

(No Model.)

2 Sheets—Sheet 1.

E. H. KAVANAGH & E. E. WINKLEY.

STONE WORKING MACHINE.

No. 467,937.

Patented Feb. 2, 1892.

Fig. 1.

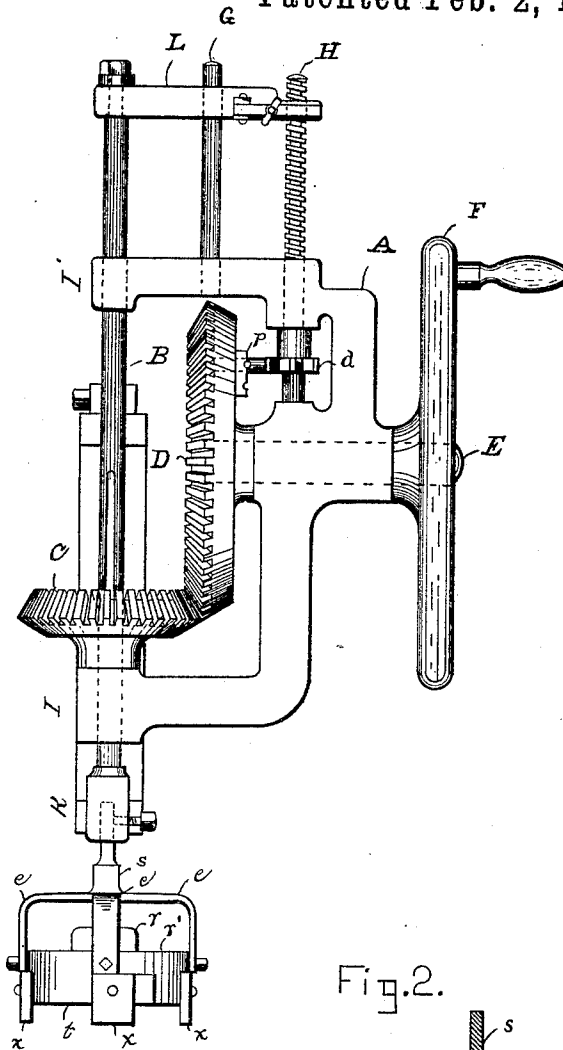


Fig. 4.

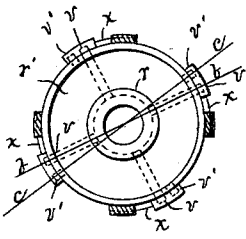


Fig. 5.

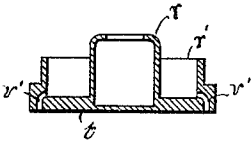


Fig. 2.

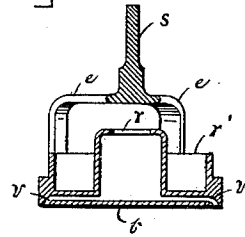
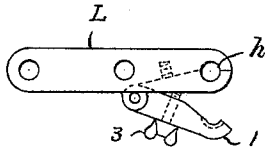


Fig. 3.



WITNESSES..

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(No Model.)

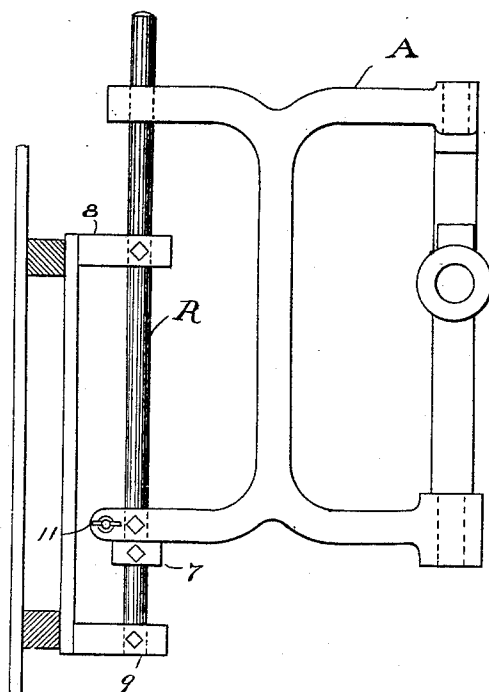
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Fig. 6.



