

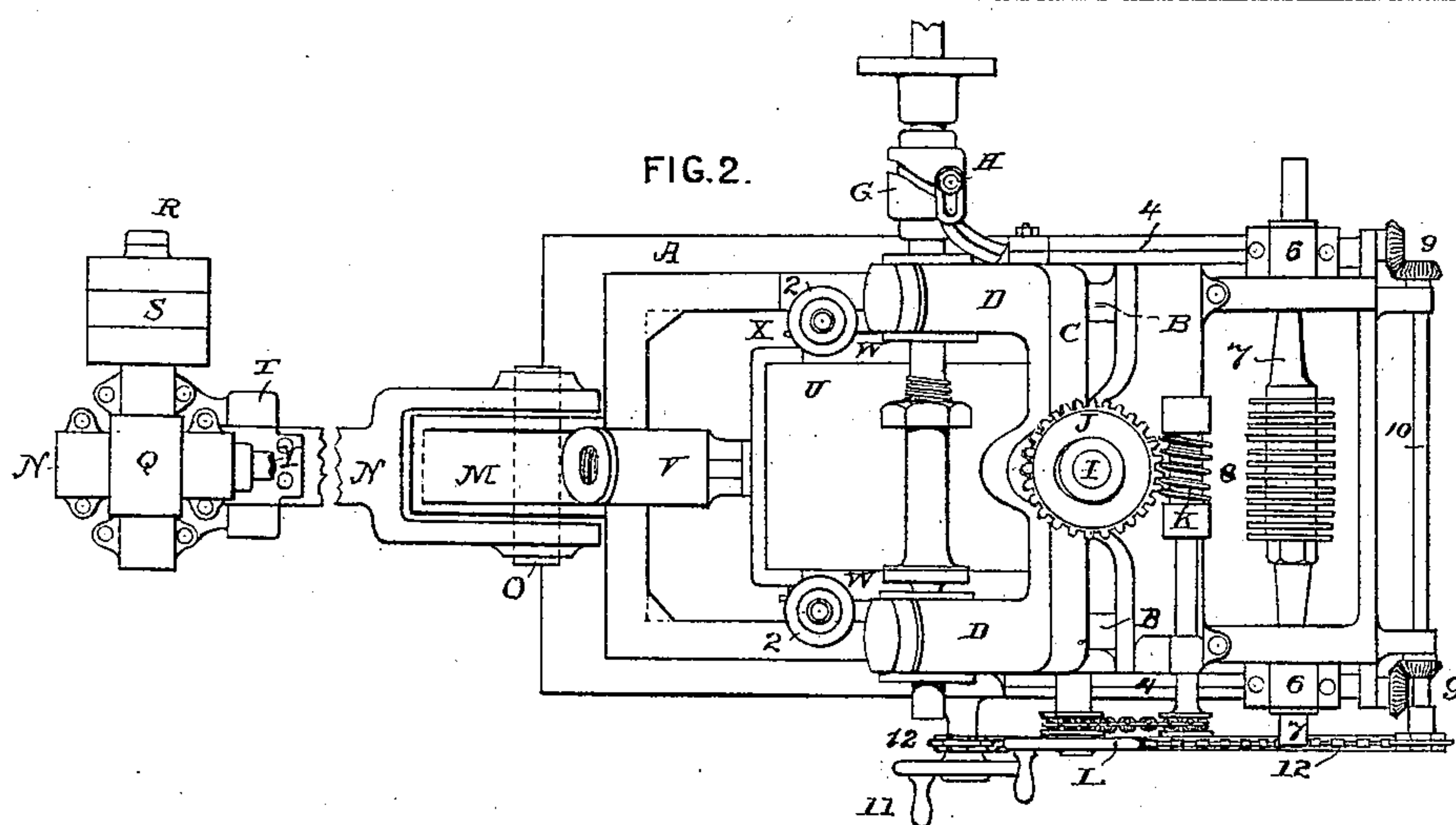
