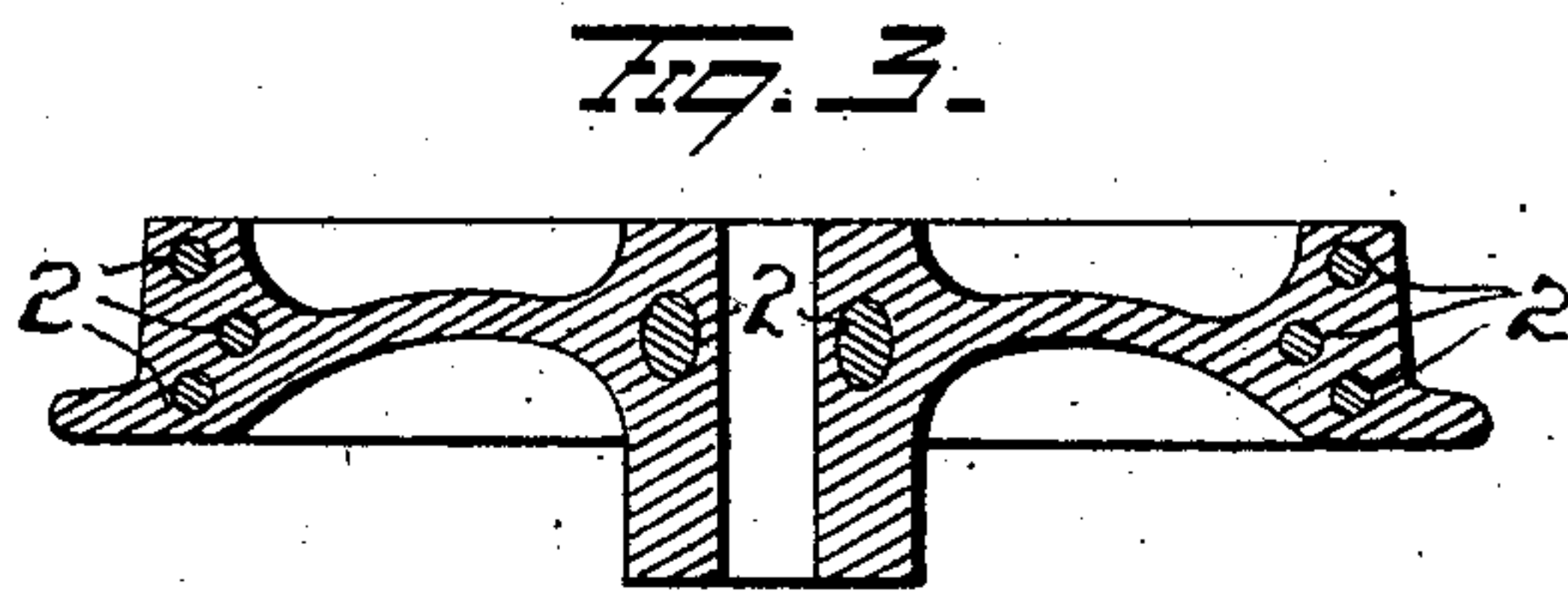
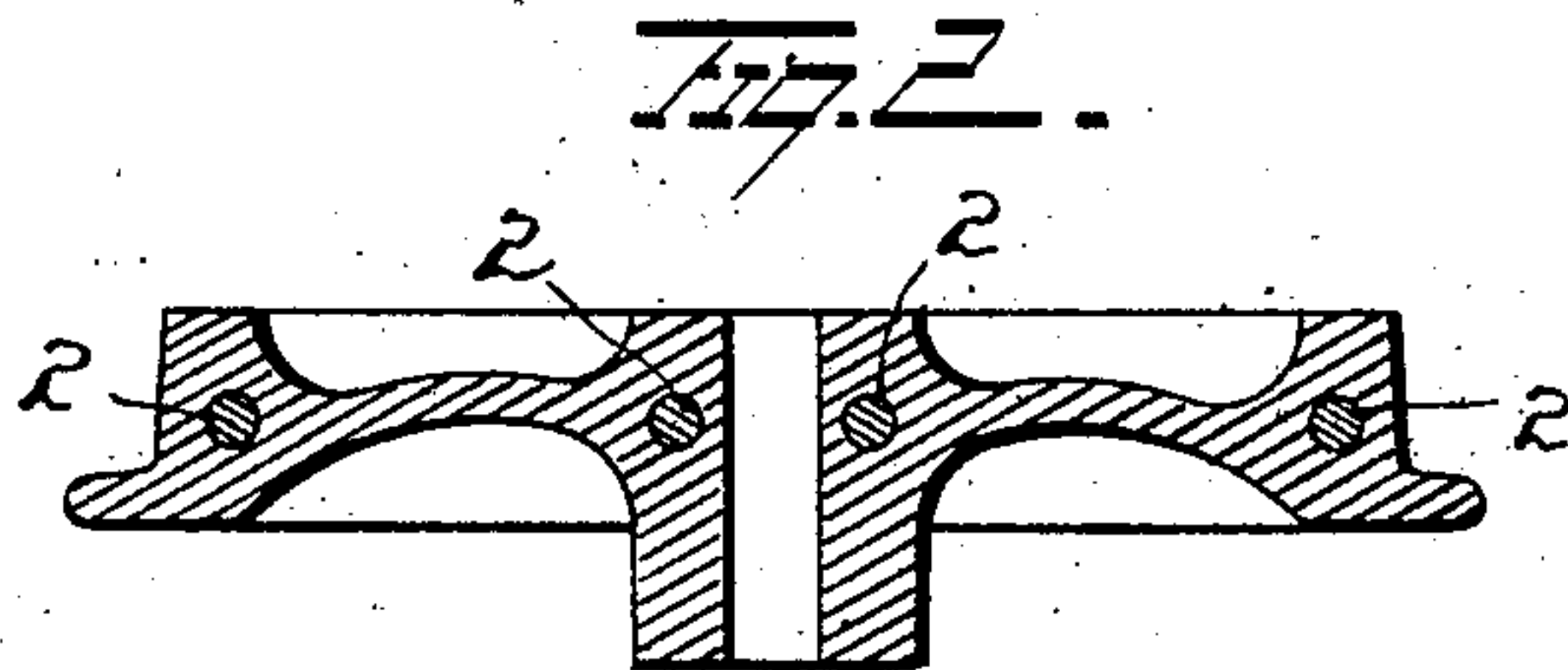
