H. DE VRIES AND W. A. DONALDSON.

APPARATUS FOR GRINDING OR POLISHING PRECIOUS STONES.

APPLICATION FILED JUNE 13, 1918.

1,305,038.

Patented May 27, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

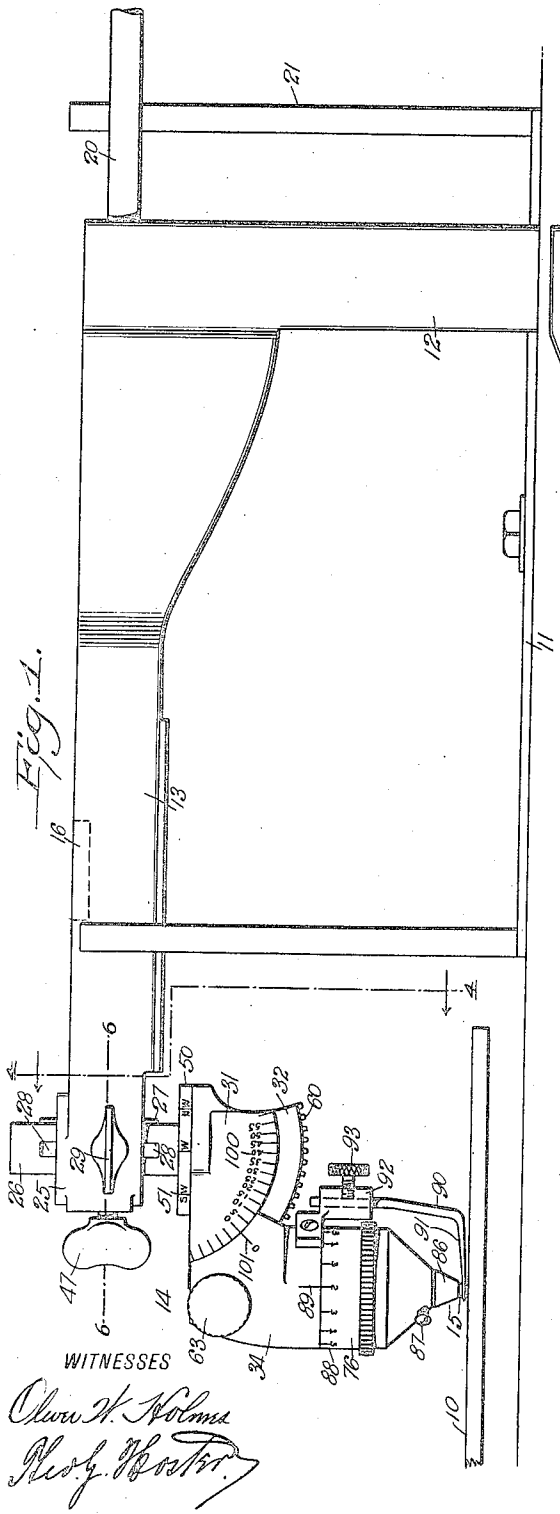
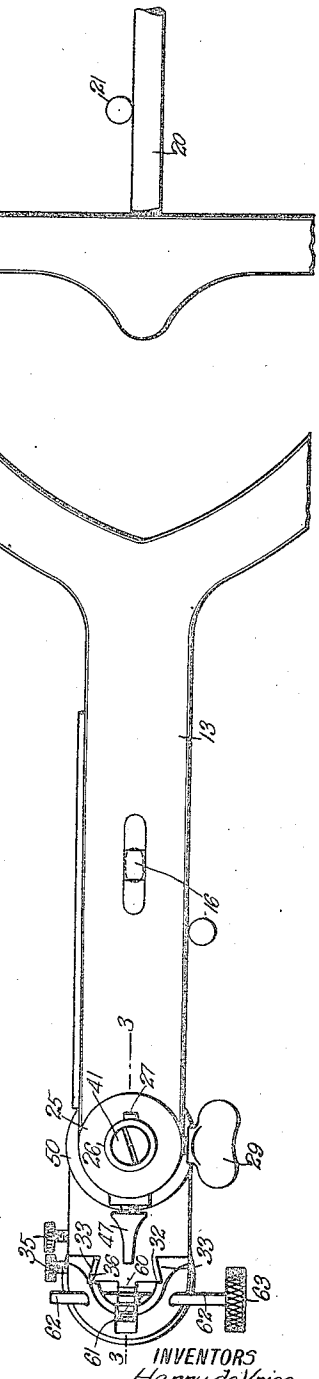


