

UNITED STATES PATENT OFFICE.

JOHN W. GEBHARD, OF MUNCIE, INDIANA, ASSIGNOR TO ARMOR STEEL & FOUNDRY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ARIZONA.

PROCESS FOR HARDENING STEEL CASTINGS.

1,036,995.

Specification of Letters Patent.

Patented Aug. 27, 1912.

No Drawing. Application filed May 15, 1909, Serial No. 496,124. Renewed January 25, 1911. Serial No. 604,678.

To all whom it may concern:

Be it known that I, JOHN W. GEBHARD, citizen of the United States, residing at Muncie, in the county of Delaware and State of Indiana, have invented certain new and useful Improvements in Processes for Hardening Steel Castings, of which the following is a specification.

This invention relates to compounds for preparing molds used in producing steel castings, whereby the face of the casting as a whole, or in certain portions, is hardened and toughened.

In co-pending applications for patents I have set forth certain processes involving the coating of the face of the mold with a compound in which finely comminuted manganese is mixed with silica, aluminum, ferro-chrome and a suitable liquid binder. This application is intended to cover a modification of the compounds described in said applications, which has been found efficacious under certain conditions. This compound is composed of finely ground manganese, finely ground vanadium and a suitable liquid binder such as linseed oil, to which may be added finely ground tungsten or ferro-chrome. I prefer to use these substances in substantially the following proportions:—
To 20 pounds of finely comminuted manganese add 8 ounces of vanadium, and mix thoroughly; then when the compound is to be applied to a mold, add 5 ounces of linseed oil thus making a paste which will adhere to the face of the sand mold.

Instead of using 8 ounces of vanadium I may use 4 ounces of said element and 4 ounces of tungsten or ferro-chrome. The vanadium, tungsten and ferro-chrome produce a quick and effective fusing of the molten steel with the manganese coating, so that this compound is especially adapted to the making of small castings and enables me to omit silica which under some conditions is objectionable.

So far as I am aware, the physical action of ferro-chrome, vanadium and tungsten is substantially the same when used with manganese in the manner set forth in my co-pending application, but they differ in their chemical action, the variance depending upon their respective constituents.

In producing a casting in a mold coated with the above compound, it has been found that the elements of the compound are fused by the molten steel and uniting with the latter produce a hard and dense facing upon the casting at the points corresponding to the portions of the mold so treated. The texture strength and hardness of this facing depend upon the high carbon properties of the substances used. The fusing is facilitated by the oil which not only forms a binder for the comminuted minerals present, but aids combustion.

Having thus described my invention what I claim is:—

1. A compound for treating molds in the art of making steel castings, said compound comprising finely ground manganese, and finely ground vanadium mixed with a suitable binder to form a paste.

2. A compound for treating molds in the art of making steel castings, said compound comprising finely ground manganese, finely ground vanadium and finely ground tungsten mixed with a suitable binder.

3. A compound for treating molds in the art of making steel castings, said compound comprising finely ground manganese, finely ground vanadium and finely ground tungsten mixed with a suitable oil to form a paste.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN W. GEBHARD.

Witnesses:

H. DE LOS HIGMAN,
F. BENJAMIN.