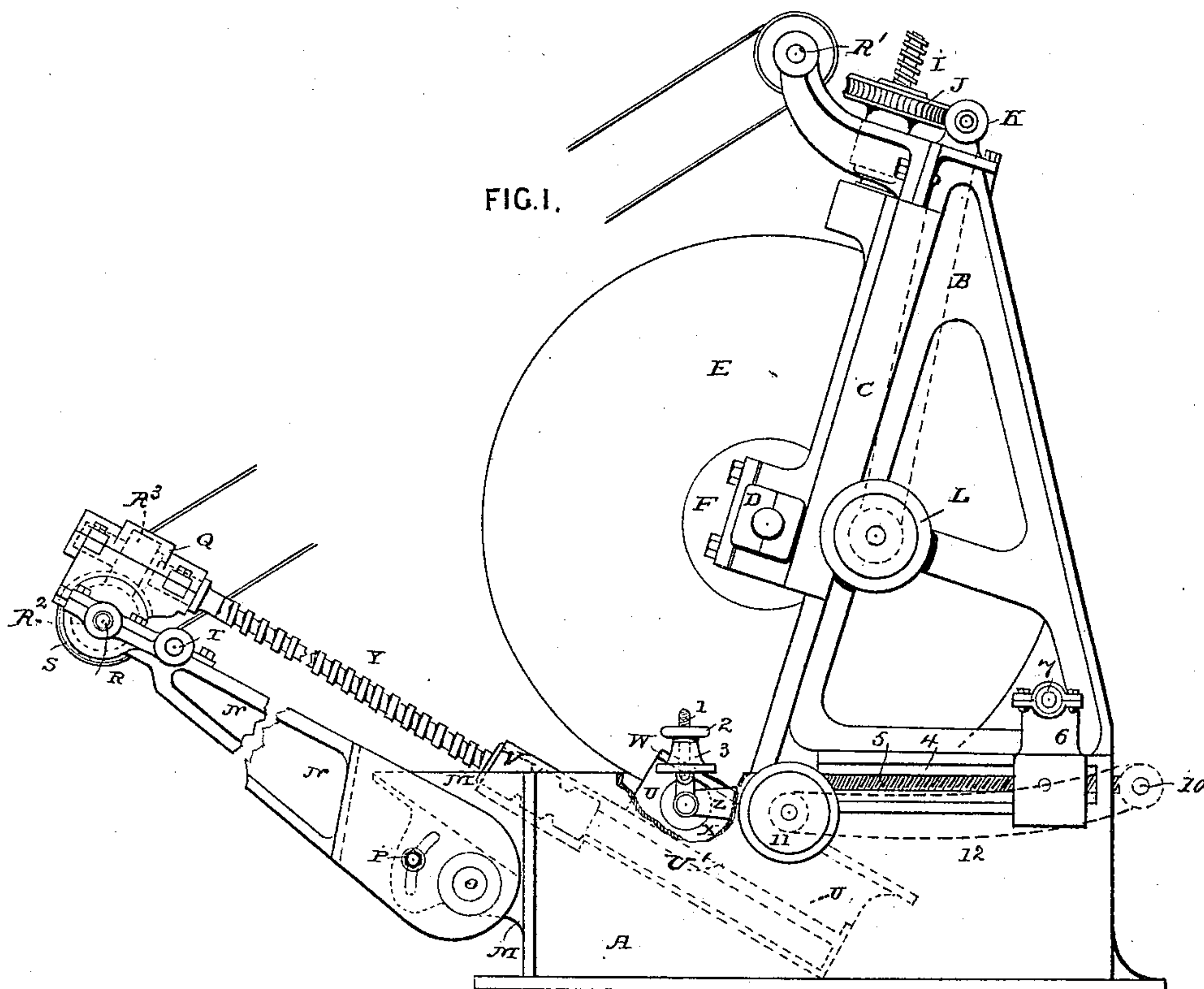
(No Model.)

