

J. B. TARR.  
CAR WHEEL.

No. 104,792.

Patented June 28, 1870.

Fig. 1.

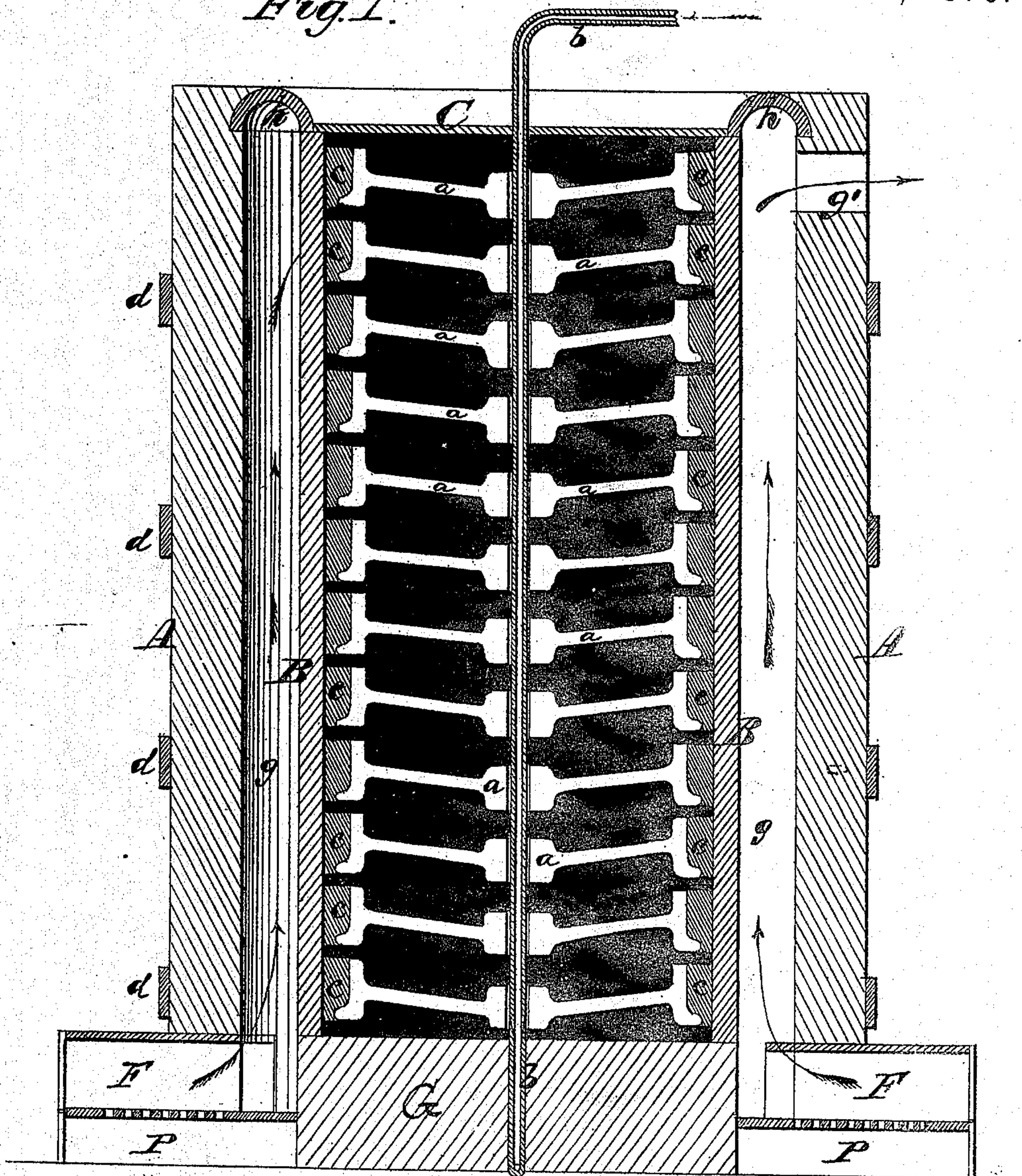
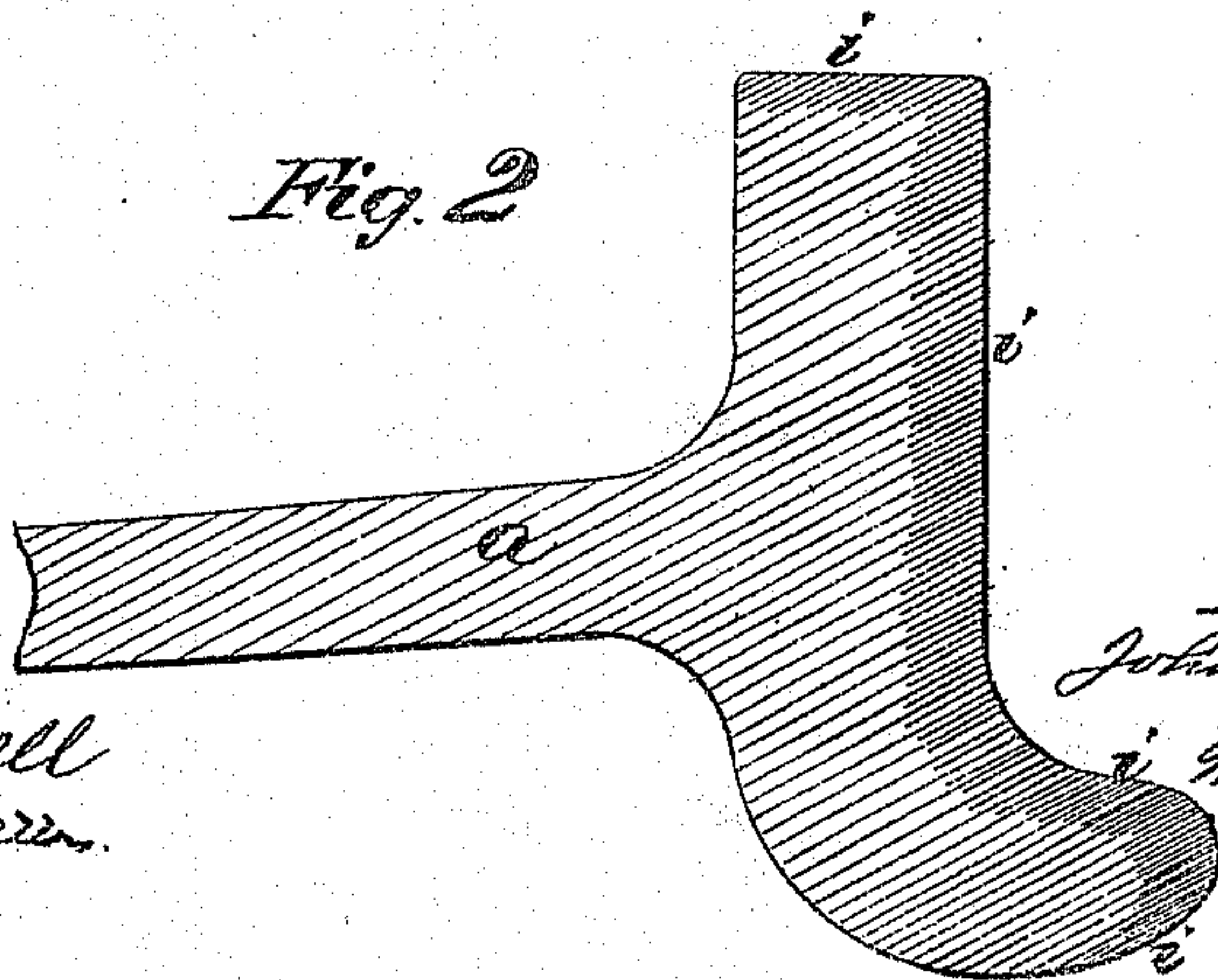


