Jan. 21, 1947. J. KLIPPER 2,414,598

METHOD OF GRINDING FACETS ON PRECIOUS STONES

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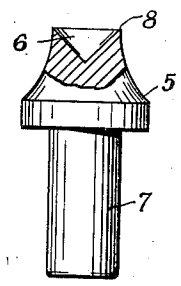


Fig. 1.

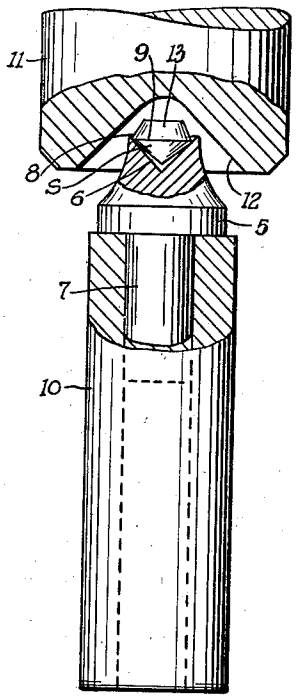


Fig. 2.

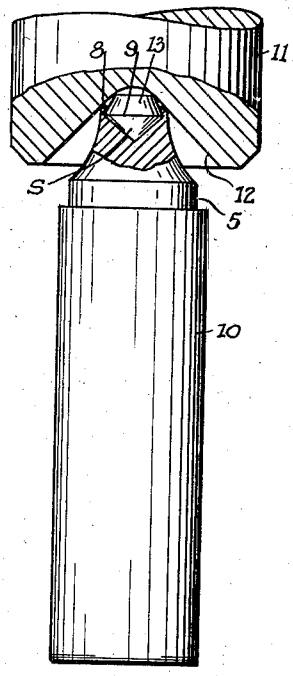


Fig. 3.

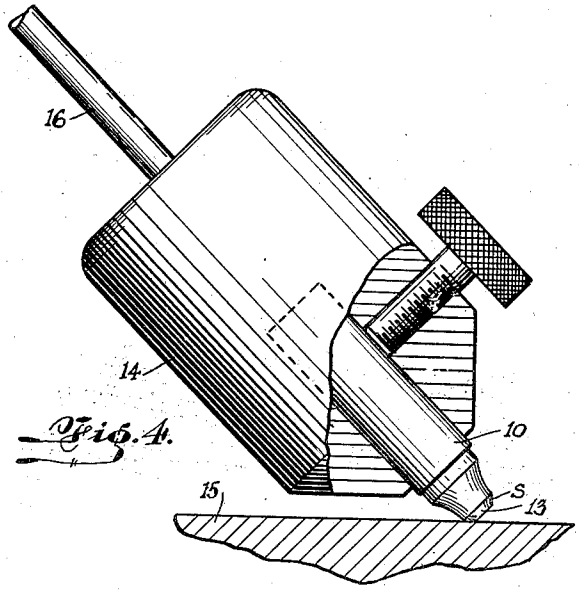


Fig. 4.

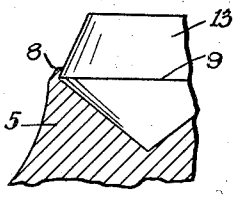


Fig. 5.

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METHOD OF GRINDING FACETS ON PRECIOUS STONES

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Application January 1, 1945, Serial No. 570,958

3 Claims. (Cl. 51—229)

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This invention relates to a method of grinding facets on previous stones. This application is a continuation in part of my application filed November 24, 1941, Serial No. 420,188.

The cost of precious stones, especially diamonds, of smaller sizes and which run from twenty to two hundred to a carat, has greatly increased because of the shutting off of the foreign sources of supply. The cost of producing these small stones in this country is, at present, almost prohibitive due to the high labor cost in cutting and polishing, the high cost being due to the necessarily careful methods employed in mounting the stones for proper presentation to the grinding and polishing wheel. Expert diamond cutters prefer to lend their time to the production of larger gems and it, therefore, falls to the younger, less experienced apprentices and helpers to grind and polish smaller stones in an attempt to keep the cost thereof within marketable range.

