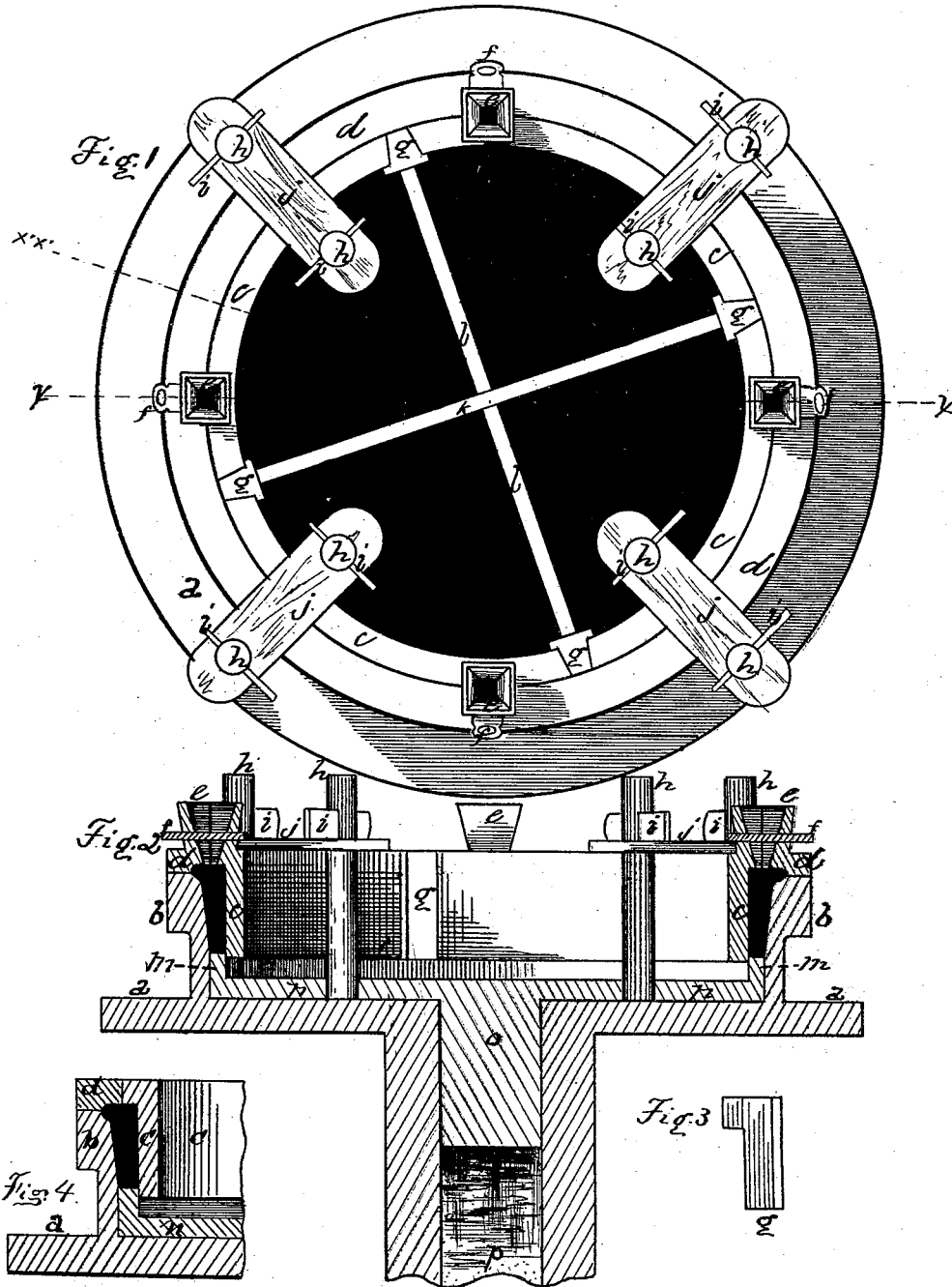


N. WASHBURN.
CASTING TIRES.

No. 180,399.

Patented July 25, 1876.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN CASTING TIRES.

Specification forming part of Letters Patent No. **180,399**, dated July 25, 1876; application filed August 30, 1875.

