

(No Model.)

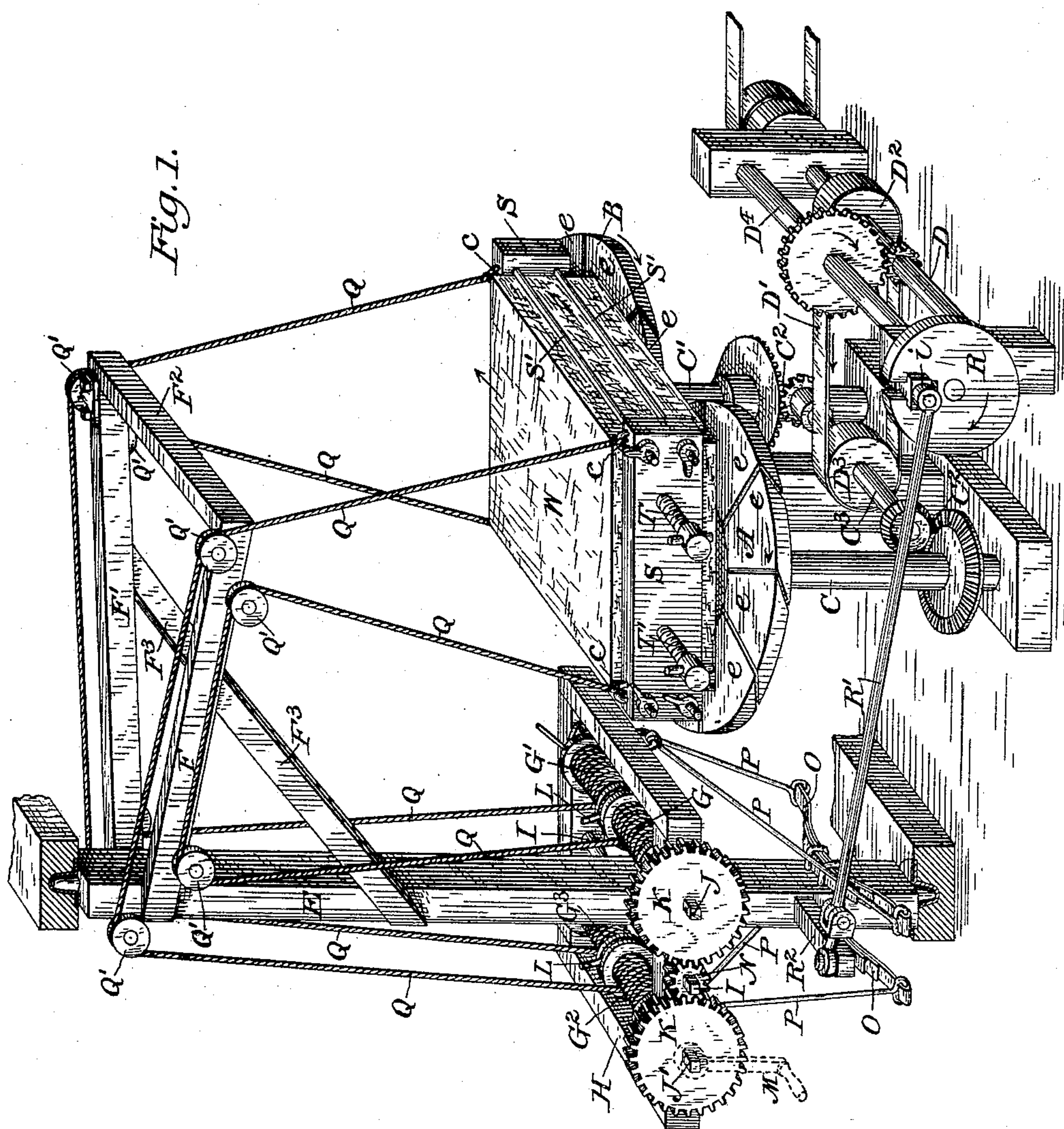
2 Sheets—Sheet 1.

J. McENERNEY.

MACHINE FOR GRINDING AND POLISHING STONE.

No. 429,860.

Patented June 10, 1890.



Attest:

A. A. Jesbira.

E M Watson

Inventor:

John M. Overney

By: David Arsen

Atty.

