No. 893,920. PATENTED JULY 21, 1908.

W. H. GRIESCH.

GEM CUTTING AND POLISHING APPARATUS.

APPLICATION FILED APR. 4, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

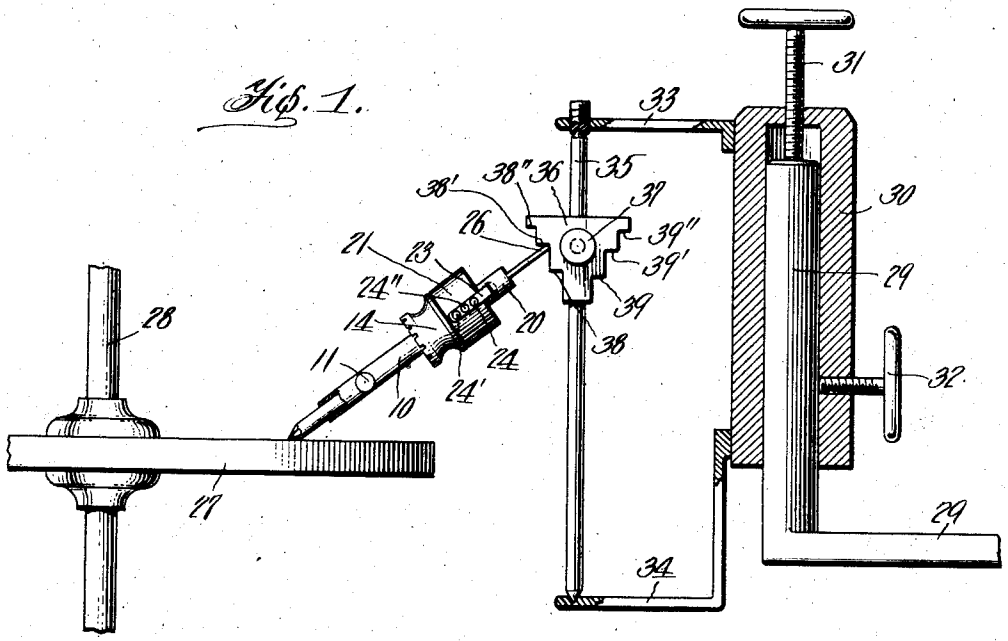


Fig. 2.

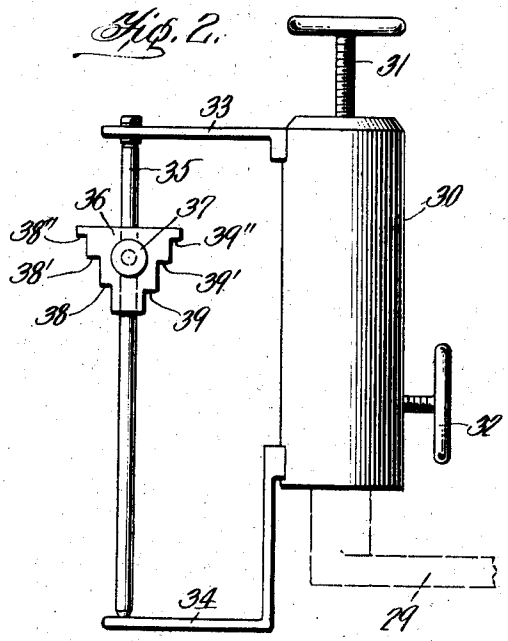
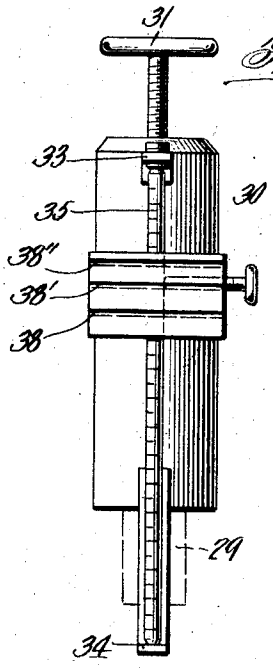


