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CHROMIUM-PLATED CARBON ARTICLE.

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The invention is an article of carbon (used herein to include graphite) having a plating of chromium, and designed for a use wherein it is subjected to the action of a fluid material of high melting point, such as a molten metal. The article may be, for example, a mold or chill.

Graphite and other forms of carbon have qualities which adapt them for use in the casting of many metals and alloys. The materials are readily shaped and have, particularly in the case of graphite, a high heat conductivity, which is often advantageous. Graphite is frequently used for molds where rapid cooling of the casting is desired. In the making of toothed cutters from alloys of the cobalt-chromium type, it has been found desirable to cast the cutter in a sand mold into which there has been set at the point where each tooth will form, a small prism of graphite, called a chill, for the purpose of rapidly cooling the metal at the surface of the tooth, so that the cutting portion of the tooth will have the requisite hardness.

It is found, however, that carbon is considerably attacked by the molten metal when it is used for such purposes as those mentioned, especially if the molten material is at an unusually high temperature. The carbon surface is eroded by currents of molten material, and gases are evolved at the surface of the carbon, presumably by reaction between constituents of the molten material and the carbon, producing blow-holes in the casting.

I have found that carbon articles for the uses referred to are greatly improved by plating them with chromium. The plate may be applied electrolytically, for example, with or without an underlying plating of copper or other metal.

Chromium is hard, has a very high melting point, and does not alloy readily at the temperatures usually encountered in casting operations. For these reasons it renders a carbon article more resistant to wear and erosion, and it tends to obviate gas-producing reactions such as would give rise to unsound castings. A chromium plating favors rapid cooling of the casting, which is desirable in those cases where a carbon mold is used, because the metal-to-metal contact is more intimate and conducts heat more readily than the contact between the molten metal and graphite. The plating is of course in intimate contact with the body of the mold.

I claim:

1. A chromium-plated carbon article for use in contact with hot molten material.

2. A chromium-plated graphite chill.

In testimony whereof I affix my signature.

FREDERICK M. BECKET.

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