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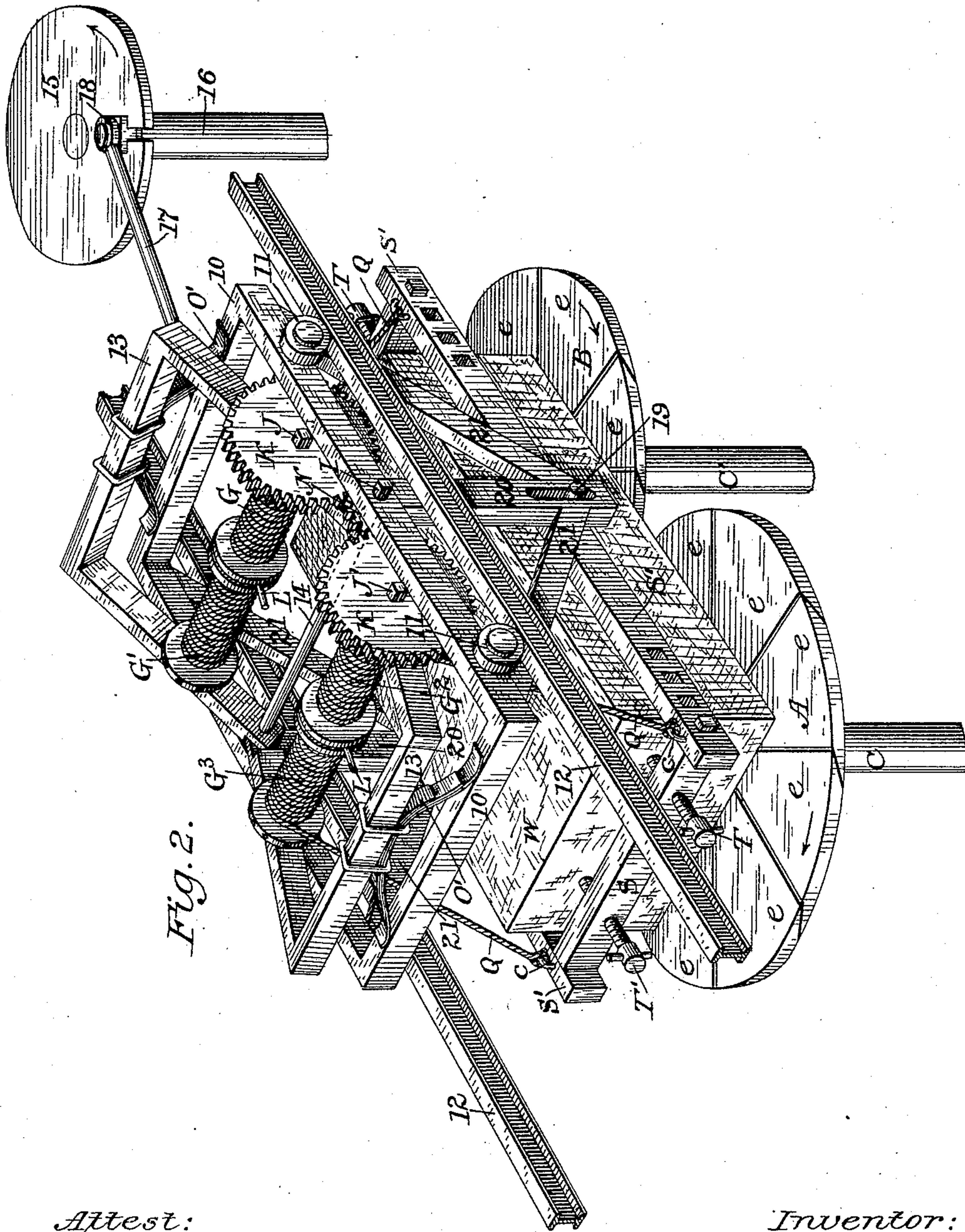


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN McENERNEY, OF NEW YORK, N. Y., ASSIGNOR TO THE AMERICAN
GRANITE COMPANY, OF SAME PLACE.

MACHINE FOR GRINDING AND POLISHING STONE.

SPECIFICATION forming part of Letters Patent No. 429,860, dated June 10, 1890.

Application filed September 28, 1889. Serial No. 325,422. (No model.)

To all whom it may concern:

Be it known that I, JOHN McENERNEY, of the city, county, and State of New York, have invented certain new and useful Improvements in Machinery for Grinding and Polishing Stones; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, making a part of this specification.

This invention relates to an improvement in machines for grinding and polishing stone; and it consists in the novel construction and arrangement of devices for supporting, adjusting, and moving the stone over revolving disks adapted to grind and polish its surface, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a view in perspective of my improved stone grinding and polishing machine; and Fig. 2 a similar view illustrating a modification thereof, and in which the gearing by which the grinding-disks are actuated is omitted.

