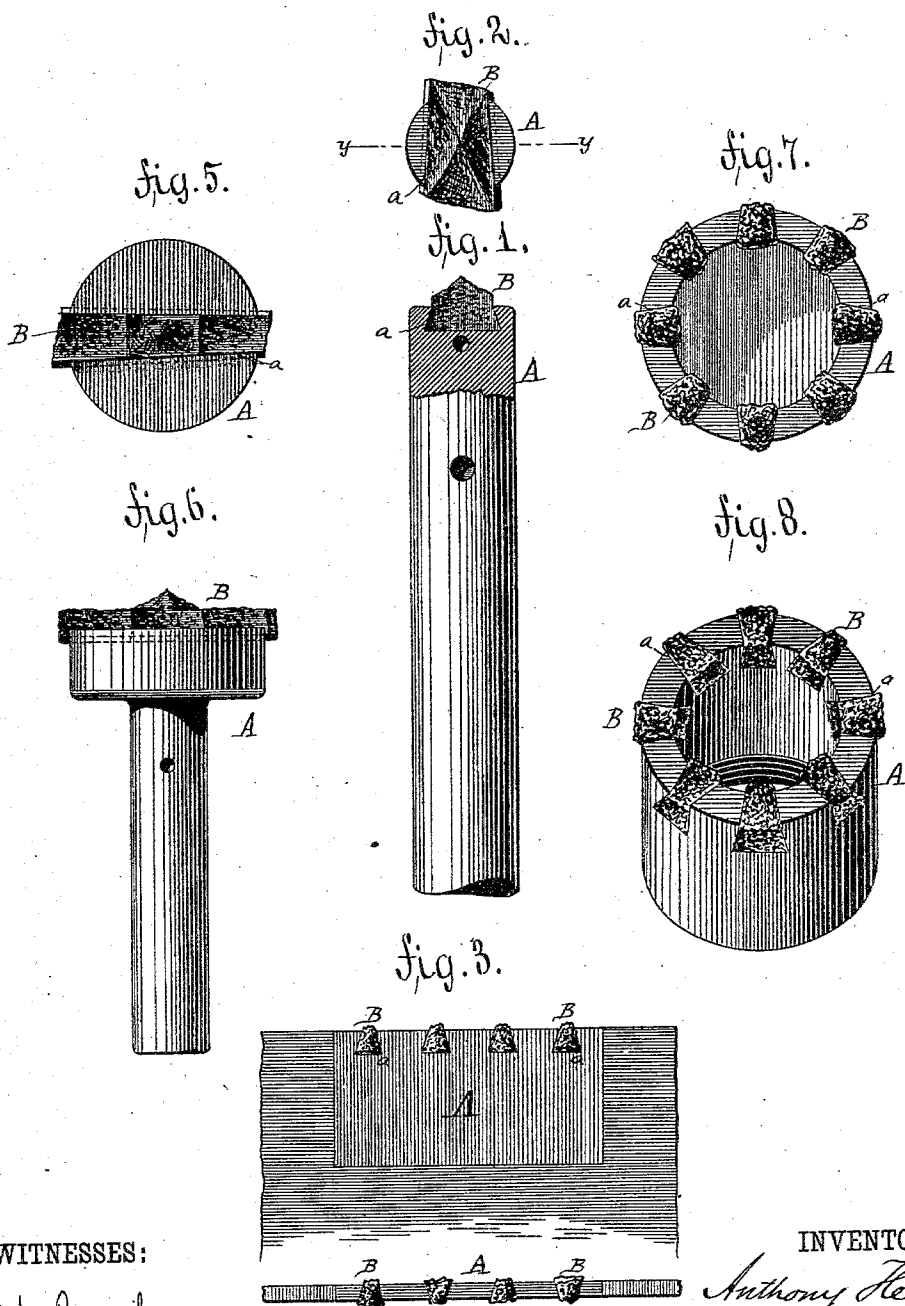


(No Model.)

A. HESSELS.
SETTING DIAMONDS IN TOOLS.

No. 295,394.

Patented Mar. 18, 1884.



WITNESSES:

Jos. H. Rosenbaum.
Martin Petry.

