June 8, 1926. 1,587,805

E. N. TAYLOR

TOOL AND METHOD OF MAKING THE SAME

Filed Jan. 3, 1924

Fig. 1.

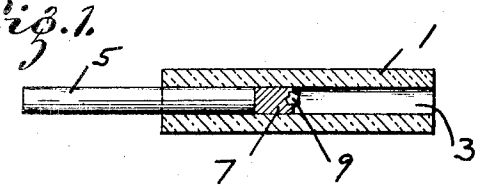



Fig. 2.

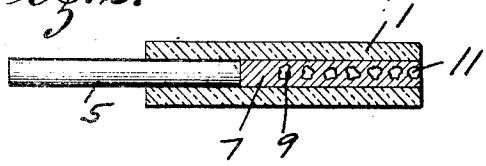



Fig. 3.

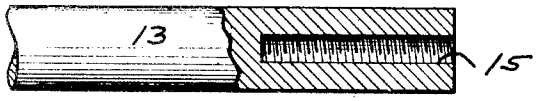



Fig. 4.

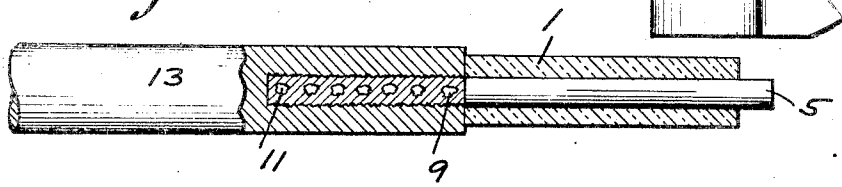



Fig. 5.

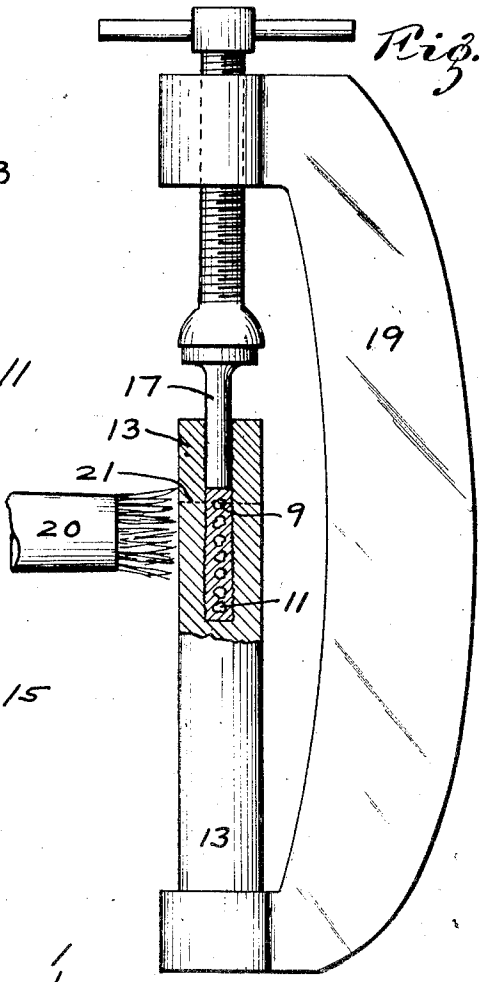
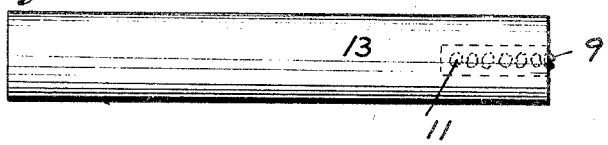



Fig. 6.




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# UNITED STATES PATENT OFFICE.

EDWARD N. TAYLOR, OF NEWARK, NEW JERSEY.

## TOOL AND METHOD OF MAKING THE SAME.

Application filed January 3, 1924. Serial No. 684,271.

This invention relates to tools and method of making the same, and with regard to certain more specific features, to diamond tools.

Among the several objects of the invention may be noted the provision of a simple and durable tool construction; and the provision of an effective and inexpensive method of making a tool. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the features of construction, steps and sequence of steps, combinations of elements and arrangements of parts, which are exemplified in the description hereinafter in connection with the accompanying drawings, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is illustrated diagrammatically one of various possible embodiments of the invention,

Fig. 1 is a central sectional elevation of a piece of glass tubing and steel rod, and a partly constructed tool in the tubing;

Fig. 2 is a similar view, showing the tool in a partly completed stage of manufacture;

Fig. 3 is an elevation, partly in section, of a tool holder;

Fig. 4 is a similar view of the holder, when the contents of the glass tubing of Fig. 2 have been pushed into said holder;

Fig. 5 is an elevation, partly in section, illustrating heating of the tool; and

Fig. 6 is an elevation of the completed tool.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Referring now more particularly to Figs. 1 to 4 of the accompanying drawings, there is illustrated at 1 a piece of glass tubing, into the central bore 3 of which has been inserted a steel rod 5, to close one end of the tubing.

