May 15, 1923. 1,455,091

W. H. NICHOLS

METHOD AND APPARATUS FOR CASTING ROLLS

Filed Jan. 10, 1921

FIG. 1

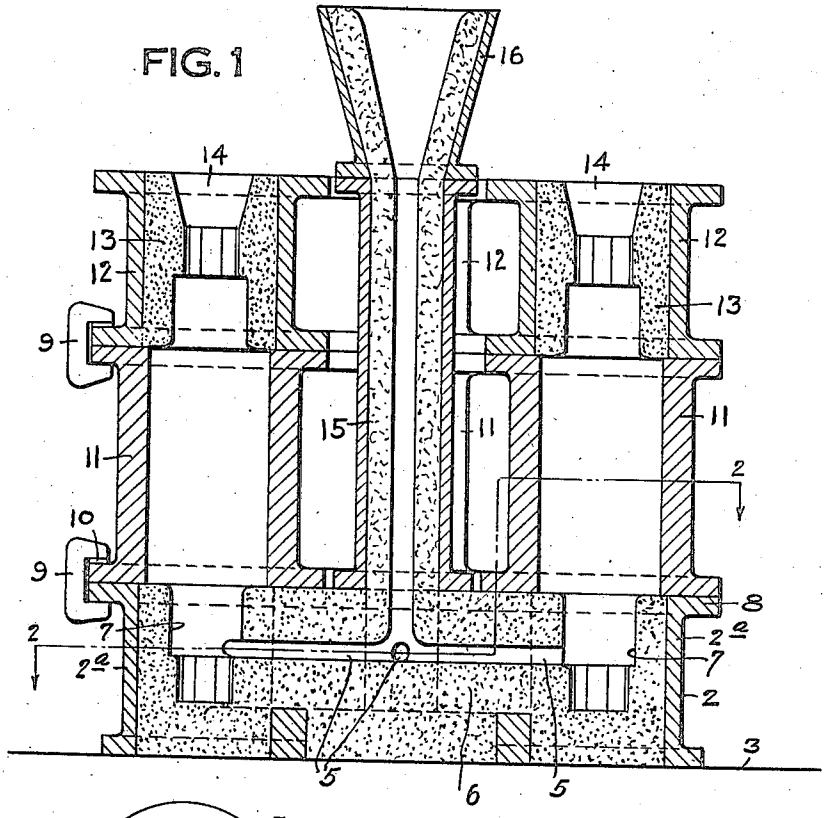
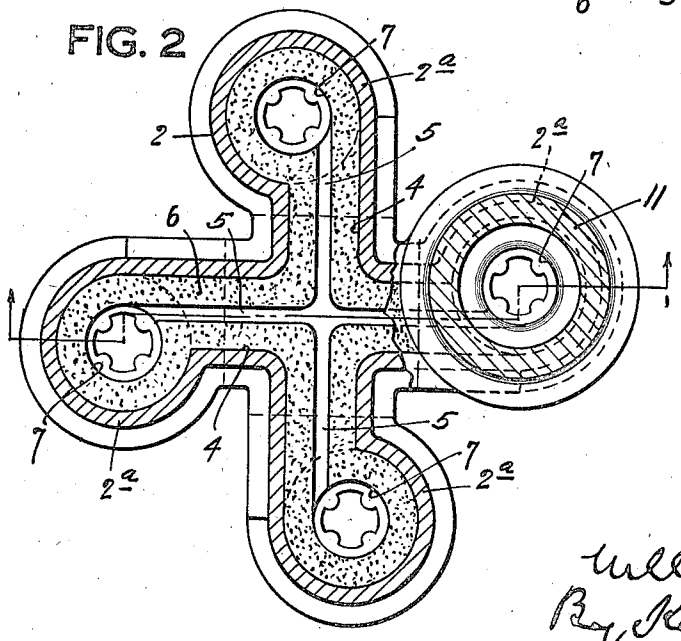


FIG. 2



INVENTOR

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UNITED STATES PATENT OFFICE.

WILLIAM H. NICHOLS, OF WILKINSBURG, PENNSYLVANIA.

METHOD AND APPARATUS FOR CASTING ROLLS.

Application filed January 10, 1921. Serial No. 436,313.

To all whom it may concern:

Be it known that I, WILLIAM H. NICHOLS, a citizen of the United States, and resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Methods and Apparatus for Casting Rolls; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a method of casting rolls.

The present method universally employed in the manufacture of rolls is to cast each roll separately, which involves the making up of a distinct and separate mold for each roll, and when the rolls are poured the ladle is tipped for the pouring of the metal into the mold each time a mold is poured, and such method furthermore involves the moving of the ladle from one mold to the other. This constant tipping of the ladle results in a waste of metal as the pouring can never be done so accurately as not to allow more or less of the metal to spill or slop over, and furthermore each mold must be provided with a pouring gate which is filled up with metal and this metal has to be remelted for further use.