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

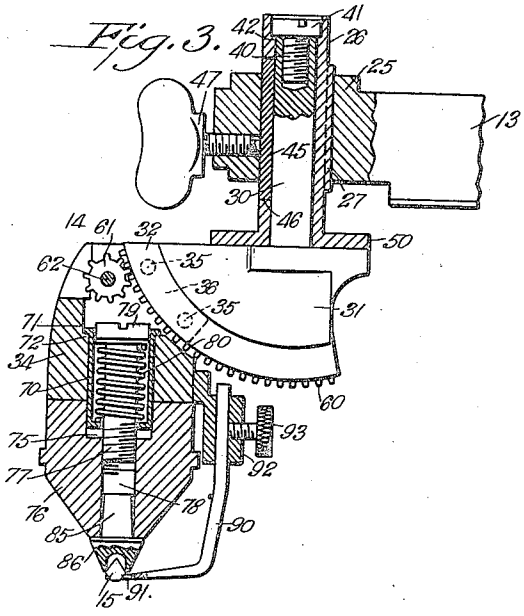


Fig. 4.

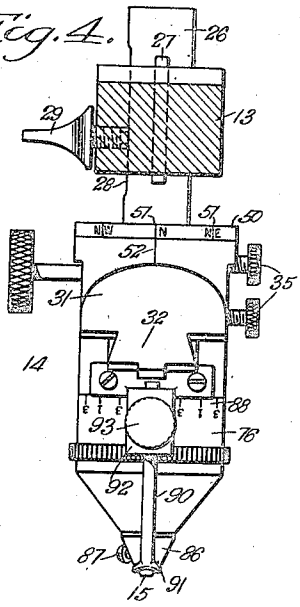


Fig. 5.

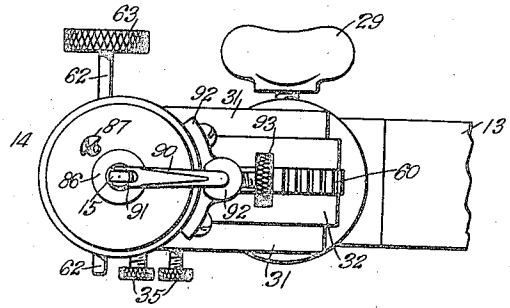
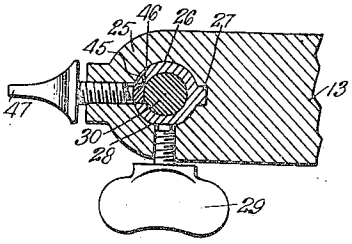


Fig. 6.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR GRINDING OR POLISHING PRECIOUS STONES.

1,305,038. Specification of Letters Patent. Patented May 27, 1919.

Application filed June 13, 1918. Serial No. 239,770.

To all whom it may concern:

Be it known that we, HARRY DE VRIES and WILLIAM ARTHUR DONALDSON, both citizens of the United States, and residents, respectively, of Newark, in the county of Essex and State of New Jersey, and of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Apparatus for Grinding or Polishing Precious Stones, of which the following is a full, clear, and exact description.

The invention relates to apparatus for grinding or polishing precious stones, such, for instance, as shown and described in the Letters Patent of the United States, No. 1,243,491, granted to us on October 16, 1917.