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

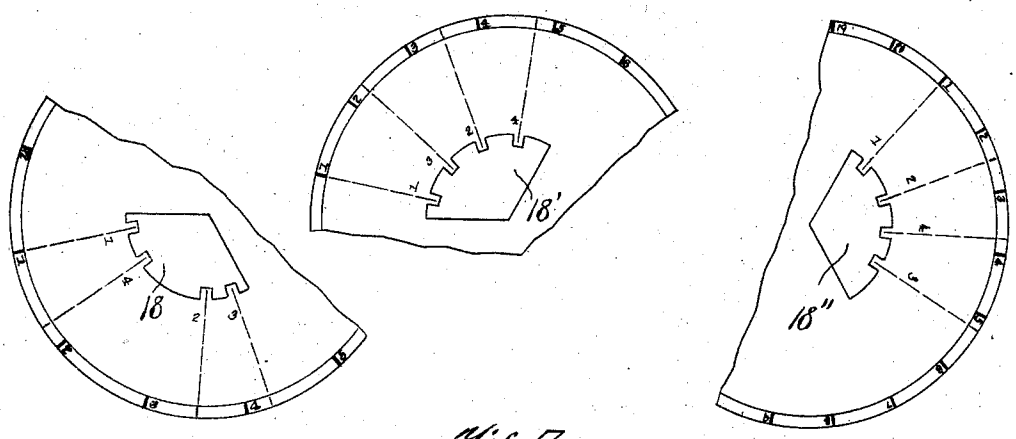


Fig. 5.

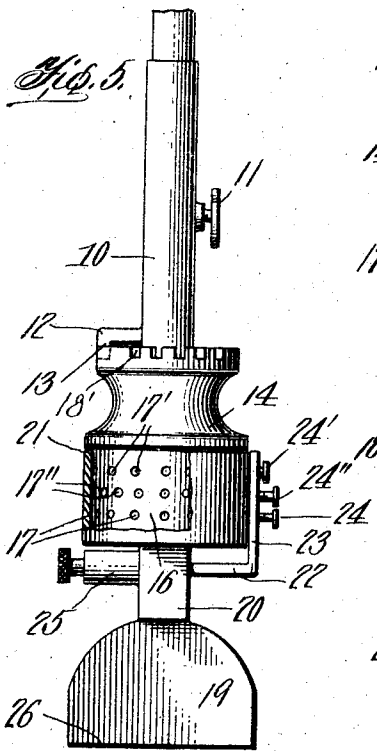


Fig. 7.

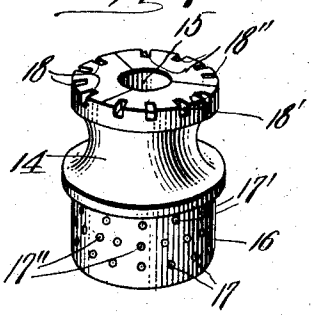
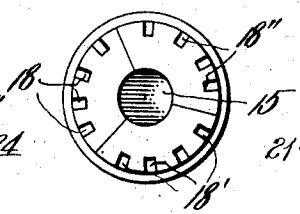


Fig. 8.



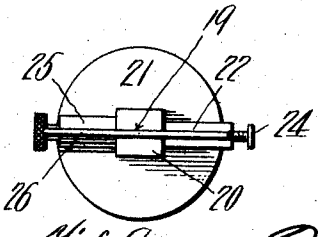
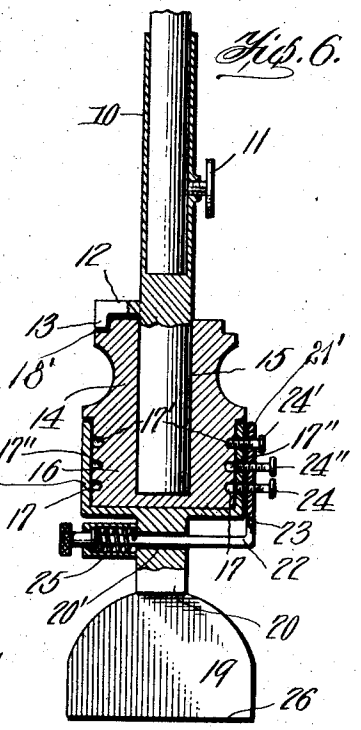


Fig. 9.

Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM H. GRIESCH, OF BROOKLYN, NEW YORK.

GEM CUTTING AND POLISHING APPARATUS.

No. 893,920. Specification of Letters Patent. Patented July 21, 1908.

Application filed April 4, 1908. Serial No. 425,275.

To all whom it may concern:

Be it known that I, WILLIAM H. GRIESCH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Gem Cutting and Polishing Apparatus, of which the following is a specification.

This invention relates to the art of stone cutting and polishing, and has particular reference to apparatus used by lapidaries for cutting and polishing precious stones. In this art among the special requisites are to provide an apparatus which will insure accuracy with respect to all of the facets in any one row around the gem with respect both to the angle thereof with the axis of the gem and as to the breadth of the facets. Inasmuch furthermore as diamond cutting is a comparatively slow operation, it is essential that the machines used by the lapidaries shall be capable of rapid manipulation in order to limit the expenditure of time as much as possible, without detracting from the accuracy as above suggested.