The object of my invention is to provide a method in which a number of economies are effected and to these ends it consists, generally stated, in forming a plurality or group of molds for casting rolls around a common pouring gate so that the metal for a number of rolls is poured into one gate, and the necessity for tipping the ladle for pouring the individual molds is done away with.

In the accompanying drawing, illustrating suitable apparatus for carrying out my improved method, in which Fig. 1 is a vertical section on the line 1—1, Fig. 2; and Fig. 2 is a cross section on the line 2—2, Fig. 1.

In the drawing the numeral 2 designates the lower box or drag which rests upon the molding floor 3, and this lower box is filled with sand in which a wood pattern is molded which forms the coupling and neck of the roll in the ordinary manner. The lower box 2, as illustrated, has four neck-molds 2^a, although it is apparent that any number may be employed. These neck-molds are connected by the passages 4 with the central part of the box, and the sprue runners 5 radiate from the central portion of the box to the molds, said runners being formed in the sand 6 and enter the molds 7 tangentially, so as to give the proper swirl to the metal in pouring, by which the heavy and pure iron is carried toward the periphery or face of the mold and the sullage will concentrate in the center.

Resting on the flanges 8 of the lower-box 2 and connected thereto by clamps 9 held in place by wedges 10 are the chills 11 of the ordinary type. Resting on the chills 11 are the upper-boxes 12 containing the sand 13 in which the mold for the upper roll-neck and coupling is formed. The customary head 14 is provided in which the impurities of iron which rise to the top in casting are collected.

Resting on the lower box 2 is the pouring gate 15 at the upper end of which is secured the funnel 16 for convenience in pouring.

When a group or plurality of rolls are formed, in the above manner, the metal is drawn from the cupola or open-hearth furnace into the ladle carried by an overhead crane and the ladle is then moved into position for pouring a group of molds and tilted to allow the metal to enter the funnel 16 whence it passes down through the gate through the radial channels 5 into the lower ends of the molds. The metal, as stated, is given a swirl and rises within the mold until the mold is filled, the impurities gathering in the head 14 at the top.

By pouring a plurality of molds at one time the ladle is only tipped once and the pouring of the molds is accomplished in less time, and furthermore the metal does not have an opportunity to cool off where one continuous pour is made so that the molds are all poured with metal of the same temperature and under exactly the same conditions which insures a uniformity of product.

There is furthermore a great reduction in the waste of metal due to the fact that there is less chance of the metal dripping and slopping over, which occurs each time the ladle is tipped in the pouring of single molds, and as there is only one pouring gate there is a reduction in the amount of metal necessary to pour the molds as distinguished from the old method where each mold had its individual pouring gate.

It will be observed that the upper surface of the sand in the drag flask is substantially all covered by the lower flanges of the chills

11 and of the upright gate 15. This construction holds down the sand in the drag during the pouring operation and prevents the sand from being lifted above the runners 5 while the metal is being poured.

What I claim is:

1. The method of casting chill rolls that comprises arranging adjacent to a common pouring gate a plurality of molds each having a separate and independent chill, pouring molten metal into said gate, and directing said metal tangentially into the lower portions of said molds.

2. The method of casting chill rolls that comprises arranging around a common pouring gate a plurality of molds each having a separate and independent chill, providing runners communicating with said pouring gate and opening tangentially into said molds, and pouring into said gate, without interruption, enough metal to fill all of said molds.

3. Apparatus for casting chill rolls comprising a drag having a plurality of neck cavities formed therein, an upright pouring gate, sprue runners extending from said pouring gate and opening tangentially into said neck cavities, and separate and independent chills mounted upon said drag above said neck cavities.

4. Apparatus for casting chill rolls comprising a drag having a plurality of neck cavities formed therein, an upright pouring gate disposed centrally upon said drag, sprue runners extending radially from the lower end of said pouring gate and opening tangentially into said neck cavities, and separate and independent chills mounted upon said drag above said neck cavities.

5. Apparatus for casting chill rolls comprising a drag box having a plurality of generally circular recesses arranged symmetrically around a common center and communicating with a central space through straight passages, a neck cavity molded within each of said recesses, an upright pouring gate disposed centrally upon said drag, sprue runners extending from the lower portion of said pouring gate and through said straight passages in said drag box, said runners opening tangentially into said neck cavities, and separate and independent chills mounted upon said drag above said neck cavities.

6. Apparatus for casting rolls comprising a drag box having four generally circular recesses arranged symmetrically around a common center and communicating with a central space through straight passages, a neck cavity molded within each of said recesses, an upright pouring gate disposed centrally upon said drag, sprue runners extending radially from the lower portion of said pouring gate and through said straight passages in said drag box, said runners opening tangentially into said neck cavities, and separate and independent chills mounted upon said drag above said neck cavities.

In testimony whereof I, the said WILLIAM H. NICHOLS, have hereunto set my hand.

WILLIAM H. NICHOLS.

Witnesses:

JOHN F. WILL,

ROBT. D. TOTTEN.