

No. 839,642.

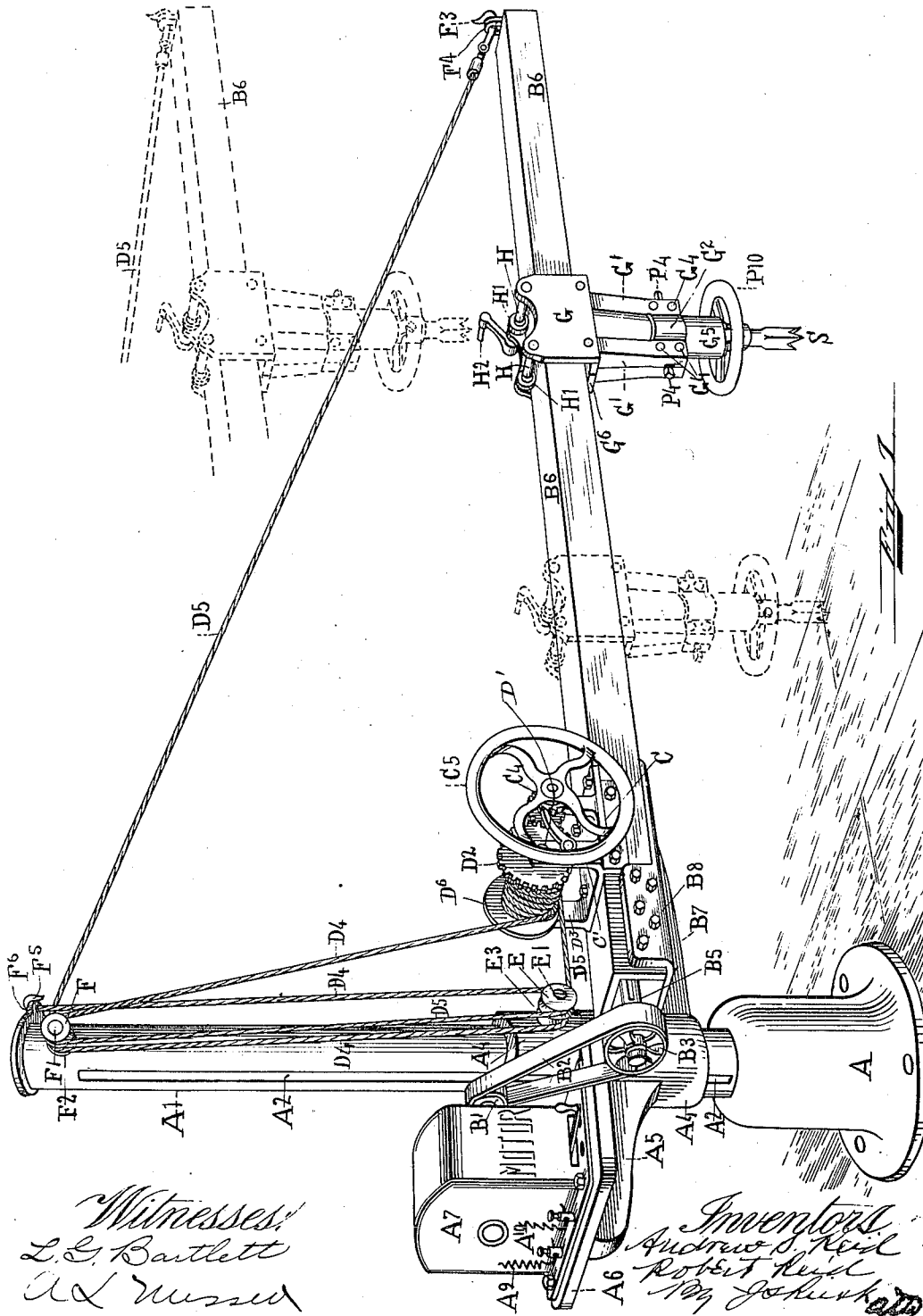
PATENTED DEC. 25, 1906.

