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H. WICKHAM, Jr.

Grinding-Machine.

No. 196,063. Patented Oct. 9, 1877.

Fig. 1

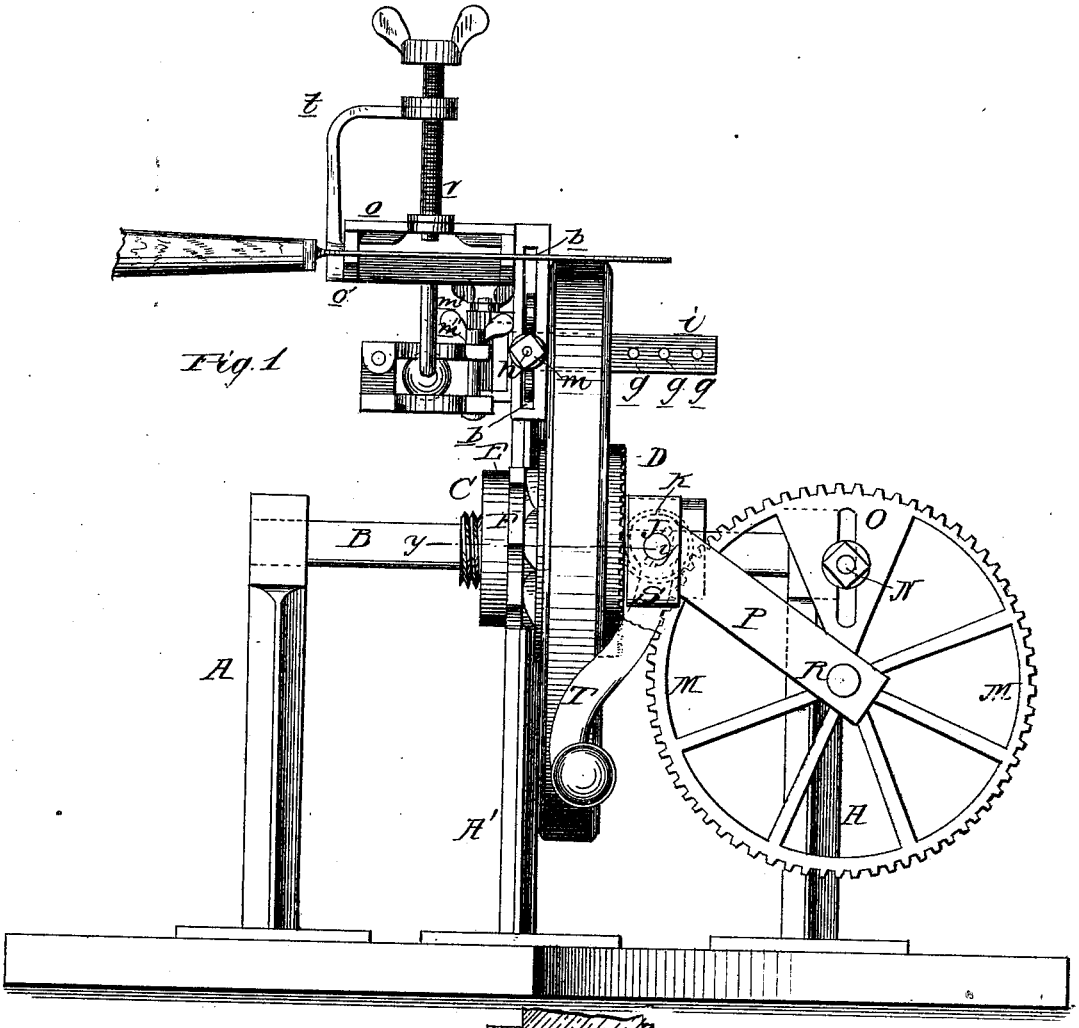

Fig. 3.

