(No Model.)

R. BAGALEY & W. HAINSWORTH.

CAST STEEL CAR WHEEL.

No. 389,787. Patented Sept. 18, 1888.

FIG.1.

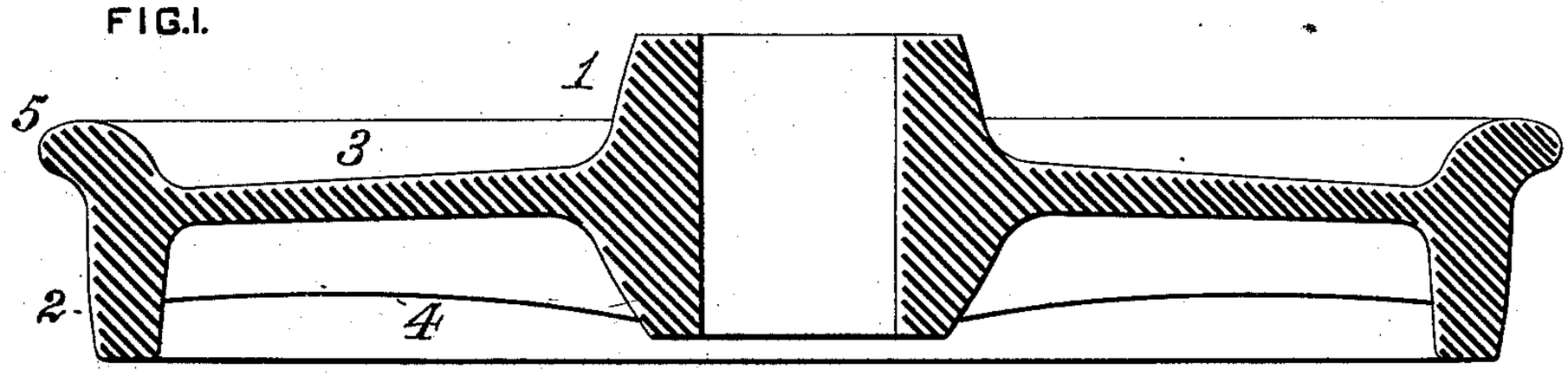
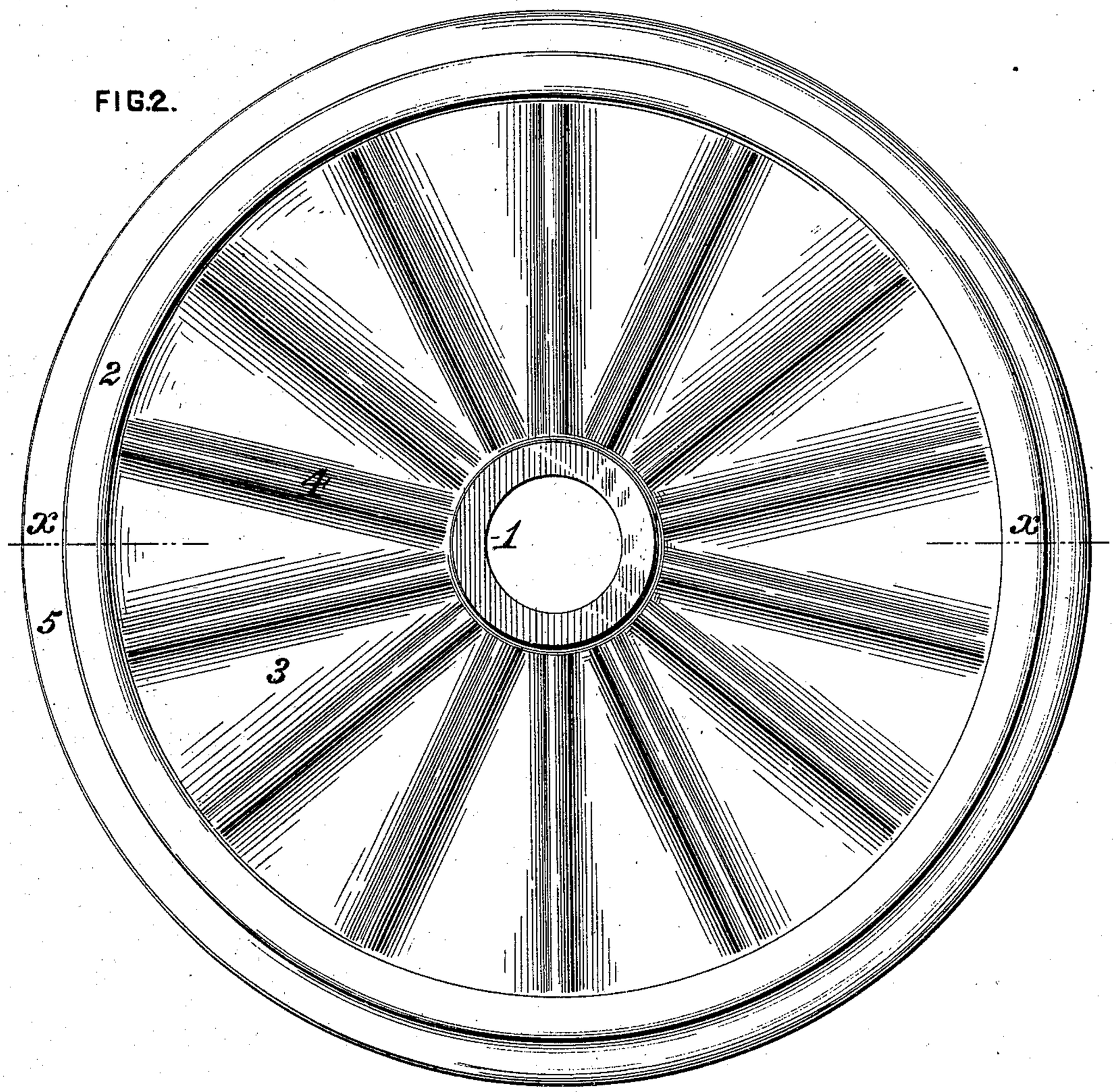


