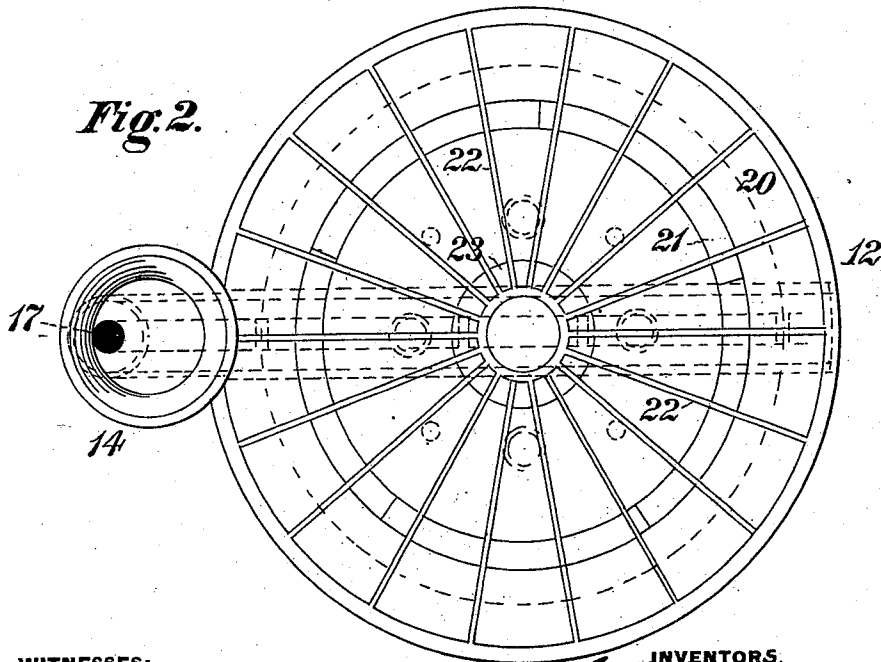
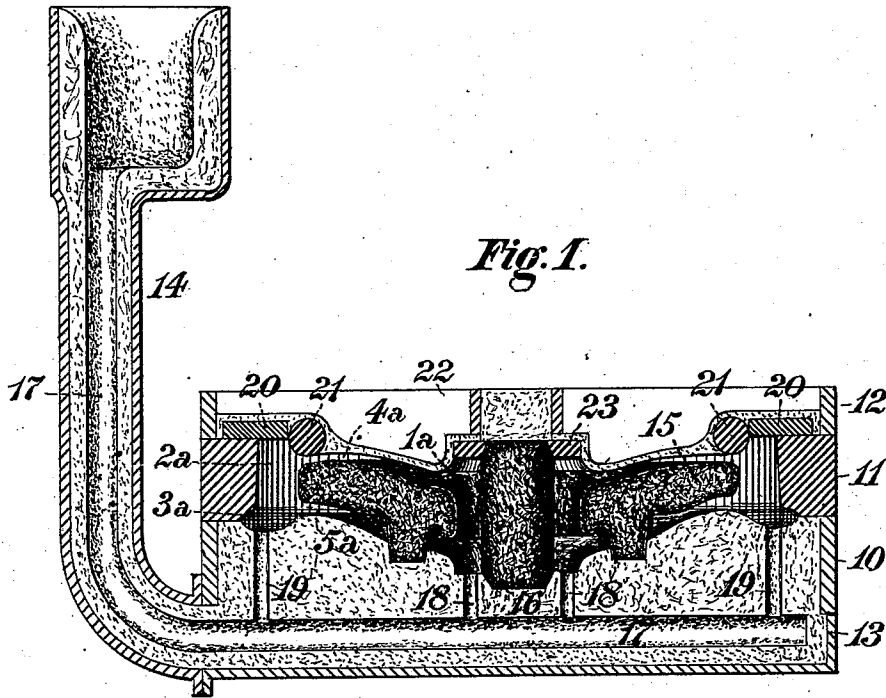


(No Model.)