A. S. & R. REID.

TOOL FOR WORKING STONE AND OTHER MATERIAL.

APPLICATION FILED MAY 24, 1905.

4 SHEETS—SHEET 1.



Witnesses:
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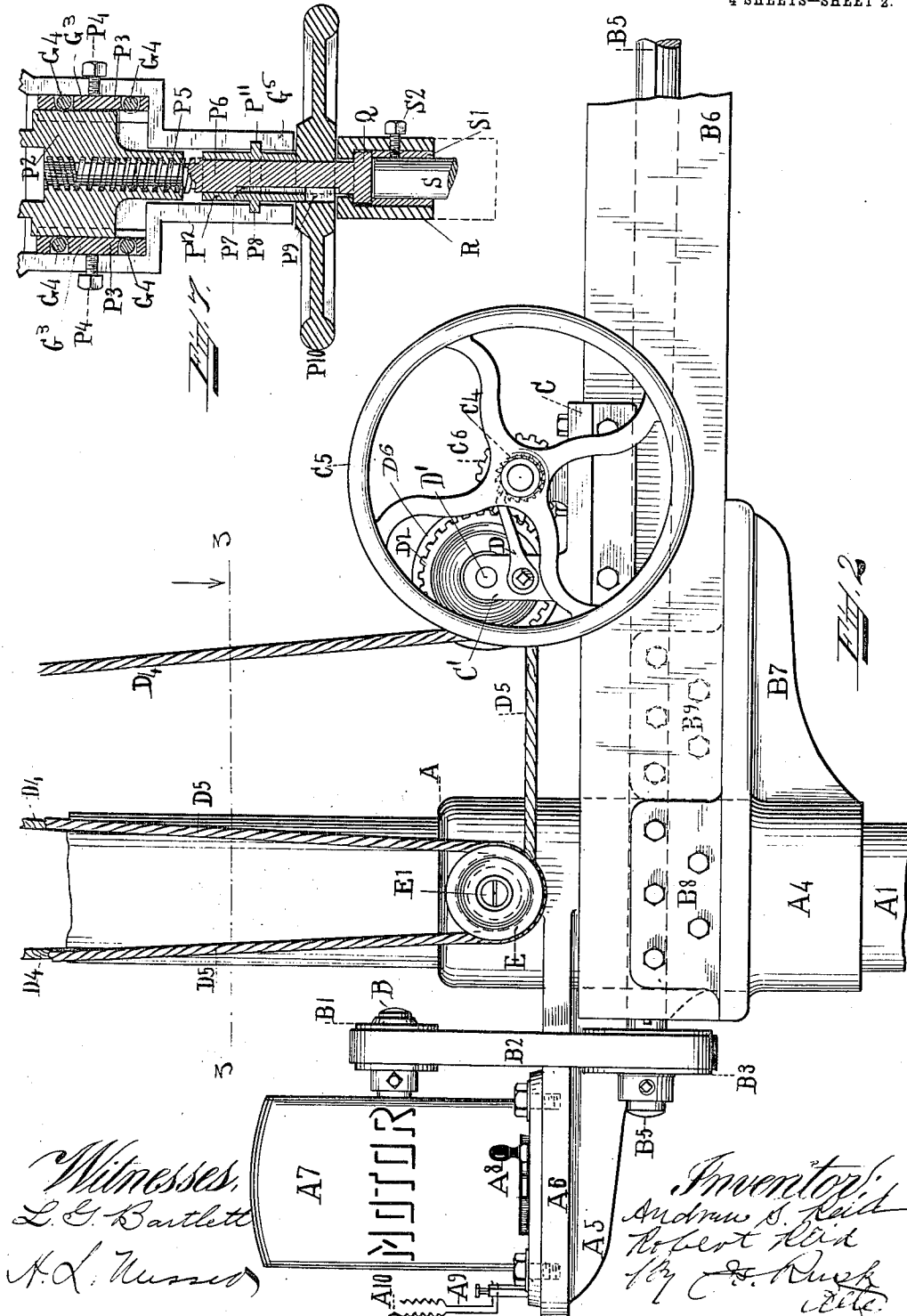
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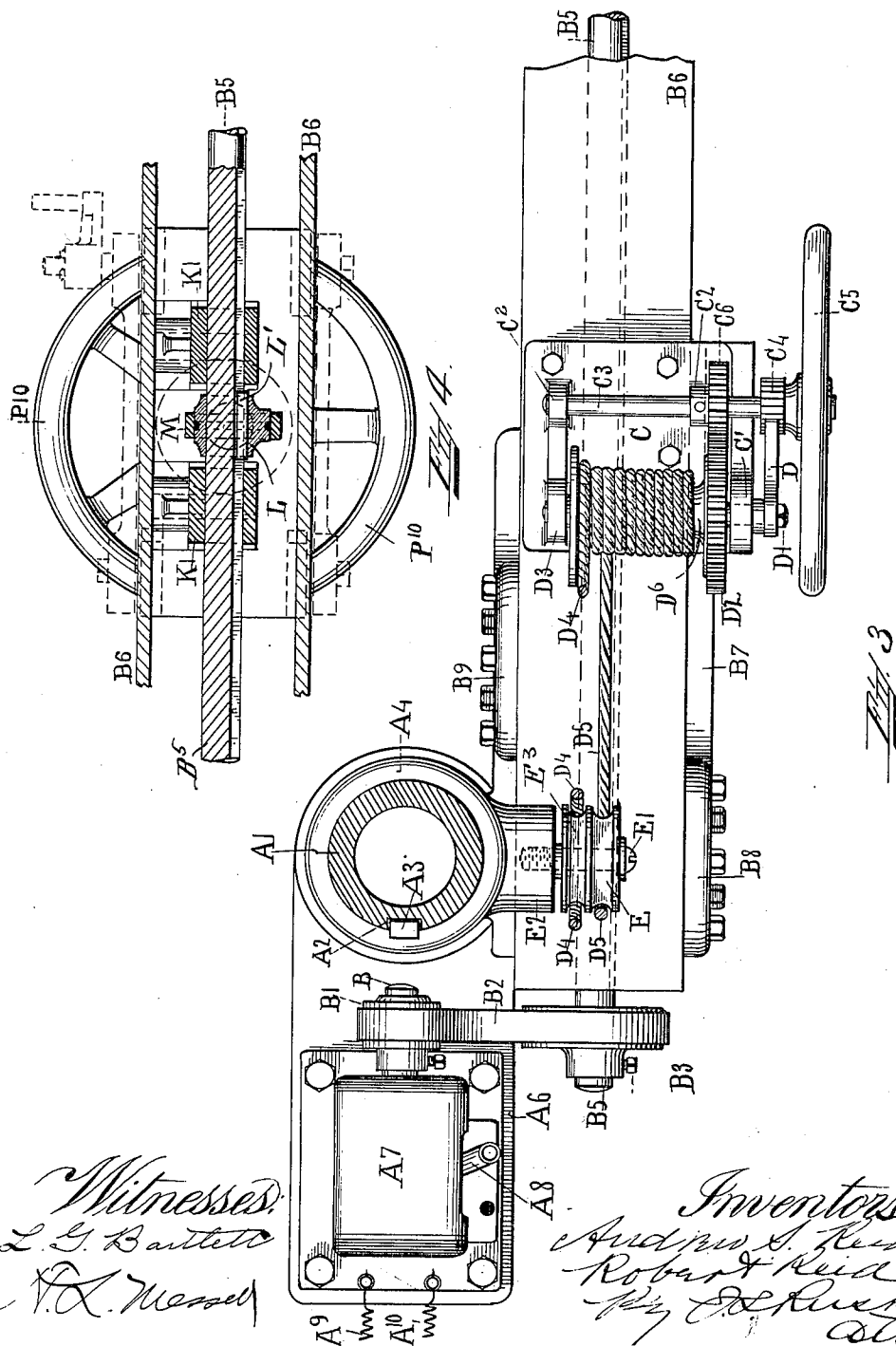
