

(No Model.)

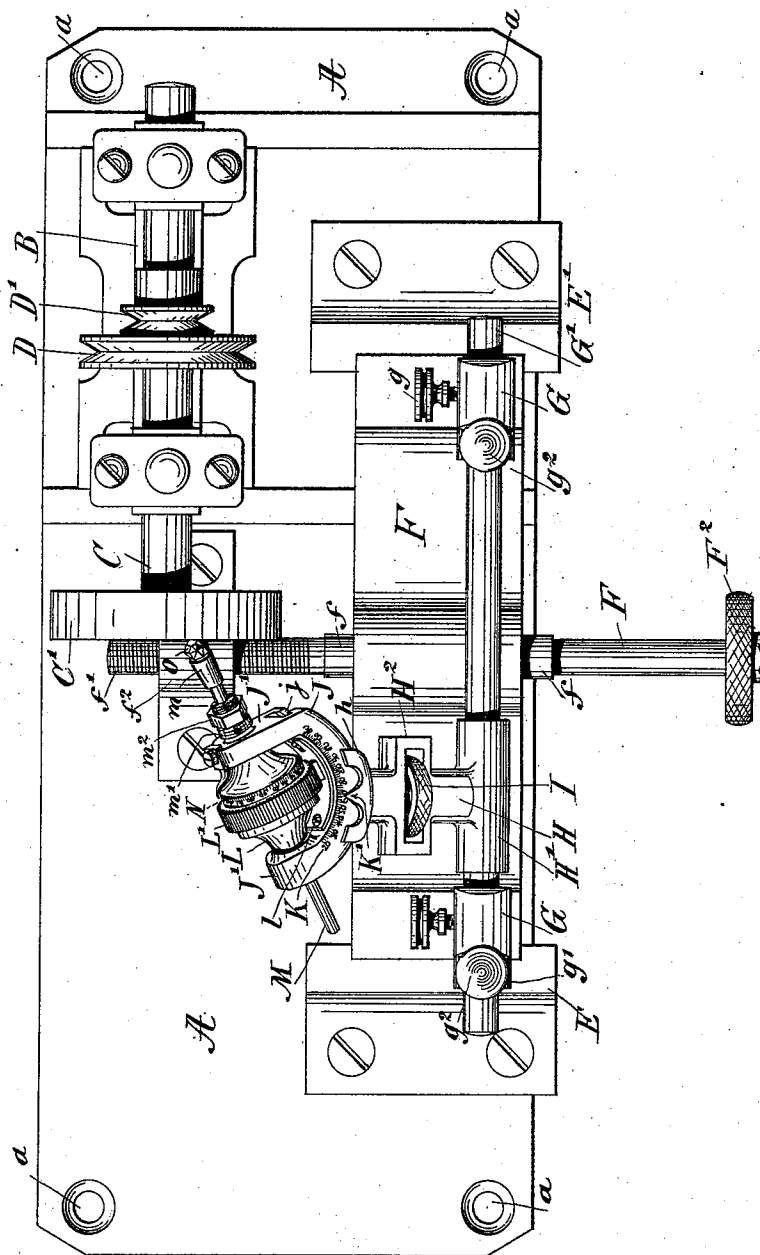
3 Sheets—Sheet 1.

G. ARMENY.
MACHINE FOR CUTTING PRECIOUS STONES.

No. 523,504.

Patented July 24, 1894.

Fig. 1.



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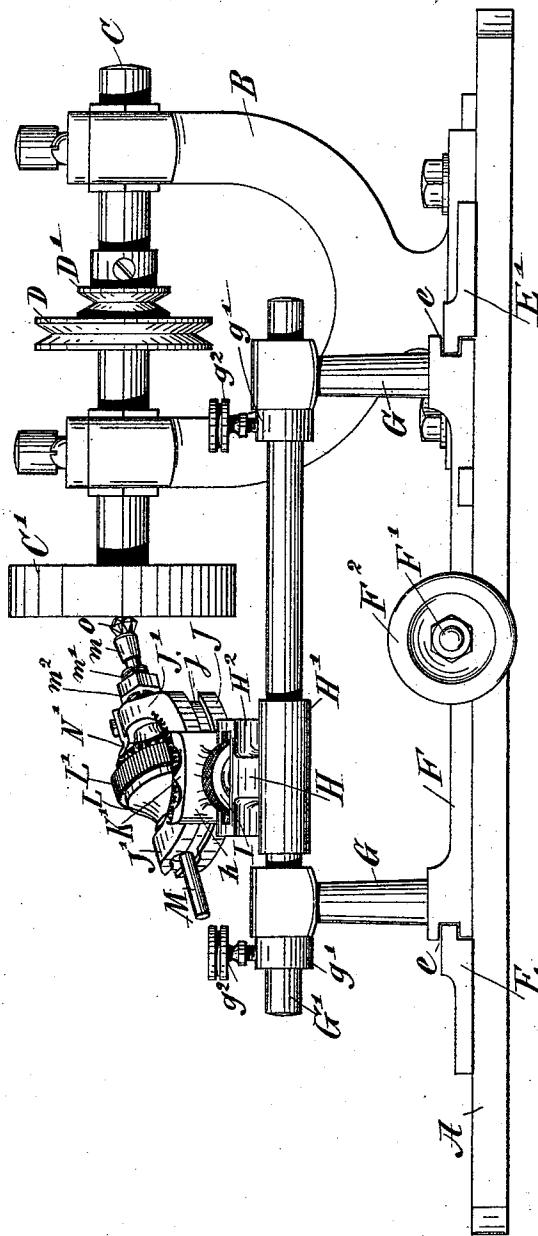
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Fig. 2.



