

(No Model.)

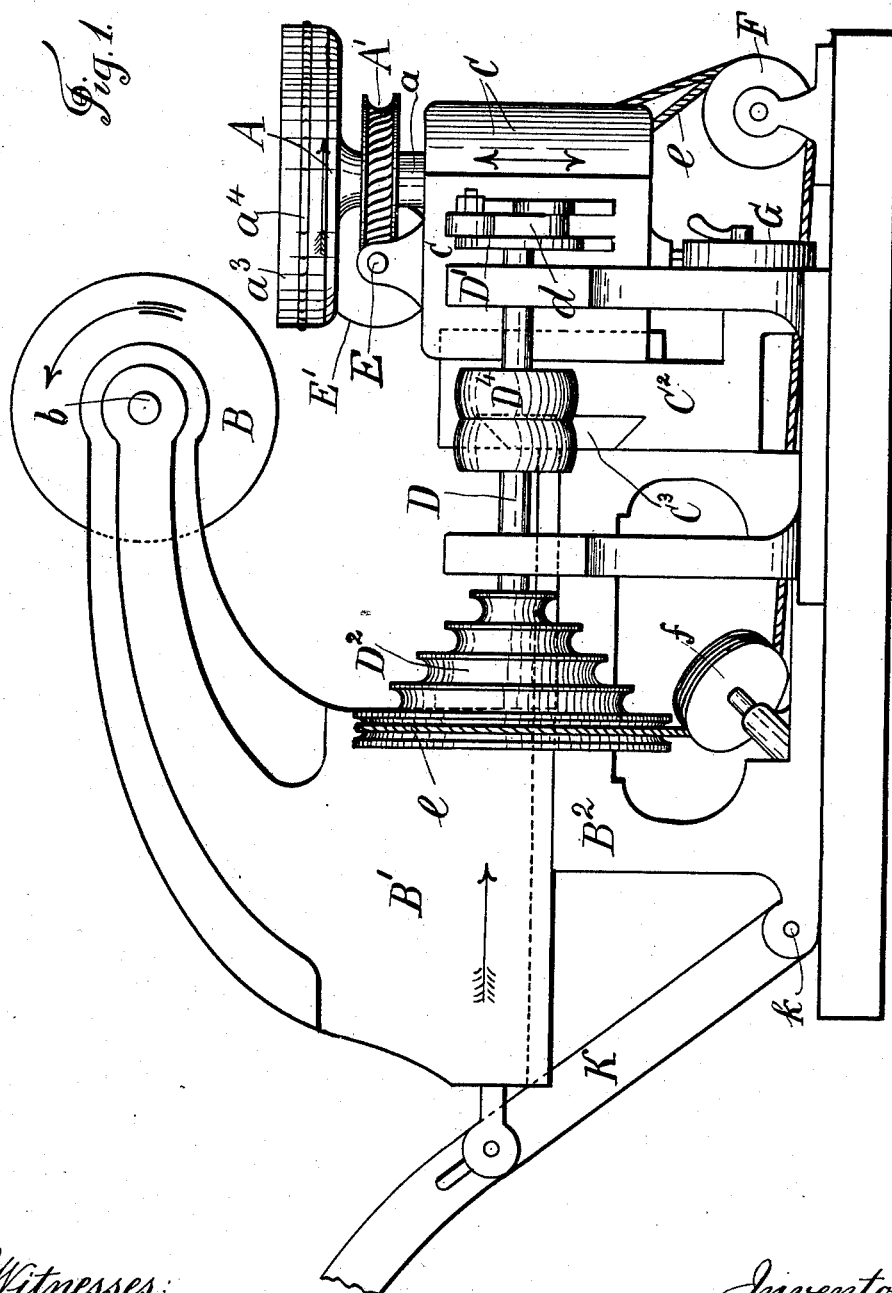
4 Sheets—Sheet 1.

A. NEYDECK.

TOOL FOR GRINDING OR POLISHING PRECIOUS STONES.

No. 523,002.

Patented July 17, 1894.



Witnesses:
J. Staib
Chas. N. Smith

Inventor:
Alfred Neydeck
per Lemuel W. Merrill

(No Model.)

