

E. RIVETT.
GRINDING OR POLISHING MACHINE.

(Application filed Aug. 12, 1897.)

(No Model.)

2 Sheets—Sheet 1.

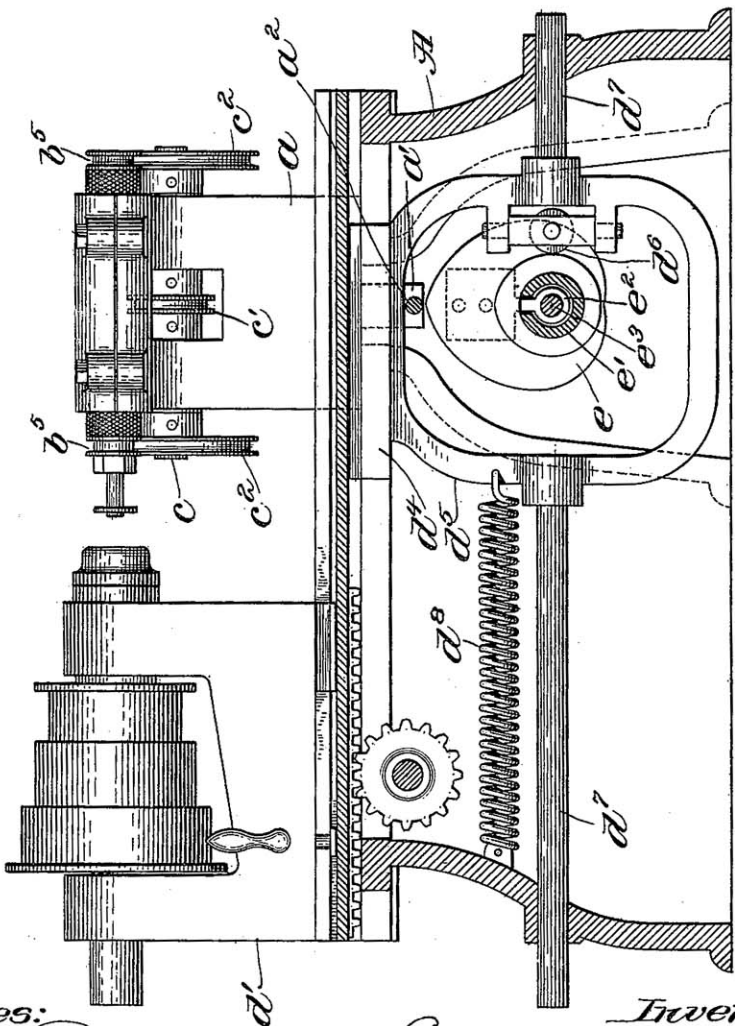


Fig. 1.

Witnesses:
Arthur J. Spudace
Otis Lindquist.

Inventor:
Edward Rivett
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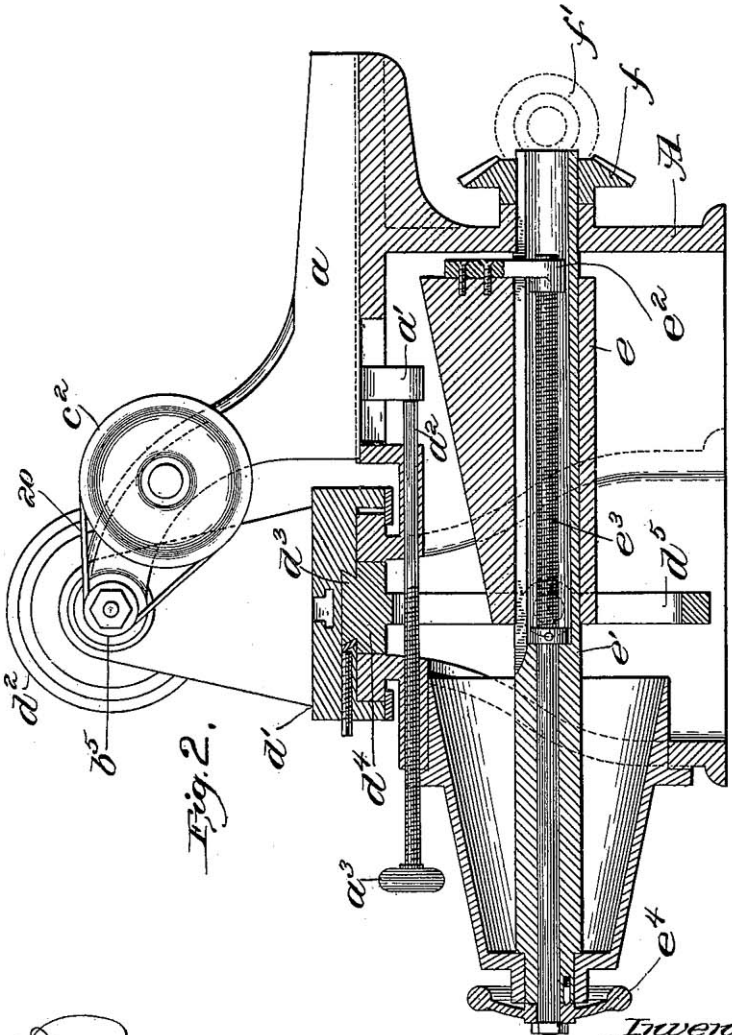