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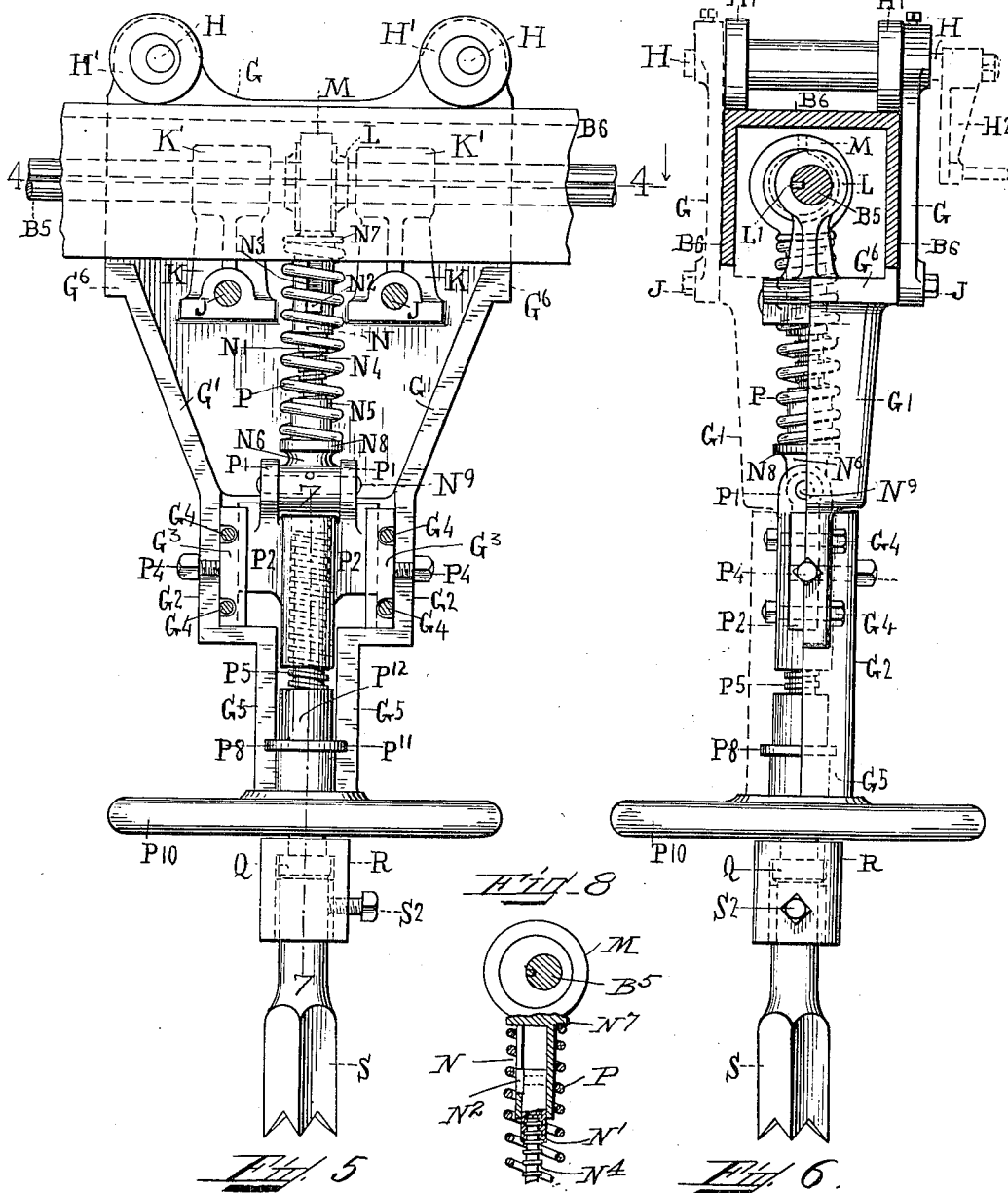
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UNITED STATES PATENT OFFICE.