WITNESSES..

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UNITED STATES PATENT OFFICE.

EDWARD H. KAVANAGH AND ERASTUS E. WINKLEY, OF LYNN, MASSACHUSETTS; SAID WINKLEY ASSIGNOR TO SAID KAVANAGH.

STONE-WORKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 467,937, dated February 2, 1892.

Application filed June 8, 1891. Serial No. 395,433. (No model.)

To all whom it may concern:

Be it known that we, EDWARD H. KAVANAGH and ERASTUS E. WINKLEY, both citizens of the United States, and residents of Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented a new and useful Stone-Working Machine, of which the following is a specification.

Our invention relates to improvements in machines of the above class; and it consists of an adjustable frame in which is mounted a tool-carrying shaft free to rotate and slide in its bearings, a threaded shaft also free to rotate, both of which are connected with a rotating shaft also mounted in said frame, so as to be rotated thereby, and a connecting-bar connecting said threaded shaft with the tool-carrying shaft, so that the rotation of the threaded shaft produces a sliding motion of the tool-carrying shaft.

Our invention further consists of improvements in boring-tools adapted to be used in and which form part of said machine.

The object of our invention is to provide a simple and cheap device for the purposes hereinafter set forth.

Our invention is illustrated by the accompanying drawings, in which—

Figure 1 is a side view thereof with boring-tool inserted. Fig. 2 is a section along *b b*, Fig. 4. Fig. 3 is a detailed view of the device for controlling the feed. Fig. 4 is a bottom view of our improved boring-tool. Fig. 5 is a section along *c c*, Fig. 4. Fig. 6 is a side view showing attachment of frame to vertical rod.

Similar letters and numerals refer to similar parts in the several views.

The following is a description in detail of our invention.

A rod *R* is rigidly set in the lugs 8 and 9, which are attached to any convenient upright standard and which hold the rod *R* in a vertical position. A frame *A* is hung on the rod *R* by means of shoulders projecting therefrom, through which the rod *R* passes. The frame *A* may be swung horizontally about the rod *R*, and may also be raised and lowered upon the same. One of the bearings of rod *R* in frame *A* is made in two parts connected by a thumb-screw 11, which may be set so as to prevent any motion of frame *A*, as above set

forth. On the rod *R* beneath the lower shoulder of frame *A* is a nut 7, free to slide on rod *R*, but provided with a set-screw, so that it may be secured in any desired position thereon, thereby preventing the frame *A* from moving downward on said rod when the thumb-screw 11 is loosened so as to allow frame *A* to swing horizontally.

In the frame *A* is mounted the shaft *B*, which is adapted to slide longitudinally through its bearings *I I'* and to rotate therein. To one end of shaft *B* is attached a tool-holding device *K*. The bevel-gear *C* is splined to shaft *B*, so as to rotate therewith and leave the shaft *B* free to slide through the bearings *I I'*, as hereinafter set forth. The gear *C* is held in position by the shoulder forming the bearing *I*. Meshing with the gear *C* is a gear *D*, fixed to the shaft *E*, to which is attached the operating-lever *F*. To the gear *D* a pin *p* is attached, which upon each revolution of the gear *D* comes in contact with the toothed wheel *d*, causing a partial revolution thereof. The toothed wheel *d* is mounted upon and revolvable with the shaft *H*, the upper portion of which is threaded. Between the shafts *B* and *H* is a rigid guide-shaft *G*, on which a bar *L* is arranged to slide. The shaft *B* passes through one end of the bar *L* and is secured thereto by a shoulder and nut, preventing longitudinal motion, but leaving shaft *B* free to rotate. The other end of the bar *L* is provided with a circular aperture *h*, (see Fig. 4,) through which the shaft *H* passes, and a portion of the interior of which is grooved, the grooves engaging with threads on shaft *H*. Through the aperture *h* the bar *L* is divided and the parts hinged together and held in contact by the thumb-screw 3. The grooved portion of the interior of aperture *h* is upon the part *I*, so that when the part *I* is thrown out of contact the shaft *H* passes freely through the bar *L*, and when in contact cannot be moved therein, except by the revolution thereof.

