

No. 736,102.

PATENTED AUG. 11, 1903.

A. F. HOWE.
MOLDING CAR WHEELS.
APPLICATION FILED SEPT. 25, 1902.

NO MODEL.

Fig. 1.

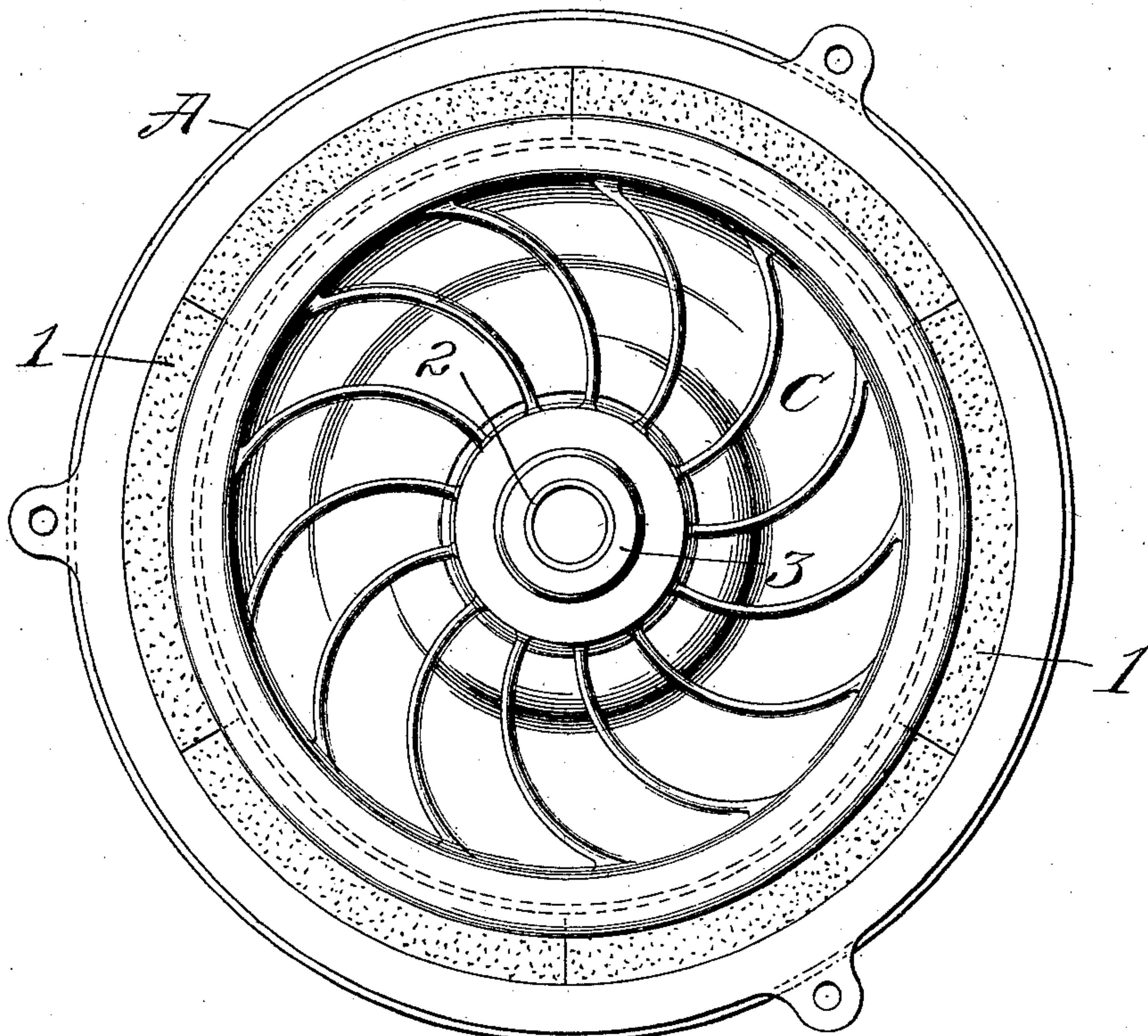
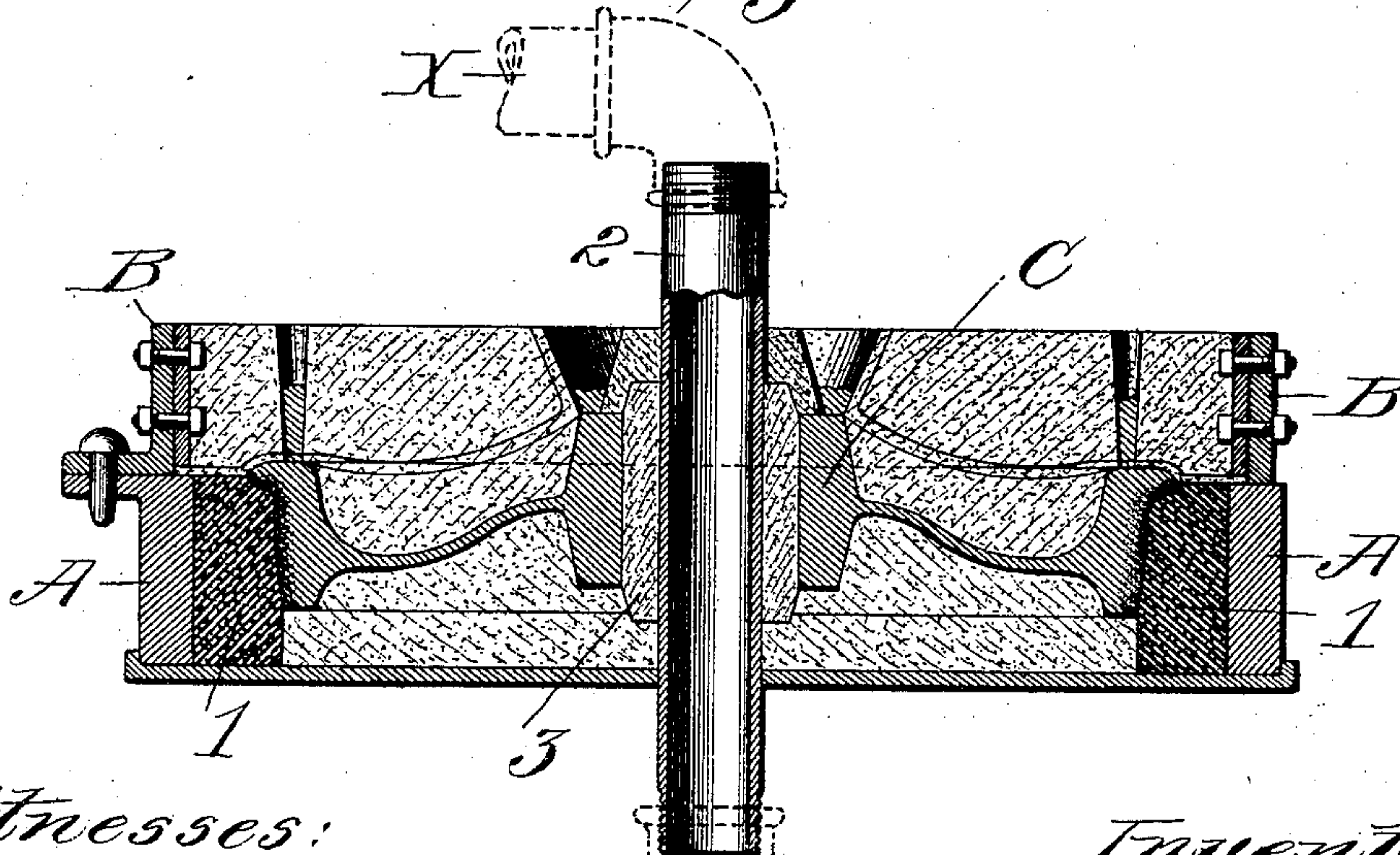