ANDREW S. REID AND ROBERT REID, OF BEVERLY, MASSACHUSETTS,
ASSIGNORS TO LEONARD W. ROSS, OF CANTON, MASSACHUSETTS.

TOOL FOR WORKING STONE AND OTHER MATERIAL.

No. 839,642.

Specification of Letters Patent.

Patented Dec. 25, 1906.

Application filed May 24, 1905. Serial No. 261,996.

To all whom it may concern:

Be it known that we, ANDREW S. REID and ROBERT REID, of Beverly, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Tools for Working Stone and other Material, of which the following is a specification.

Our invention relates to improvements in tools for working stone and other materials; and the object is to produce a tool for drilling, pounding, cutting, polishing, and otherwise working upon stone, and the tool may also be used in various other ways.

In the accompanying drawings, which illustrate a construction embodying our invention, Figure 1 is a perspective view looking at one side of the machine. Fig. 2 is a side elevation of a portion of the machine. Fig. 3 is a plan view, partly in section, taken on the line 3 3, Fig. 2. Fig. 4 is a longitudinal sectional view on the line 4 4, Fig. 5. Fig. 5 is a side view of the tool with part of the casing removed. Fig. 6 is an end view of the tool with part of the casing in dotted lines to show the interior parts. Fig. 7 is a sectional view on the line 7 7, Fig. 5. Fig. 8 is a detail sectional view of part of the operative mechanism.

Like letters of reference refer to like parts throughout the several views.

The hollow column A' is suitably mounted in the base A, so as to be revolved thereon at will, and surrounding said column is a sleeve A⁴, capable of vertical adjustment on said column and is keyed thereto, preventing rotation by the spline A³, working in the keyway A², Figs. 1 and 3. Extending outward from said sleeve and forming a part thereof is the bracket A⁵, carrying the table A⁶, to which is secured the electric motor A⁷, controlled by the switch A⁸ and having the usual in and out wires A⁹ A¹⁰. On the shaft B of said motor is a pulley B' for transmitting the motion of said pulley to the operating mechanism. On one end of the shaft B⁵, within the casing B⁶, is located the pulley B³, secured thereto by a suitable set-screw, and around said pulley B³ and pulley B' is located the belt B² for communicating power from the motor A⁷ to the shaft B³. From one side of the sleeve A⁴ extends the arm B⁷, having the upwardly-extending branch side arms B⁸ B⁹, which are bolted to the casing B⁶ and support the same at the inner end. On

the outer end of said casing B⁶ is an eye F⁴, with which engages the hook F³, secured to one end of the elevating-rope D⁵, which extends upwardly and over the pulley F on the shaft F' and down and around the pulley E on the shaft E' to the drum D⁶, fast on the shaft D' and mounted in the supports C' and D³ of the plate C, suitably bolted to the top of the casing B⁶. On said shaft D' is fixed the gear-wheel D², which meshes with a smaller gear C⁶, fast on the shaft C³, mounted in the bearing C² of the plate C. Beyond said gearing C⁶ is another gear C⁴, fast on said shaft C³, with which is adapted to engage the pawl D, carried on the shaft D', and hold the rope-winding drum in any desired position. Beyond said gear C⁴ there is a wheel C⁵, fast on the shaft C³ and by means of which the winding-drum D⁶ is operated to raise or lower, as desired, the sleeve A⁴ and the casing B⁶. Another rope D⁴ has a hook F⁵ at its upper end secured to the eye F⁶ at the top of the column A', and said rope extends downwardly and around the pulley E³ and up around the pulley F² and down to the winding-drum D⁶, so that by means of these two ropes D⁵ and D⁴ and the coöperating mechanism the sleeve A⁴ and the casing B⁶ may be vertically adjusted to any desired position.

