

UNITED STATES PATENT OFFICE.

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CHILLED CASTING.

No. 874,018.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES J. MESTA, of West Homestead, Allegheny county, Pennsylvania, have invented a new and useful
5 Improvement in Chilled Castings, of which the following is a full, clear, and exact description.

My invention relates to the manufacture of articles made of chilled cast iron in part or
10 in whole; for example, chilled rolls, chilled car wheels, etc.

The object of my invention is to make the chilled cast iron or white iron more dense and tough in character, and increase the
15 depth of the chill.

To that end the invention consists in adding vanadium in a small percentage to the chilling iron which is cast in the chill mold.

The percentage of vanadium added may
20 be varied, but I have found that in the manufacture of chilled rolls one quarter of one per cent. gives excellent results. In adding the vanadium to the cast iron, it may be added either in the charge of iron to be melted,
25 or it may be pre-melted either with or without mixing molten cast iron therewith, and then added to a ladle or receptacle containing the melted cast iron.

Where an air furnace is used for melting
30 the cast iron, the vanadium may be added to the charge, as the loss from oxidation is comparatively small in this process. Where the chilling iron is melted in a cupola, I preferably pre-melt the vanadium in a crucible
35 with some cast iron, and then pour this molten mixture into the cast chilling iron after it is tapped out from the cupola. Other ways of adding the metal may be employed without departing from my invention, since

I consider myself the first to discover the ad- 40
vantages accruing from the addition of vanadium to chilling irons.

In the use of rolls prepared in accordance with my invention, the following advantages are found: 1st,—The elastic limit and tensile
45 strength are increased; 2nd,—The chilled metal is of a denser and tougher quality, and is greater in depth; 3rd,—The fatigue limit is increased; 4th,—The wearing qualities of the roll are increased; 5th,—The roll
50 will better resist expansion and contraction. The last quality is specially important, since in the use of chilled rolls, it is the alternate expansion and contraction, more than the shocks and wear which destroy these rolls.
55 It is also found that the vanadium aids in preventing spalling. The chilling iron with this small amount of vanadium may be employed for any article wherein any part or all of the metal is chilled. .
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Many variations may be made in the mixture, in the proportion of vanadium, and in the manner of mixing without departing from my invention.

I claim:—

1. As a new article of manufacture, a
65 chilled cast iron article containing vanadium.

2. As a new article of manufacture, a chilled cast iron article having a small percentage of vanadium; substantially as de-
70 scribed.

In testimony whereof, I have hereunto set my hand.

C. J. MESTA.

Witnesses:

JOHN MILLER,
H. M. CORWIN.