

UNITED STATES PATENT OFFICE.

SAMUEL JOHNSTON, OF NEW YORK, N. Y., ASSIGNOR TO GEORGE H. SONNEBORN, TRUSTEE, OF SAME PLACE.

MATERIAL SUITABLE FOR MOLDS, CORES, &c.

SPECIFICATION forming part of Letters Patent No. 598,632, dated February 8, 1898.

Application filed June 22, 1897. Serial No. 641,829. (No specimens.)

To all whom it may concern:

Be it known that I, SAMUEL JOHNSTON, of New York, N. Y., have invented certain new and useful Improvements in Materials Suitable for Molds, Cores, Crucible-Covers, Furnace-Linings, Fireproofing, and other Uses and Method of Preparing the Same, of which the following is a description.

I have discovered that if rock of the hornblende family be thoroughly burned, pulverized, and mixed with plaster-of-paris and water in the proportions hereinafter explained a very excellent self-hardening material, capable of taking the finest details in molding work, may be produced, against which molten metals, including the high-melting metals as well as the low, will lie better, run thinner, and reproduce the pattern most exactly. Moreover, the surface of metal cast from such material is free from oxidation, from scale, and from pitting. Owing also to the lack of heat conductivity, and apparently also to a low specific heat, the chilling of metal is avoided and the greatest accuracy in reproduction is obtainable.

I prefer on account of cheapness to use the refuse from the manufacture of asbestos-pulp from rock of the hornblende family. The substance, whether such refuse or the hornblende rock itself, is burned in a furnace at high temperature until it becomes pale red. It is then finely powdered and mixed in dry state with plaster-of-paris (powder) in proportions explained below. Then to about ten parts of the mixed powder is added eight or nine parts (by volume) of water and thoroughly stirred in. The plastic so formed may also be used just as plaster-of-paris is now ordinarily used, and it sets (hardens) in about the same length of time.

For lining molds, veneering cores, or forming complete molds, especially for the fine arts, about one part plaster-of-paris to three parts (volumes) of the prepared hornblende or asbestos may be used.

In making molds for art work apply the first coat by means of a brush, stippling it onto the object to be reproduced. Then add subsequent coats to thickness desired. Unlike plaster-of-paris, the successive coats

readily adhere even when the preceding coat has dried.

In lining molds the pattern is placed within the mold box or shell and the intermediate space is filled with my material, either by pouring or injecting it around the pattern. The pattern should previously be oiled, preferably with castor-oil, though kerosene or vaseline may be used with less advantage.

In veneering cores or core-supports the center or support is fixed in the core-box, the inside of the box being first oiled, and then mold material is poured in or injected. Where an exact core is not required, the support may be covered by brush or by dipping.

Before casting metal in my material the water must be thoroughly driven out by baking or applying heat directly to the surface of the core or mold by blowpipe or otherwise. The surface may be brought to a red heat without injury.

As an improved substitute for plaster-of-paris in making molds for casts in plaster or other plastic, one part prepared hornblende to four parts plaster-of-paris may be used. Successive coats or layers of this composition will adhere and set one upon another.

Considerable departure may be allowed from the proportions I have named, and the operator will be guided in this respect by the fact that an increase in the amount of plaster-of-paris hardens the material and makes it more difficult to dress. More than one part plaster-of-paris to one part hornblende will render the material unsuitable for casting high-melting metals. Increase in the proportion of hornblende makes the material delicate, and up to the proportion of six parts to one of plaster-of-paris it works excellently with hot metals. Above that ratio it does not set properly and hardens only by evaporation of the water. Without any plaster-of-paris, however, the hornblende prepared in the manner stated may be used in pursuance of this invention for molds, cores, mold-linings, furnace-linings, and like uses. It constitutes an improved substitute for sand thoroughly dry and is far superior in non-conductivity and in preventing scale and glassy spots on the cast.

My material when used for cores with preferably about one part plaster to three of the prepared ashes of hornblende is so affected by the high-melting metals (aluminium and
5 higher) that the core after casting the metal may be shaken out as fine dust after drawing out the core-support.

I claim and desire to secure by Letters Patent as follows:

10 1. The material for the purposes described, consisting of thoroughly-burned semifused or sintered and powdered rock of the hornblende family with plaster-of-paris, substantially as described.

15 2. The material for the purposes described, consisting of thoroughly-burned semifused or sintered asbestos reduced to a powder, substantially as described.

20 3. The mold or core for casting containing a dried admixture of thoroughly-burned semifused or sintered hornblende rock, plaster-

of-paris and water of crystallization, substantially as set forth.

4. The process of preparing material for the purpose described, which consists in sub- 25
jecting rock of the hornblende family to intense heat until burned, semifused or sintered and then reducing it to powder, substantially as set forth.

5. The process of preparing material for 30
the purposes described, which consists in subjecting asbestos to intense heat until semifused or sintered, reducing it to a powder and then mixing it with plaster-of-paris and water. 35

In testimony whereof I have hereunto set my hand this 3d day of June, 1897.

SAMUEL JOHNSTON.

Witnesses:

GEORGE H. SONNEBORN,
HAROLD BINNEY.