4 Sheets—Sheet 2.

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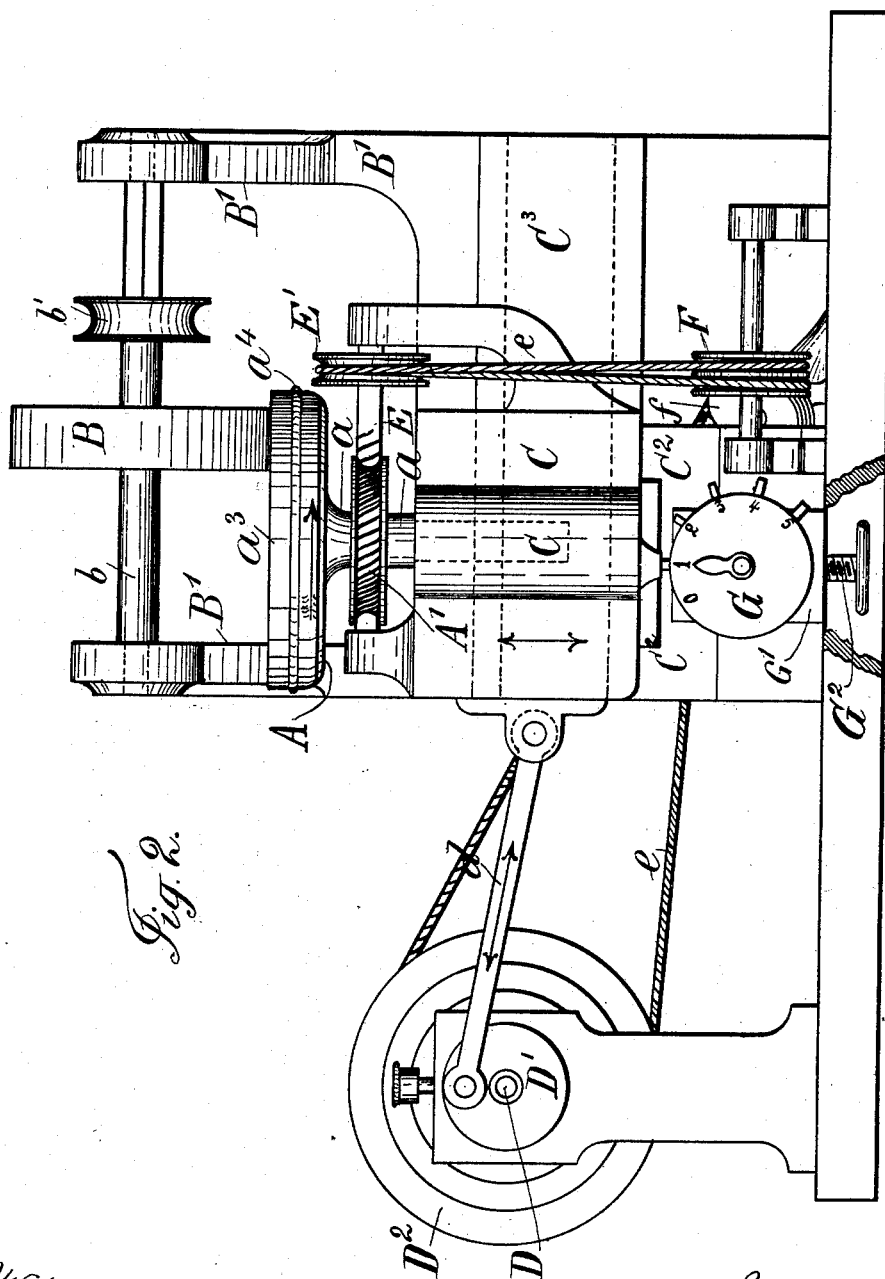


Fig. 2.

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Inventor:
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per Lemuel W. Terrell
Atty

(No Model.)

