for its object the production of an improved cast-iron car-wheel in a novel manner.

Cast-iron car-wheels as now commonly constructed and known to me are made by pouring or casting the metal into a mold provided at its periphery with a chilling-surface, usually an iron ring. When the mold has been filled with the metal, that portion of the metal in contact with the chill cools very much more rapidly than the center of the car-wheel, which is not in contact with the chill. In this manner the periphery of the car-wheel is rendered very much harder than the center, and is enabled to withstand considerable strain or pounding, such as it would receive in service on a railway.

I have discovered that a cast-iron car-wheel having a chilled periphery may be greatly strengthened and made very much more durable than the ordinary cast-iron car-wheel if the chilled periphery is manipulated or worked, as by rolling.

In accordance with my present invention therefor I propose to make cast-iron car-wheels in substantially the following manner, viz: The cast-iron in a molten state is poured into a mold having a chilling-surface, by which the periphery of the wheel is chilled, and preferably as soon as the metal has become sufficiently "set" so as to enable the wheel to be handled the said wheel is taken from the mold and placed in a rolling-mill, which may, and preferably will, be substantially such as shown and described in the United States Patent No. 437,270, granted to me September 30, 1890, in which the chilled surface or periphery of the car-wheel is manipulated or worked by the rolls of the said machine, whereby the fiber of the chilled portion of the cast-iron car-wheel is very materially changed and is rendered compact and strong.

In a cast-iron car-wheel made in the ordinary manner without the periphery being manipulated in the rolling-mill a fracture of the metal discloses that the chilled portion of the periphery, which usually extends a considerable distance toward the center of the wheel, has a laminated structure or appearance, the laminations of the metal extending in a radial line toward the center of the wheel.

By manipulating the chilled periphery of the cast-iron car-wheel in the rolling-mill while in a heated condition the laminated structure or appearance of the chilled portion of the wheel is wholly destroyed, and the appearance of a fracture of the manipulated periphery shows the metal compact and very close and the grain of the metal is entirely changed.

It has been demonstrated by an experimental use that a car-wheel made of cast-iron and having a chilled periphery which has been manipulated as described possesses a many-fold increase in strength and wearing capacity over the ordinary cast-iron car-wheel having a chilled periphery. Preferably the cast-iron car-wheel will be placed in the rolling-mill as soon as the metal has become sufficiently set to enable it to be handled; but, if desired, the wheel may be allowed to cool and then reheated to as near fusion as may be desired and then worked in the rolling-mill.

I claim—

1. The herein-described cast-iron wheel having a non-laminated chilled tread, substantially as described.

2. The herein-described process of manufacturing cast-iron car-wheels, which consists in pouring the molten cast-iron into a mold, chilling only the tread of the cast-iron wheel, and thereafter rolling the chilled tread to change its physical structure and make the chilled surface stronger and more durable, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

NATHAN WASHBURN.

Witnesses:

JAS. H. CHURCHILL,  
A. S. WIEGAND.