G. W. CUSHING & J. W. RAMPE.
MOLD FOR CASTING CAR WHEELS.

No. 486,327.

Patented Nov. 15, 1892.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE W. CUSHING, OF EVANSTON, ILLINOIS, AND JOHN W. RAMPE, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO THE AMERICAN STEEL WHEEL COMPANY, OF JERSEY CITY, NEW JERSEY.

MOLD FOR CASTING CAR-WHEELS.

SPECIFICATION forming part of Letters Patent No. 486,327, dated November 15, 1892.

Application filed July 20, 1892. Serial No. 440,650. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. CUSHING, of Evanston, in the county of Cook and State of Illinois, and JOHN W. RAMPE, of Boston, in the county of Suffolk and State of Massachusetts, have jointly invented a certain new and useful Improvement in Molds for Casting Car-Wheels, of which improvement the following is a specification.

Our invention relates to car-wheel molds of the class in which the molten metal is fed into the mold from below and the tread-surface of the mold is formed in a chill or metallic section interposed between the cope and the drag.

The object of our invention is to provide a mold which shall be desirably adapted for casting car-wheels either in iron or in steel, and by the use of which in making steel wheels the metal shall be concentrated and solidified and piping or blow-holes eliminated therefrom.

To this end our invention, generally stated, consists in a mold having a cope, a main or tread chill, a drag, a vertical pouring-head inclosing a runner communicating with a horizontal runner below the mold cavity, vertical hub and flange runners extending from the horizontal runner to the hub and flange portions of the mold-cavity, an edge-chill forming the wall of the front of the rim portion of the mold-cavity or that opposite the flange, a ring-chill adjoining the edge-chill and forming part of the wall of the adjacent portion of the mold-cavity for the front plate, and a hub-chill forming the front wall of the hub-space of the mold-cavity.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a vertical central section through a car-wheel mold embodying our invention, and Fig. 2 a plan or top view of the same.

In the practice of our invention we provide a mold which, as herein shown, is adapted to the formation by casting of a double-plate car-wheel, the mold-cavity having a central hub-space 1^a, an outer rim or tread-portion space 2^a, provided with a space 3^a for the

usual rail-flange on its lower side, and spaces 4^a 5^a for front and back plates or webs, connecting and cast integral with the hub and rim portions of the wheel. The mold may, however, without change of principle or substantial variation of structure be employed for casting single-plate or spoke wheels. In the instance illustrated it is composed of a nowel or drag 10, a chill 11, located above the nowel and inclosing and forming the outer wall of the space for the rim or tread portion of the wheel, and a cope 12, having a series of radial cope bars or ribs 22 for the support of sand, extending between its center and its periphery. The nowel is closed on its lower side by a bottom plate 13, to which is connected on one side a vertical pouring-head 14. The cope and drag are filled with sand, which is compacted therein in the usual manner, so as to present upper and lower mold-cavity surfaces in accordance with a determined pattern, and the annular space between the side plates of the wheel and the cylindrical space within its hub are formed, respectively, by cores 15 and 16. A main runner or pouring-channel 17 extends downwardly through the pouring-head 14 to its lower end, and thence extends horizontally across the mold in a box or casing formed centrally on the bottom plate 13 to or near the line of the opposite side of the rim portion of the mold-cavity. The horizontal portion of the runner 17 is, as in prior practice, connected by vertical hub-runners 18 with the portion of the mold-cavity surrounding the hub-core 16, and is also connected by vertical flange-runners 19 with the back or lower side of the portion 3^a of the mold-cavity in which the flange is formed. Said flange-runners are not in and of themselves claimed as of our present invention, and the same, in operative combination with other members of a mold, form the subject-matter of a separate application, Serial No. 440,657, filed by George W. Cushing aforesaid, of even date herewith. The wall of the front of the rim portion of the mold-cavity, or that forming the front face or edge of the rim—i. e., the side thereof opposite the flange—is formed by an edge-

chill 20, the same being an annular plate of metal placed on top of the main or tread-surface chill 11 and extending inwardly therefrom for a distance equal to the front thickness of the rim of the wheel. The edge-chill 20 may be either formed integral with the tread-surface chill 11 or be a separate piece suitably connected thereto, as preferred.