The object of the present invention is to provide a new and improved apparatus for grinding or polishing diamonds and other precious stones, and arranged to enable the operator to quickly and accurately adjust the dop-holding device in an up and down direction to correctly locate the precious stone relative to the lap. Another object is to permit the workman to readily detach the dop-holding device from the frame and store it with the precious stone attached thereto during the non-working hours in a safe, vault, or similar place, and to re-attach the dop-holding device at the beginning of the next work day to the frame and in exactly the same position as it was in on removing it therefrom. Another object is to simplify the construction of the mounting of the dop holder in the carrier.

With these and other objects in view, the invention consists of certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the apparatus for grinding and polishing precious stones;

Fig. 2 is a plan view of the same;

Fig. 3 is an enlarged sectional side elevation of the same on the line 3—3 of Fig. 2;

Fig. 4 is a cross section of the same on the line 4—4 of Fig. 1;

Fig. 5 is an inverted plan view of the same; and

Fig. 6 is a sectional plan view of part of the same on the line 6—6 of Fig. 1.

The lap 10 is arranged a short distance above a table 11 on which rest the legs 12 of the frame 13 supporting at its free end a dop-holding device 14 carrying the precious stone 15 to be ground or polished on the upper surface of the lap 10. The frame 13 is provided near its forward end with a spirit level 16 of usual construction to enable the operator to readily maintain the frame 13 in a horizontal position. The frame 13 is provided at its rear end with the usual horizontally disposed rod 20 held against lateral displacement by abutting against a vertical post 21 rising from the table 11.

The frame 13 is provided at its forward end with a bearing 25 in which is mounted to slide up and down a hollow stem 26 provided with a key 27 engaging a keyway arranged in the bearing 25 to hold the stem 26 against turning but to allow up and down movement of the said stem. The front face of the stem 26 is provided with a flattened portion 28 (see Figs. 1, 4 and 6) engaged by a set screw 29 screwing in the bearing 25 and adapted to securely fasten the stem 26 in the adjusted position.

In the hollow stem 26 is mounted to turn a spindle 30 provided at its lower end with the web 31 of a sector 32, preferably in the form of a dovetailed tongue engaged by a dovetailed groove 33 (see Fig. 2) formed in a carrier 34 forming part of the dop-holding device 14. One or two set screws 35 secure a collar 34 against a liner 36 abutting against one side of the sector 32 (see Fig. 2) to securely hold the carrier 34 in the desired adjusted position on the sector 32. The spindle 30 of the sector 32 is provided at its upper end with a screw 40 having a head 41 seated on a shoulder 42 formed in the upper end of the stem 26 to support the spindle 30 in the stem 26, as will be readily

understood by reference to Fig. 3. The spindle 30 is adapted to be clamped in the desired adjusted position by a clamping bar 45 held in a slot 46 formed in the wall of the stem 26, and the said clamping bar 45 is engaged by a set screw 47 screwing in the bearing 25 and abutting against the said clamping bar 45 to force the latter into firm engagement with the spindle 30. It will be noticed that when the set screw 47 is loosened the spindle 30 can be readily turned in the stem 26 to move the dop-holding device 14 into a desired position, and when this position has been reached the set screw 47 is screwed up to clamp the spindle 30 in position in the stem 26 by the action of the clamping bar 45. The lower end of the stem 26 is provided with a collar 50 provided on its peripheral edge with a graduation 51 corresponding to the points of a compass, and a pointing mark 52 is arranged on the back of the sector web 31 to register with any one of the marks of the compass graduation 51 (see Fig. 4). The sector 32 is provided on its peripheral face with a segmental gear wheel 60 in mesh with a pinion 61 secured on a shaft 62 extending transversely and journaled in the carrier 34. The front end of the shaft 62 is provided with a head 63 adapted to be taken hold of by the operator for turning the pinion 61 to slide the carrier 34 around on the sector 60 according to the direction in which the shaft 62 is turned at the time, it being, however, understood that during this adjusting movement of the carrier 34 on the sector 32 the set screws 35 are loosened and after the desired adjustment is made the set screws 35 are screwed up to lock the carrier 34 in position on the sector 32.