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Fig. 5.

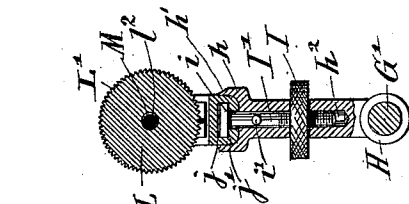


Fig. 4.

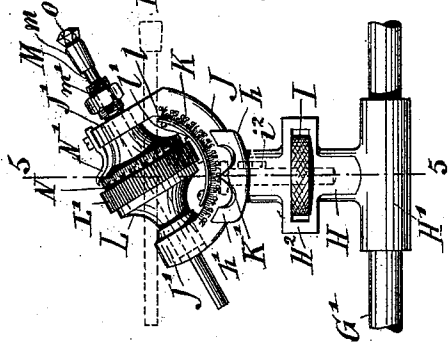
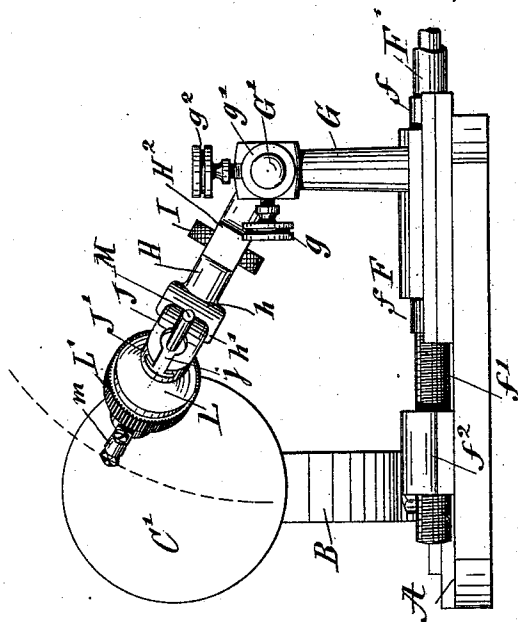


Fig. 3.



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UNITED STATES PATENT OFFICE.

GYULO ARMENY, OF NEW YORK, N. Y.

MACHINE FOR CUTTING PRECIOUS STONES.

SPECIFICATION forming part of Letters Patent No. 523,504, dated July 24, 1894.

Application filed December 9, 1893. Serial No. 493,231. (No model.)

To all whom it may concern:

Be it known that I, GYULO ARMENY, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Machines for Cutting Precious Stones, of which the following is a specification.

My invention relates to improvements in machines for cutting precious stones and is adapted for the use of lapidaries; and the object of my invention is to provide a machine, whereby the cutting of the facets of diamonds and other precious stones is enabled to be performed in an absolutely perfect and accurate manner, so that the cutting of the facets will be accomplished uniformly and at regular angles of inclination.

To these ends, my invention consists of a new and improved machine for presenting gems or precious stones to the grinding-disk, such machine comprising a supporting-bed or plate, whereon is mounted a grinding-disk, a carriage adapted to slide parallel with the face of the grinding-disk, said carriage being received by suitable guide-ways on the bed-plate, a swinging-arm pivoted upon a suitable support on the carriage, so as to swing in a plane parallel with that of the face of the grinding-disk, and also downwardly and upwardly with respect to the base or bed-plate, a clamp on said arm, a curved segment adapted to be held in different positions by means of said clamp, a rotary head mounted to turn in suitable bearings on said segment, and a dop, the shank of which is held within said rotary head, so that the dop may be turned thereby. And my invention consists of certain other features of construction and combination of parts to be hereinafter described and then particularized in the claims.