Into the other end of the tubing has been inserted a small quantity of amalgam 7. This amalgam is preferably of the following composition by weight: powdered gold 1 part; powdered silver 9 parts; mercury 28 parts; rubbed together to give a mixture of about the consistency of putty. The powdered silver may be prepared by precipitating it from a solution of silver nitrate with a strip of sheet copper. The powdered gold may be prepared in similar manner by using a solution of auric chloride.

A diamond 9 has been set into the amalgam 7, with a pair of long pointed tweezers (not shown).

As indicated in Fig. 2, more amalgam and additional diamonds are alternately inserted into the tubing, until the tool is of the required length. The amalgam at the end of the tubing should preferably cover the right hand diamond 11; and all of the diamonds should be entirely embedded in the amalgam.

A tool holder of the type shown at 13 in Fig. 3 is preferably used. This holder has a threaded hole 15 in it, of the diameter of the bore 3 in the glass tubing 1.

The slug of amalgam and embedded diamonds shown in Fig. 2 are placed in line with the hole 15 in the holder 13, and by means of the rod 5 the slug of amalgam and diamonds are pushed into said hole in the holder, to the position indicated in Fig. 4.

A steel rod 17 (Fig. 5) is then fitted into the hole 15 in the holder, one end of the rod 17 resting on the amalgam, the other end of said rod being pressed by a clamp 19, or other suitable device, with such a force as will put the plastic amalgam under a substantial pressure. A pressure of five thousand pounds to the square inch has been found satisfactory. This will force out a part of the mercury from the amalgam.

While the clamp thus maintains pressure on the amalgam, the tool is heated to a barely visible red heat, by means such as a burner indicated conventionally at 20 in Fig. 5. This drives off substantially all the mercury in the form of vapor. The amalgam shrinks so that the clamp has to be tightened from time to time. The gold and silver alloy does not melt, but is compressed so as to conform to the contour of the diamonds and to the threads in the holder. After the combined heating and pressure step has been concluded, and after the tool has cooled, the tool is cut off to as to expose a suitable portion of the surface of the outermost diamond. A plane for such cutting is indicated in dotted lines at 21 in Fig. 5, and the finished tool is illustrated in Fig. 6.

The tool is now ready for use for the various purposes to which diamond tools are adapted.

As the outermost diamond wears away, the tool may be cut off to expose more of said diamond, and then may be cut off successively to expose the other diamonds that are located in the tool.

This construction permits the utilization of quite small diamonds.

As many modifications of the embodiment above illustrated might be made without departing from the spirit or scope of the present invention, it is intended that the above description and accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A diamond tool comprising a holder filled with amalgam and embedded diamonds spaced therein.

2. A diamond tool comprising a holder filled with amalgam and embedded diamonds spaced therin; and a face cut on said tool to expose the outermost diamond.

3. The method of making a diamond tool comprising the loading of a holder with amalgam and the embedding of diamonds therein, and the heating of said amalgam in the tool while applying pressure thereto with a ram.

4. The method of making a diamond tool, which comprises inserting amalgam and diamonds embedded therein into a tool holder; subjecting said amalgam and embedded diamonds to compression by means of a ram.

5. The method of making a diamond tool, which comprises inserting amalgam and diamonds embedded therein into a tool holder; subjecting said amalgam and embedded diamonds to high compression by means of a ram, to drive off the mercury and to compress the gold and silver to form an alloy securely retaining the diamonds in spaced relation in said alloy.

6. The method of making a diamond tool, which comprises inserting amalgam and diamonds embedded therein into a tool holder; and subjecting said amalgam and embedded diamonds to compression to the magnitude of five thousand pounds to the square inch and simultaneously heating the same to drive off the mercury and to compress the gold and silver to form an alloy securely retaining the diamonds in said alloy.

7. The method of making a diamond tool, which comprises inserting amalgam and diamonds embedded therein into a tool holder; subjecting said amalgam and embedded diamonds to compression to the magnitude of five thousand pounds to the square inch and simultaneously heating the same to drive off the mercury and to compress the gold and silver to form an alloy securely retaining the diamonds in said alloy and cutting off the tool to expose successive diamonds as required.

8. The method of making a diamond tool, which comprises inserting into the bore of tubing a slug of amalgam; inserting a diamond into said amalgam; inserting more amalgam and additional diamonds in said tubing; forcing said slug of amalgam and embedded diamonds into the bore of a tool holder; subjecting said slug of amalgam and embedded diamonds to compression and simultaneously heating the same to drive off the mercury and to compress the gold and silver to form an allow securely retaining the diamonds in spaced relation in said alloy.

9. The method of making a diamond tool, which comprises inserting into the bore of glass tubing a slug of amalgam formed of gold, silver and mercury in the ratio (by weight) of approximately 1:9:29; inserting a diamond into said amalgam; inserting more amalgam and additional diamonds in said tubing; forcing said slug of amalgam and embedded diamonds into the threaded bore of a tool holder; subjecting said slug of amalgam and embedded diamonds to compression to the magnitude of five thousand pounds to the square inch and simultaneously heating the same to a barely visible red heat, to drive off the mercury and to compress the gold and silver to form an alloy securely retaining the diamonds in spaced relation in said alloy; and cutting off the tool to expose successive diamonds as required.

In testimony whereof, I have signed my name to this specification this thirty-first day of December, 1923.

EDWARD N. TAYLOR.