Fig. 2.

Witnesses:

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Inventor:

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Att'y

UNITED STATES PATENT OFFICE.

EDWARD RIVETT, OF BOSTON, MASSACHUSETTS.

GRINDING OR POLISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 623,742, dated April 25, 1899.

Application filed August 12, 1897. Serial No. 647,743. (No model.)

To all whom it may concern:

Be it known that I, EDWARD RIVETT, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Grinding or Polishing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

This invention relates to grinding and polishing machines having a head or spindle carrying the object to be ground or polished and a grinding or polishing tool; and it has for its object to improve the construction of the means employed for reciprocating one of said essential parts of the machine relative to the other—as, for instance, to reciprocate the head or spindle relative to the grinding or polishing tool—and for adjusting the reciprocating device in such manner as to vary the length of travel or extent of reciprocating movement of said head.

In carrying out this invention the reciprocating head has an engaging portion, and a rotating cam is provided upon or against which said engaging portion continuously bears, said cam being adjustable to vary the extent of movement of the head. The cam is made heart-shaped in cross-section and is mounted on a shaft, by means of which it is rotated, and it is made tapering from end to end, thereby giving to it a varying radius, and means are provided for adjusting it along on said shaft, so that any part of it may be brought into position to act upon the engaging portion of the head to thereby reciprocate said head to a greater or less extent, and consequently vary the limits of movement in each direction.

Figure 1 shows in side elevation a longitudinal vertical section of a grinding and polishing machine embodying this invention; Fig. 2, a vertical section of the machine shown in Fig. 1, taken on the dotted line ax .

The main frame A is of suitable shape and construction to support the operating parts.

a represents a frame or head mounted on the frame A and adapted to slide thereon transversely, it having a depending lug or ear a' , which passes through a slot in the frame A and which is engaged by a screw-threaded rod a^2 , having a handpiece a^3 , by which it may be

turned, said rod a^2 turning in the frame A and serving as an adjusting device for the head a . The head a has its upper end formed or provided with a horizontal bearing or support, which is adapted to receive within it a shaft b' and bushings at the ends of said shaft b' .

Each end of the shaft b' is provided with a belt-pulley b^5 , and a driving-shaft c has its bearings in the head a , which has secured to it, at a point substantially midway its length, a driving-pulley c' , and it has also secured to it at its ends driving-pulleys c^2 c^2 , which receive belts 20, which pass around the pulleys b^5 on the shaft b' . The shaft b' is constructed and arranged to serve as a shaft to carry the grinding and polishing tool, and any suitable form or construction of tool may be employed, as an emery-wheel.

The spindle d has its bearings in a head d' , and it has secured to it suitable belt-pulleys d^2 , and said spindle is constructed and arranged to receive and support the part to be ground or polished, and said head d' is mounted upon the frame A and, as herein shown, is adapted to be reciprocated longitudinally or toward and from the grinding and polishing tool.