3 Sheets—Sheet 1.

D. ASHTON.
GRINDING MACHINE.

No. 451,192.

Patented Apr. 28, 1891.



Witnesses

H. A. Lamb
Geo. M. Whitney.

Inventor,

DAVID ASHTON,

By his Attorney

Francis Forbes,

(No Model.)

3 Sheets—Sheet 2.

D. ASHTON.
GRINDING MACHINE.

No. 451,192.

Patented Apr. 28, 1891.

FIG. 3.

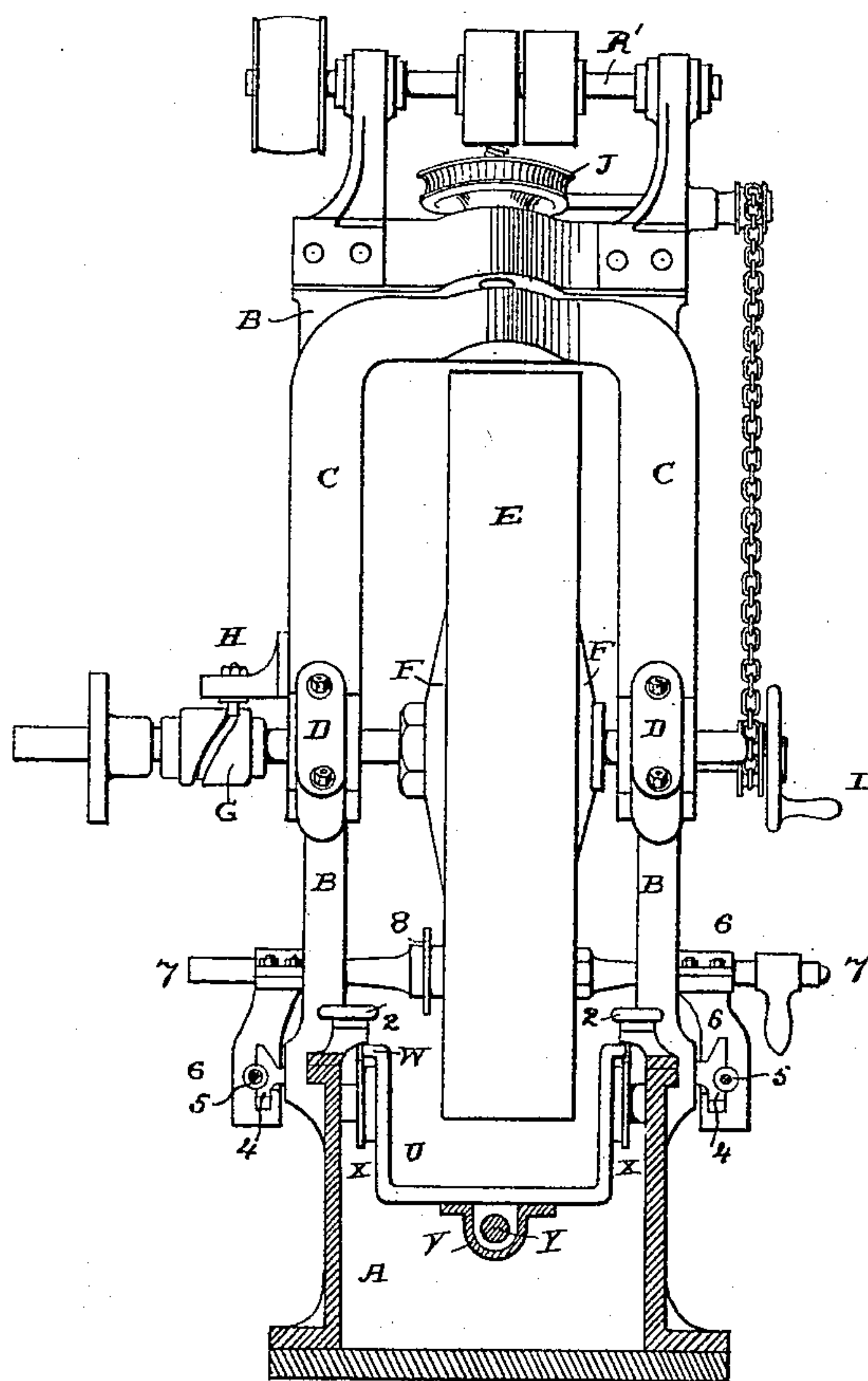
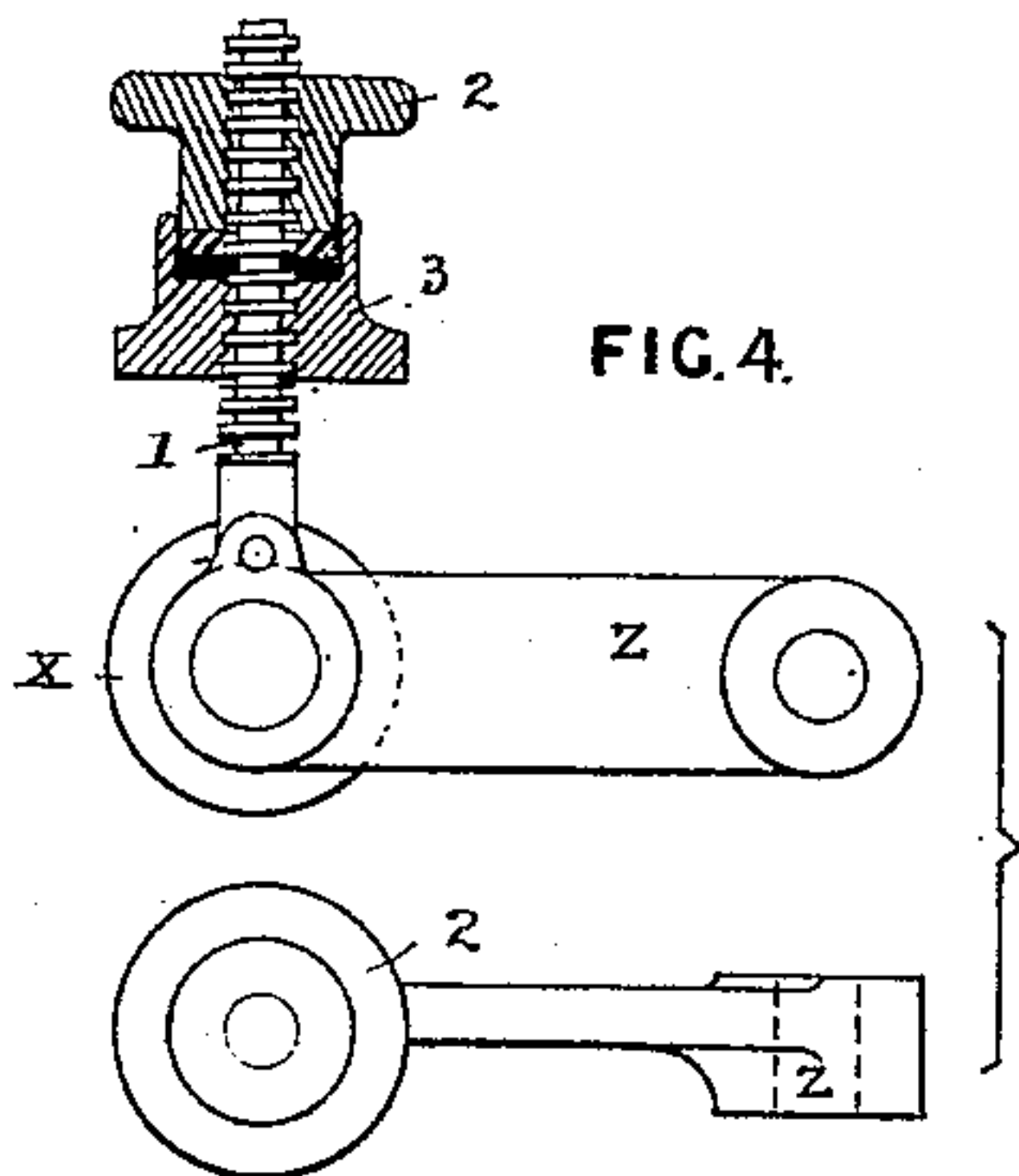