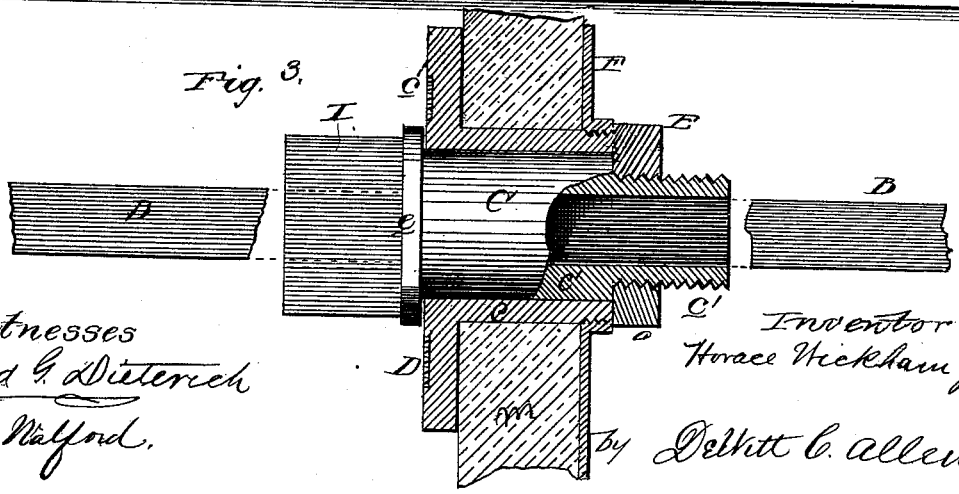

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Fig. 15

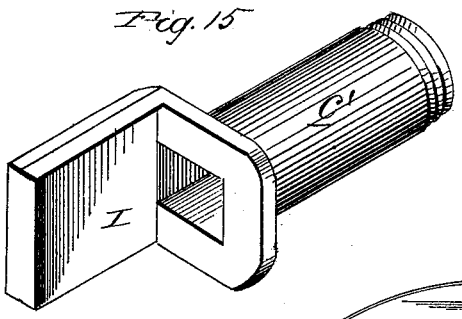

Fig. 16.

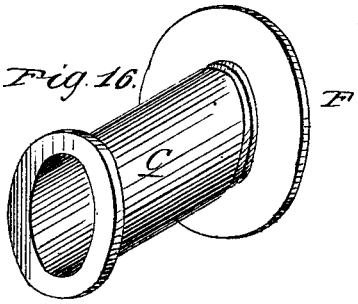

Fig. 2.

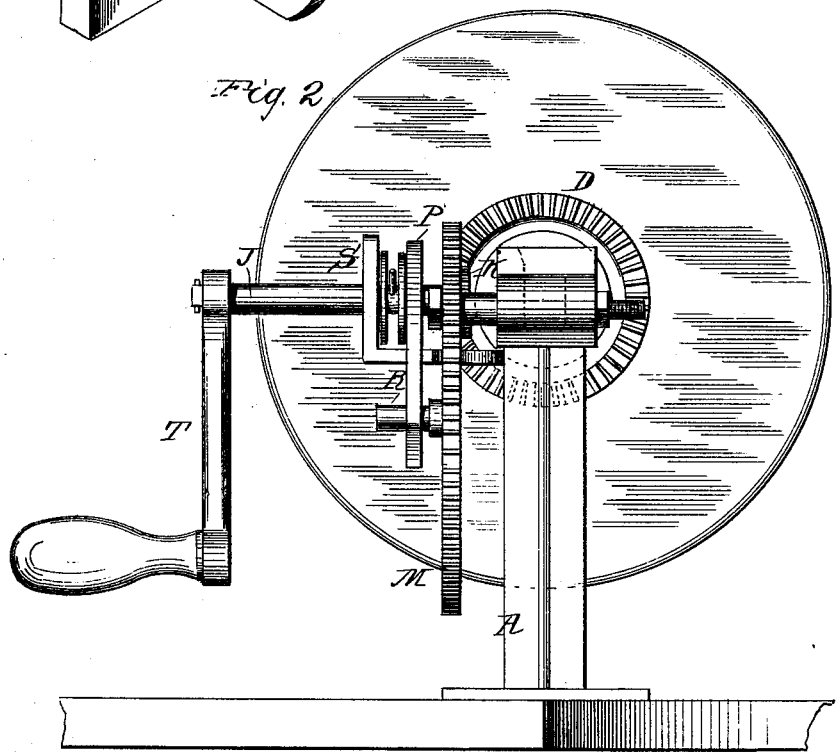

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Fig. 4.

