W. WILMINGTON.

METHOD OF CASTING CAR WHEELS.

No. 170,925. Patented Dec. 7, 1875.

Fig. 1.

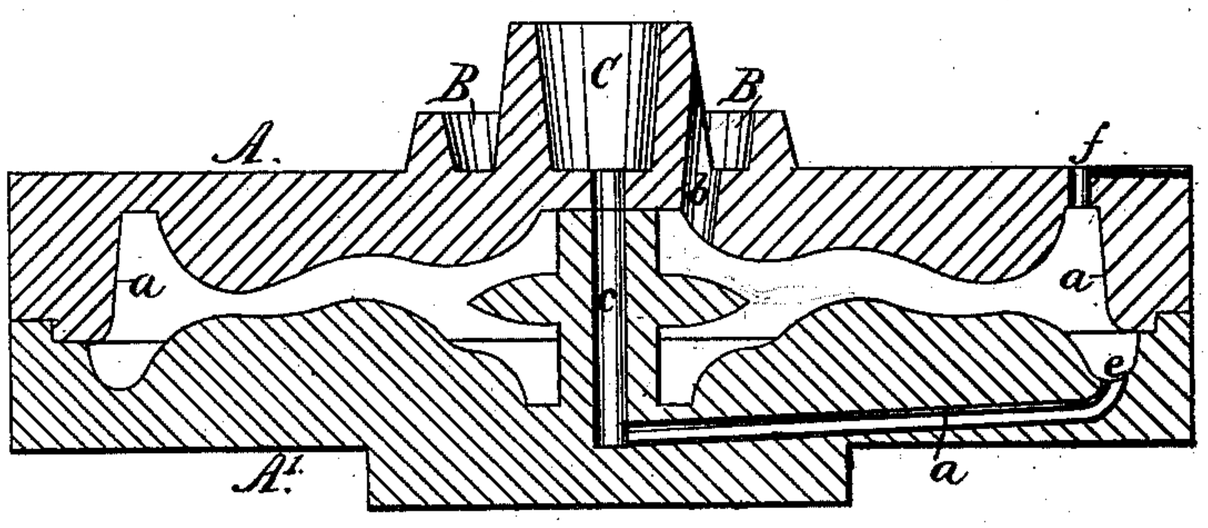
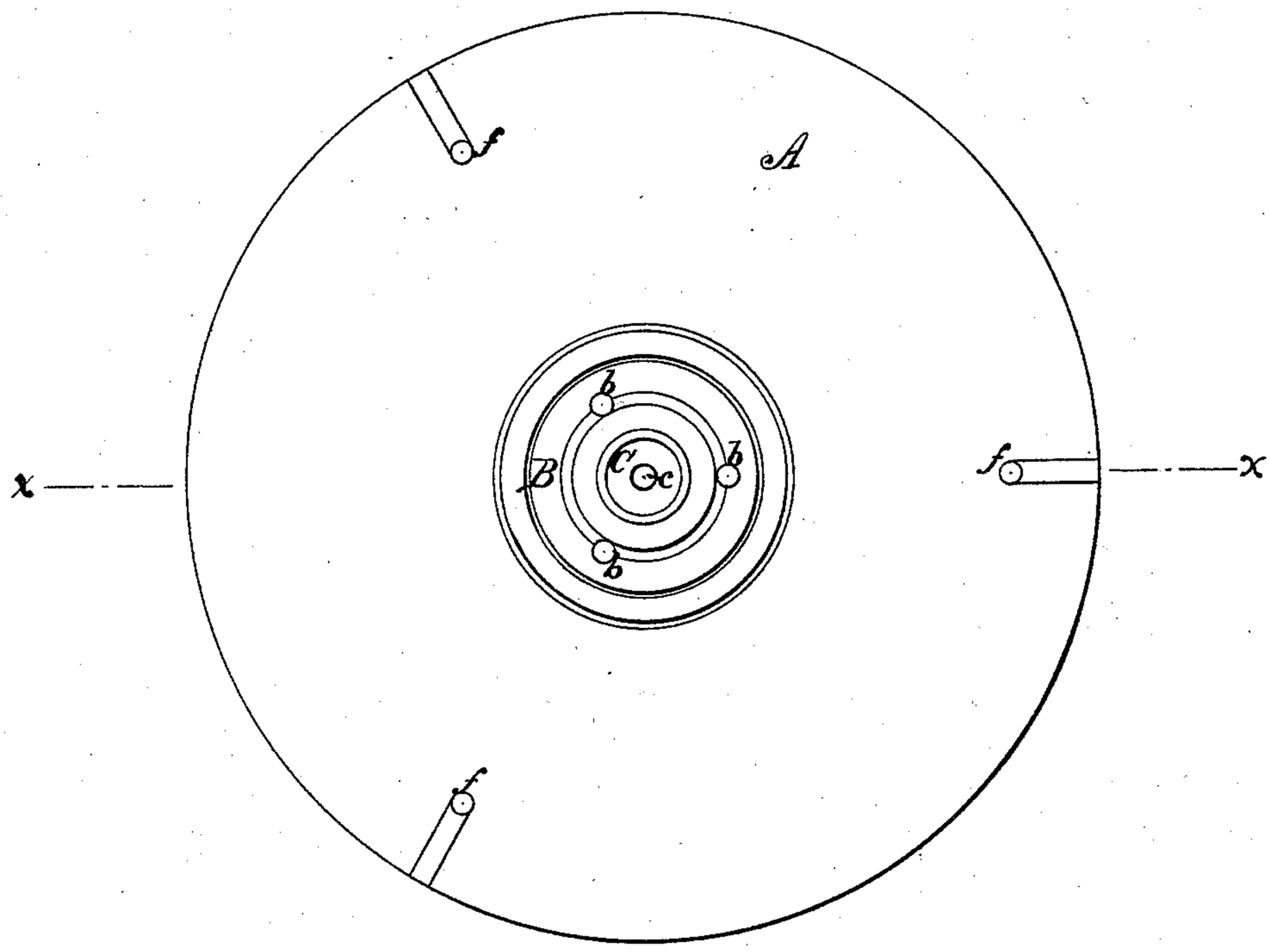