The head d' is provided on its under side with a dovetailed recess, which receives a dovetailed projection d^3 , formed or provided on a slide d^4 , constructed and arranged to slide back and forth in a slot provided for it in the frame A, and said slide d^4 has depending from it a yoke d^5 , which surrounds or incloses a cam e , secured to or mounted upon a shaft e' , said yoke having a friction-roll d^6 or an equivalent engaging portion, which is in continuous engagement with said cam e . The journals of the friction-roll d^6 are rotatably mounted in an upright support d^{20} , Fig. 1, which is journaled in lateral ears d^{22} , secured to or forming part of the yoke d^5 , whereby the support is adapted to rock on substantially vertical pivots, so that the face of the roll will remain in parallelism and in contact with the surface of the cam e whatever portion of the latter is adjusted to rotate opposite said roll. The yoke has projecting from it, in opposite ways, horizontal rods or bars d^7 d^7 , which slide in bearings for them in the main frame A, and a strong spring d^8 is attached at one end to the frame and at the other end to said yoke,

which serves as a means for continuously holding the yoke in engagement with the cam.

The cam *e* is made heart-shaped in cross-section and tapering from end to end, and it is mounted upon a hollow shaft *e'*, and it has secured to it—as at one end, for instance—a projection *e²*, which enters a slot formed or provided in said shaft *e*, said projection having a screw-threaded hole through it which receives the screw-threaded end *e³* of a rod which passes axially through the shaft *e'*, said rod having an end piece or hand-wheel *e⁴*, by means of which it may be turned. As said rod, with its screw-threaded end *e³*, is turned the tapering heart-shaped cam *e* will be adjusted longitudinally along on the shaft *e'*, upon which it is mounted, and the roll *d⁶* on the yoke *d⁵* will engage it at different points, according to the relative positions of said cam and yoke.

The shaft *e'* has secured to its rear end a beveled gear *f*, which is engaged by a beveled gear *f'*, which may be turned by any power-driven shaft to in turn rotate the cam-shaft *e'*.

It will be seen that as the cam-shaft *e'* revolves the cam *e* will be correspondingly turned, and by its engagement with the yoke depending from the head *d'* or other engaging portion said head will be moved at a constant speed toward and from the tool-carrying shaft *b'* and that as the cam is adjusted along on the shaft supporting it the stroke or extent of movement of said head may be varied—that is to say, it may be more or less.

The head *d'* is connected with or locked to the slide *d³* by a set-screw 30, so that said head may be connected to said slide at different points and may be quickly disconnected at any time to be moved independently of the slide to test the work or for any other purpose.

In order to effect a uniform reciprocation of the moving part affected by the cam, the latter must be of a true heart shape in cross-section and made tapering from end to end, so that any cross-section of the cam will be

of similar shape to any other, and unless the cam is truly heart-shaped, as in the present case, the periods of reversal of the part to be reciprocated will be indefinite and irregular.

I claim—

1. In a grinding or polishing machine, a tool-carrying shaft, a work-holding spindle, and means for reciprocating one of said parts relatively to the other, said means comprising a rotatable heart-shaped cam made tapering from end to end, and an engaging member mounted to rock on the reciprocating part to thereby continuously bear upon or against said cam and in parallelism with its surface.

2. The revolving heart-shaped cam made tapering from end to end, combined with a part to be reciprocated, a roll thereon in continuous engagement with the surface of the cam, and means for adjusting said cam and the part to be reciprocated one relatively to the other in the direction of the longitudinal axis of the cam to vary the extent of reciprocating movement, substantially as described.

3. In a grinding or polishing machine, a longitudinally-slotted main frame, a slide movable thereon, a tool-shaft, a work-holding spindle, one of said parts being movable with the slide, a yoke depending from the latter and provided with bars extended in the direction of travel of the slide, bearings in which said bars move and are supported, a rotatable tapering heart cam mounted in and at right angles to the yoke, means to adjust the position of said cam, a roll on the yoke, mounted to rock in upright pivots thereon to thereby be maintained continuously in engagement with the cam-surface, and a spring to maintain the roll and one side of the yoke pressed toward the cam, substantially as described.

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

EDWARD RIVETT.

Witnesses:

B. J. NOYES,
ARTHUR F. RANDALL.