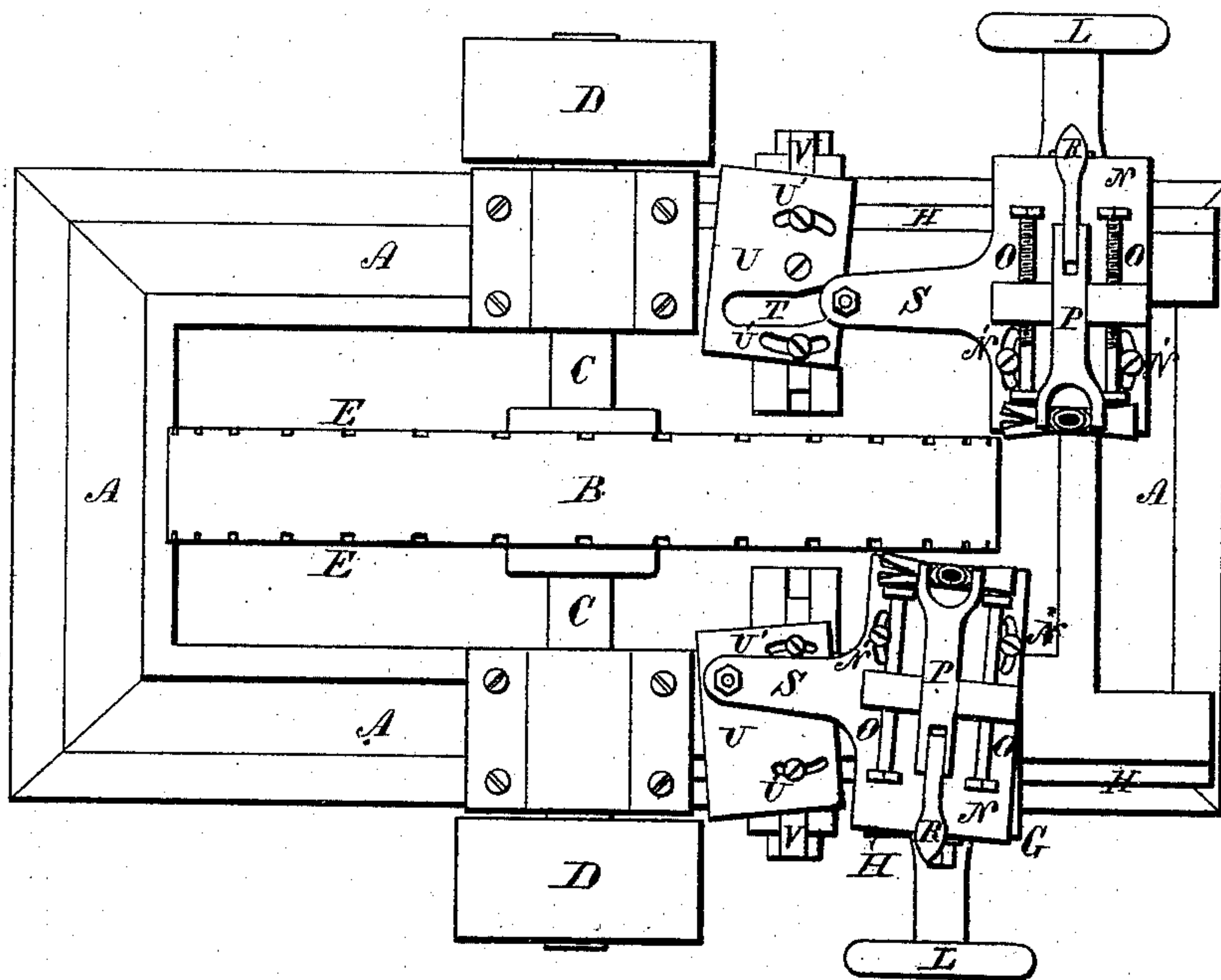


H. HAMMOND.
Grinding Machine.

No. 229,250.

Patented June 29, 1880.

Fig. 1.



Witnesses.

Willard Eddy
Wilmot Horton

Inventor.