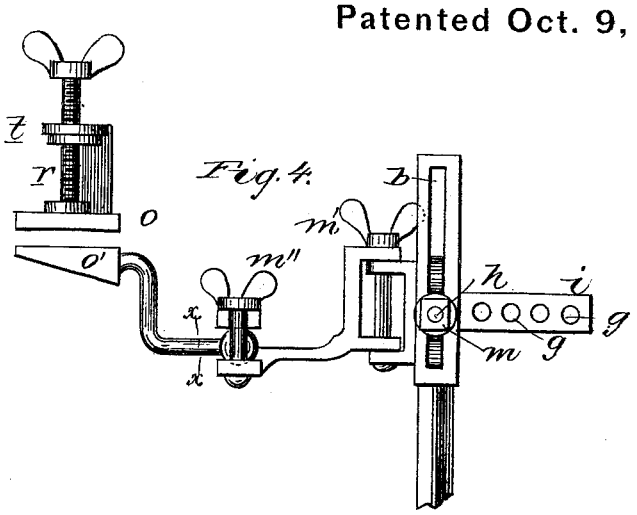

Fig. 5

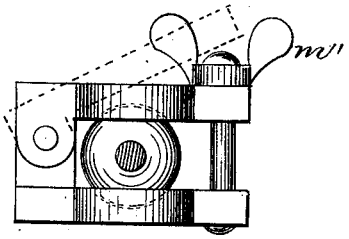

Fig. 6

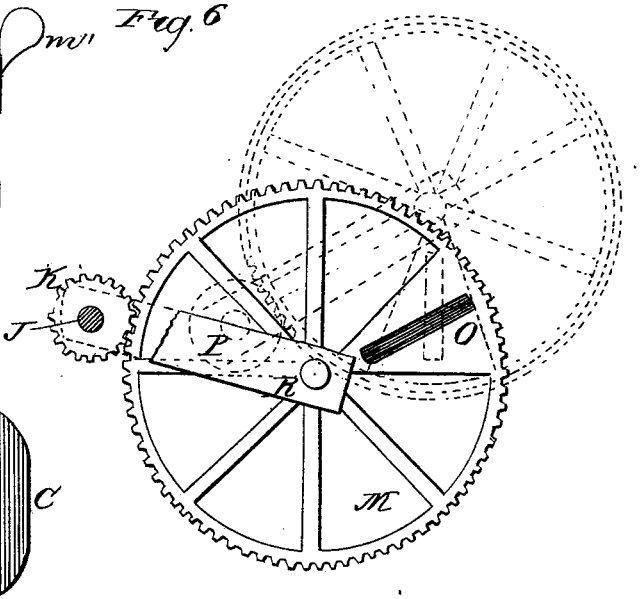

Fig. 7

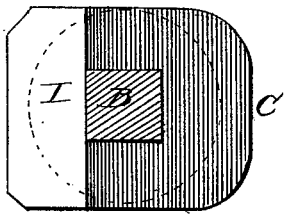

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Fig. 8

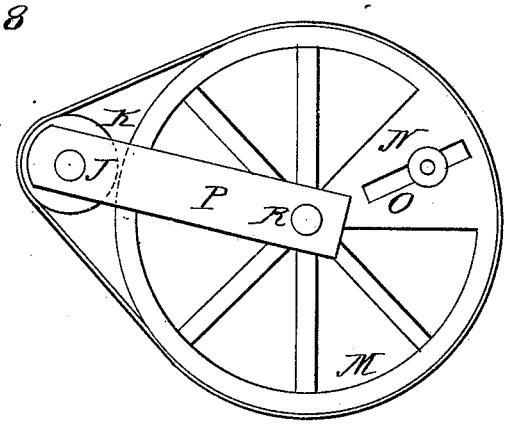


Fig. 10

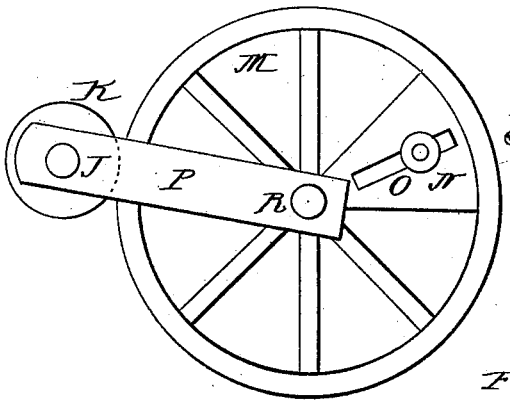


Fig. 9