As shown in Fig. 6, the casing B⁶ consists of two sides and a top, and on said casing is adapted to be moved to any desired position the tool which forms the subject-matter of this application.

The tool has two side plates G, with inwardly-extending plates G⁶ inclosing the arm and the casing B⁶ at that point where the tool is located. These plates G⁶ have downwardly-projecting plates G' and extensions G², which form into the column G⁵, Figs. 5, 6, and 7. This construction covers the interior working parts of the tool and protects same from excess of dust and dirt.

The bolts J pass through the sides G and support the standards K, carrying bearing-blocks K', in which is mounted the shaft B⁵, and said shaft is keyed by the spline L' to the eccentric-ring L, surrounded by the eccentric-ring M, which has a hollow vertical downward collar N, in which freely works the sleeve N', having a pin N² working in the slot N³ of the hollow collar N, forming a loose joint.

The screw-threaded rod N⁴ is turned at its

upper end into the sleeve N' and at its lower end into the stud N⁵ of the hub N⁶. A spring P bears at its upper end against the flange N⁷ on the collar N and at its lower end against the flange N⁸ of the hub N⁶ and operates to extend the loose joint between the sleeve N' and the collar N. This construction forms a longitudinally-yieldable connecting-rod that operates to give a rebound blow to the tool S, so that the latter striking the work yields through the spring P and a crushing blow to the stone is avoided. By this means such a blow is given that its effect does not extend beyond that part of the stone directly receiving the impact of the tool. Consequently the formation of the stone adjacent to the part struck is not affected and will not crumble.

The hub N⁶ is mounted on the shaft N⁹, fast in the supporting-lugs P' of the slide P², movable in the opposite guides G³, held in place by the bolts G⁴, which, with the bolts J, hold the opposite plates together, as described. The guides are adjusted by the screws P⁴. This slide P² is interiorly screw-threaded, as shown, and adapted to mesh therewith is the screw-threaded upper end P⁵ of the rod P⁶, around which is located the collar P¹², provided with the circular flange P⁸, which is adapted to turn in the circular slot P¹¹ of the column G⁵. Forming part of or screw-threaded to said collar P¹² is a wheel P¹⁰, which is keyed by the spline P⁹ to the rod-plunger P⁶, Fig. 7. Said rod has an extended keyway P⁷ to allow for the upward and downward adjustments of said rod by the operation of the handle P¹⁰. By turning the wheel or handle P¹⁰ the rod P⁶ is moved either upwardly into the slide P² or downwardly in said slide, so that the adjustment of the tool in relation to the work can be had as desired, and in said adjustments the key P⁹ remains in the position shown in Fig. 7, with the slot P⁷ located in different positions, depending on the upward or downward adjustment.

The lower end of the rod P⁶ is provided with a shoulder Q, on which freely rests the chuck R, having the inner packing S', within which is located the tool S, and the upper end thereof is held firmly in place by the set-screw S², which passes through the chuck and the packing and engages the upper end of said tool and holds the same firmly in place, so that the tool while fast to the chuck moves with the chuck. This construction provides the necessary features for a successfully working tool—viz., the tool must be loose on the stone to work, it must be capable of turning, and it must also be capable of being lifted from the work at each stroke, allowing the tool to free itself from the stone and to revolve freely or change position by the action of the blow in hitting the tool against the stone.

In the upper ends of the side plates G are

mounted the shafts H, carrying the wheels H', on which are journaled the wheels L', so that the tool may be moved along the casing L⁶ by pushing on the wheel P¹⁰. The ends of the shafts H are eccentric thereto and may be operated by suitable handles H², so that the shafts will raise or lower the frame G and hold it in any desired position on the arm or casing B⁶.