The present invention, therefore, seeks to provide a novel method for mounting small stones for grinding and polishing whereby accurately cut stones are obtained without the need for expert expensive labor.

Another object is to facilitate and hasten the cutting of small stones to further reduce the production cost thereof.

When it is borne in mind that the labor costs of cutting small stones are frequently five to six times that of the value of the uncut stones, the purposes and objects of the invention will become more clearly understandable. The following specification, which is based on the accompanying drawing, explains in detail, the principles of the invention and realizes said invention with regard to both the novel contemplated method and to the novel stone holder obtained thereby.

In the drawing:

Fig. 1 is an elevational view, partly in section, of a primary holder for the stone.

Fig. 2 is a similar view showing the primary holder mounted in a secondary holder and prior to the fixing of a stone in said primary holder.

Fig. 3 is a similar view illustrating the impressing of a stone in the primary holder.

Fig. 4 is an elevational view, partly in section, showing the assembled holder as mounted in a dop and as applied to a grinding and a polishing wheel.

Fig. 5 is an enlarged fragmentary view of the stone held in the primary holder, showing the peripheral edge peened over the girdle of the stone.

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The mounting of a precious stone in a dop for presentation of said stone to the surface of a diamond cutting wheel, is, at present, done in several ways. Certain of these ways lend themselves only to the mounting of larger stones and comprise the use of molten metal, certain sealing wax, or the application of heat upon the stone holder. Such methods cannot be used efficiently for small stones which become so completely embedded as to be insufficiently exposed for proper grinding and polishing. The method most commonly used for holding small stones entails the use of a dop in which a holder is set, said holder being formed with a seat upon which the stone is held by a claw-like member. By this method, the stone is easily unseated and requires the services of an expert to supervise its cutting.

The known methods further require that every time a facet of a stone has been completed by a polisher, the stone must be adjusted in the proper position for the next facet, by another operative, called "turner" and hence the work of the polisher is repeatedly interrupted which necessarily interferes with his capacity. By the method and means herein disclosed the need for the highly skilled "turner" is eliminated.

Referring now to the drawing in greater detail, Fig. 1 shows a primary holder 5 which, as contemplated herein, is formed with a seat 6 having the general shape of either the top of a stone or the back thereof. This holder may be provided with a shank 7 and is preferably made of a semi-hard metal such as copper, aluminum, etc. The outer diameter of the seat 6 preferably forms a peripheral edge 8 which is relatively thin, said periphery being at least as large as the girdle 9 of the stone (Fig. 2) to be set in said holder 5.

The primary holder thus provided is then mounted in a secondary holder 10 which may comprise a somewhat harder metallic sleeve. It is contemplated to make the secondary holder of cold rolled steel or the like. Fig. 2 shows this condition.

Thus formed, the combined holder is ready for the setting of a stone S thereinto. The stone, which is rough cut to shape so that at least the girdle 9 thereof is formed, is set into the seat 6 with the back thereof in the seat, if the top is to be cut, and with the front in the seat, if the back is to be cut.

The next step in the instant method entails the forcing of the stone into the seat 6 whereby said stone is impressed into the metal of the primary holder 5, to conform said seat to the shape of said stone. For this purpose it is pre-

ferred to use a tool such as shown in Figs. 2 and 3 at 11, said tool being formed with a conical cavity 12, the walls of which engage exposed portions of the stone S. As pressure is applied to the tool 11, the stone is impressed into the relatively soft metal of the primary holder 5 and simultaneously the peripheral edge 8 of the primary holder is rolled or peened over the girdle 9 so that the stone becomes embedded in the metal and may not easily be displaced. It will be noted from Fig. 3 that the peripheral edge 8 is forced into firm and intimate engagement with the girdle 9 of the stone and yet leaving the top 13 thereof clear and unobstructed, save for the peened over rim 8 of the primary holder 5.

By this method advantage is taken of the natural hardness of the stone as compared to the relatively soft primary holder 5 to firmly mount said stone whereby it is securely held and yet may be easily pried out after the cutting and polishing operations have been performed.