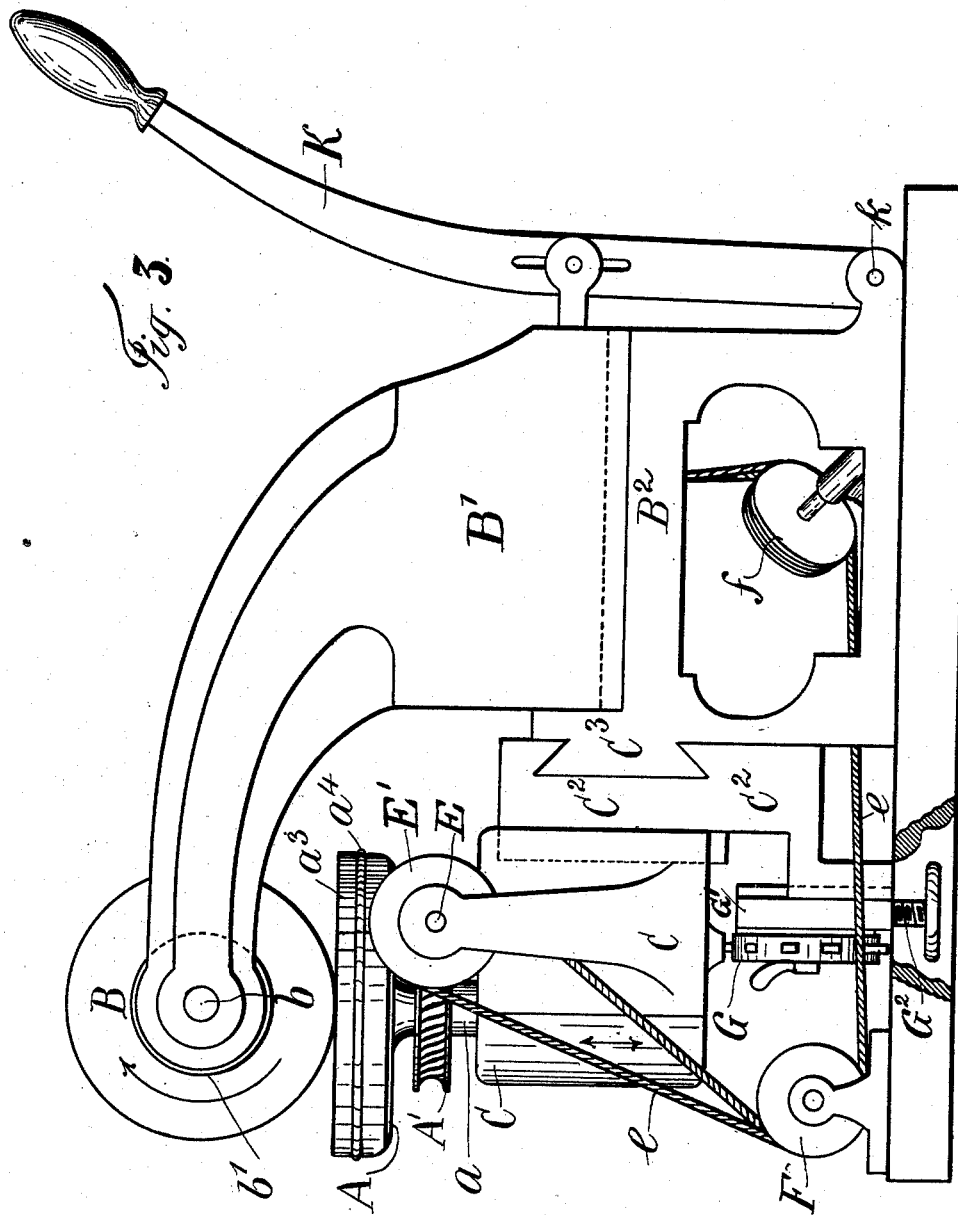
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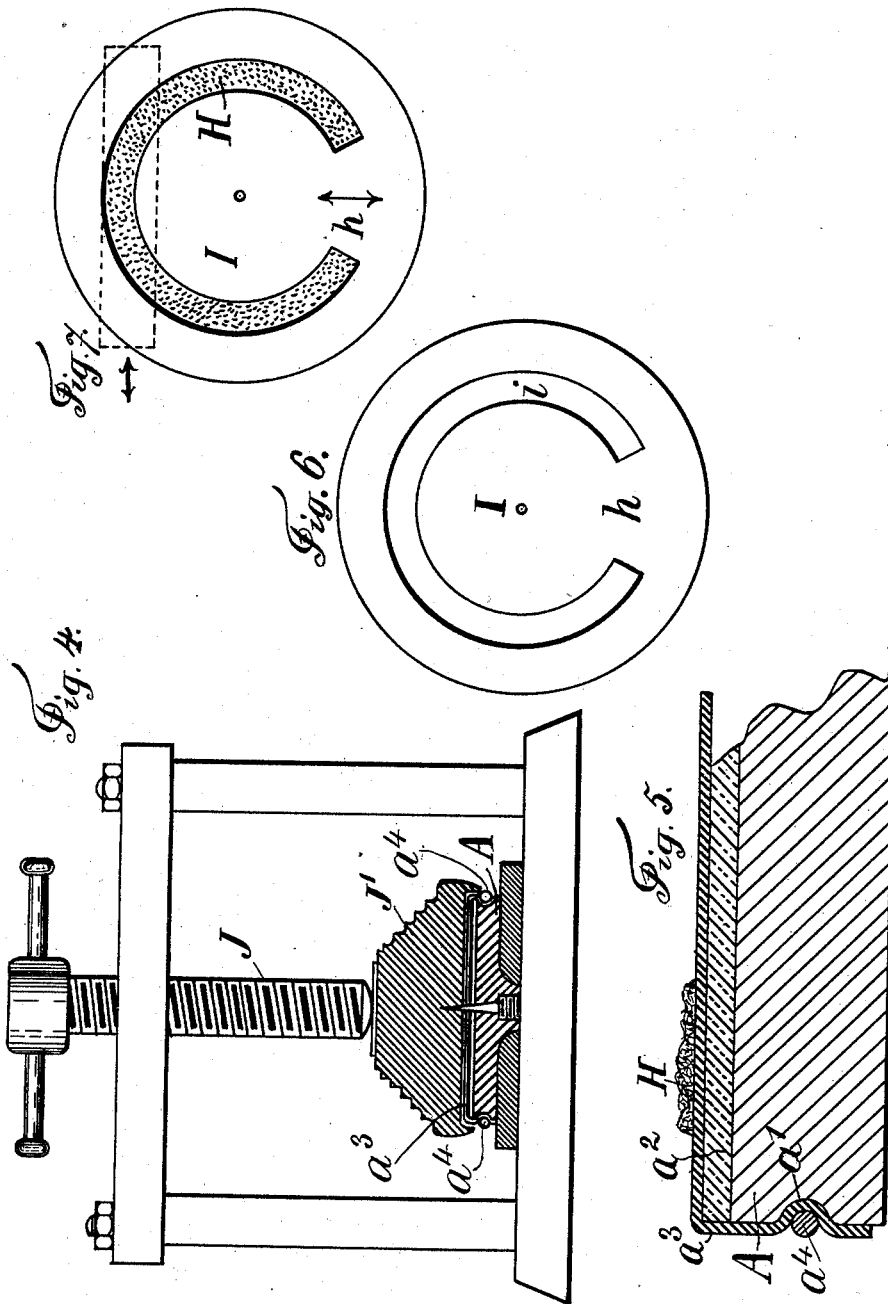
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Att'y.