FIG. 4.



Witnesses
H. A. Lamb
Geo. M. Whitney.

Inventor.
DAVID ASHTON,
By his Attorney
Francis Forbes &

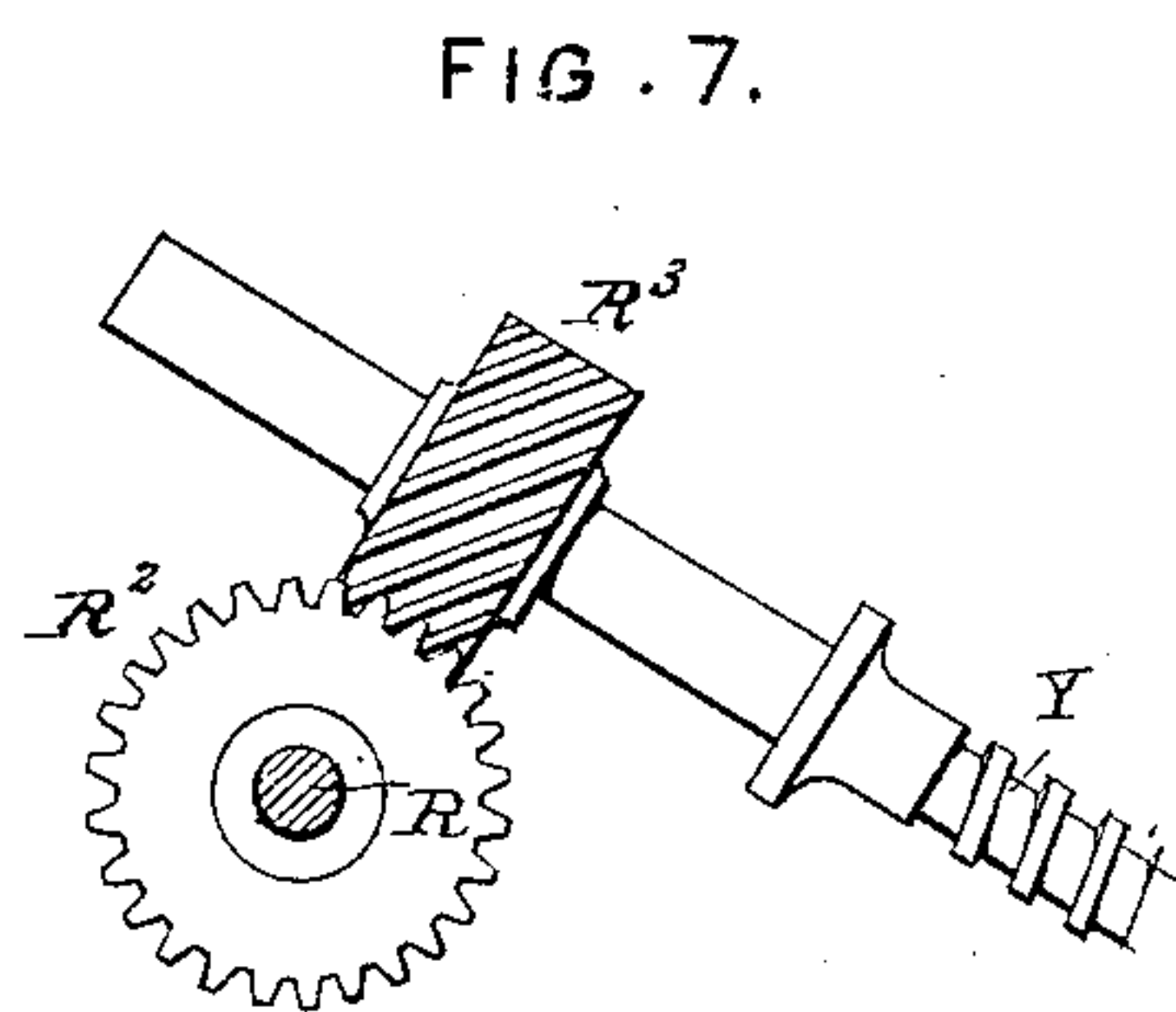
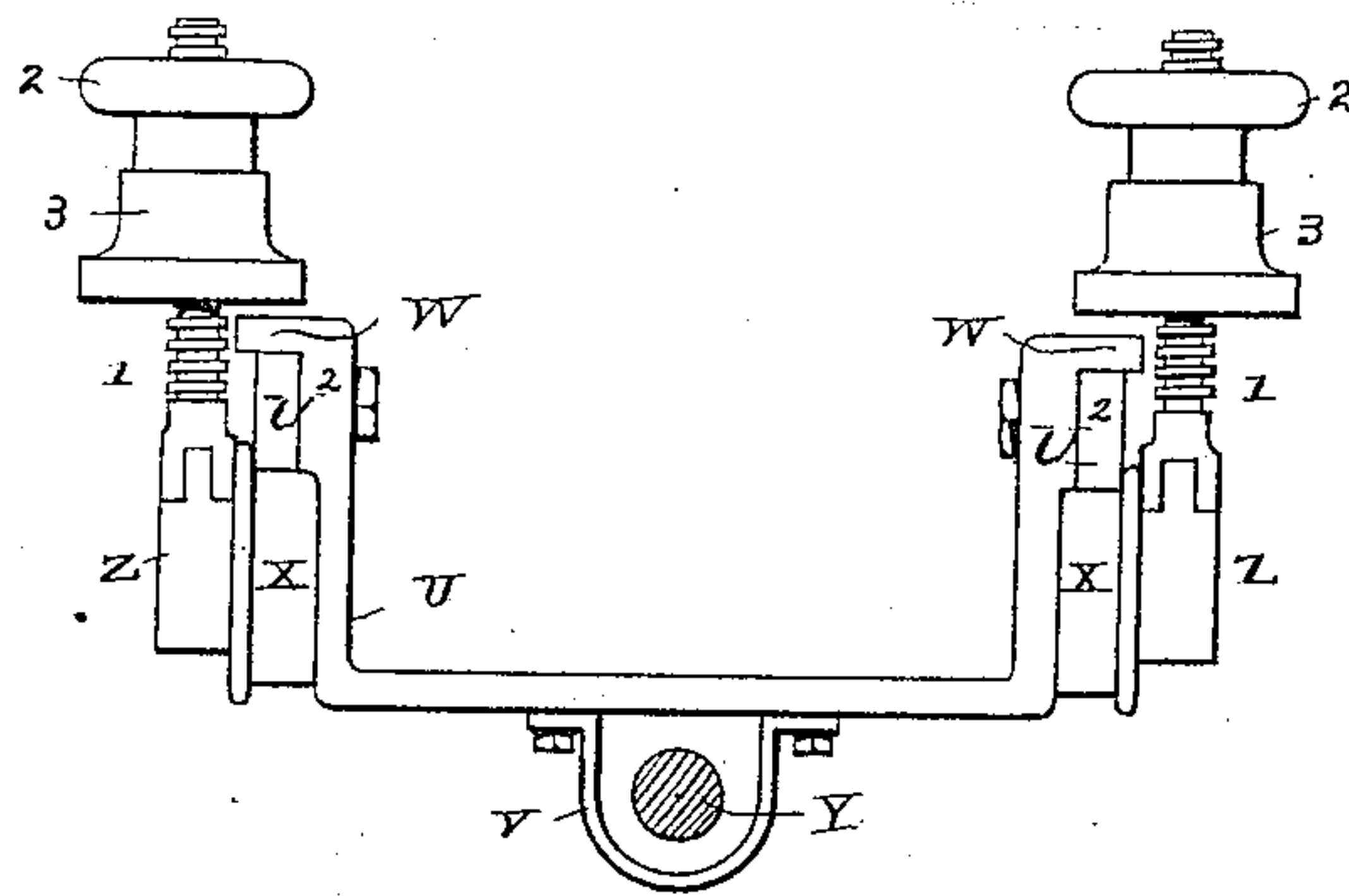
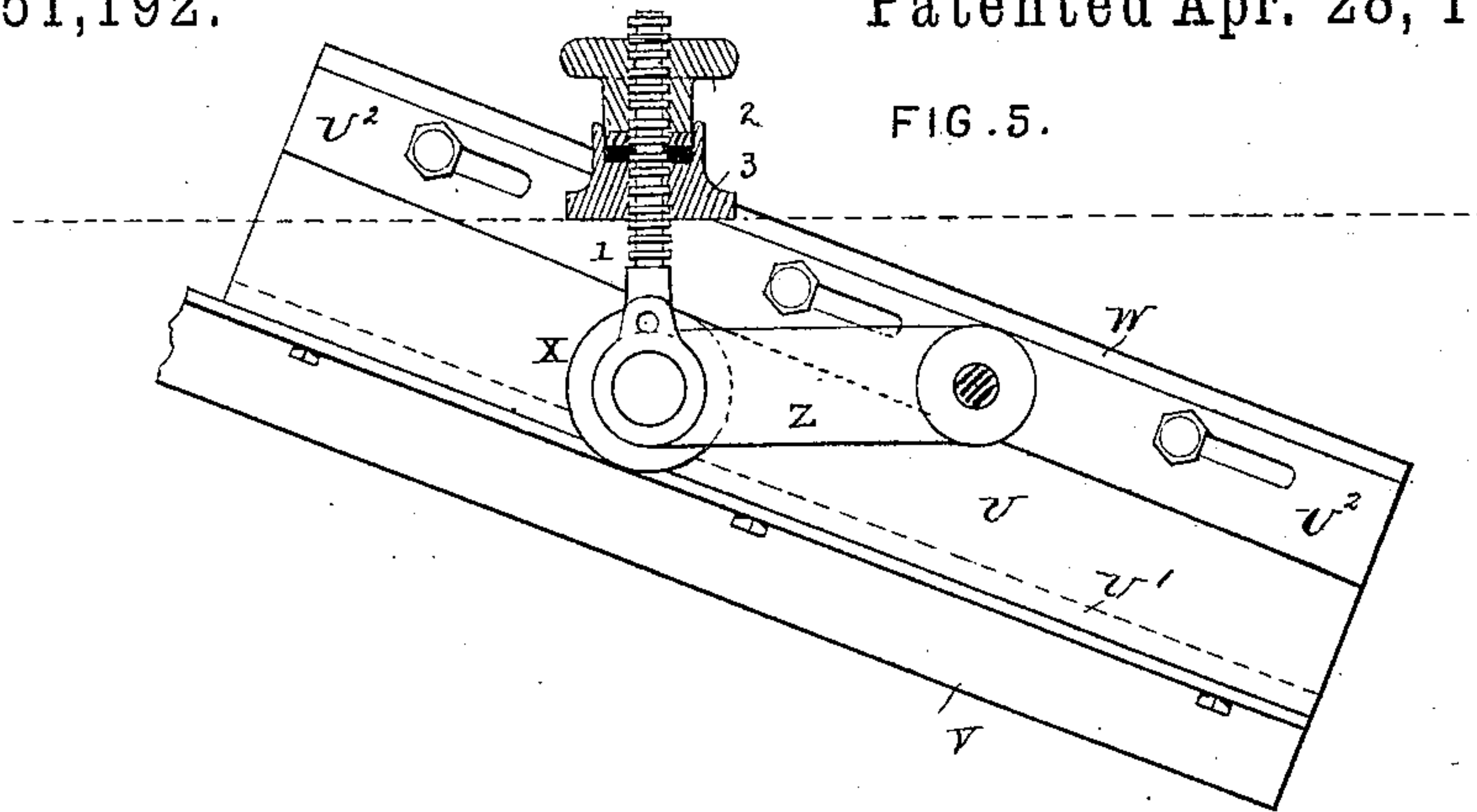
(No Model.)