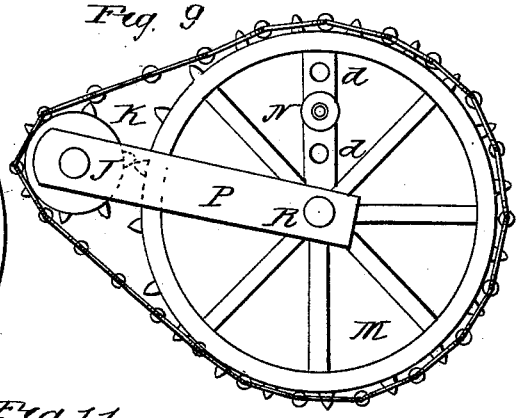
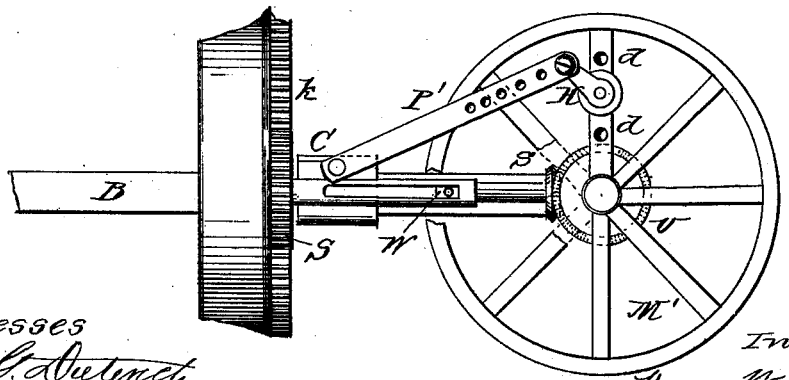


Fig. 11



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Grinding-Machine.

No. 196,063. Patented Oct. 9, 1877.

Fig. 12

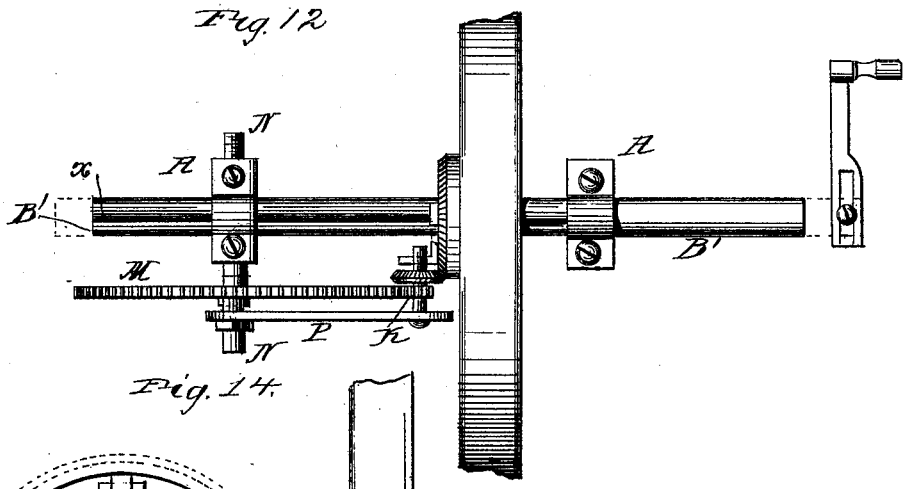


Fig. 14.

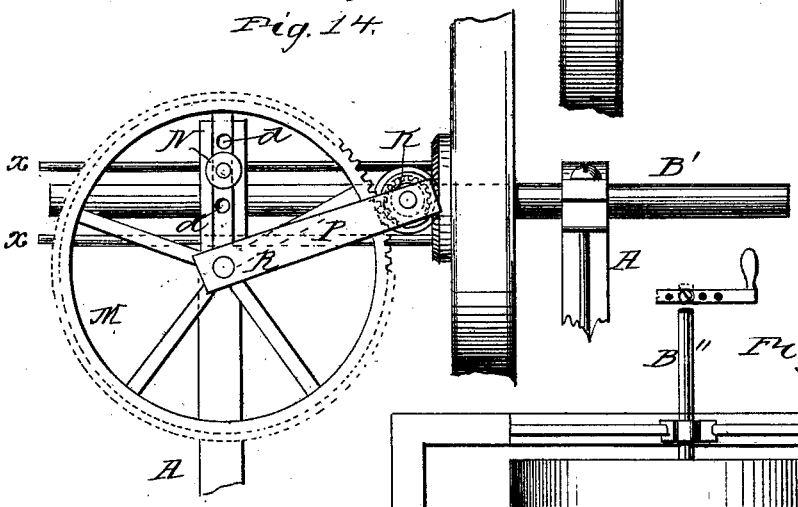
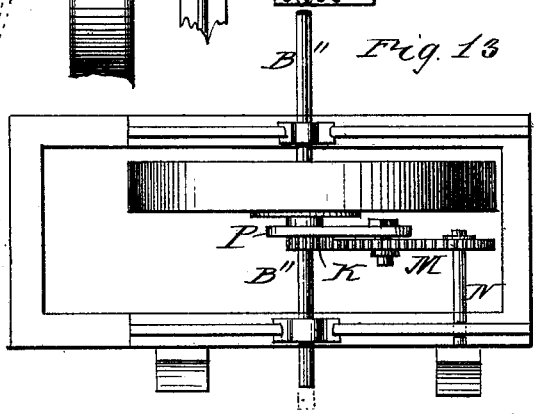


