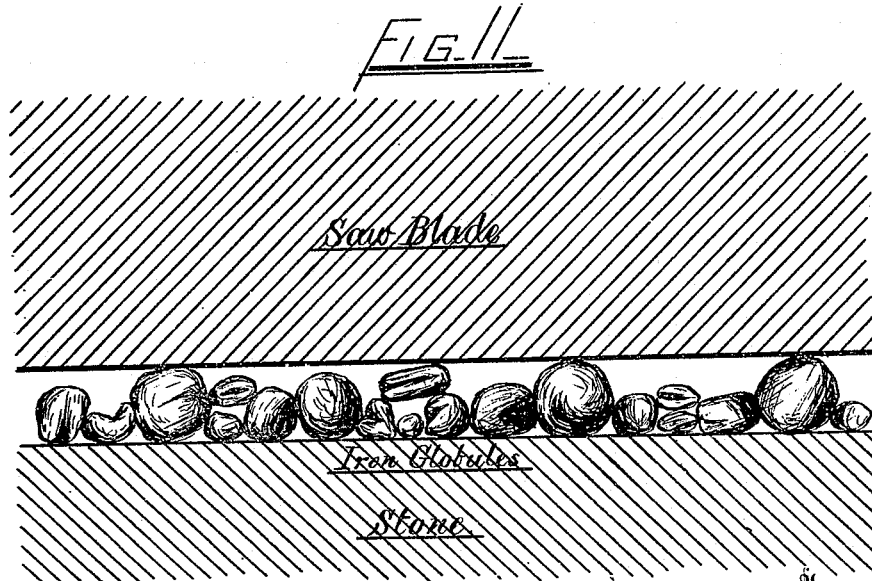
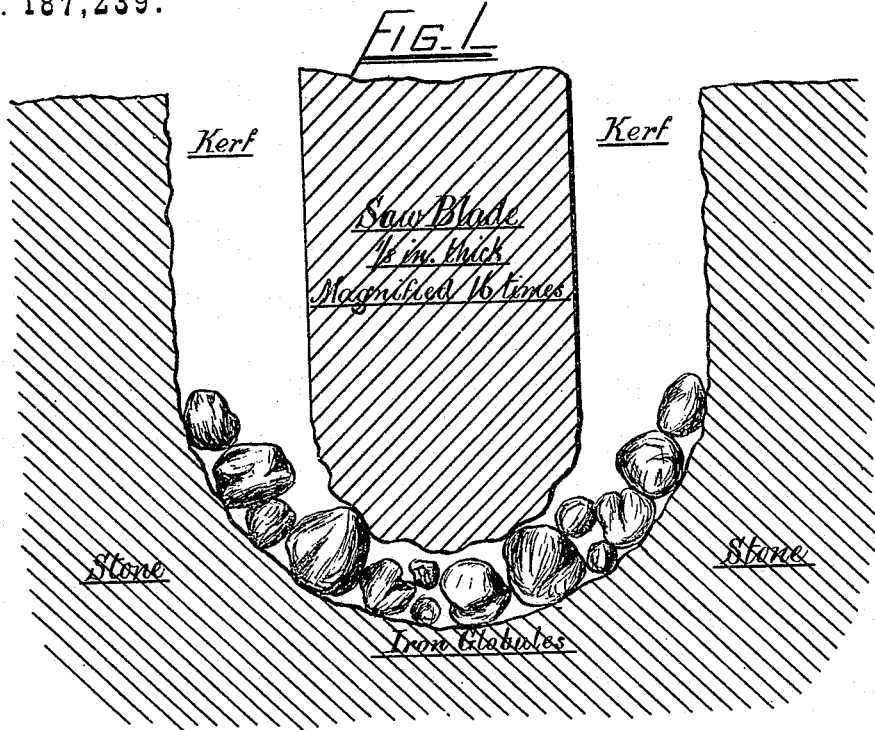


R. A. TILGHMAN.

SAWING STONE.

No. 187,239.

Patented Feb. 13, 1877.



Witnesses  
R. A. Tilghman  
J. Bonsall Taylor

R. A. Tilghman Inventor

George Harding

Attorneys

# UNITED STATES PATENT OFFICE.

RICHARD A. TILGHMAN, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN SAWING STONE.

Specification forming part of Letters Patent No. 187,239, dated February 13, 1877; application filed December 20, 1876.

*To all whom it may concern :*

Be it known that I, RICHARD A. TILGHMAN, of Philadelphia, Pennsylvania, have invented certain Improvements in Sawing Stone, 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 it was considered to be better to use grains or globules of nearly uniform sizes during the same operation, and that when the globules became worn or broken much below their average original size the small particles became inefficient in cutting, because of their tendency to escape the pressure of the saw-blade.

Now, I have discovered, by experiment, that in sawing stone with metallic grains or globules, I can obtain greater rapidity and economy by using, instead of uniform sizes, a mixture of various sizes of globules, keeping below that maximum size, which is governed by the nature of the stone and the desired smoothness of cut.

The following is a method of carrying my invention into effect as applied to the sawing of stone:

The grains or globules are to be applied to the saw in the same manner as the sand commonly used, and are fed into the saw-kerf with small streams of water, so that a constant supply of them will be washed down, and will be caught and rubbed between the edge of the saw and the stone. The grains which escape from the kerf are collected and thrown back again to feed the saw, after suitable washing, if required, to remove the mud of the powdered stone; but the small pieces and powder of the worn and broken grains of metal should not be removed, as I find they are still useful in cutting the stone.

The explanation of the improved results which I have obtained by the use of a mixture of grains or globules of various sizes I believe to be this: The wear on the cutting-edge of the saw-blade keeps it of a rounded section, nearly semi-cylindrical, and as the kerf or cut in the stone is always wider than the saw-blade, the globules, pressed upon by this round edge of the moving blade, have a

tendency to escape its pressure by rolling from under it to the sides of the kerf.

Now, if the globules are all of about the same size, and were all under pressure simultaneously, they would escape sidewise nearly about the same time, and the result would be that the saw-blade would then be let down to the bare stone, on which it would rub uselessly for the remainder of its stroke.

If a mixture of globules of various sizes is used, the cutting effect would commence by the saw pressing upon the largest globules, while the smaller would lie loose on the bottom of the kerf; then, as the largest escaped sidewise, those somewhat smaller would be caught by the saw and receive its pressure and begin to cut, and so on with the smaller sizes, successively to the end of the stroke, the result being that the saw would be less likely to reach the bare stone, and more likely to cut during the whole length of the stroke.

Beside this increased cutting efficiency, the use of mixed sizes of grains or globules has an additional economy in the cost of the material employed.

In the production of grains or globules by the subdivision of melted iron or steel, or their alloys, various sizes of grains are produced simultaneously, and these would require to be sifted into many different lots, if each size was to be used separately, and for some of these sizes there might be but little demand; whereas, by my improvement, after separating what is too coarse and the fine dust, the entire remainder can be used together, and consequently at less cost.

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

I claim as my invention—

The use of a mixture of different sizes of grains or globules obtained from melted iron or steel, or their alloys, in the sawing of stone, glass, pottery, and similar hard substances, in place of using grains of nearly uniform size in the same operation, as heretofore supposed to be preferable in practicing the said process patented to B. C. Tilghman.

R. A. TILGHMAN.

Witnesses:

B. C. TILGHMAN,  
J. BONSALE TAYLOR.