The foregoing and other objects of the present invention are secured by the mechanism hereinafter specifically described and illustrated in the accompanying drawings, in which,

Figure 1 is a general view of my invention, showing the same in substantially the position which it occupies when in use, partly in elevation and other parts in section; Fig. 2 is a side elevation of the fulcrum block and its support; Fig. 3 is a front elevation of the parts indicated in Fig. 2; Fig. 4 is a diagrammatic representation of the relation between the series of notches and the corresponding rows of holes in the thimble member to be hereinafter described; Fig. 5 is an elevation of the gem holder and foot piece; Fig. 6 is a view corresponding to Fig. 5, principally in vertical section; Fig. 7 is a detail perspective of the thimble; Fig. 8 is a plan view of one end of said member, and Fig. 9 is a plan view of the other end of said thimble member.

Throughout the following description and on the several views of the drawings similar parts are referred to by like reference characters.

In carrying out this invention there is employed a stick holder 10, preferably cylindrical throughout its extent, and provided at one end with a bore for the reception of the stick or dop which is held in place by means of a set screw, and being further provided intermediate of its ends with an arm 12 projecting laterally therefrom and which arm terminates in a finger 13 extending substantially parallel to the stick holder 10. A thimble 14 is provided with a central cylindrical bore 15 for the reception of one end of the stick holder 10. The thimble 14 is furthermore provided at one end 16 with a plurality of parallel rows of holes 17, 17′, and 17″ extending around the periphery of the thimble. The holes in each row are spaced equidistant, and the number of holes in the several rows being unequal. At the end of the thimble opposite to that just described there are provided a plurality of series or groups 18, 18′, and 18″ of notches corresponding respectively with the aforesaid parallel rows of holes and the notches of each series being staggered with respect to the row of holes corresponding thereto. The notches just described are adapted for the reception of the finger 13 of the stick holder.

Associated with the thimble is a foot piece 19 comprising a shank 20 having a transverse hole 20′ therethrough and a cup or socket 21 is secured rigidly to one end of the shank 20 and adapted to receive the end of the thimble having the parallel rows of holes. On one side of the cup 21 are a plurality of holes 21′ which register with the parallel rows of holes in the thimble. A plunger 22 whose main portion projects through the hole 20′ in the shank has one end 23 turned at substantially a right angle to the main portion thereof and lying adjacent to the side of the cup 21. The end 23 carries a plurality of adjustable members, shown in the nature of screws 24, 24′, and 24″, adjustable toward or from the thimble 14 through the holes 21′ of the cup and adapted to be received in the holes of the thimble. A spring 25 tends to normally hold the plunger in such position as to cause one of the screws just mentioned to be received in one of the thimble holes and thereby prevent rotation of the thimble and the stick holder secured therein. The foot piece at its end opposite the cup 21 terminates in a broad, straight, and unbroken knife edge 26 which lies at a right angle to the axis of the shank and cup.

At 27 I have indicated an ordinary form of lapidary's lap mounted for rotation on a vertical axis 28. Located adjacent to said lap is a bracket 29 substantially cylindrical

in form and projecting upwardly, and mounted upon said bracket 29 is a sleeve 30 having at its upper end an adjusting screw 31 and a set screw 32 on its side for securing the same in place with respect to the bracket 29 after being adjusted. The sleeve 30 is provided with suitable outwardly projecting arms 33 and 34 in and between which is mounted a vertical gage rod 35, the gage rod being pivoted for rotation between said arms. A fulcrum block of peculiar form 36 is mounted slidably upon said rod 35 and is adapted to be locked thereto in adjusted position by a set screw 37. The fulcrum block is provided on each of its two opposite sides with a series of steps. The steps 38, 38′, and 38″ on one side being arranged at different elevations from the corresponding steps 39, 39′, and 39″ on the opposite side.

Having thus set forth the specific mechanical construction of the invention, the operation and advantages thereof are substantially as follows: The lapidary after securing the stone to be cut in the end of the stick or dop by means of wax, or the like, places the stick in the stick holder 10, securing it therein by means of the set screw 11. The stick holder 10 will then be placed within the thimble 14 and the latter within the cup 21. After this the lapidary will place the knife edge 26 against one of the steps or ledges of the fulcrum block 36, the particular ledge selected being determined by the particular angle desired for the facet to be produced with respect to the axis of the gem. The fulcrum block 36 will be adjusted vertically upon the rod 35 in accordance with the varying shapes and sizes of the gems to be cut and the results to be secured. The several rows of holes 17, 17′, and 17″ will determine the number of facets which may be produced with one adjustment of the stick holder 10 in the thimble 14. Assuming, for instance, that there be twelve holes in the row 17 and it be desired to cut twelve facets all at the same angle the finger 13 will be engaged in the first notch of the series of notches 18. After the lapidary has cut one facet with this arrangement, the knife edge 26 being held in position against a particular step of the fulcrum block, he may thereafter cut all of the remaining eleven facets successively by simply pressing upon the plunger 22 against the resistance of the spring 25 withdrawing the screw 24 from a hole in the row of holes 17 and allowing the thimble to be rotated step by step within the cup 21. It will be understood that during this operation the screws 24′ and 24″ will be retracted so as not to interfere with the rotation of the thimble or operation of the plunger with the screw 24 carried thereby. Again, assuming that the row 17′ contains sixteen holes and it be desired to cut such number of facets, the finger 13 would be removed from the position before described and placed in the first notch of the series of notches 18′, and the screw 24 would be withdrawn or moved outwardly and the screw 24′ would be brought down so as to coöperate with the holes 17′ successively. Should it be desired to cut only eight facets the same arrangement of the stick holder and its finger with respect to the thimble would be employed as that just described and the lapidary would employ every alternate hole of the row 17′ instead of every hole.