Fig 2.



WITNESSES:

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WILLIAM WILMINGTON, OF TOLEDO, OHIO.

IMPROVEMENT IN METHODS OF CASTING CAR-WHEELS.

Specification forming part of Letters Patent No. **170,925**, dated December 7, 1875; application filed October 23, 1875.

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 Improved Method 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 a part of this specification, in which—

Figure 1 is a section through line *x x;* Fig. 2, a plan view.

The object of this invention is to prevent chill-cracks in car-wheels which are cast with the tread or flange in contact with a chill for hardening the same, the said cracks being incident to the process of casting by reason of the rapid cooling of the metal, and involving a great waste in the manufacture of the said wheels. In the casting of the said wheels I have observed that the cracks always occur where the melted iron is the hottest, which is due to the fact that as the iron cools its tenacity and rigidity increase, and, in contracting, causes the ruptures to occur at the hottest points, where the metal is the weakest. To obviate these difficulties the mold is first partially filled with molten metal. I then introduce metal which has been more highly heated, and cause it to pass in streams directly across the part of the mold forming the flange and tread, and out through vents upon the other side of the mold, so that, while the filling of the mold is being completed by the second inflow of metal, the streams of this highly-heated metal are passing across the tread and flange of the wheel, so that the wheel is divided into a number of sections, which are hardening while the said streams are flowing, the cracks which would be produced by the said hardening and contracting being prevented by these streams of metal, which accommodate themselves to the contraction of the sections. As soon as the cooling has progressed sufficiently, the streams are stopped, and the whole wheel allowed to become cool.

In the drawing, A A′ represent two parts of a car-wheel mold, of which the inner edge *a* represents the face of the chill. The top part A is provided with an annular trough, B, with inlets *b b b* to the inner part of the mold, through which the first portion of the molten metal is poured in until the mold is about half full. C is a central basin, opening below through a channel, *c*, in the core and radial channels *d* in the bottom part of the mold. Said radial channels open upward into the mold at the points where the tread and flange of the wheel are formed. After the mold has been partially filled with the metal first poured in, the hotter metal is then poured into the central basin C, and it passes down channel *c* and up through channels *d* into the mold. Immediately above the mouth *e* of channels *d* are outlet-holes *f* in the top part of the mold, and as soon as the metal reaches said outlets the hotter iron, which is being poured into the central basin, commences to pass out through these outlets, thereby establishing small streams of very hot metal at the portion of the wheel which forms the tread and flange. The wheel is thereby resolved into sections, which cool and contract while the said streams are flowing, the latter serving to fill up or accommodate themselves to the contraction produced by cooling. In constructing the central basin C, I extend the walls of the same higher than the annular trough, so as to have a column of metal in the said basin whose weight shall establish a more positive flow of the streams, and thereby insure a free issue of metal at the outlets *f*. The object of the streams of highly-heated metal is to keep the metal that comes in contact with the chill-mold at those points in a fluid state, so that the sections of the tread and flange between these said streams may cool and contract without producing cracks and fissures. The discharge of the hotter metal must commence at an early stage of the second filling, and must be prolonged until the whole of the wheel commences to contract rapidly in diameter, when the flow of the highly-heated metal may gradually cease.

In some form of wheels it may be necessary to insert a tube of thin metal into the openings that the highly-heated metal is discharged from, which tubes must reach up and project through the top of the mold. After the streams of metal therethrough are perfectly established the said tubes may be removed.

In making use of my invention I do not con-

fine myself to partially filling the mold with the first metal of a lower temperature, for it is obvious that the mold may be entirely filled with this metal, and the streams afterward established in substantially the same way, to produce the same effect.

In passing the streams of hot metal across the chill, moreover, I find it desirable to provide the chill with a facing of infusible or non-conducting material, which will obviate the melting and wearing away of the chill at these points, and for this purpose the chill may be recessed at such points to receive the said material.

Having thus described my invention, what I claim as new is—

The herein-described method of casting car-wheels by first introducing into the mold molten metal of a proper temperature, and then introducing metal of a higher temperature, which is allowed to escape from the mold in streams across the flange and tread portion while the intermediate sections are being cooled, substantially as and for the purpose described.

The above specification of my invention signed by me this 18th day of October, 1875.

WM. WILMINGTON.

Witnesses:

SOLON C. KEMON,

CHAS. A. PETTIT.