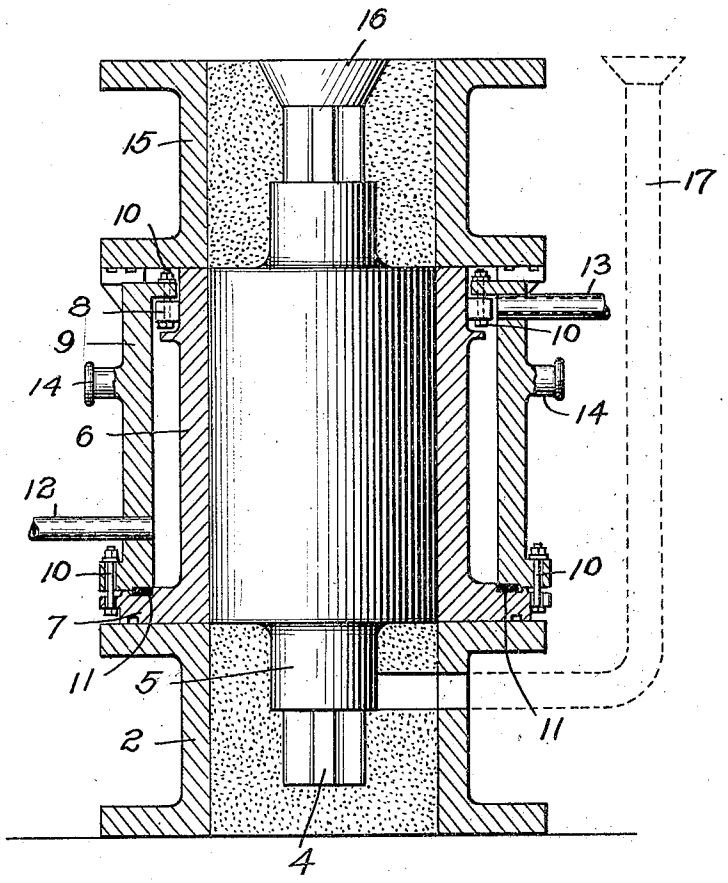
W. H. NICHOLS.

METHOD OF MAKING CHILLED ROLLS.

APPLICATION FILED AUG. 18, 1919.

1,374,517. Patented Apr. 12, 1921.



INVENTOR

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WILLIAM H. NICHOLS, OF PITTSBURGH, PENNSYLVANIA.

METHOD OF MAKING CHILLED ROLLS.

1,374,517. Specification of Letters Patent. Patented Apr. 12, 1921.

Application filed August 18, 1919. Serial No. 318,380.

To all whom it may concern:

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

My invention relates to a method of making chilled rolls.

In an application filed by me of even date herewith, Serial No. 318,378, I have described and claimed a chill-mold for casting chilled rolls in which a water-jacket surrounds the chill and by circulating water through the same the chill is cooled and the expansion of the same due to the heat of the molten metal contained therein is largely obviated. My present invention involves this cooling of the chill as one of the steps of the method.

As is well understood in casting a chilled roll the couplings and necks are cast in sand and where the chill is cooled by the action of the water circulating through the water-jacket, the chilled or body portion of the roll cools very much quicker than the couplings and necks which are cast in the sand. Accordingly my present invention consists in cooling the chilled portion of the roll, removing the roll from the mold and reheating the chilled portion by the heat from the couplings and necks which flows into the chilled portion, said heat acting to anneal and relieve the chilled portion from any strains set up in the casting of the roll.

I have illustrated my invention in connection with the mold which forms the subject matter of the above referred to application in which the numeral 2 designates the lower box filled with sand in which a wood pattern is molded which forms one of the couplings 4 and necks 5 of the roll.

Supported on the box 2 is the chill 6 which is cylindrical in form and formed of cast iron. The chill 6 has the bottom flange 7 and the upper flange 8.

A water-jacket 9 surrounds the chill 6, said water-jacket being bolted to the flanges 7 and 8 of the chill by bolts 10. A gasket 11 is interposed between the flange 7 and the lower end of the water-jacket to guard against leakage.

The water-jacket 9 has the inlet 12 at its lower end for the admission of water or other cooling fluid as air, and the outlet 13 at its upper end for the discharge of the water.

Handles 14 are provided for handling the water-jacket and the chill secured thereto.

Resting on the water-jacket is the upper box 15 likewise filled with sand, and in which the other coupling and neck of the roller are cast. The customary head 16 is provided in which the impurities of the iron which rise to the top in casting are collected.

The casting gate 17 conducts the metal down into the lower journal of the roller, all in the ordinary manner.

When the metal is poured into the mold and fills the same the action of the chill will be to harden or solidify the metal which comes in contact with its inner walls, and the metal in the interior commences to part with its heat and to contract away from the interior of the mold as it does so. By the circulation of the water the chill is cooled and the effect of the heat of the molten metal is counteracted, so that the expansion of the chill is prevented and the casting takes place without the expanding of the chill away from the casting.

When the roll has set or hardened and cooled sufficiently, the roll is removed from the chill, but it will be found that while the chilled portion of the roll is comparatively cool the couplings and necks which were cast in the sand are still at a high heat. This heat from the couplings and necks will flow into the chilled portion of the roll and will act to anneal the same or relieve the strains set up in the metal during the casting operation. This will insure a stronger roll and one less liable to crack under heavy strains in the rolling of metal.

What I claim is:—

1. The method of making chilled rolls, consisting in cooling the chilled portion while the couplings and necks are still highly heated, removing the roll from the mold, and reheating the chilled portion by the heat permeating it from the couplings and necks.

2. The method of making chilled rolls, consisting in cooling the chilled portion of the roll by water-cooling means, while the couplings and necks remain in a heated condition, removing the roll from the mold, and reheating the chilled portion by the heat permeating it from the couplings and necks.

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

WILLIAM H. NICHOLS.

Witnesses:
ROBT. D. TOTTEN,
JOHN F. WILL.