

UNITED STATES PATENT OFFICE.

BENJAMIN C. TILGHMAN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SAWING AND GRINDING HARD SUBSTANCES.

Specification forming part of Letters Patent No. **187,240**, dated February 13, 1877; application filed December 20, 1876.

To all whom it may concern:

Be it known that I, BENJAMIN C. TILGHMAN, of Philadelphia, Pennsylvania, have invented certain Improvements in Sawing and Grinding Hard Substances, of which the following is a specification:

My invention consists in an improvement upon the process patented to B. C. Tilghman November 26, 1872, No. 133,501, for cutting hard substances by using metallic grains or globules in place of sand.

In the early applications of said process, the practice was to make the water used in connection with the iron globules alkaline with lime, as recommended in said patent, to prevent the globules from rusting and cementing together. Now I have found that, although the alkaline water produces the desired effect so long as its alkalinity continues, yet, in practice, some of the iron grains are likely to get scattered over the rough surfaces of the stone, and the lime-water mixed with them loses its alkalinity by absorption of carbonic acid, and the iron grains are then liable to rust and cement together. When the sawed stones are removed from the mill and exposed to the weather these iron grains communicate stains to the stones, which are troublesome to remove, and injure their value.

Now, my invention consists in mixing solid or undissolved lime, magnesia, or other alkali with the iron grains, and using this mixture to feed the saw. The following is a method of carrying my invention into effect, as applied to sawing stone:

Quicklime is slaked in the usual manner, and enough water is added to make a thick paste. About one measure of this paste is mixed with six or eight measures of the iron grains, and the mixture is applied to the saw in the same manner as the sand commonly used, and is fed into the saw-kerf with small streams of water, so that a constant supply of the grains and lime will be washed down, and caught and rubbed between the edge of the saw and the stone. The grains which escape from the kerf are collected and returned to feed the saw. When the proportion of mud from the stone becomes too large, they should be separated from it by washing, and then a proper quantity of lime-paste should be mixed with them before they are again used.

Another part of my invention consists in covering with a coat of lime whitewash such

of the surfaces of the stone as are likely to afford lodgment for the iron grains. This coat should fill up the roughnesses and pre-occupy the crevices of the stone, so that the grains will be less apt to adhere to it. After the sawing is finished, the stone is to be washed and cleaned from the grains; and, if it is to remain exposed to the weather before being worked up and finished, it is prudent to again whitewash its surface, so as to prevent staining from any iron grains accidentally adhering to it.

In using the iron grains for rubbing or smoothing stone, either on the wheel or by hand, I add about one-sixth or one-eighth of their bulk of lime-paste, to prevent the staining of the stone and the rusting and cementing together of the grains. When the iron grains are to be kept in a moist state for any length of time, I find it useful to mix lime-paste with them.

I do not confine myself to the proportion of lime-paste above mentioned. Any proportion may be used which will supply a considerable excess or reserve of hydrate of lime to the iron grains. I prefer to use lime, as being cheapest and most convenient; but magnesia, soda, or other alkali can be used if desired, or may be mixed with the lime. When the paste of solid or undissolved alkali is mixed with the iron grains according to my invention, it becomes unnecessary to make the water alkaline before applying it to the stone, &c.

I believe that the explanation of the improved result from the use of alkali in a solid or pasty form is the presence of a large excess or reserve of alkali in an undissolved condition, and the formation by drying of an alkaline crust to the grains and the stone, which prevents the injurious action.

I do not claim anything included or described in the patent of B. C. Tilghman, November 26, 1872, No. 133,501; but

I claim as my invention—

The use of solid or undissolved lime, magnesia, or other alkali, in combination with grains or globules of iron or steel or their alloys, in the cutting, sawing, boring, and grinding of stone, glass, pottery, and similar hard substances.

B. C. TILGHMAN.

Witnesses:

R. A. TILGHMAN,
J. BONSALE TAYLOR.