Our improved boring-tool consists of two concentric cylinders set on the bottom plate *t*, thus forming an inner and outer reservoir *r* and *r'*, adapted to carry, respectively, water and sand. The outer cylinder is secured to the shoulders *e e e e*, connecting it with a cen-

tral shaft *s*, which is adapted to be set in device K hereinbefore referred to. To the outer cylinder is also attached the cutting parts *x x x*, extending below plate *t*. (See Fig. 1.)

5 These parts may be of any desired shape; but we find the most convenient form to be, as shown in the drawings, a strip of metal or other suitable material, having a flat bottom surface which comes in contact with work. Leading from the reservoirs *r* and *r'* are the passages *v v v v* and *v' v' v' v'*, which open at or near the circumference of the outer cylinder and in the path of the cutting parts as the tool is rotated.

15 It is evident that other forms of stone-working tools may be inserted in device K and operated by the mechanism herein first described, and we consider our invention to cover such use thereof.

20 The operation of our invention is as follows: A tool is fixed in device K and brought in contact with the work by bringing frame A into desired position. Power is then applied to the lever F and shaft E rotated, and rotary motion communicated to shaft B by the connecting-gears C and D, the tool in device K thus receiving rotary motion. As the gear D rotates, the pin *p*, striking the toothed wheel *d*, rotates shaft H, thereby moving the bar L along the shaft G, thereby imparting longitudinal motion to shaft B and feeding the tool into the work. When desired to rotate tool without feed, the pin *p* may be removed. The device shown in Fig. 4 enables the tool to be removed quickly from work, the part I being thrown out by thumb-screw 3. When the boring-tool is adjusted in device K, the reservoirs *r* and *r'* are filled with sand and water, respectively, and the jar of the machine in operation causes the water and sand to flow out through passages *v v v*, &c., and *v' v' v'*, &c., in the path of the cutting parts, which, acting with the same, grind a circular slot in the stone.

45 We claim as our invention, and desire to secure by Letters Patent, in a stone-working machine—

1. The combination of a vertically and horizontally adjustable frame A, a shaft B, mounted therein and free to rotate or slide longitudinally, a shaft E, to which power is ap-

plied, carrying a gear D in mesh with a gear C, splined to the shaft B, a threaded shaft H, geared to the shaft E, so as to be rotated by the rotation thereof, and a connecting-bar connecting the shaft B with the threaded shaft H, so that longitudinal motion is imparted to the shaft B by the rotation of the shaft H, all substantially as set forth, and for the purposes specified.

2. The combination of the frame A, the shaft B, free to rotate or slide longitudinally in the bearings I I', the tool-carrying device K, attached thereto, a gear C, splined to shaft B and arranged to rotate therewith, and through which shaft B is free to slide, a gear D in mesh with gear C and attached to shaft E, to which power is applied, a threaded shaft H, adapted to be rotated by gear D, and a cross-bar L, arranged to slide on a guide-shaft G and connecting the shaft B with the threaded shaft H, so that a longitudinal motion is imparted to shaft B by rotation of shaft H, the shaft B being left free to rotate, all substantially as set forth, and for the purposes specified.

3. The combination, with a frame and shaft mounted therein and adapted to receive rotary and longitudinal motion, of concentric cylinders adapted to be secured to said shaft and closed at one end to form reservoirs adapted to carry, respectively, sand and water, cutting parts extending below the bottom of said reservoirs, and passages arranged to discharge the sand and water therefrom in the path of the cutting parts, all substantially as set forth, and for the purposes specified.

4. A rotary boring-tool consisting of concentric cylinders secured to a central shaft and closed at one end to form reservoirs adapted to carry, respectively, sand and water, cutting parts extending below the bottom of said reservoirs, and passages arranged to discharge the sand and water therefrom in the path of the cutting parts as the tool is rotated, all substantially as set forth, and for the purposes specified.

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ERASTUS E. WINKLEY.

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