The carrier 34 is provided with a pivot 70 preferably in the form of a cup having a flange 71 at its upper end seated on a shoulder 72 formed on the carrier 34 (see Fig. 3). The lower end of the pivot 70 projects into a central recess 75 formed in a dop holder 76 mounted to turn on the said pivot 70. The top of the dop holder 76 abuts against the under side of the carrier 34 and a screw 77 screws centrally into a central bore 78 in the dop holder 76. The said screw 77 extends through the bottom of the pivot 70 and is provided with a head 79 against which abuts the upper end of a spring 80 seated at its lower end in the bottom of the cup-shaped pivot 70. By the arrangement described the dop holder 76 is mounted to turn on the pivot 70 and is held against accidental turning by frictional contact of its top with the under side of the carrier 34 owing to the pressure of the spring 80. The face of the dop holder 76 is provided with a raised knurled band 81 adapted to be taken hold of by the operator to permit of conveniently turning the dop holder 76 when changing the position of the stone 15 relative to the lap 10. Into the lower end of the bore 78 of the dop holder 76 fits the stem 85 of the dop 86 carrying the precious stone 15 in the usual manner, the said dop 86 being securely held in position on the dop holder 76 by a set screw 87 screwing in the lower end of the dop holder 76. The peripheral face of the dop holder 76 is provided with an annular graduation 88, preferably in the form of thirty-two marks spaced equal distances apart. A pointing mark 89 is arranged on the face of the carrier 34 (see Fig. 1) adapted to register with any one of the marks of the graduation 88 on turning the dop holder 76 on the pivot 70, as above explained. It is understood that this graduation 88 serves to aid the operator to adjust the dop holder 76 and consequently the dop 86 and the precious stone 15 carried thereby, to set the stone 15 in proper relation to the lap 10 and to the number of facets. It is further understood that the dop holder 76 can be readily turned on the carrier 34 owing to the yielding connection by the use of the spring 80 and the pivot 70 and at the same time the dop holder 76 is securely held in the adjusted position by frictional contact of its dop with the under side of the carrier 34.

In order to properly support the stone 15 in the dop holder 76 use is made of the usual rod 90 provided with a claw 91 engaging the projecting end of the precious stone 15 held in the dop 86, as plainly indicated in Figs. 1, 3, 4 and 5. The rod 90 is held adjustably in an up and down direction in a bracket 92 attached to the carrier 34, and the rod 90 is fastened in the adjusted position by a set screw 93 screwing in the bracket 92 and against the rod 90, as plainly shown in Fig. 3.

In order to indicate the exact angular position of the facets of the stone 15 relative to the face of the lap 10 use is made of a degree scale 100 (see Fig. 1) marked on the web 31 of the sector 32 and a pointing mark 101 is marked on the face of the carrier 34 to register with any one of the degree marks on imparting a sliding motion to the carrier 34 on the sector 32, as previously explained. When the several parts are in the position shown in the drawings then the mark 101 is opposite zero of the graduation 100 and the axis of the dop 86 is vertical and parallel to the axis of the spindle 30, and in which spindle axis the center of the sector 32 is located. On sliding the carrier 34 downward on the sector 32 the position of the stone 15 relative to the lap 10 is correspondingly changed, the corresponding degree of the scale 100 indicating the angle of a facet relative to the face of the lap 10.

Thus by the arrangement described, the operator can accurately and quickly set a dop with a view to correctly hold the stone 15 in position relative to the lap 10.

It will be noticed that by making the spindle 30 carrying the sector 32 and the dop-holding device 14 turnable in the stem 26, it is evident that the stone 15 can be moved in contact with different portions of the face of the lap 10 to allow of utilizing the entire face of the lap for grinding purposes. It will further be noticed that by the arrangement described the dop-holding device can be readily detached from the frame 13 on loosening the set screws 29 and 47 and sliding the stem 26 out of the bearing 25. The dop-holding device can now be readily stored in a safe, vault or other place, with the precious stone attached to the dop 86, and when it is desired to again proceed with the grinding or polishing operation of the precious stone 15 it is only necessary for the operator to remove the dop-holding device from the storage place and reëngage the stem 26 with the bearing 25 and screw up the set screws 29 and 47 to again fasten the dop-holding device in exactly the same position in the frame 13 that it had when it was removed therefrom for storing purposes.