FIG.2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

RALPH BAGALEY AND WILLIAM HAINSWORTH, OF PITTSBURG, PENNSYLVANIA.

CAST-STEEL CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 389,787, dated September 18, 1888.

Application filed April 20, 1888. Serial No. 271,336. (No model.)

To all whom it may concern:

Be it known that we, RALPH BAGALEY and WILLIAM HAINSWORTH, citizens of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Cast-Steel Car-Wheels, of which improvement the following is a specification.

The object of our invention is to provide a car-wheel of such form as will embody ample strength and proper disposition of parts for the requirements of service, and which can be cast in steel in a sand mold without liability to the presence of defects in its tread or flange surface or to undue waste of metal in the operation.

To this end our invention, generally stated, consists in a cast-steel car-wheel having a plate or web extending from its hub to a plane in its rim at or adjoining the inner line of its flange.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a transverse section through a car-wheel embodying our invention; and Fig. 2 a front view, in elevation, of the same.

In the manufacture of cast-steel car-wheels of the ordinary form—that is to say, those having their webs united to their rims in or near the central plane of the latter—material difficulty has been encountered in attaining the formation in the mold of tread and flange surfaces sufficiently smooth and free from imperfections to admit of being brought by a subsequent rolling operation to the condition required in a good and merchantable wheel. The defects in these surfaces, which consist in small cavities or depressions in the periphery of the wheel, we have ascertained to be occasioned by the chilling and consequent shrinkage of the partially-solidified metal in the web, which in contracting tends to draw the hotter and more fluid metal of the periphery of the rim and flange away from the adjacent wall of the mold, and thereby forms shrinkage-holes in the surface of the tread and flange, which render the cast wheel to a greater or less degree imperfect and defective, and in many instances make it valueless, except for remelting. This objection is obviated in the casting of wheels in accordance with our invention, under which the web is so located relatively to the flange that these members shall be as nearly as practicable in the same plane, such condition being sufficiently and satisfactorily complied with by connecting the web to the rim at or closely adjoining the inner line of the flange. In casting a wheel of this form the pressure of the metal in the web and sinking head is exerted almost directly against that in the flange and adjoining portion of the rim and acts to force and hold the same closely against the mold during solidification, thereby avoiding the tendency to the formation of shrinkage-holes heretofore experienced and producing an approximately smooth and perfect surface upon the periphery of the wheel.

In the practice of our invention we form, by casting in a sand mold, a steel car-wheel having a hub, 1, and rim 2, connected by a web or plate, 3, which may be either curved or, as shown, inclined in transverse section, and which is joined to the rim 2 in a plane coinciding with or closely adjoining the inner line of the flange 5, which is, as usual, formed on one side of the rim 2. A series of radial ribs or arms, 4, extending from the hub to the rim, is preferably located on the front face of the web 3, said ribs bracing the wheel and equalizing the transmission of strain to the major portion of the rim, which, under our construction, is located in advance of the web. The cavities provided in the mold for the formation of the ribs further serve for the conduction of the fluid metal to the rim and present an additional weight of metal, exerting outward pressure upon that in the surface of the wheel. In casting we employ a single sinking head at the hub, and thereby avoid the waste of metal which is due to the use of a series of sinking heads with which car-wheels have heretofore usually been cast, as well as the unequal action upon the metal of the rim resultant upon the location of sinking heads at several different points. The

wheel is finished by reheating and rolling upon its periphery, as heretofore practiced.

We claim as our invention and desire to secure by Letters Patent—

A cast-steel car-wheel having a plate or web extending from its hub to a plane in its rim at or closely adjoining the inner line of its flange, substantially as set forth.

In testimony whereof we have hereunto set our hands.

RALPH BAGALEY.
WILLIAM HAINSWORTH.

Witnesses:
J. SNOWDEN BELL,
D. C. O'BRIEN.