The operation of the eccentric L will be clearly understood, as during one part of the operation it raises the slide P² and on the other part of the movement it moves the slide P² down, the movement being yielding by reason of the spring P, thus giving a rebound blow to the tool S. Along the edges of the stone light blows are given to prevent clipping the edges. For light work the tool is carried a little farther away from the surface of the stone than would be the case for heavy work. Ordinarily the casing or arm B⁶ is adjusted so that the bottom of the tool S is about three-eighths of an inch from the top of the stone, and if it be desired to make further adjustment for different classes of work the same can be accomplished by operating the wheel or handle P¹⁰, as previously described.

It will be observed that the rotating shaft B⁵, plunger-rod P⁶, and tool S are all in vertical alinement, so that the movement of the shaft is communicated in a direct line to the tool. The tool, as previously described, may be moved in any desired position, vertically, radially, or laterally, as indicated in the two dotted positions shown in Fig. 1.

The reciprocative mechanism for imparting vibratory motion to the tool comprises the eccentric L, splined on the shaft B⁵, and the ring M on the eccentric. By using the term "reciprocative mechanism" in the claims it is not intended to limit them to the specific construction set forth, but to include any means capable of imparting a vibratory motion.

Having thus described the nature of our invention and set forth a construction embodying the same, what we claim as new, and desire to secure by Letters Patent of the United States, is—

1. In apparatus of the character described, reciprocative mechanism, a slide, a longitudinally-yieldable connecting-rod between said reciprocative mechanism and said slide, a spring compressed between said reciprocative mechanism and said slide to extend said connecting-rod, a plunger-rod adjustable in said slide, and a tool-holder loose on said plunger-rod.

2. In apparatus of the character described, reciprocative mechanism, guides separate from said reciprocative mechanism, a slide movable in said guides, a longitudinally-yieldable connecting-rod between said reciprocative mechanism and said slide, a spring interposed between said reciprocative mech-

anism and said slide and operating to extend said connecting-rod and to transmit motion from said reciprocative mechanism to said slide, a plunger-rod adjustable in said slide, and a tool-holder loose on said plunger-rod.

3. In apparatus of the character described, a rotatable shaft, a supporting-frame adjustable longitudinally of said shaft, reciprocative mechanism mounted in said frame and actuated by said shaft, guides on said frame, a slide movable on said guides, a longitudinally-yieldable connecting-rod between said reciprocative mechanism and said slide, a spring interposed between said reciprocative mechanism and said slide and operating to extend said connecting-rod and to transmit motion from said reciprocative mechanism to said slide, and a tool-holder carried by said slide.

4. In apparatus of the character described, a rotatable shaft, an eccentric adjustable on said shaft, a ring on said eccentric, a collar carried by said ring, a sleeve movable in said collar and having a loose joint therewith, a slide connected with said sleeve, a spring bearing on said slide and normally operating to extend the loose joint between said collar and said sleeve, and a tool-holder carried by said slide.

5. In apparatus of the character described, a rotatable shaft, an eccentric splined on said shaft, a ring on said eccentric, a collar carried by said ring, a sleeve movable in said collar and having a loose joint therewith, a slide, a hub hinged to said slide, a screw-threaded rod connecting said hub with said sleeve, a spring normally extending the loose joint between said collar and said sleeve, guides for said slide, and a tool-holder carried by said slide.

6. In apparatus of the character described, a rotatable shaft, a supporting-frame adjustable longitudinally of said shaft, reciprocative mechanism mounted in said frame and actuated by said shaft, guides on said frame, a slide movable in said guides, a longitudinally-yieldable connecting-rod between said reciprocative mechanism and said slide, a spring interposed between said reciprocative mechanism and said slide and operating to extend said connecting-rod and to transmit motion from said reciprocative mechanism to said slide, a plunger-rod adjustable in said slide, and a tool-holder loose on said plunger-rod.