Fig. 13



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UNITED STATES PATENT OFFICE.

HORACE WICKHAM, JR., OF WAUKEGAN, ILLINOIS.

IMPROVEMENT IN GRINDING-MACHINES.

Specification forming part of Letters Patent No. **196,063,** dated October 9, 1877; application filed September 26, 1877.

To all whom it may concern:

Be it known that I, HORACE WICKHAM, Jr., of Waukegan, county of Lake, State of Illinois, have invented a new Grinding or Polishing Machine, which invention is fully set forth in the following specification and accompanying drawings.

The object of my invention is to furnish an automatic grinding or polishing machine of different sizes and shapes for all purposes where the same can be used; and consists of different devices and ways of using and applying said devices to grindstones, emery-wheels, tools, and other kinds of polishing implements and wheels or other articles made use of in grinding, polishing, or sharpening, all of which will be hereinafter more fully set forth and described.

Referring to the accompanying drawings, Figure 1, front view or elevation; Fig. 2, side view or elevation; Fig. 3, section on line *y y*, Fig. 1; Fig. 4, side view of tool-holder; Fig. 5, section on line *x x*, Fig. 4; Fig. 6, detached view of wheel M, pinion K, and connecting-rod P; Fig. 7, end view of part *c'*, Fig. 3. Figs. 8, 9, 10, 11, 12, 13, and 14 are modifications.

In the drawings, A A represent the standards for supporting the ends of axial shaft B, (or any other kind of supports or frame-work can be used instead.) The said axial shaft B can be made in any desired form, and is secured in said standards in such manner as to allow of a combined rotary and reciprocating motion on axial shaft B, as clearly shown in Figs. 13 and 14, or in a stationary manner, as shown in Fig. 1. C represents the grindstone or emery-wheel holder, made in two parts, *c c'*, as shown in Figs. 15 and 16. The outer part, *c*, has a wheel, D, either loose or cast upon one end thereof, and a threaded binding-nut, E, upon the other end, between which a grindstone or emery-wheel is rigidly secured by tightening the nut E. That part, *c*, of the holder between the wheel D and nut F can be externally of any desired form. The part *c* also has a round opening through its length to admit the part *c'*, around which it revolves. A shoulder, *e*, upon one end and a nut, E, upon the other keep the part *c* in its place, but free to revolve. The part *c'* has an opening through its length corresponding to the size and shape of the shaft used, but fitting loosely enough upon the shaft to allow of its traveling back and forth thereon without side play. Upon one end of part *c'* is a projecting arm or lug, I, which answers as a bearing for one end of shaft J. A pinion or wheel, K, upon the shaft J meshes into the wheel D. The wheel K also meshes into an eccentrically pivoted wheel, M. Said wheel M is provided with a slot, O, Fig. 1, or one or more holes, *d d d d*, Fig. 14, for the purpose of changing the crank-motion of said wheel M, and, as an obvious result, giving a more or less reciprocating movement to the grindstone or emery-wheel and holder C, according to the length of the article being ground or polished. The shaft N of the eccentric-wheel M is supported by the standard A, or a frame-work, as desired. One end of the shaft N passes through the slot O or holes *d* of wheel M, and has a binding-nut, *b*, to keep the wheel M in its place.

The connecting-rod P is loosely connected to the shaft J and to the arm R, projecting from the center of wheel M. The connecting-rod P is for the purpose of keeping the eccentric-wheel M and pinion K in mesh, and giving a reciprocating movement to the grindstone. The outer end of shaft J is supported by the projecting arm S, which projects from the lug I. The handle T is connected to the outer end of shaft J, Figs. 1 and 2.

When power is used it can be applied to shafts B' B'' N J. The eccentrically-pivoted wheel M and pinion or wheel K can and are to transmit power and motion from one to the other, and to any connecting parts, by means of gear-teeth, Fig. 6, endless belt or belts, Fig. 8, endless chain or chains, Fig. 9, or by friction, Fig. 10, as may be desired.