INVENTOR

Anthony Hessels.
BY *Loipel & Raegener*
ATTORNEYS

UNITED STATES PATENT OFFICE.

ANTHONY HESSELS, OF NEW YORK, N. Y.

SETTING DIAMONDS IN TOOLS.

SPECIFICATION forming part of Letters Patent No. 295,394, dated March 18, 1884.

Application filed November 23, 1883. (No model.)

To all whom it may concern:

Be it known that I, ANTHONY HESSELS, of the city, county, and State of New York, have invented certain new and useful Improvements in Setting Diamonds into Tools, of which the following is a specification.

This invention has reference to an improved method of inserting diamonds into the bits or teeth of boring, drilling, sawing, grinding, and other tools, by which the diamonds or carbons are secured rigidly and permanently in position in said tools without bracing or soldering and without any possibility of getting detached and lost.

In the accompanying drawings, Figure 1 represents a vertical transverse section on line *y y*, Fig. 2, of a boring-tool, the bit of which is mounted according to my improved method. Fig. 2 is a top view of the same. Figs. 3 and 4 show a side and top view of a tooth for stone-cutting saws. Figs. 5 and 6 are a top and side view of a diamond boring-tool of larger size, and Figs. 7 and 8 a top and side view of a diamond drill in which the diamonds are inserted according to my improved method.

Similar letters of reference indicate corresponding parts.

A in the drawings represents the stock of a boring, sawing, or drilling tool, which is provided with one or more transverse recesses, *a*, of dovetailed shape, the sides of which converge slightly toward the longitudinal axis of the recess. Into the recess or recesses diamonds or carbons *B* are inserted, which are shaped at two opposite sides so as to correspond exactly to the shape and size of the recess, for which purpose the sides of the diamond are ground off to the same degree of inclination toward its vertical and longitudinal axis as the sides of the recess.

To obtain diamonds of the proper size required for the different tools, the raw diamonds found in nature are broken up, which is accomplished by making a slight incision with a diamond-cutting tool at the point where the diamonds should be separated, and then cleaving the diamonds in the line of said incision by a suitable tool. The diamonds are then cut into the required shape at two

opposite sides, and inserted with the narrower end foremost into the bit or tooth by means of a few light blows on the wider end. The double wedge action of the dovetailed and longitudinally-inclined recess holds the tapering base of the diamond rigidly and permanently in position.

The diamond *B* is arranged to project at both sides of the bit, tooth, or drill, and is also pointed at its center when required for boring purposes.

For larger sizes of boring-tools, several diamonds of smaller size, shaped in the manner described, are driven close to each other into the recesses of the boring-tool, as shown in Figs. 5 and 6.

When used for stone-cutting saws or for rock-drills, the diamonds are so inserted that the longitudinal inclination of one transverse recess is in opposite direction to that of the next adjoining recess, whereby the stock is exposed to the same strain on both sides and the diamonds prevented from getting loose or detached from the tool.

The cutting of the sides of the diamonds to the required degree of lateral and longitudinal inclination is accomplished on diamond-cutting machines of any approved construction, after the diamonds have been cleft to the size required by the recesses in the tools. Diamonds from the smallest to the largest size can thus be prepared and inserted into the bits or teeth of diamond boring or cutting tools with perfect reliability without getting loose by use.

The advantages of my improved method of mounting or setting of diamonds or carbons are, first, that they can be inserted into the tools at the place of use by an average mechanic, so that the necessity of returning the bits or teeth for setting the diamonds is obviated; secondly, that the diamonds do not get loose or detached by use, so that none of them can be lost; thirdly, that when they are worn off they can be exchanged and used with bits of smaller size until they are entirely used up.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of a stock provided with

a transverse recess the sides of which are slightly inclined toward the vertical and longitudinal axes of the recess, and a diamond or carbon two opposite sides of which are shaped
5 to correspond to the recesses of the stock, substantially as set forth.

2. The combination of a stock or tool body provided with transverse dovetail recesses, said recesses being alternately tapered in op-
10 posite directions, and a series of cutting-dia-

monds dovetailed and tapered to fit said recesses.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ANTHONY HESSELS.

Witnesses:

OTTO RISCH,
SIDNEY MANN.