7. In apparatus of the character described, a rotatable shaft, a supporting-frame adjustable longitudinally of said shaft, reciprocative mechanism mounted in said frame and actuated by said shaft, guides on said frame, a slide movable in said guides, a longitudinally-yieldable connecting-rod between said reciprocative mechanism and said slide, a spring interposed between said reciprocative mechanism and said slide and operating to

extend said connecting-rod and to transmit motion from said reciprocative mechanism to said slide, a collar journaled in said frame, a plunger-rod keyed in said collar and having a screw-threaded connection with said slide, a tool-holder carried by said plunger-rod, and means for rotating said collar to turn said plunger-rod to adjust said tool-holder relatively to said slide.

8. In apparatus of the character described, a rotatable shaft, reciprocative mechanism operated by said shaft and adjustable longitudinally thereon, a slide, a longitudinally-yieldable connecting-rod between said reciprocative mechanism and said slide, a spring interposed between said reciprocative mechanism and said slide to normally extend the connecting-rod, a plunger-rod having a screw-threaded connection with said slide, a collar keyed on said plunger-rod and in which said plunger-rod is longitudinally movable, means for rotating said collar to turn said plunger-rod into and out of said slide, and a tool-holder loosely mounted on said plunger-rod.

9. In apparatus of the character described, a rotatable shaft, an eccentric splined on said shaft, a ring on said eccentric, a collar carried by said ring, a sleeve movable in said collar and having a loose joint therewith, a slide, guide for said slide, a hub hinged to said slide, a screw-threaded rod connecting said hub with said sleeve, a spring normally extending the loose joint between said sleeve and collar, a plunger-rod having a screw-threaded connection with said slide, a rotatable collar keyed on said plunger-rod, and a tool-holder loosely mounted on said plunger-rod.

10. In apparatus of the character described, a rotatable shaft, a supporting-frame adjustable longitudinally of said shaft, an eccentric splined on said shaft and adjustable with said frame, a ring on said eccentric, a collar carried by said ring, a sleeve movable in said collar and having a loose joint therewith, guides on said frame, a slide movable in said guides, a hub hinged to said slide, a screw-threaded rod connecting said hub with said sleeve, a spring interposed between said hub and said collar and operating to extend the loose joint between said sleeve and said collar and to transmit motion from said eccentric to said slide, and a tool-holder carried by said slide.

11. In apparatus of the character described, a rotatable shaft, a supporting-frame adjustable longitudinally of said shaft, an eccentric splined on said shaft and adjustable with said frame, a ring on said eccentric, a collar carried by said ring, a sleeve movable in said collar and having a loose joint therewith, guides on said frame, a slide movable in said guides, a hub hinged to said slide, a screw-threaded rod connecting said

hub with said sleeve, a spring interposed between said hub and said collar and operating to extend the loose joint between said sleeve and said collar and operating to transmit
 5 motion from said eccentric to said slide, a plunger-rod having a screw-threaded connection with said slide, a collar journaled in said frame and keyed on said plunger-rod, means for rotating said collar to move said
 10 plunger-rod, and a tool-holder loosely mounted on said plunger-rod.

12. In apparatus of the character described, reciprocative mechanism, a movable slide, an adjustable longitudinally-yieldable
 15 connecting-rod between said reciprocative mechanism and said slide, a spring interposed between said slide and said reciprocative mechanism and operating to extend said connecting-rod and to transmit motion
 20 from said reciprocative mechanism to said slide, and a tool-holder carried by said slide.

13. In apparatus of the character described, a reciprocative mechanism, a movable slide, an adjustable longitudinally-yieldable connecting-rod between said reciprocative mechanism and said slide, a spring interposed between said slide and said reciprocative mechanism and operating to extend
 25 said connecting-rod and to transmit motion from said reciprocative mechanism to said slide, a plunger-rod adjustable in said slide, and a tool-holder loosely mounted on said
 30 plunger-rod.

In testimony whereof we have signed our names to this specification, in the presence
 35 of two subscribing witnesses, this 17th day of May, A. D. 1905.

ANDREW S. REID.
 ROBERT REID.

Witnesses:

EDWARD S. WEBBER,
 HORACE P. FOSTER.