A grindstone or emery-wheel can be hung at any angle or parallel with the shafts B B' B'', or in any manner so that a rotary or a reciprocating motion, or both, can be given to them and their connecting parts. A rotary movement can be had alone by throwing the eccentrically-pivoted wheel M out of gear and binding the part *c'* to the shaft B by means of a pin, set-screw, or in any other manner. The shaft B can also be made only to revolve by any suitable means that will keep the shaft from moving endwise.

The standard A′ supports one end of the tool or implement holder, Fig. 4. The standard A′ has two slots, *b b*, through which a bolt, *h*, passes. The bolt *h* also passes through the holes *g g* in the projecting arms *i i* of the rear end of the holder, Fig. 4, and supports the same in any position it may be placed between the slots *b b*, and is held in such position by means of the clamping-nut *m*. The tool-holder, Fig. 4, is made in three or more (or less) parts, and jointed together, the joints being made rigid or flexible at will by means of the clamping-nuts *m m′ m″* upon the ends of the bolts used in making the joints. The joints can be either simple, universal, or ball-and-socket, or a combination of each, as is shown in Fig. 4. The parts forming the holder, Fig. 4, can be made in any shape desired, so as to form joints, the shapes herein shown not being essential. By means of a combination of joints the article to be ground or polished can be brought in any position upon the stone or burr that may be desired or required.

The clamping-jaws *o o′* of the holder, Fig. 4, are opened and closed by means of the screw-bolt *r*, which passes through and is supported by an upward and inwardly projecting arm, *t*. The upper jaw *o* is loosely riveted (or otherwise secured) to the lower end of the screw-bolt *r*, so as not to turn with said bolt *r* when it is being turned in opening or closing the jaws. Any kind of a holder can be used in connection with the other parts of my invention.

I consider the clamping-jaws now used in planing-mills the best adapted to use with my grinder when used for grinding planing-irons, and do now propose to and will so use in my large machines.

I also design giving all kinds of holders or clamping-jaws a reciprocating movement by means of the mechanical movements herein set forth.

Instead of having the large wheel M journaled eccentrically, I can have the wheel M′, Fig. 11, journaled concentrically, and an adjustable connecting-rod, P′, Fig. 11, connected at one end to an adjustable crank-rod, H, Fig. 11, which is arranged eccentrically upon said large wheel M′, Fig. 11, the other end of the connecting-rod P′ being connected to a holder, C, substantially arranged as in Figs. 15 and 16. A self-adjusting double shaft, W, Fig. 11, carrying a gear-wheel, *s*, at each end, meshes respectively with a gear-wheel, U, on the large wheel M′, and the wheel *k* secured to the stone, which will give the same rotary reciprocating movement to said burr or stone, all as clearly shown in Fig. 11.

I design making use of a double-threaded screw-shaft instead of the shaft B when a more positive movement is required in a larger machine than can be obtained by using the plain shaft B.

Operation: The machine being set up, each part in its proper place, the article to be ground or polished is placed between the jaws *o* and *o′* of the holder, Fig. 4, and placed in a proper position upon the stone; then, by turning the crank T, a rotary movement is imparted to the wheel or pinion K, which in turn imparts it to the wheel D, which causes the grindstone to revolve. The pinion K also causes the eccentrically-pivoted wheel M to revolve, and it, by means of the connecting-rod P, gives a reciprocating movement to the grindstone, and thereby causes the grindstone to travel back and forth upon (or under) the article being ground or polished. To change the length of the reciprocating movement, move the eccentrically-pivoted wheel M so that the shaft N is changed from one of the holes *d d d* to another, or slide the wheel M on the shaft N in the slot O. (Shown in Fig. 1.)

The stone is to be kept wet by a water-trough hung under the stone, and moving therewith, or by a drip-cup above or at the side of the stone, also moving therewith.

Having described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of a non-revolving axial shaft, a grinding burr or stone, and a grindstone or burr holder mounted on the axial shaft, permitting both the revolution and the lateral reciprocation of the stone or burr, substantially as set forth.

2. The combination, with a grinding burr or stone and its supporting-shaft, of the eccentrically pivoted or journaled wheel M, pinion or wheel K, and connecting-rod P, substantially as herein shown and described.

3. The combination, with a grinding burr or stone and its supporting-shaft, of the burr or stone clamping and sliding holder *c c′*, substantially as herein shown and described.

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