The combined holder, mounted with the stone as above described, may then be placed in a dop 14, as shown in Fig. 4, and so positioned with respect to a grinding wheel 15 as to cut facets on the exposed stone top 13. The dop may be mounted in a clamp by means of the rod 16 in any approved manner.

It will be seen that the entire peripheral edge of the primary holder is turned over the edge of the girdle of the stone to retain the stone until all the facets are ground. As each facet is ground, a portion of the holder, that is a portion of that part of the holder which has been peened over the girdle of the stone, will likewise be ground up to the girdle, but that there are always remaining sufficient portions of the peripheral edge of the seat of the holder to retain the stone in position, in much the same way that the prongs of a mounting hold the stone in a ring. It will thus be seen that all of the facets may be ground and polished without removing the stone from its primary holder for re-setting or for turning. As stated above, the primary holder itself or an auxiliary or secondary holder 10 may then be placed in dop 14 in which it may be adjustably rotated to grind and polish the various facets.

From the foregoing, it will be seen that a holder for stones has been provided which is economically and expeditiously produced by the novel disclosed method; that said holder effectively holds the stone for presentation to a grinding wheel and thereby renders the positioning of said stone for cutting quick and easy; and that inadvertent displacement of the stone during cutting thereof is greatly minimized.

The virtues of the invention will stand forth more clearly when it is stated that Figs. 1, 2 and 3 are drawn seven times full size and that the stone S runs from sixty to seventy to the carat, being about $^{5}/_{64}$'' in diameter.

While the invention has been described with particular reference to its use and advantages in polishing small diamonds, it will be obvious that the same method and means may be employed for holding diamonds of any size. A device in accordance with the invention and the method disclosed, has already been used with diamonds running three hundred to the carat, and also on large-sized stones of a carat or more. The method and means may be used in sawing, cutting and polishing gems of any size.

It should be understood that the foregoing description is not intended to limit the scope of the invention as claimed inasmuch as skilled persons may follow the teachings herein in other practical ways without departing from the spirit of the invention as defined in the appended claims.

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

1. The method of grinding facets on precious stones which consists in forming a seat in a metal holder approximating the shape of the portion of the stone to be placed in said seat, and forming said seat with a peripheral edge at least as large as the girdle of said stone, forcing said stone into said seat to conform the seat to said mentioned stone portion, turning said peripheral edge over the girdle and into firm engagement therewith, rotatably adjustably mounting said holder in a dop and thereafter grinding all the facets in the same circle of facets adjacent the girdle of said stone by rotatably adjusting the holder in said dop and without removing said stone from its holder until all the facets are ground, and incidently grinding away all metal which may overlie that portion of the stone which is being ground to produce the facet.

2. The method of grinding facets on precious stones which consists in forming a seat in a metal holder approximating the shape of the portion of the stone to be placed in said seat, and forming said seat with a peripheral edge at least as large as the girdle of said stone, forcing said stone into said seat to conform the seat to said mentioned stone portion, turning said peripheral edge over the girdle and into firm engagement therewith, rotatably adjustably mounting said holder in a dop and thereafter grinding all the facets in the same circle of facets adjacent the girdle of said stone by rotatably adjusting the holder in said dop and while the stone remains fixedly secured in said holder, the facets being ground, actually defining or touching the girdle.

3. The method of grinding facets on precious stones which consists in forming a seat in a metal holder approximating the shape of the portion of the stone to be placed in said seat, and forming said seat with a peripheral edge at least as large as the girdle of said stone, forcing said stone into said seat to conform the seat to said mentioned stone portion, turning said peripheral edge over the girdle and into firm engagement therewith, rotatably adjustably mounting said holder relative to a grinding wheel and thereafter grinding all of the facets adjacent the girdle of said stone by rotatably adjusting the holder and without removing said stone from its holder until all the facets are ground, and incidently grinding away all metal which may overlie the portion of the stone which is being ground to produce the facet.

JOSEPH KLIPPER.