3 Sheets—Sheet 3.

D. ASHTON.
GRINDING MACHINE.

No. 451,192.

Patented Apr. 28, 1891.



Witnesses

H. A. Lamb
Geo. M. Whitney.

Inventor.

DAVID ASHTON,

By his Attorney

Francis Forbes

UNITED STATES PATENT OFFICE.

DAVID ASHTON, OF SHEFFIELD, ENGLAND.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 451,192, dated April 28, 1891.

Application filed May 22, 1889. Serial No. 311,654. (No model.) Patented in England December 13, 1888, No. 18,196.

To all whom it may concern:

Be it known that I, DAVID ASHTON, engineer, a subject of the Queen of Great Britain and Ireland, and a resident of Sheffield, in the county of York, England, have invented certain new and useful Improvements in Grinding-Machines, (patented to me in Great Britain by Letters Patent No. 18,196, dated December 13, 1888;) and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention is for a machine of improved construction and superior grinding or abrasive powers for grinding files, machine-cutters, and other similar articles having flat, curved, or irregular surfaces, the grinding medium being either the ordinary grindstone, an emery-wheel, or the like.

The machine is represented in the annexed sheets of drawings.

Figure 1 is a side elevation of the machine; Fig. 2, a plan of same. Fig. 3 is a front elevation of the machine, partly in section; Fig. 4, an enlarged sectional detail of one of the table-supports, showing side and top views; Figs. 5 and 6, side and end views of the table and its supports detached, and Fig. 7 a detail of the gearing.

The machine consists of a strong cast-iron trough A, flanged at the top and bottom edges, and supporting two standards B, the front faces of which incline backward at a suitable angle to form a support and slideway for a sliding saddle or head-stock C, provided with two bearings D at its lower end to carry the axle of the grindstone E, (omitted in Fig. 2,) which is secured in position by screwing it between metal plates F in the usual manner between the bearings D.

Upon one end of the axle of the stone E, outside the standard, I fix a cam G, the groove of which engages with a finger or stud H, so that when the axle revolves a reciprocating movement is imparted to the axle and the stone. This prevents the face of the stone wearing in grooves or ridges or like irregularities and keeps the face of the stone true, level, and smooth.

The saddle C, with the grindstone E, which

it supports upon its axle, can be either raised or lowered upon the inclined faces of the standards B by means of a centrally-placed screw I, fixed to the top of said saddle and passing through the screwed boss of a worm-wheel J, working in the cross-head, which connects the tops of the two standards B. The worm-wheel J is operated by a worm K, which is rotated by means of a chain driven by a conveniently-placed hand-wheel L. This arrangement enables the attendant to adjust the grindstone in position as it becomes smaller in diameter by wear or when a new stone is put into the apparatus.