UNITED STATES PATENT OFFICE.

ALFRED NEYDECK, OF GENEVA, SWITZERLAND.

TOOL FOR GRINDING OR POLISHING PRECIOUS STONES.

SPECIFICATION forming part of Letters Patent No. 523,002, dated July 17, 1894.

Application filed November 13, 1893. Serial No. 490,734. (No model.)

To all whom it may concern:

Be it known that I, ALFRED NEYDECK, manufacturer, of Geneva, Switzerland, have invented Improved Tools for Grinding and Polishing Precious Stones, of which the following is a specification.

Precious stones are used extensively in the works of watches as bearings for the arbors and in the escapements, and in their preparation for this use the precious stones are divided into slabs having approximately parallel planes or faces.

This invention relates particularly to mechanism employed for grinding truing and polishing the slabs of precious stones, or in other words, the parallel faced jewels, in the most perfect manner and with great rapidity and regularity.

The gems or stones to be ground, trued and polished are fixed to a plate that is rotated gradually, and a rapidly revolving wheel the periphery of which is provided with black diamonds or comminuted particles of white diamonds embedded in its periphery or with diamond dust and oil, is employed for grinding, truing and polishing the stones upon the revolving disk.

In the drawings, Figure 1 is a side elevation of the apparatus. Fig. 2 is a front elevation. Fig. 3 shows the opposite side to Fig. 1. Fig. 4 represents the mechanism employed for connecting the paper that carries the stones to be ground to the disk, a portion of the devices of this figure being in section. Fig. 5 is a section in larger size of the disk that supports the precious stones, near one edge thereof. Fig. 6 is a plan of the disk employed in placing the precious stones in position, and Fig. 7 represents the paper and indicates the position occupied by the precious stones and the adhesive material supporting the same.