A and B represent the two grinding-disks by which the surface of the stone is ground and polished. These grinding-disks are mounted upon vertical spindles C C', to revolve side by side in a horizontal plane, and the upper face of each is adapted when in motion to abrade and cut, either directly or by means of an interposed layer of sand or other abrading material, the surface of a stone brought in contact therewith in manner as well known to the art. Preferably these grinding-disks are constructed as described in the Letters Patent granted to me August 20, 1889, No. 409,419—viz., with a series of segmental plates e e, supported and secured upon an underlying disk, and so formed as to leave an inclined opening between the several adjacent plates, whereby in the rotation thereof the abrading or grinding material placed thereon is evenly distributed over the entire surface. The vertical spindles C C' move in unison, being geared by bevel-wheels C² to a counter-shaft C³, which is driven from the main shaft D by a belt D', carried over the pulleys D² D³.

My present invention relates to an adjust-

ment and movement back and forth of the stone to be polished over these revolving grinding-disks by means of an oscillating carrier, which may be embodied in the form of a swinging crane, as shown in Fig. 1, or of a reciprocating carriage, as shown in Fig. 2 of the drawings.

In Fig. 1, which illustrates my invention when embodied in the form of a crane, E represents the vertical post of the crane, mounted in suitable pivotal bearings at the top and bottom, so as to be freely rotative on its axis. Its jib, constituting properly the oscillating stone-carrier of the machine, is constructed of two divergent projecting arms F F', secured to the upper end of the post E, and connected at their outer ends by a cross-bar F², so as to form in fact a triangular frame connected to the post at its apex and suitably braced by stays F³.

G G' G² G³ are four winches supported in a rectangular frame H, which embraces the post near its lower end, and is pivoted upon a central shaft I, passed transversely through the post or mounted in bearing-plates secured thereto parallel with the cross-bar F² of the jib. The winches are arranged in pairs to revolve upon axial shafts J J', supported in the pivoted frame on each side of the post parallel with the shaft I.

A spur-wheel K is secured upon one end of each shaft J J', and the winches G G² next to the spur-wheels are each keyed to its shaft to turn with it. The remaining two winches G' G³ are left free to turn loosely each upon its appropriate shaft, but admit of being severally coupled with the adjacent winch on the same shaft by an interposed clutch L, of any approved form, so as to be made to turn with it when required.

Each shaft J J' may be turned independently by means of a crank M, fitted upon its outer end. (See dotted lines, Fig. 1.) Each of the two winches G' G³, which revolve loosely upon their shafts, is turned independently, when required, by means of a lever to be inserted in holes in the periphery of the winch. A reverse movement of the several winches is prevented, in the customary manner, by a pawl and ratchet.

A pinion N is fitted to play longitudinally upon a spring on the end of the pivotal shaft I of the winch-frame H, and is adapted thereby to be carried into and out of gear with the two spur-wheels K K, and by turning the shaft I by means of a crank when the pinion N is in gear the shafts J J' and the winches thereon may all be turned in unison.

The pivoted winch-frame H is stayed in a horizontal position by means of two springs O O, made fast to the post E under the frame, and which are coupled to the opposite sides of the frame by connecting-rods P P. A rope Q is carried from each winch over suitable guide-rollers Q' to the outer end of one of the arms F F' of the jib or stone-carrier, to depend thence in readiness for attachment to the four corners of the stone. The crane is made to oscillate by means of an eccentric R on a counter-shaft D', geared to the driving-shaft D, said eccentric being coupled by a connecting-rod R' to the end of an arm R², projecting radially from the post E.

The suspension of the stone W from the stone-carrier is facilitated by means of a clamping device by which to seize and hold it. Said device may be constructed of head-plates S S, which are clamped against the ends of the stone by means of clamping-bolts S' S', extending from the one plate to the other, and, in connection with set-screws T T, working through the head-plates against the ends of the stone. The four ropes Q Q from the stone-carrier are attached to hooks or rings c c at the four corners of this clamping device.

In the use and operation of this machine the stone W to be polished is either inclosed and clamped between the head-plates S S, and the four ropes Q Q are made fast to its four corners, as shown in Fig. 1, or the ropes are attached to rings secured directly to the corners of the stone in the customary manner. The pinion N is then thrown into gear with the spur-wheels K K, and by means of a crank applied to the shaft I the four winches G, G', G², and G³ are turned in unison until the stone is properly elevated to allow the crane to be swung around to bring the stone immediately over the grinding-disks A B. After the stone has been lowered into contact with the disks it is leveled by an independent movement of the several winches, the pinion N being thrown out of gear for the purpose and the clutches L disengaged to admit thereof. Either end or corner of the stone may thus be separately raised or lowered to make it bear more or less firmly upon the grinding-disks, as may be required in dressing and polishing its surface, while the springs O O, in connection with the flexible ropes Q Q, afford an elastically-yielding support for the stone, which is advantageous in its working. After the stone W has been adjusted above the grinding-disks the eccentric R is coupled to the crane-arm R², so that when the driving-shaft is set in motion to produce a revolution of the grinding-disks the crane will be auto-

matically swung to and fro, so as to cause the stone to traverse back and forth over the rapidly-revolving disks.