In order that my invention may be more fully understood, I will now proceed to describe the same with reference to the accompanying drawings, in which—

Figure 1 is a plan view of my improved machine for cutting precious stones, parts being shown in perspective. Fig. 2 is a front elevation thereof. Fig. 3 is an end elevation thereof, looking toward the face of the grinding-disk. Fig. 4 is a plan view of the swinging-arm, the segment, the rotary head, and the dop adapted to be turned by said head.

Fig. 5 is a section on line 5—5, Fig. 4, the dop being shown in the position when in horizontal alignment with the horizontal axis of the grinding-disk.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the supporting-bed or plate of my improved machine for cutting precious stones, the said plate being provided with a number of screw-holes *a*, whereby it is adapted to be secured to a work-table or bench by means of suitable screws or other fastenings. On the top of the bed-plate is mounted a bifurcated bracket B, the bifurcations of which afford bearings for the ends of the shaft C of the grinding-disk C', made of suitable abrading material. Grooved pulleys D, D', located on the shaft C, between the bifurcations of the bracket B, are adapted to receive a driving-belt (not shown) so that the grinding-disk may be turned at different rates of revolution, when desired, said pulleys being of different dimensions for that purpose. Parallel guide-ways E, E', extending parallel with the face of the grinding-disk, fit into parallel grooves *e*, *e'*, at opposite sides of a traveling carriage F, which consists of a plate extending longitudinally of the bed-plate A and provided with a transverse bore or opening through which passes an operating rod F', provided at its outer end with a milled head F², whereby said rod may be rotated. The movement of the carriage is effectuated by means of this rod F', and, to this end, said rod is provided at each side of the carriage with stops or collars *f*, *f*, which prevent the movement of the carriage lengthwise of the rod, but permit the rod to turn, while the inner end of the rod is provided with a screw-thread *f'*, which is received by an interior screw-thread of a lug *f*² fixed to the top of the bed-plate, so that when the rod is turned, it will be caused to advance the carriage either to or from the side of the grinding-disk C', according to the direction of its rotation.

Rising from the top of the plate F of the carriage, at each end, are posts or pillars G, which at their upper ends are provided with proper openings to receive a cylindrical rod G', which is secured to said posts or pillars

by means of thumb-screws g . Collars g' are secured on the rod by screws g^2 , so that before the screws g are turned in, the position of the rod may be determined. Pivoted on this bearing-rod G' , so as to swing in a plane parallel with that of the face of the grinding-disk, is a swinging-arm H , provided with a sleeve H' at its inner end, through which said rod is passed. At the outer end of the swinging-arm H is a shoe h , having side flanges h' , and between said shoe h and the sleeve H' is formed an open guard-frame H^2 , the opening of which receives a milled nut I and permits the rotation of the latter, while preventing its lateral movement. Said nut I is provided with a suitable screw-threaded perforation, through which passes an externally screw-threaded stem I' which is received by a smooth longitudinal bore or socket h^2 in the arm H . By turning the nut I , the clamping head i at the outer end of the stem is caused to advance toward, or recede from the shoe h , so as to form conjointly a clamp.

To allow of the longitudinal movement of the stem I' within the socket of the arm H , the same is provided at one side with a pin i' which is guided in a longitudinal groove or recess i^2 in the wall of the socket h^2 , thereby preventing at the same time the rotation of the stem within its socket. The clamp described is for the purpose of holding, in its different positions the arcuate segment J , said segment being provided with a longitudinal undercut groove j , T-shaped in cross-section, and located at its convex outer side, the enlarged inner portion of which groove receives the head i of the clamp, the shoe h of the arm being curved longitudinally so as to conform to the convexity of said segment. When the segment J is in position in the holding clamp, it is adapted to be clamped in position by means of the head i of the stem I' , which engages the intumed flanges j' of the segment, (said flanges being produced by means of said T-shaped groove) whereby said flanges are held between the head and the shoe h . By loosening the clamp-hold on the segment J , it may be shifted into different positions, said segment moving in the arc of a circle. At the concave inner side of the segment J is a semi-circular series of graduations forming a scale K , in conjunction with which co-operates an indicator K' , projecting from about midway of one side of the shoe h . The ends J' of the segment are arranged in parallel position and are perforated so as to constitute bearings for the ends of a substantially double-shaped cone which forms a rotary head L , the central portion of which is provided with a transversely notched or toothed ring or bead L' , whereby said rotary head may be turned. A curved, freely-acting, spring l is secured to the concave inner side of the segment J and is provided at its central-portion with a tooth l' which takes into the notches of the head or ring L' , whereby, when said head is rotated in one or the

other direction, it will be held to its adjustment, until a positive rotary movement is imparted thereto by the hand of the operator. The central axial-bore or hole l^2 of the rotary head receives the shank M of the dop m whereby the gem on which the facet is to be cut is held in the usual manner, the shank of said dop being gripped and secured within said head by means of a tapering, externally screw-threaded, split protuberance m' which projects from the head L beyond the bearings therefor, and receives a nut m^2 , which, when turned in one or the other direction, either contracts said split protuberance m' so as to grip the shank, or loosens the hold thereon. A circular scale of graduations N extends around said rotary head L , concentrically with its operating ring or bead L' , and a pointer or finger N' extends from one of the bearings or ends of the segment J and indicates the numbers at said scale.