Upon the front end of the trough A, I fix a movable bracket M, forming a continuation of the top part of the trough and carrying a long arm N, supported on the joint-pin O, upon which it can be raised and lowered, and it can be also fixed at any desired point by means of the nut P, Fig. 1.

On the front end of the arm N, I fix a box-bearing Q, which forms a support for one end of the screw Y, and also carries a pair of skew-wheels R^2 R^3 , Figs. 1 and 7, one of which is fixed upon the screw Y and its companion upon the driving-shaft R, upon which shaft are also fixed a set of reversing pulleys S, similar to those of a planing-machine, and these I prefer to drive from a counter-shaft R' , the brackets of which are fixed to the top of the standards B, thus making the machine self-contained.

The box-bearing Q is carried upon a joint T, which may be fixed rigidly or may be allowed to move with the rise and fall of the grinding-table U, to which the other end of the screw is attached by engaging with the screw-box V, which forms part of the grinding table. The said table is constructed with side plates rising above the face of the table upon which the work to be ground is placed, which is indicated by the dotted line U' in Figs. 1 and 5, and the top edges of the said sides project or overhang outward at W, and are provided with slots or other means by which any suitably-shaped templets, shapers, or paths U^2 , Figs. 5 and 6, may be secured underneath the said overhanging edges and be readily fixed and adjusted in position. These templets are made of the desired curve, taper,

or other configuration that it is desired the article on the table should correspond with. The overhanging edges W of the table U on said templets beneath them rest upon and
 5 are supported by two rollers X, one on each side, and the table can be drawn to and fro upon the said rollers, according as the screw Y is caused to revolve in one direction or the other by the action of the pulley S, this alter-
 10 nate motion being produced by the ordinary belt-reversing action as used on metal-planing machines or other belt-reversing action worked by the traveling table U. The said rollers X are carried by swing brackets or
 15 arms Z, one end being pivoted to the side of the trough A and the other or loose end, to which the roller is fixed, being supported by an adjusting-screw 1, passing through the threaded boss or hand-wheel 2, which rests
 20 upon an elastic bed or cushion let into the support 3, this arrangement being to avoid rigidity between the stone and the article to be ground. The rollers X are preferably situated so that a line drawn from their cen-
 25 ters to the center of the stone E will be parallel with the face of the standards B. This arrangement is to give support to the articles to be ground directly under the point of contact between the stone and the article being
 30 ground.

The articles to be ground may in some cases be simply laid on the table U; but small articles may be held on plates or placed on trays laid on the table, or other suitable
 35 means may be employed, according to the shape or size of the article, as this arrangement forms no part of this invention. The operation of grinding takes place under the surface of the water, and the water being con-
 40 stantly kept in motion by the movement of the table, the grit or sand held in suspension in the water aids materially in the operation of grinding.

To enable the face of the stone to be dressed
 45 and kept true and square with the face of the table U, I arrange a slide-bed 4 on each side

of the trough, provided with traversing screws 5 and traveling supports 6, carrying a cross-shaft 7, on which are fixed a number of circular toothed hackers 8, forming a milling- 50 tool.

The traversing screws 5 are connected by bevel-wheels 9 and cross-shaft 10, and can be operated by means of a hand-wheel 11 and machine-chain 12; but I do not claim the use 55 of a circular hacker, *per se*, as it is at present in use for similar purposes.

Having thus described my improvements in grinding machinery, what I desire to claim is— 60

1. The combination, with the grindstone and means for rotating it, of a trough containing water which immerses the grinding-point of the periphery of the stone, a table within said trough supporting the objects to 65 be ground, and mechanism for moving said table back and forth, and thereby agitating the water to keep the contained grit in suspension, substantially as hereinbefore specified. 70

2. In combination with the grindstone and means for rotating it, a subjacent table, rollers upon which said table is movable back and forth, and elastic supports for said rollers, substantially as hereinbefore specified. 75

3. In combination with the grindstone and means for rotating it, a subjacent table supporting the objects to be ground and supported by a roller on each side thereof, mechanism for reciprocating said table, an arm support- 80 ing said mechanism, and means whereby said arm may be adjusted in a vertical plane, substantially as hereinbefore specified.

In testimony that I claim the foregoing as my own I have affixed hereto my signature, in 85 presence of two witnesses, this 1st day of May, 1889.

DAVID ASHTON.

Witnesses:

ROBT. F. DRURY,
 B. E. DRURY.