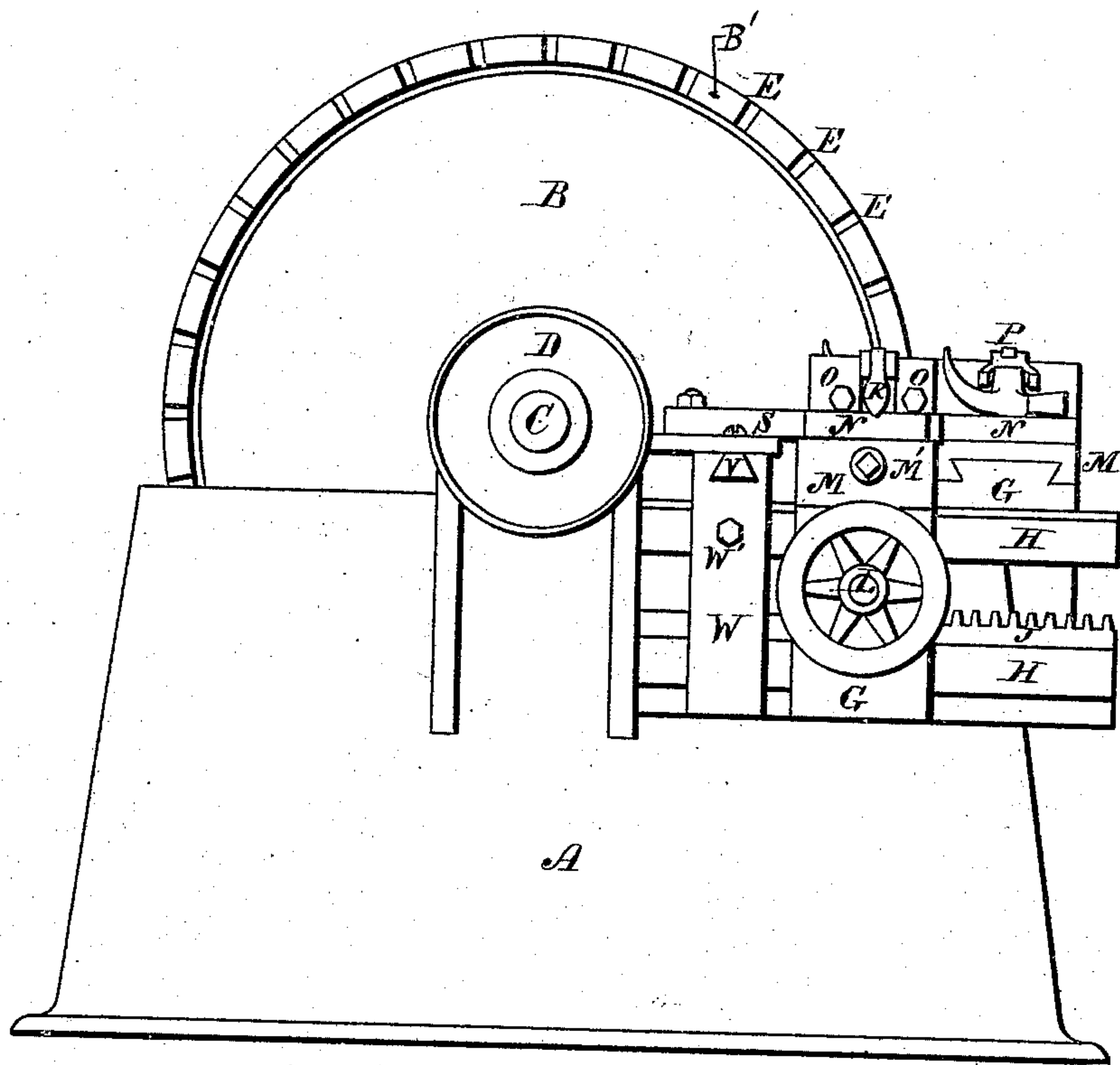
Henry Hammond
by Theo. G. Ellis
Attorney.

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Patented June 29, 1880.

Fig. 2.



Witnesses.

Willard Eddy
Wilmot Horton

Inventor.

