N. WASHBURN.
Chilled Car-Wheels.

No. 212,825. Patented Mar. 4, 1879.

Fig. 1.

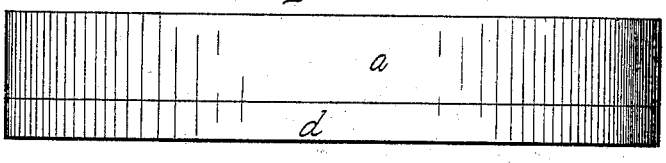


Fig. 2.

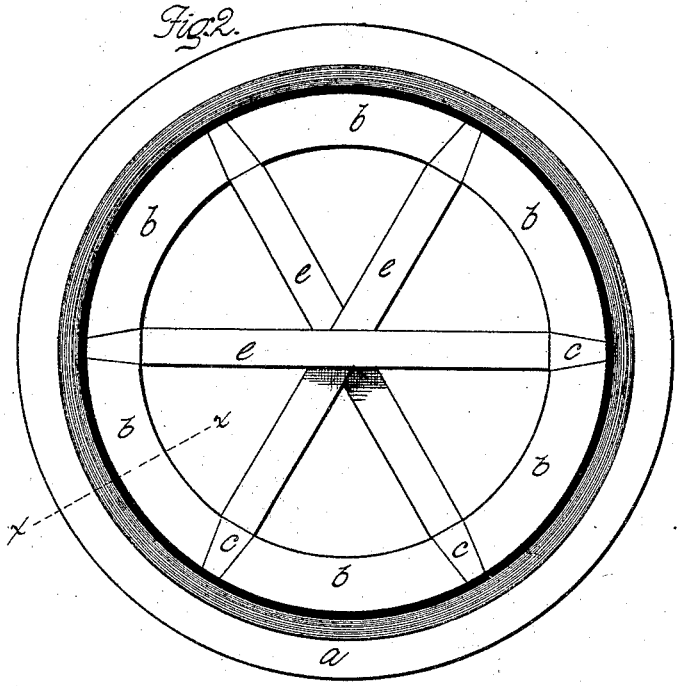
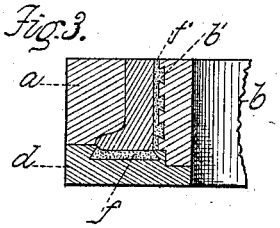


Fig. 3.



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NATHAN WASHBURN, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN CHILLED CAR-WHEELS.

Specification forming part of Letters Patent No. **212,825**, dated March 4, 1879; application filed September 16, 1878.

To all whom it may concern:

Be it known that I, NATHAN WASHBURN, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements Pertaining to the Manufacture of Chilled Cast-Iron Car-Wheels, of which the following is a specification, reference being had to the accompanying drawings, where—

Figure 1 is a side view or elevation of the mold made use of. Fig. 2 is a top view of the mold. Fig. 3 is a sectional view of the same on the vertical plane *x x*.

The most common kind of wheel for railway-cars is the so-called "chilled" wheels—that is, a wheel cast of iron, with the periphery or tread chilled and hardened by being cast in contact with an iron chill-ring. A difficulty in the practical manufacture thereof is that the molten iron has to be poured into the mold when comparatively cool. If poured very hot a majority of the wheels will chill-crack and spoil. If the iron could safely be poured very hot the chill effect would be greater and the tread much harder, giving vastly-increased durability.

Another difficulty met with in the making of these wheels is that of, in many cases, making the center and hub of the wheel so hard that they cannot be bored or drilled for the axle with the necessary accuracy. For this reason alone many wheels are rendered useless, and thereby causing a needless waste of no small amount.

In my present method I am enabled to use for the center and hub of a wheel a softer iron than that usually used for producing the chilled tread and consequently avoid the difficulty heretofore experienced in drilling the hub.

I have devised a means for making chilled cast-iron wheels with the rim-tread or tire poured at the hottest possible point without liability to chill-crack, and with the attainment of extreme hardness and increased durability.

I will now describe a mold for putting my improvement into practice: The letter *a* denotes the outer or chill ring of the mold; *b b b b b b*, the sections which go to make up the inner ring; *c c c c c c*, wedges to tighten the ring-sections *b* to place; *d*, the base-ring; and *e e e*, wedge-sticks to hold the wedges to place. All but the wedge-sticks are generally made of cast-iron.

In using this mold I also use substantially the runners described in former Letters Patent to me, No. 197,753, dated December 4, 1877, but with the difference that I leave the matrix of the mold open on the top all the way around and enlarge the feet of the runners, which sit upon the mold, to cover the otherwise open top.

I line the inner side of the matrix, and also the bottom thereof, with some non-chilling material. I have used for this purpose a mixture of equal parts of fire-sand and plumbago. The letters *f f* denote this non-chilling lining both on the bottom and the inner side of the matrix.

The base-ring *d* contains an annular groove all around to hold the non-chilling material. The non-chilling coat is made to adhere to the ring-sections by means of the dovetailed annular grooves *b'*. It will be understood that the plumbago is ground up or powdered up and mixed with the fire-sand, that the mixture is then dampened and applied to the mold, and finally dried. The under side of the feet of the runners, which practically form the top of the matrix, are also coated with the non-chilling material.

It is obvious that the tire cast in this mold will only be chilled on the tread; and actual trial shows that very hot molten iron may be cast in it without chill-cracking.

After a tire is cast in this mold it is transferred, still hot, and, preferably, in its chill-ring, after the manner set out in prior Letters Patent to me, No. 181,504, dated August 22, 1876, and No. 183,786, dated October 31, 1876, to another mold, where the center or body of the wheel is cast in, and, by the same process welded to the tire.

The essential thing in casting the tire is that the molten iron shall be chilled on the

tread, and not on the inner side. It is preferable, but not essential, that the two edges of the tire be not chilled.

I claim as my invention—

The process of making a chilled cast-iron car-wheel, consisting in first casting a tire with its periphery or face in contact with a chill-ring, and with its inner side in contact with non-chilling material; second, transferring the still hot tire to a second mold; third, casting the center or body within the tire, all substantially as described.

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