My improved machine for cutting the facets of precious stones is operated as follows: To set the angle of inclination or bevel of the facet which is to be produced upon a stone such as O , the clamp-action on the segment J is loosened, and the segment is set so that the indicator K' will point to a number of the scale corresponding to the desired pre-determined bevel. The segment is then clamped to the arm, and is thereto firmly and securely held until another angle or bevel is desired to be imparted to the facet. Having set the segment so that the dop m will be at the desired angle of inclination with respect to the face of the grinding-disk, it is essential that the carriage F be shifted either to or from the grinding-disk, so that when the lapidary takes hold of the head L to move the stone across the face of the grinding-disk, said stone will always be set to traverse across the axis of the grinding-disk, and thereby bring into play the whole of the face of the latter, so that no uneven surfaces will be produced thereon. It will be understood however, that when the angle of inclination of the facet to be produced is changed, the carriage has to be shifted, so that the stone carried by the dop may swing in a curve which passes through the axis of the grinding-disk, as indicated by broken lines in Fig. 3. By turning the rotary head a greater or less distance, which distances are at equal intervals of one complete revolution of the head, the number of facets around the stone or gem is regulated, and the finger N' indicates to the operator upon the scale N just how far to move the head at each interval. By increasing or diminishing the intervals of movement of the rotary head, the operator is enabled to change the number of facets which should be produced upon the stone. The spring-tooth l' which takes into the notches of the ring L' encircling the rotary head, holds the same in the position that it may be set, until another positive movement is exerted thereupon by the operator. By loosening the nut m^2 upon the split pro-

tubercance *m'* of the rotary head, the dop is enabled to be removed, so that a new one may be readily inserted and the action of the machine may be resumed upon another stone.

5 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with a suitable bed-plate and a grinding-disk provided with suitable means of rotation, of a carriage adapted to slide to and from the side of the grinding-disk, a swinging-arm pivoted on the carriage so as to swing in a plane parallel with that of the face of the grinding-disk, a clamp on said arm, an adjustable segment adapted to be secured in said clamp, a rotary head having bearing in said segment, and a dop for holding a stone to the face of the disk, the shank of which dop is adapted to be secured to said head, substantially as set forth.

2. The combination, with a suitable bed-plate, a grinding-disk thereon, and means for rotating the disk, of a carriage mounted to slide on the bed-plate to and from the grinding-disk, posts projecting upwardly from the carriage, a bearing-rod fixed to the posts, a swinging-arm having a sleeve bearing on said rod, a clamp on said arm, an adjustable segment held by said clamp, a rotary head having bearing in said segment, and a dop for presenting the stone to the face of the grinding-disk, the shank of said dop being fixed to said head, substantially as set forth.

3. The combination, with a bed-plate, and a grinding-disk mounted thereon and provided with suitable means of rotation, of a carriage adapted to move to and from said grinding-disk, an arm pivoted on said carriage so as to swing in a plane parallel with the grinding face of the disk, a clamp on said arm, a segment adapted to be adjust-

ably held in said clamp, a rotary head provided with a circular series of notches, a spring tooth fixed to the segment and adapted to take into said notches, and a dop adapted to present a stone to the face of the grinding-disk, the shank of said dop being adapted to be retained within said head, substantially as set forth.

4. The combination, with a bed-plate and a grinding-disk provided with suitable means of rotation, of a carriage adapted to move to and from said grinding-disk, an arm pivoted on said carriage so as to swing, a clamp mounted on the arm, a segment adapted to be retained adjustably in position by said clamp, a rotary head provided with a tapering externally-threaded, split-protuberance, a nut received by the screw-thread of said protuberance, and a dop adapted to present a stone to the face of the grinding disk, the shank of said dop being held by the binding action of said split protuberance, substantially as set forth.

5. The combination, with a suitable bed-plate and a grinding-disk provided with suitable means of rotation, of a carriage mounted to slide on the bed-plate, relatively to the grinding-disk, an arm pivoted to the carriage, a clamp on said arm, the same comprising a shoe and a movable headed-stem, a segment having an undercut groove for receiving the head of said stem and a rotary dop supported on said segment and for holding a stone to the face of the disk, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

GYULO ARMENY.

Witnesses:

PAUL GOEPEL,
GEO. L. WHELOCK.