The grinding wheel B is upon an axis or shaft *b* that is rotated at the proper speed by a belt to a pulley *b'*, and this shaft or axis *b* is in a frame *B'* that rests upon the bed piece *B²*, there being suitable slide-ways upon the bed piece supporting the frame *B'*, so that such frame *B'* can be slid back and forth upon the bed piece *B²* by the lever *K* pivoted at *k* and connected to the frame *B'*. This movement is given by hand in bringing the

grinding wheel B into action as hereinafter described.

Upon the front of the bed piece *B²* is a slide-way *C³* supporting a carriage *C²*, and this carriage *C²* receives a movement back and forth by the connecting rod *d* extending to a crank pin on a disk *D'* at the end of the shaft *D*, which shaft is rotated preferably by a belt to the pulley *D²*.

Upon the face of the carriage *C²* is a vertical dovetailed slide-way receiving the bearing *C* for the shaft *a* of the disk *A* to which the stones to be ground or polished are affixed, as hereinafter described, and upon the shaft *a* is a worm wheel *A'* with which the screw pinion *E* engages, and such screw pinion *E* is driven by a pulley *E'* and a belt *e* that passes over the guide pulleys *F* and *f* to one of the pulleys in the cone of pulleys *D²*, so that the disk *A* is rotated gradually by a movement derived from the rotation of the shaft *D* and simultaneously the bearing *C* and the carriage *C²* are reciprocated bodily, moving the disk *A* horizontally and in a direction parallel to the axis *b* of the grinding wheel *B*.

It is necessary to adjust the bearing *C* and the disk *A* bodily and vertically, and with this object in view there is on the lower side of the bearing *C* a projection coming above the disk *G* which is supported by a pivot upon a carriage *G'* which is movable vertically in slide-ways in the foot piece of the carriage, there being an adjusting screw *G²* to act upon the said carriage *G'* to move the same bodily, and in the periphery of the disk *G* there are studs that project more or less from the periphery of the disk *G*, as indicated in Fig. 2, where such studs are numbered 1, 2, 3, 4, 5, and it will now be understood that when the projection at the lower end of the bearing *C* rests upon the periphery of the disk *G*, the disk *A* will be in its lowest position and farthest from the grinding wheel *B*, and the bearing *C* and disk *A* can be raised the desired amount according to the thickness that may be required in the stones that are ground, trued and polished by the action of the wheel *B* by turning the disk *G* so as to bring one or the other of the studs in contact with the projection at the lower end of the bearing *C*, and this adjustment is not changed during one grinding operation because the bearing *C*, the disk *G* and the car-

riage C² move together as they are reciprocated by the action of the connecting rod *d* and crank pin.

The grinding wheel B is to be of any well known character, preferably carrying cutting diamonds or diamond particles or coated with diamond dust and oil.

In preparing the disk A for supporting the slabs of precious stones or parallel faced jewels to be ground and polished, I take a disk of suitable paper *a*³ that is of larger diameter than the disk A, and upon the surface thereof I lay a pattern of paper or similar material represented in Fig. 6, such pattern I having a segmental slot *i* cut in the same, there being a blank space between the ends of the slot, as shown at *h*, and this disk of paper is concentric to the disk *a*³, and I lay in the segmental slot in the pattern I the slabs of precious stones that are to be ground and polished and apply shellac or similar adhesive material in a powdered condition so as to fill in the slot *i* and surround the slabs of stones that are to be treated, and this paper *a*³ is then laid upon a plate which is sufficiently warm to cause the shellac to melt and to hold the slabs of precious stones firmly in position on the disk of paper *a*³, and it is preferable to remove the pattern I previous to heating the shellac to melt the same. It will now be observed that the slabs of stones that are to be ground, trued and polished are held firmly in the segment of a circle upon the paper *a*³ and they are represented sectionally in Fig. 5 at H and in the plan view Fig. 7. This disk of paper *a*³ with the slabs of stones adhering thereto is laid upon a disk *a*² of india rubber or similar material which intervenes between the metal disk A, and such disk of paper *a*³, and the parts are rendered concentric preferably by a point in the center of the disk A, represented sectionally in Fig. 4, and a hollow or bell-shaped die J' is brought down so as to press the edges of the disk of paper *a*³ downwardly around the disk A, and to effect this a screw J is advantageously employed, and a suitable rubber band or clamp *a*⁴ is made use of to hold the paper of the disk *a*³ firmly into the peripheral groove *a*¹ around the disk A; and it is advantageous to make the exterior of the die J' with peripheral ribs of progressively larger diameter, as shown in Fig. 4, so that the rubber band *a*⁴ can be stretched progressively from one ledge to the other and finally passed over the edge of the die J' so that it contracts around the paper of the disk *a*³ to hold the same and the stones to be ground firmly in position.