It is understood that the distance the stem 26 is moved up or down in the bearing 25 is readily determined by the position of the spirit level 16 which when in central position indicates that the frame 13 is in a horizontal position with the stone in contact with the lap 10 and irrespective of the position of the carrier 34 on the sector 32 or the position of the dop holder 76 on the carrier 34.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:—

1. In an apparatus for grinding or polishing precious stones, a frame adapted to rest at one end on a support and provided at its free end with a bearing, a hollow stem adjustably secured in the said bearing, a sector having a spindle mounted to turn in the said hollow stem, a clamping member held in the said stem and engaging the said spindle, a set screw screwing in the said bearing against the said clamping member to force the latter in clamping contact with the said spindle to hold the latter against turning in the stem, and a dop-holding means adjustably secured to the said sector.

2. In an apparatus for grinding or polishing precious stones, a frame adapted to rest at one end on a horizontal support and provided at its other end with a bearing having a keyway, a hollow stem slidable up or down in the said bearing and having a key engaging the said keyway, means for adjustably securing the stem in the bearing, a sector provided with a spindle mounted to turn in the said hollow stem, means for securing the spindle in and to the sleeve, means fastening the said spindle in position against turning in the said stem, a carrier mounted to slide on the said sector, a dop holder mounted to turn on the said carrier, and a dop removably held on the said dop holder.

3. In an apparatus for grinding or polishing precious stones, a frame adapted to rest at one end on a horizontal support and provided at its other end with a bearing having a keyway, a hollow stem slidable up or down in the said bearing and having a key engaging the said keyway, the said stem having a collar provided with a compass graduation, a sector having a pointing mark and provided with a spindle mounted to turn in the said hollow stem, means fastening the said spindle in position against turning in the said stem, a carrier mounted to slide on the said sector, a dop holder mounted to turn on the said carrier, and a dop removably held on the said dop holder.

4. In an apparatus for grinding and polishing precious stones, a support, a carrier adjustably mounted in the support, a cup-shaped pivot carried by the carrier, a dop holder engaging the carrier and having its upper end recessed to receive the pivot, a screw passing through the pivot and screwing into the dop holder, a spring surrounding the screw between its head and the bottom of the cup, and a dop carried by the said holder.

5. In an apparatus for grinding and polishing precious stones, a support, a carrier adjustably mounted on the support, a cup-shaped pivot carried by the carrier, a dop holder abutting against the carrier and provided with a bore having its upper end recessed to receive the cup-shaped pivot, a screw passing through the cup-shaped pivot and screwing into the bore of the dop holder, a spring surrounding the screw in the pivot between the bottom thereof and the head of screw, and a dop having a stem secured in the bore of the dop holder.

6. In an apparatus for grinding and polishing precious stones, a frame provided with a bearing, a hollow stem mounted to slide but not to turn in the bearing, said stem being provided with a slot, means for adjustably securing the stem in the bearing, a sector having a spindle mounted to turn in the stem, means for securing the spindle in the stem, a clamp bar in the slot of the stem and engaging the spindle, a set screw mounted in the bearing and engaging the clamping bar and dop holding means adjustably mounted on the sector.

7. In an apparatus for grinding and polishing precious stones, a frame provided with a bearing, a hollow stem mounted to

slide but not to turn in the bearing and provided with an opening and internal shoulder at its upper end, a set screw for adjustably securing the stem in the bearing, a dop holding device having a member provided with a spindle extending into the stem, a screw screwing into the upper end of the spindle and having its head engaging the shoulder of the stem, a clamping bar in the opening of the stem and engaging the spindle, and a set screw engaging the clamping bar.

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