The portion of the wall of the front-plate space of the mold-cavity adjacent to the rim-space is formed by a ring-chill 21, the same being a metal ring of circular section, which is divided into a series of segments for the purpose of its ready removal after the casting has been made, and also to afford the proper elasticity to admit of the shrinking of the wheel upon it in cooling.

The upper end of the hub-space 12 of the mold-cavity is closed by an annular metallic hub-chill 23, which forms the wall of the mold-cavity on the upper and front face of the hub-space and is directly above and opposite to the hub-runners 18, through which the molten metal is supplied thereto in casting a wheel.

In casting a car-wheel in a mold substantially as above described the molten metal is poured from the ladle into the top of the pouring-head 14, and after passing downwardly and transversely through the main runner 17 rises therefrom through the flange-runners 19 and hub-runners 18 into the rim and hub portions, respectively, of the mold-cavity, entering the rim portion at the back of the space 3^a therein for the formation of the flange, solidly filling the rim portion and abutting against the edge-chill 20 at the top thereof, and flowing inwardly therefrom through the portions 4^a 5^a of the mold-cavity, in which the front and back plates of the wheel are formed, joining therein with the molten metal supplied to the hub-space of the mold-cavity by the hub-runners 18, which metal flows outwardly from the hub-space through the front and back plate spaces and abuts at the top of the hub-space against the hub-chill 23.

By the employment of the edge-chill 20, located directly opposite the incoming molten metal supplied through the flange-runners 19, and the use of the adjacent ring-chill 23 the metal is solidified and concentrated at and adjacent to the front face of the rim and the junction of the front plate therewith, and any

impurities are thrown toward the top of the annular core 15, tendency to the formation of blow-holes, if any, being exerted in this direction and being correspondingly less objectionable than if in the body of the rim or tread-section of the wheel. A similar solidification and concentration of metal at and near the front face of the hub is effected by the hub-chill 23.

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

1. The combination, in a mold for casting car-wheels, of a cope, a drag, an interposed main or tread-surface chill, a vertical pouring-head inclosing a main runner or pouring-channel, a horizontal runner communicating therewith and located below the mold-cavity, vertical flange-runners connecting said horizontal runner with the flange-space of the mold-cavity, and an edge-chill forming the wall of the mold-cavity on the side of the rim-space thereof opposite the flange, substantially as set forth.

2. The combination, in a mold for casting car-wheels, of a cope, a drag, an interposed main or tread-surface chill, a vertical pouring-head inclosing a main runner or pouring-channel, a horizontal runner communicating therewith and located below the mold-cavity, vertical flange-runners connecting said horizontal runner with the flange-space of the mold-cavity, an edge-chill forming the wall of the mold-cavity on the side of the rim-space thereof opposite the flange, and a ring-chill forming the wall of the mold-cavity at and adjacent to the inner and upper portion of the rim-space thereof, substantially as set forth.

3. The combination, in a mold for casting car-wheels, of a cope, a drag, an interposed main or tread-surface chill, a vertical pouring-head inclosing a main runner or pouring-channel, a horizontal runner communicating therewith and located below the mold-cavity, vertical hub-runners connecting said horizontal runner with the lower portion of the hub-space of the mold-cavity, and a hub-chill forming the upper end wall of the hub-space, substantially as set forth.

GEORGE W. CUSHING.
JOHN W. RAMPE.

Witnesses:

JAS. A. DOWD,
WM. A. BATES.