Fig. 2



Witnesses  
R. Campbell  
J. H. Campbell

Inventor  
John B. Tarr  
by his atty  
J. M. Hewitt



# United States Patent Office.

JOHN BLAKE TARR, OF FAIRHAVEN, MASSACHUSETTS.

Letters Patent No. 164,792, dated June 28, 1870; antedated June 18, 1870.

## IMPROVED STEEL CAR-WHEEL.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JOHN BLAKE TARR, of Fairhaven, in the county of Bristol and State of Massachusetts, have invented a new and improved Car-Wheel; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a vertical central section through a furnace which I employ in the process of hardening the treads and flanges of the wheels.

Figure 2 is a sectional view of a portion of a car-wheel having its tread and flange hardened.

Similar letters of reference indicate corresponding parts in the two figures.

The object of my invention is to improve cast-steel car-wheels by hardening their treads and flanges, so as to obtain wheels which possess all the required degree of toughness and strength, for affording durability and safety, and also which are so hard at their treads and flanges as will prevent these surfaces from "cutting out" or wearing untrue.

I am aware that car-wheels were made before this invention of cast-iron, with chilled treads and flanges, and also that compound wheels, having chilled cast-iron tires, and wrought-iron webs and hubs, have been used before my invention.

Cast-steel car-wheels, when made either by forging, or by casting in molds under pressure, are so soft on their treads and flanges as to cause them to rapidly wear out, and also to wear untrue. This objection is, in a great measure, obviated in the cast-iron wheel, but the central portion of the cast-iron wheels is so brittle that they are liable to crack and break down, and are very dangerous.

To enable others skilled in the art to understand my invention, I will describe the best means known to me for carrying it into effect.

In the accompanying drawing, fig. 1, I have represented a cementing-furnace, which is adapted for use in the operation of hardening the treads and flanges of a number of wheels at one time.

This furnace consists of a cylindrical upright shell, A, inclosing a cylindrical wall, B, so as to leave a flue space, g, between the shell and wall, for the circulation of the highly-heated products of combustion rising from fire-places F F.

I shall employ four fire-places, F, arranged at equal distances apart, and a single flue-outlet, g', which latter is located near the top of the wall A, just beneath the annular arch h, which caps the said space g.

The cylindrical wall B is erected upon a solid foundation, G, and is capped by a plate, C, which can be removed at pleasure.

This plate C has a hole centrally through it, through which a pipe, b, is passed, that fits into the upper end of a stand-pipe, b', in the foundation G. The pipe b is removable, and is inserted in place when the furnace is filled, as shown in fig. 1. This pipe b should communicate, at its upper end, with some convenient water-vessel or supply-reservoir or with a force-pump, and the discharge end of the lower pipe b' is carried out of the foundation-wall G, between two of the furnaces F, for conducting away the water. Instead of using water, cool air may be forced through this pipe, either upwardly or downwardly.

It will be seen, by reference to fig. 1, that the wheels are packed into the space inclosed by the wall B between layers of sand, clay, or other suitable material, and that the annular spaces between the treads and flanges and the wall B are filled with a cement which may be composed of salt and prussiate of potash, in about the following proportions, say five pounds of salt and one pound of prussiate of potash. This compound I have found best for this purpose, but I do not confine my invention thereto.

It is packed into annular spaces, c c, so as to operate only upon those portions of the peripheries of the wheels which are exposed to wear on the rails.

When the wheels a have been carefully packed into their cementing-chamber, as above described, the top plate C is confined tightly down in place, after which the water-supply pipe b is inserted through the eyes of all the wheels, and its tapered end forced tightly into the flaring end of the stand-pipe.

The fires are made, and the process of cementing conducted, as fully understood by those skilled in the art of cementation.

Water is caused to flow through the pipe b during the process, thereby keeping the hubs and central portion of the webs of the wheels comparatively cool, while the peripheries of the wheels and flanges are properly converted, and rendered very hard.

I determine when the process is complete by removing plate C, or a cover to a test-hole which may be made through it, and examining the top wheel. If this wheel is found to be at a red heat, (cementing heat,) the fires are drawn and the wheels removed, and their circumference cooled as quickly as possible, and thereby hardened.

By this process I am enabled to practically harden the treads and flanges of one or a number of car-wheels, and at the same time keep the hubs and webs of the wheels soft.

I deem it proper to state that I prefer to employ a low grade of steel, known as boiler-steel, which is wrought iron sufficiently charged with carbon to allow it to be melted, but not to render it brittle. This kind



of steel is not liable to crack under the roughest usage, nor is it liable to crystalize by the shocks and concussions which the wheels receive when in use.

Wheels of steel, whether made by forging or by casting the metal in molds, or otherwise, may be thus improved and rendered superior to all other car-wheels hitherto used, in point of strength, durability, lightness, and safety.

Having described my invention

What I claim as new, and desire to secure by Letters Patent, is—

A steel car-wheel, having that portion of its circumference or rim which is exposed to wear hardened by the process substantially as described.

JOHN BLAKE TARR.

Witnesses:

R. T. CAMPBELL,

J. N. CAMPBELL.