The combined movements of the stone and of the disks operate, in connection with the interposed cutting or polishing material, to rapidly smooth and polish the surface of the stone, its adjustment from time to time in relation to the grinding-disks being readily and exactly made by means of the winches.

In place of carrying the winches by which the stone is adjusted upon a crane constructed to swing automatically back and forth, as described, and thereby produce an automatic reciprocation of the stone over the revolving disks, I contemplate the use of a carriage made to oscillate over the grinding-disks upon a suitable tramway, as shown in Fig. 2.

10 represents the frame of the carriage mounted upon wheels 11 11, fitted to run upon parallel rails 12 12, supported horizontally above the grinding-disks A B.

Two winch-frames 13 13 are severally pivoted, each at one end to a central revoluble rod 14, fitted transversely across the middle of the carriage 10, so that each frame may oscillate thereon, and the outer end of each is extended over the outer end of the carriage and made to rest upon an interposed spring O', attached to the one or the other.

The construction and arrangement of the winches are similar in all respects to that of the winches G, G', G², and G³, already described, the axial shaft J for each pair of winches being mounted in bearings in the middle of one of the winch-frames 13, as shown in Fig. 2.

The four winches admit of being made to revolve in unison by means of a pinion N, made longitudinally adjustable on the rod 14, so as to admit of being thrown in and out of gear with the spur-wheels K K on the winch-shafts J J', in like manner as hereinbefore described. The ropes Q Q from the four winches are carried down directly to the four corners of the stone-clamping device, so that the stone is suspended thereby immediately under the carriage, and may, by the independent movement of the several winches, obtained in manner as described, be readily adjusted and properly leveled when thus suspended.

The stone-clamping device consists of the end plates S, bearing the set-screws T T', and united by lateral bars S' S', forming a frame adjustable upon the stone. This frame is steadied by means of a pin 19, projecting outwardly from the middle of each lateral bar S' through a slot in an arm 20, depending from the carriage 10 and braced by stays 21 21. The pin and slot permit the frame to be adjusted to and from the carriage, yet steady it, so that it may not move longitudinally independently thereof.

The carriage 10 is run upon the rails 12 12 into position over the grinding-disks A B, and after the stone has been properly adjusted

in contact with their grinding-faces is made to traverse back and forth over the same by means of an eccentric or crank-wheel 15 upon a shaft 16, geared to the driving-shaft by which the grinding-disks are actuated, and connected to the carriage by means of a coupling-rod 17. The wrist-pin 18, to which the coupling-rod 17 is pivoted on the eccentric-wheel, is made radially adjustable upon the wheel, so as to admit of an adjustment in the length of the stroke of the coupling-rod.

I claim as my invention—

1. The combination, in a stone grinding and polishing machine, with a revolving grinding-disk, of a stone-carrier made to oscillate above the disk, a stone-clamping device made to seize and hold the stone, and a series of intermediate adjustable connections, whereby the stone is suspended from the carrier and adjusted with reference to the disk, substantially in the manner and for the purpose herein set forth.

2. The combination, in a stone grinding and polishing machine, of the adjustable supporting-ropes by which the stone to be worked is suspended, an independent winch for each rope, a carrier for the winches, means, substantially as described, for producing a movement of the winch-carrier, and revolving disks, over which the suspended stone is made to oscillate by the movement of the winch-carrier, substantially in the manner and for the purpose herein set forth.

3. In a stone grinding and polishing machine, the combination of the driving-shaft, the horizontally-revolving grinding-disks actuated thereby, the oscillating stone-carrier mounted

above the disks and actuated by said driving-shaft, a stone-clamping device, and intermediate adjustable connecting devices, whereby the stone is carried back and forth over the face of the revolving disks in synchronism with the movement thereof, substantially in the manner and for the purpose herein set forth.

4. The combination, with the grinding-disks, the carrier oscillating over the disks, the winch-frame moving with the carrier, the winches revolving in said frame, and the stone-supporting device suspended from said winches, of the stay-springs attached to the carrier and governing the winch-frame, substantially in the manner and for the purpose herein set forth.

5. The combination of the grinding-disks, the crane mounted to swing over the disks, means, substantially as described, for producing its oscillation, a winch-frame pivoted thereto, winches mounted to revolve independently in said frame, a rope led from each winch to depend from the jib of the crane, and means for attaching the ropes to the four corners of a stone, whereby it is suspended and made to traverse over the disks, substantially in the manner and for the purpose herein set forth.

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

JOHN MCENERNEY.

Witnesses:

WM. H. DEMOREST,
GEO. L. GILL.