

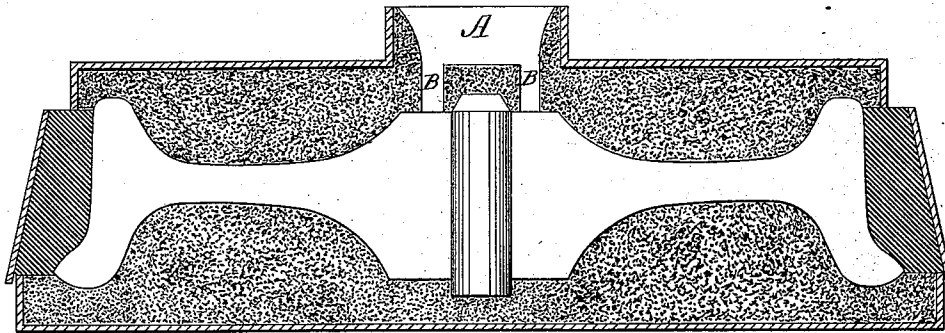
(No Model.)

W. WILMINGTON.

METHOD OF CASTING CAR WHEELS.

No. 289,741.

Patented Dec. 4, 1883.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

WILLIAM WILMINGTON, OF TOLEDO, OHIO.

## METHOD OF CASTING CAR-WHEELS.

SPECIFICATION forming part of Letters Patent No. 289,741, dated December 4, 1883.

Application filed October 20, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM WILMINGTON, of Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Methods of Casting Car-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification.

10 This invention relates to the manufacture of cast-iron car-wheels, the object being to modify the chill-hardening qualities of the cast-iron forming the hub and plate portions of the wheel, to prevent these parts from becoming too hard and rigid, which occurs from the molten iron forming these portions being too suddenly cooled by the moist sand and the cold compact cores of the mold. The prevention of the hardening of the hub and plate portions of the wheel by an admixture of another quality of metal at these points will secure a degree of softness and elasticity to the hub and plate parts of the wheel, the advantages of which are well known.

25 Heretofore Letters Patent of the United States have been granted me (No. 273,658, dated March 6, 1883, and No. 281,422, dated July 17, 1883) for methods of modifying the chill-hardening qualities of the iron forming the hub and inner plate parts of car-wheels, the first being a displacement process, and the second a churning or agitating process. These methods produce more or less beneficial results; but there are objections to these methods, because of the increased cost, and also the uncertainty of melting the powdered ferro-manganese or its equivalents by contact with a certain and unchanging quantity of molten iron in the receiving-basin of the mold. Another objection is because of the natural cooling of the molten iron and the increased rapidity of cooling of the same when the cold ferro-manganese or its equivalent is placed in the basin. The ferro-manganese in consequence will not always be melted and diffused in sufficient quantity to modify the chilling properties of the iron forming the hub and plate parts of the car-wheel to that degree which is desirable.

50 To secure with certainty the melting of powdered or granulated ferro-manganese or its

equivalents by contact with molten cast-iron during the process of casting, and to cause the same to be carried down and diffused in the molten iron forming the hub and plates of the wheel, and to lessen the cost of the wheel, are the objects of my improvement.

In carrying out my invention, I take in a pouring-ladle a sufficient quantity of iron to pour a car-wheel weighing about five hundred and fifty pounds and pour it into the mold in the ordinary manner of casting car-wheels, with the exception or addition of the following process: When the mold is about three-fourths filled with molten iron, and while the metal is flowing, I commence to place gradually into the current of molten iron flowing from the pouring-ladle (or in the receiving-basin) about a pound of finely powdered ferro-manganese or its equivalent, allowing the same to be melted by its particles being in contact and intermingling with the hotter and continuous stream of molten iron falling into the basin during the last of the filling of the mold. The continuous flow of molten iron into the basin will carry with it into the mold the ferro-manganese or its equivalent, which will be disseminated in the molten iron forming the hub and plate portions of the wheel. The molten iron which has formed the parts of the tread of the wheel, which is most subject to wear, being in contact with the chill of the mold, has become solidified to such an extent that will prevent the diffusion of the ferro-manganese in the same.

To modify the chilling qualities of the iron composing the hub and plate portions by my process, I prefer to use ferro-manganese, because it takes less to produce the desired results. However, I do not confine myself to the use of ferro-manganese alone to modify the iron composing the hub and plate parts of car-wheels, because in using different qualities of chill-hardening cast-irons I find it desirable, instead of the ferro-manganese, to use powdered or granulated spiegeleisen in larger proportions. I also find it desirable to use for the same purpose by my process small particles of cast-iron derived from cast-iron which has been made from argillaceous or black-band iron ores, having a large proportion of uncombined carbon in their composition.

I furthermore use in some combinations of chilling irons for car-wheels any of the above-named metals singly or in combination, in such proportions as practice shows produces the best results upon car-wheels by my process, as described above.

I do not confine myself to the exact relative proportions of the different metals used by my process, as the same may be varied to meet the requirements of the chill-hardening irons from which the car-wheel is to be cast.

The drawing represents a cross-section of a single plated car-wheel mold.

A shows the receiving-basin, and B represents two or more openings in the bottom of the basin, leading into the mold.

I disclaim as my invention the broad idea of alloying molten cast-iron with an admixture of ferro-manganese, spiegeleisen, or other metals derived from argillaceous or black-band iron ores when the same is melted in a furnace, cupola, or crucible.

I also disclaim in this application for a patent melting by contact with molten iron in a receiving-basin of a car-wheel mold powdered or granulated ferro-manganese or its equivalent, when the same is melted by contact with molten iron in a receiving-basin containing an unchanging quantity of molten cast-iron.

The distinctive feature of my invention is in the single pouring and the gradual addi-

tion of the ferro-manganese to the flowing metal at the latter end of the pouring, whereby I save the expense and time of two pourings, or one pouring and a mixing operation, and whereby the ferro-manganese is more certainly carried into the mold, and more uniformly disseminated.

What I claim as my invention is—

The method of casting car-wheels which consists in pouring into the mold of a car-wheel about three-fourths the capacity of the mold of suitable chill-hardening cast-iron, then, in the same pouring, placing in the current of the molten iron from the pouring-ladle, or in the receiving-basin of the mold, a quantity of ferro-manganese or its equivalent, whereby the same is melted by the continuous falling and intermingling of the same with the stream of molten iron from the ladle into the basin, and is carried thence into the mold by the inflow of molten metal from the basin, thus causing the ferro-manganese to be disseminated in the molten iron forming the hub and plate portions of the wheel, all substantially as described, and for the purpose hereofore set forth.

WILLIAM WILMINGTON.

Witnesses:

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