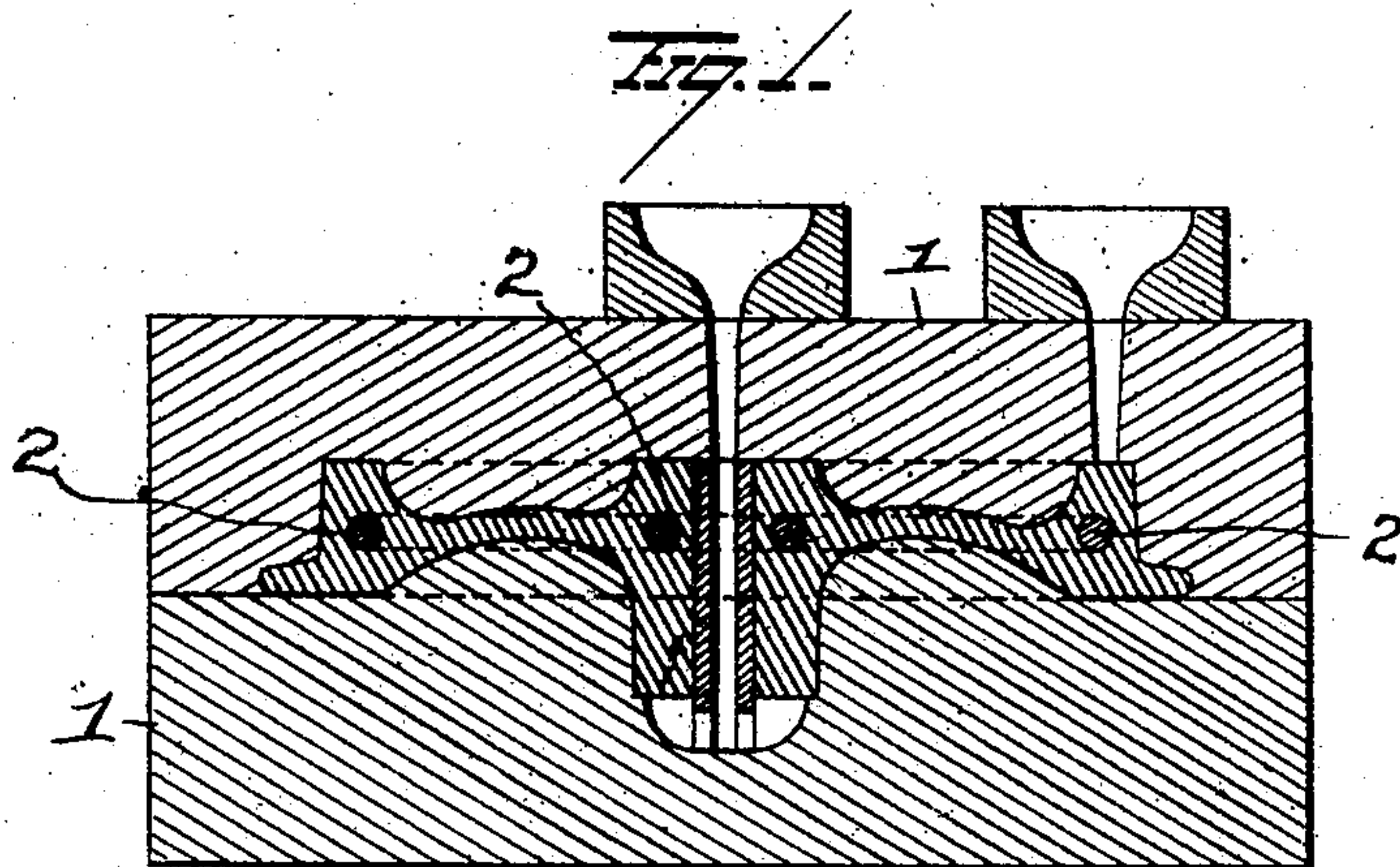