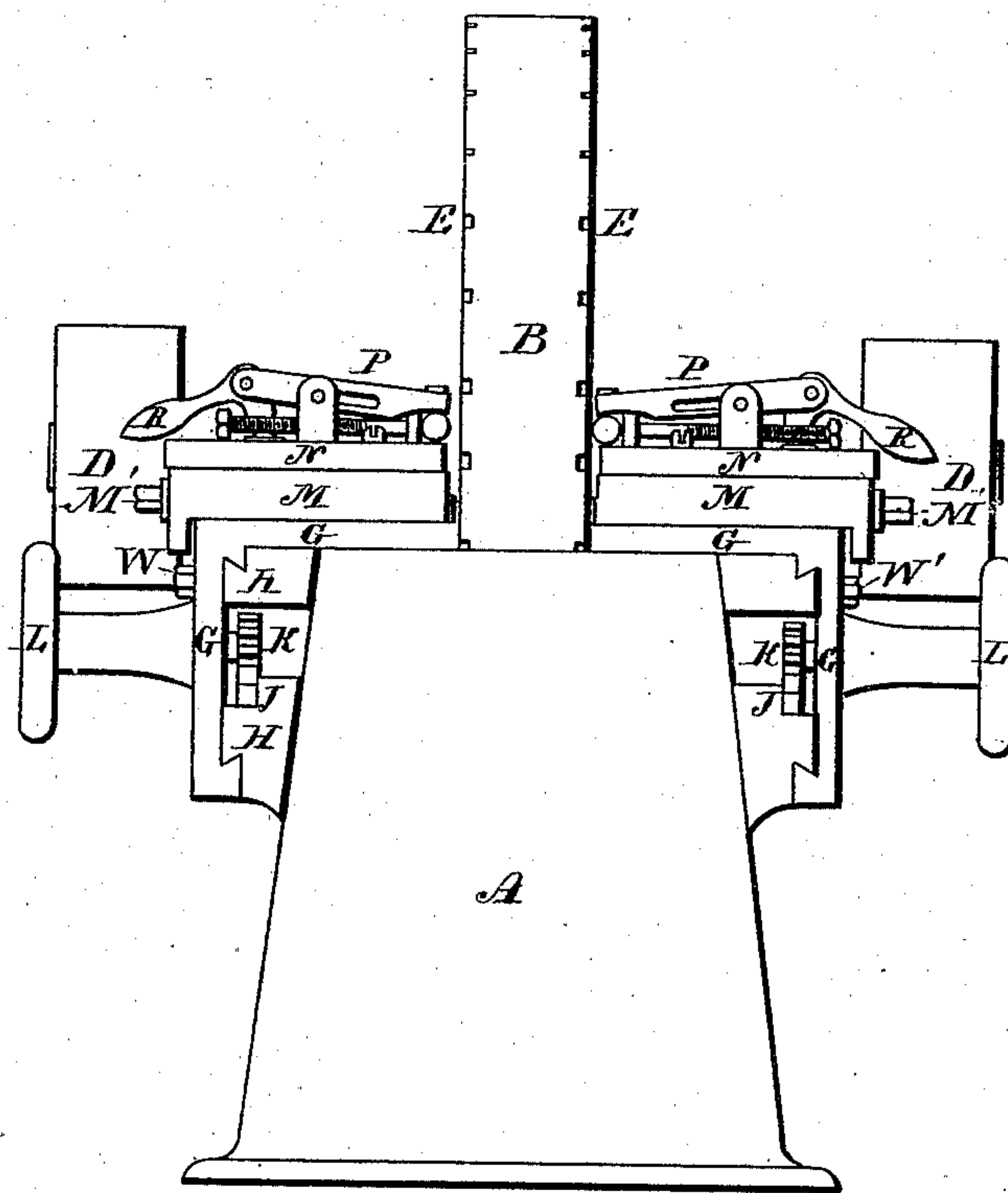
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Fig. 3.



Witnesses.

Willard Eddy.
Wilmot Horton

Inventor.

Henry Hammond
by Theo. G. Ellis
Attorney.

UNITED STATES PATENT OFFICE.

HENRY HAMMOND, OF HARTFORD, CONNECTICUT, ASSIGNOR TO HORACE CORNWALL, OF SAME PLACE.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 229,250, dated June 29, 1880.

Application filed April 13, 1878.

To all whom it may concern:

Be it known that I, HENRY HAMMOND, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Grinding-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My improvements relate to grinding-machines for the purpose of grinding and finishing hammers or other tools, or any such articles as are usually ground or finished upon a grindstone by hand or otherwise.

The object of my invention is to provide a better, quicker, and more economical method of grinding and finishing metallic articles than has heretofore been in use, and to dispense with the skilled manual labor that has heretofore been required to give such articles a uniform and exact shape and finish.

In the accompanying drawings, on three sheets, Figure 1 is a top view of my improved grinding-machine. Fig. 2 is a side view, and Fig. 3 is a front view from the operating end.

A is the frame of the machine, to which the working parts are attached. B is the grinding-wheel, fixed upon the revolving shaft C, resting in bearings on the frame A, and driven by the pulleys D D, one of which is shown at each end of the shaft.