In applying this improvement it is preferable to affix the disk A upon the end of the shaft *a* usually by screwing it on and to adjust the height of the disk to the proper position in relation to the wheel B, and the wheel B comes over the segmental line of stones H as fastened upon the paper *a*³, and the parts should be placed in such a manner

that the blank space *h* is beneath the wheel B at the time the grinding, truing and polishing operation is commenced, and the disk A is turned continuously but not rapidly as the grinding, truing and polishing is performed, and the general position which the wheel B occupies to the stones that are being treated is indicated by the dotted lines in Fig. 7, and such wheel B can be moved back and forth during the operation by the hand lever K, so that the slabs of stones secured upon the paper disk *a*³ are reduced to a uniform level.

It is to be understood that the paper *a*³ is preferably impermeable, so that the gum-lac is not perceptibly absorbed and also so that the paper does not become soft by water or other material that may be supplied upon the wheel B at its junction with the stones to be ground or polished.

After the slabs of stones have been ground, trued and polished as aforesaid on one surface, the paper *a*³ is cut out to separate the segmental band H, containing the stones, and this is turned over with their trued faces upon a new disk of paper and the slabs of stones are caused to adhere firmly thereto in any suitable manner, such as sufficient heat and pressure, to cause the gum-lac in which the stones are embedded to adhere to the new disk of paper and then the segment of old paper is removed in any suitable manner and the stones subjected to a second grinding operation whereby they will be ground, trued and polished with two parallel faces as usually required in the making of watch jewels; and the projecting screws or pegs around the disk G are conveniently used as gages for the thicknesses of the slabs of stones that are ground, trued and polished.

It will be understood that by communicating to the frame B' and grinding wheel B a reciprocating movement across the surface of the disk A during the grinding and polishing operation and in the two directions indicated by the double arrow Fig. 7, the grinding and polishing operation is rendered uniform, and should one of the stones become loose accidentally, it will be thrown out of the machine and not carried away under the grinding wheel.

According to the character of the surface of the wheel B, so this device may be made use of for polishing precious stones as well as for grinding and truing them.

This machine is described with the axis of the disk A, vertical and the axis of the grinding wheel B horizontal, but the machine can be turned over to bring the axis of the disk A horizontal and of the wheel B vertical if desired.

I claim as my invention—

1. The combination with a rapidly rotating grinding wheel, of the disk A and mechanism for rotating the same, the sheet *a*³ to which the stones to be ground and polished are affixed, and means for securing the same to the disk A, substantially as set forth.

2. The combination with a rapidly rotating grinding wheel, of the disk A having a grooved periphery, the elastic disk a^2 and the disk or sheet a^3 to the surface of which the stones to be ground and polished are fastened, and the elastic band a^4 for holding the disk of paper to the disk A, and mechanism for rotating the disk A, substantially as set forth.

10 3. The grinding wheel B means for rotating and a frame for supporting the said grinding wheel, means for reciprocating the said frame bodily, a disk having a surface that is parallel to the plane to which the grinding and
15 polishing wheel is reciprocated, means for securing to the disk the stones to be ground and polished, and mechanism substantially as specified for rotating the disk, substantially as set forth.

20 4. The combination in a machine for grinding, truing and polishing slabs of precious stones, of a grinding wheel and its supporting frame, mechanism for reciprocating the frame in a plane parallel to the surfaces to
25 be ground, a disk upon the surface of which the stones to be ground, trued and polished are secured, a shaft and bearing for the disk, a screw pinion and wheel for slowly rotating

the disk, a carriage for supporting the bearing and means for reciprocating the carriage, bearing and disk bodily, substantially as set forth.

5. The combination in a machine for grinding, truing and polishing slabs of precious stones, of a grinding wheel and its supporting frame, mechanism for reciprocating the frame in a plane parallel to the surfaces to be ground, a disk upon the surface of which the stones to be ground, trued and polished are secured, a shaft and bearing for the disk, a screw pinion and wheel for slowly rotating the disk, a carriage for supporting the bearing, means for reciprocating the carriage, bearing, and disk bodily, and mechanism for adjusting the bearing and regulating the distance between the grinding wheel and the disk to which the stones are connected, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED NEYDECK.

Witnesses:

E. IMER SCHNEIDER,
TH. IMER.