Fig. 2.



Witnesses:
Wm. H. Scott
Ralph K. Smith

Inventor:
Andrew F. Howe
By Bakewell Lemwall
Attys

UNITED STATES PATENT OFFICE.

ANDREW F. HOWE, OF GRANITE CITY, ILLINOIS.

MOLDING CAR-WHEELS.

SPECIFICATION forming part of Letters Patent No. 736,102, dated August 11, 1903.

Application filed September 25, 1902. Serial No. 124,769. (No model.)

To all whom it may concern:

Be it known that I, ANDREW F. HOWE, a citizen of the United States, residing at Granite City, Madison county, Illinois, have invented a certain new and useful Improvement in Molding Car-Wheels, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view with the cope removed; and Fig. 2 is a sectional view showing the relative position of all the parts, as when a car-wheel has been cast.

The object of the invention is to produce a car-wheel in which the body portion, comprising the hub and web, shall be of low-carbon steel and in which the tread and a portion of the flange shall be of high-carbon steel capable of receiving such temper as is desirable in car-wheels, though heretofore unattainable in such wheels as heretofore manufactured of cast metal.

To that end the invention consists in a new and economical process of manufacturing the same by casting the entire wheel of a low-carbon steel, with the drag of the molding-flask filled with a granular material rich in carbon in proximity to the flange and tread portion of the casting and causing such carbon to be drawn into the perimeter of the wheel to enrich the same with such an amount of carbon as will fit it for tempering.

In carrying out the process any suitable apparatus may be used which will accomplish the desired end, though for convenience of illustration there is herewith shown an apparatus in which A is a drag, and B a cope of ordinary construction, except that both are provided with a central opening, through which is projected a cooling-pipe 2, provided with a surrounding sand core 3, forming a neutral body capable of conducting heat more slowly from the casting C than if the casting should be formed in direct contact with said central metal pipe 2.

It is not intended to chill or case-harden any part of the metal comprising the wheel, but to cast the same in a sand mold or in material lean in carbon, except that the filling

(indicated by 1 in the drawings) shall be a substance rich in carbon and so combined as to conduct heat slowly from the molten metal under normal conditions.

If it were not for the centrally-arranged pipe 2, the casting would cool substantially uniformly, and such carbon as might be absorbed from the filling 1 would be localized to a great extent, thereby defeating the object of the invention. However, to prevent such localization of the recarburizing-supply the pipe 2 is projected through the flask with the sand core 3 fixed thereon to prevent chilling the metal of the hub portion of the wheel, after which the molten metal is poured and fills the matrix in the flask, thereby forming a car-wheel of low-carbon steel. After the wheel is cast and before it has had an opportunity to cool a refrigerant comprising a current of cold liquid or cold air is projected through said pipe 2, which first cools the pipe and then cools core 3. As the heat passes from the cast hub to said core it will draw heat equally in all directions through the web portion of the wheel from the flange and tread portions thereof, when, owing to well-understood laws, the carbon from the filling 1 will be drawn freely into the tread and flange portions of such wheel, and by the time the metal has cooled sufficiently to permit removal thereof from the flask the flange and tread portions will be so thoroughly recarburized as to permit subsequent tempering thereof.

The tempering apparatus forms no part of this invention, but is illustrated in an application for United States Letters Patent filed by me September 25, 1902, known as Serial No. 124,770.

Various means have heretofore been employed for recarburizing metals for a variety of purposes. Means have been employed to cool the hubs of cast wheels wherein the tread portions were cast in contact with metallic chills to harden the same, and metal wheels have been cast and subsequently wholly or partially annealed; but none of these inventions employ the improved process comprising the present invention, which includes the casting without case-hardening and recarburization of the tread and a portion of the flange in one continuous process without re-

moval of the casting from the mold in which it is formed.

I am aware that minor changes may be made in the apparatus and that the process may
5 be varied slightly without in the least departing from the spirit of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

10 1. The herein-described improvement in the manufacture of flanged car-wheels which consists in casting the same of a relatively low carbon steel, while contacting with a portion of the flange is a carbonaceous material,
15 the sides of the wheel being cast in contact with a non-carbonaceous material and the hub being cast around a sand core in which is a cooling-pipe; substantially as described.

20 2. The herein-described improvement in the manufacture of wheels, consisting in casting the tread in contact with carbonaceous material while cooling means contact with the interior of a core within the hub; substantially as described.

25 3. The herein-described improvement in the manufacture of wheels, consisting in casting the body portion of the wheel in a non-carbonaceous material and the tread against a carbonaceous material and subjecting the
30 hub to a cooling influence passing through a

sand core therein about which it is cast; substantially as described.

4. The herein-described improvement in the manufacture of wheels, consisting of casting a unitary structure in which the perimeter is formed in contact with a carbonaceous material and the central portion cast upon a non-metallic core which is rapidly cooled while the perimeter is in such contact by cooling means passing through said core; substantially as described. 35 40

5. The herein-described process of manufacturing car-wheels comprising, preparing the mold with a material high in carbon to contact with the tread and a portion of the flange of a car-wheel, and a material lean in carbon to contact with the web and hub portion, next inserting through the hub portion a conduit in a non-carbonaceous core, next pouring the molten metal, next passing a refrigerant through said conduit and finally removing the wheel from the mold; substantially as described. 45 50

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 23d day of September, 1902. 55

ANDREW F. HOWE.

Witnesses:

F. H. GIBBS,

GEORGE BAKEWELL.