The purpose of the plurality of notches in each series will now be described and using the same illustration as at first, and assuming that row 17 has twelve holes, should it be desired to produce twenty-four facets and no row of holes is provided with such number, the finger 13 will be removed from notch number 1 of the series 18 and placed in notch number 2, such notch being so spaced with respect to the first notch as to cause the number of facets to be doubled, in other words, new facets will be made twelve in number midway between the original twelve and at equal distances apart. The latter twelve facets will be formed successively by rotating the thimble step by step within the socket 21 as in the first case. Notch number 3 of each series of notches is spaced so as to add another set of facets equal in number to the first two sets, thereby making a total of thirty-six facets, and likewise notch number 4 when used will cause another twelve facets to be produced, making in all forty-eight. It will be seen therefore that when the fulcrum block 36 is once properly set in elevation so as to form a facet with the desired angle, the knife edge being against a definite one of the steps all of the facets of the same row will be successively formed of precisely the same angle, and yet the lapidary may freely manipulate the holder for the purpose of inspection as the operation progresses. Again, by shifting the foot piece with its knife edge from one step to another of the fulcrum block, facets of varying angles will be produced. Upon turning the fulcrum block half way around so as to present the steps upon the opposite side a still different effect of angulation may be produced. Ordinarily the fulcrum block will be so designed that the steps upon one side will be used for forming and polishing the facets on the top of the gem and the steps upon the other side of the fulcrum block will be used for producing the facets upon the bottom of the gem and all without intermediate adjustment of the fulcrum block on the bar 35. The knife edge 26 being of considerable extent and at right angles to the axis of the shank 20 and the members associated therewith and coöperating with the fulcrum block in the manner before described will insure uniformity of angle and

yet permit of considerable lateral movement of the gem holder with respect to the axis of the fulcrum block, and whereby the range of movement of the gem while being cut over the face of the lap will be materially increased.

I claim:

1. In an apparatus of the character set forth, the combination of a cylindrical stick holder having an arm projecting laterally therefrom, said arm terminating in a finger extending substantially parallel to the said holder, a thimble having a central cylindrical bore to receive one end of said stick holder, one end of said thimble being provided with a plurality of parallel circular rows of holes extending around its periphery, the holes in each row being equi-distant and the several rows having different numbers of holes, the other end of the thimble being provided with sets of notches for the reception of the said finger, one set for each row of holes aforesaid, the notches of each series being staggered with respect to the row of holes corresponding thereto, and a foot piece comprising a shank, a cup secured to the shank to receive the end of the thimble having the rows of holes, the cup having a series of holes registering with the aforesaid parallel rows of thimble holes, a spring pressed plunger extending through said shank and having its end turned at substantially a right angle to its main portion and lying adjacent to said cup, and a plurality of independently adjustable members mounted in said plunger end and adapted to coöperate with said rows of holes and through the said cup holes.

2. The hereindescribed thimble for a diamond cutting and polishing apparatus consisting of a cylindrical member having at one end a central axial bore and a plurality of series of notches, the notches of each series being at unequal distances apart, and having at the other end as many parallel rows of peripheral holes as there are series of notches aforesaid, the holes in each row being equi-distant.

3. In a diamond cutting apparatus, the combination of a stationary support, a gage rod mounted thereon for rotation on a vertical axis, a fulcrum block adjustable vertically on said gage rod, said fulcrum block having series of steps, one series on each of the two opposite sides, and the steps of one series being at different distances from the top of the block than the steps of the other series, and a diamond holding device including a foot piece having an extended knife edge for cooperation with the several steps of the fulcrum block aforesaid.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. GRIESCH.

Witnesses:

WILLIAM R. HENDRICKSON,

AUG. OKESSEN.