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METHOD OF MANUFACTURING COATING FOR PERMANENT METAL MOLDS.

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To all whom it may concern:

Be it known that I, FRIEDRICH MAYER, a citizen of the German Republic, residing at Solingen, Bruderstrasse 47, Germany, have invented certain new and useful Improvements in or Relating to a Method of Manufacturing Coating for Permanent Metal Molds, of which the following is a specification.

When casting mold-castings in permanent molds, especially in metallic ones, it is necessary to coat the surface of the permanent mold with a coating, as otherwise the casting can be removed from the mold only with difficulty and, besides, the surface of the permanent mold is affected and destroyed after a short time by the frequent direct contact with the highly heated liquid metal.

The coating used up to now consists generally of a pulp or slime composed of graphite or talc and water. The drawbacks entailed by the employment of a pulp or slime of this kind consist in the wash or coating scaling off the molds and the cores at certain parts of the surfaces thereof when the castings are being removed which entails the necessity of coating the respective surfaces, or the surface-parts concerned, nearly after every casting.

A particularly disturbing circumstance resides, however, in the feature that varying thickness of the coating or layer present on the surfaces of the molds and the cores impairs more or less the accurateness of the dimensions of the castings, although the object of the use of permanent molds is to produce particularly accurately dimensioned castings. The deviations experienced in this respect entail the very disadvantageous drawback that jammings occur when the castings are being removed from the molds, or the cores are being removed from the castings, whereby a great loss of time is caused.

These and other drawbacks and disadvantages met with in practice have, of late, become still more disturbing as it has proved necessary to make use of complicated permanent molds, and, besides, alloys, for instance aluminium-alloys, have been improved in such a manner that they fill up the molds absolutely completely, whereby, however, the risk of the castings "sticking" to the molds has only been increased.

Besides the purpose stated in the first paragraph after the preamble, the coating can be employed also for other purposes, as, for instance, concerning steel-castings, binding the oxygen and the other gases dissolved in the metal, for which purpose it has been proposed to add an easily oxidizable metal-powder, for instance pulverulent aluminum, to a coating composed of graphite, clay, water-glass, and the like. It has also been recommended to add silicic acid (quartz) to the coating in order to moderate the intense cooling caused by the use of the iron molds, when castings of steel and iron are to be produced, and to prevent the material from being chilled, or hard.

But also in these cases one does not escape the disadvantages caused by the thickness of the coating applied to the molds and the cores; they are, in fact, even increased.

Now, the present invention which is intended for use in connection with the production of metallic castings, especially such as aluminium, permits not only to obviate all drawbacks and disadvantages stated in the preceding paragraphs, but warrants also extremely quick cooling of the castings, in consequence whereof a fine grain is obtained and the quality of the product is extraordinarily improved.

The gist of the invention resides in producing the coating by dissolving the mineral substance or substances employed with the aid of a colloidizing process, that is to say, instead of producing a pulp or slime of the respective substance or substances (graphite, talc, clay, etc.) and water, it is, or they are, dissolved, as already stated, with the aid of a colloidizing process. The thus prepared solution is so thorough or complete, that it can be poured through filtering-paper; it is, however, employed not in this state, but in greatly diluted state, and the degree of dilution may, in fact, be such that the layer remaining upon the mold when this latter has been coated with the diluted solution, or immersed thereinto, or the solution has been squirted upon the mold, and when the water has evaporated or dried up, is so thin that it is practically impossible to measure it; still, this very thin layer is sufficient to prevent any direct contact between the mold and the cast metal. The thinner the colloidal solution is, the more strongly adheres it to the mold, the lesser is the risk of its scaling off the mold, and the more rarely need the coating be renewed.

It has been found that graphite is best suited as base-substance for a coating pre-

pared according to this invention, but also other mineral substances, such as talc, clay, and the like, can be used successfully in the state of a colloidal solution, as described.

What I claim is:—

The method of manufacturing coatings for permanent molds for the production of aluminum castings, which consists in dissolving the mineral matter such as graphite employed by the aid of a colloidizing process, diluting the same and rendering it capable of being readily poured into the mold.

In testimony whereof I affix my signature.

FRIEDRICH MAYER.