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 new and useful Improvements Pertaining to Molds for Tires and Rings of Cast Metal, of which the following is a specification, reference being had to the accompanying drawings, where—

Figure 1 is a top view of a mold embodying my said improvements. Fig. 2 is a view of the same in vertical transverse section, on the plane denoted by the dotted line *xx*, cross-bars *kl*, hereinafter described, removed. Fig. 3 is a side view of one of the keystone-wedges made use of. Fig. 4 is a partial cross-section similar to Fig. 2, on a different plane, *x'x'*.

In the drawings the invention is shown as applied to the production of a flanged car-wheel tire made, by preference, of cast-steel.

The nature and object of my present invention are to permit of the tire to be cast to its exact shape, and to exert upon the metal while in a plastic state a pressure which expels the air, condenses the metal, and renders it tough and tenacious, and thereby does away with the necessity for the subsequent rolling or hammering.

The letter *a* denotes the base-plate of the mold, which may well be of cast-iron; *b*, the exterior annular ring, which may well be of cast-iron, for forming the exterior of the tire; *c c c*, annular sections, which may well be of cast-iron, for forming the interior and a portion of one edge of the tire; *d*, a cap-ring, which may well be of cast-iron, for forming the principal part of one edge of the tire; *e e e e e*, conduits for pouring the metal, furnished with gates *f*, which are closed after the metal is poured, and while the pressure is put upon the plastic metal, in order to prevent its escape; *g g g g*, keystone-wedges, which are driven in between the sections *c*, to properly set them in place; *h*, wrought-iron rods rising from the plate *a*, mortised near the top for the entrance of the wedges *i*; *j j j j*, clamp-plates having holes near each end, which allow them to go down on the rods *h*, till they rest on the cap-ring *d*, and which serve to secure the mold firmly to the plate *a* by means of the wedges *i*, which, driven into the mortises in the rods *h*, bear upon the tops

of these clamp-plates; *k*, a cross-bar, preferably of wrought-iron, which holds two of the wedges *g* from giving inward; *l l*, cross-bars, which act similarly upon the other two of the keystone-wedges; *m*, the annular follower of steel or iron, which effects the condensation of the metal being borne upon the disk *n*, which in turn is borne on the steel piston-rod *o*, which rests upon the fluid in the hydraulic jack *p*.

The manner of making the tire is as follows: The parts of the mold being put together, as shown in the drawings, and as hereinbefore described, the annular follower is lowered to that point which will allow the desired and requisite quantity of metal to flow into the mold; the molten metal is then passed into the matrix through the pouring-conduits, the gates *f* are closed, and the hydraulic jack is set to work, to force the annular follower upward till the desired condensation of metal is produced.

The operator is enabled to take the tire out of the mold by knocking out the wedges *i*, and taking off the clamp-plates *j*, and capping *d*, knocking out the cross-bars *k l l*, and keystone-wedges *g*, and lifting off the sections *c*, when the tire can be readily lifted out.

Although I have herein shown this invention as applied to the production of a flanged tire, it is obvious that tires without flanges and plain rings can be produced in the same manner.

It is further perfectly clear that one essential and important feature of this invention is the combination of an annular matrix-case, whether formed of the parts *b c d g*, as hereinbefore described, or of more or less parts; with an annular follower, which acts to condense the plastic metal in the molds. The metal hereinbefore spoken of, of which to make a tire, is steel. The device is, of course, applicable to the working of iron and other metals.

The devices herein shown and described are also shown and described in another application for patent by myself filed at the same date as this application.

So far as the following second clause of claim is concerned, the peculiar element of novelty is having the annular follower acting

from below, whereby it serves also as an adjustable bottom for the matrix, whereby the quantity of metal to be poured into the mold can be regulated at pleasure, the same being in combination with pouring-conduits above provided with gates, to confine the fluid metal when pressure is put upon it.

I claim as my invention—

1. The combination of base-plate *a*, exterior ring *b*, interior ring-sections *c*, wedges *g*, mortised rods *h*, clamp-plates *j*, and wedges *i*, all substantially as shown and described.

2. In combination, the matrix-case *b c d g*, the conduits *e* provided with gates *f*, and the annular follower *m*, serving as an adjustable bottom for the matrix, all substantially as described.

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Witnesses:

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