No. 824,407.

PATENTED JUNE 26, 1906.

S. P. BUSH.
CAR WHEEL.
APPLICATION FILED DEC. 2, 1904



WITNESSES

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SAMUEL P. BUSH, OF COLUMBUS, OHIO.

CAR-WHEEL.

No. 824,407.

Specification of Letters Patent.

Patented June 26, 1906.

Application filed December 2, 1904. Serial No. 235,230.

To all whom it may concern:

Be it known that I, SAMUEL P. BUSH, a resident of Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Car-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in car-wheels, the object of the invention being to provide a cast-metal wheel free from hollows or other imperfections due to uneven shrinkage of the metal and accomplish this result without the employment of sink-heads, such as heretofore necessary.

It is well known in the art of casting metals into various articles—such, for instance, as car-wheels—that the metal passes from a molten condition into a solid, a condition which must be provided for, and that as the sections of metal in the casting become heavier the exterior congeals and cools in advance of the metal in the interior and that in consequence the exterior more rapidly cooling metal will draw from the molten interior metal, so that unless the supply of molten metal is maintained until the whole body of the casting has become solidified certain void or hollow spaces will be found in the interior of the casting. The usual method of preventing such voids and making the casting solid is to provide a sink-head or riser having a sufficiently-large section and as large or larger than the section to which it is attached and projecting above the highest points of the casting which it is desired to solidify. When the molten metal is poured into the mold, it is also made to fill the space provided for the risers or sink-heads. Then as the casting contracts and solidifies the risers or sink-heads act as reservoirs from which to replenish the supply of molten metal as it is required, and thus operates automatically.

This process of making solid or shrinking castings is particularly important when employing steel, as steel shrinks or contracts more than certain other metals, and it requires a large quantity of metal to fill the risers or sink-heads and requires the expenditure of considerable time and labor to remove them after the casting has been made. My invention obviates the necessity for the employment of these sink-heads or risers, and the

wheel is stronger and better able to withstand the necessary strains and stresses to which it is subjected; and the invention consists in certain novel features of construction, as will be more fully hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in vertical section of a mold, illustrating the manner of making the wheel. Fig. 2 is a view in section of a wheel complete, and Fig. 3 is a sectional view of a modified construction of wheel.

1 represents a mold for a car-wheel, and 2 represents metal rods or bars bent into curved form. One ring so formed encircles the hub portion of the casting and is located centrally therein, and the other ring, of large diameter, encircles the rim portion of its casting and is approximately in the center thereof. These bars or rings 2 are preferably cold or of the temperature of the surrounding atmosphere. They are so located and secured in the mold to have the molten metal completely envelop them. Other forms of pieces may be used, and three rings, as shown in Fig. 3, might be employed. The pieces 2 may be of various shapes and any number may be employed; but I preferably use fibrous or other metal rods bent into ring formation, as shown. When the molten metal is poured into the mold, it gradually surrounds these pieces 2, which being cold causes the metal in contact therewith to suddenly cool and congeal as it envelops the pieces, so that when the mold has been filled and pouring completed solidification throughout the sections surrounding the pieces 2 will have been accomplished without the aid of sink-heads or risers of the usual proportions, if at all. This process has been found very effective, particularly as the shrinking pieces 2 become fused with the metal that is poured into the mold and are therefore integral and incorporated with the wheel, and the result is a wheel of greater strength and durability, for the pieces 2 add considerable strength thereto.

The action of the brake-shoes on the car-wheels is to generate considerable heat, and the wheels are therefore subjected to varying sudden changes of temperature, which owing to the expansion and contraction of the wheels is liable to crack them. The insert-pieces 2 which I employ serve to prevent cracking of the wheels under such conditions,

as they act as binders to hold the mass of metal together.

Slight changes might be made in the general details set forth, and I wish it understood
5 that I may make various changes without departing from my invention.

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

10 1. A cast-metal wheel having a metal shrink-piece embedded therein and completely enveloped at every point by the metal of the casting.

2. A cast-metal wheel having an annular
15 metal shrink-piece embedded in the tread

portion thereof and completely enveloped at every point by the metal of the casting.

3. A cast-metal wheel having embedded in its tread and hub portions, annular metal shrink-pieces, each of said shrink-pieces being completely enveloped at every point by
20 the metal of the casting.

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

SAMUEL P. BUSH.

Witnesses:

S. W. FOSTER,

R. S. FERGUSON.