The grinding-wheel B is made of iron. The central portion may be of cast metal; but the rim or working part is preferably made of soft wrought-iron, although steel untempered or soft cast-iron will answer. This rim B' projects at the sides beyond the surface of the wheel, as shown in the drawings. Across the grinding-surface are the grooves or channels E E, &c., shown rectangular in the drawings, which materially aid the grinding and give greater cutting effect to the wheel, although they are not indispensable. Without them the grinding-surface will not act so rapidly and effectively.

The wheel B is intended to have a velocity

of about twenty-five hundred revolutions per minute, or a circumferential velocity of about four hundred feet per second. This velocity may be varied somewhat; but a high speed is necessary to the perfect working of the machine. In order to communicate this rapid motion and obtain sufficient power to drive the wheel, I prefer to use the two driving-pulleys D D, as shown in the drawings.

G is a sliding rest for holding the article to be ground and carrying it along the surface of the grinding-wheel. It moves upon the guides H, and is operated by the rack and pinion J K and the hand-wheel L.

M is a plate resting upon G, and having a motion in a dovetail slide at right angles to the motion given to G by means of the rack and pinion. This plate M is adjustable upon G by means of the screw M'. This is for the purpose of adjusting the top plate of the rest to or from the side of the rim of the grinding-wheel.

N is the top plate of the rest. It swings upon a pivot in M, and is held in its place by means of the clamping-screws N'.

Upon the top plate, N, are the gage-screws O O, for adjusting the position of the object to be ground, so that a succession of similar pieces can be placed in exactly the same place and be ground in the same way. These gage-screws pass through a raised rib in the top plate, which is furnished with corresponding nuts for the screws. The top plate is also furnished with a lever, P, for clamping the object to be ground to the plate and holding it firmly while being ground. This lever is supported upon an axis in the rib upon the plate N, and is provided at the end opposite to the object held with a cam-lever, R, or other suitable device for forcibly raising that end, so as to depress the other and clip the object to be ground down upon the plate.

In the drawings the object held for the purpose of being ground is a hammer; but any other article can be substituted.

S is an arm extending outward from the plate N, the end of which is furnished with a roller or other similar device running in the slot T. This is for the purpose of swinging the plate N as the rest G advances along its

slide, so as to grind a curved or irregular surface as the object passes along the edge of the grinding-wheel.

The slot T can have any convenient form 5 given to it, so as to swing the plate N in the manner desired. For the purpose of grinding the side of a claw-hammer the slot is of the form shown in the drawings. The slot is cut in a plate, U, which is capable of adjustment 10 in two directions at right angles to each other, and it also swings in a horizontal plane, so that it can be adjusted so as to place the guiding-slot in exactly the proper position.

The plate U is pivoted at U' to the slide V, 15 to which it is clamped, when desired, by means of the screws U'.

The slide V moves in a dovetail groove in the top of the rest W, which has a longitudinal movement along the ways H. It can be 20 held in any desired position by means of the set-screw W'.

In my improved machine, as shown in the drawings, the parts for holding and guiding the article to be ground are the same upon 25 both sides of the grinding-wheel, and the foregoing description of these parts applies to either side of the machine. The two sides are represented in different positions, so as to better delineate the several part of the mechanism. 30

In the grinding of hammers and other similar articles where there are opposite and symmetrical sides the two sides of the machine are used to grind the opposite sides of the article, so that the gages do not require to be 35 changed. A machine having the rests and guides upon one side only of the grinding-wheel would, however, be useful for a variety of purposes.

40 The operation of my improved grinding-machine is as follows: The article to be ground is placed upon the plate N and the gage-screws O O adjusted, so that it shall lie in the proper position when it is placed against them. The 45 plate M, carrying the top plate, N, is then moved out or in by means of the screw M' until the distance from the edge of the grinding-wheel is such as will remove the desired amount of material from the article to be ground. If, 50 then, the article is to have a plane surface, the

sliding rest G is moved by means of the hand-wheel L, which operates the rack and pinion, so as to pass the article to be ground across the edge of the grinding-wheel B. This instantly removes the surplus material. 55

If the side of the object ground is not to be plane, but curved, as in the side of a hammer, the arm S is guided or rocked by means of the plate U, having a slot, T, which serves as a 60 templet to give the plate N the proper motion as the rest G is moved inward against the edge of the grinding-wheel.

Different plates U having different forms of slots for different forms of objects to be ground 65 can be used.

By means of the rotating movement of the plate U and the longitudinal and lateral movements of the parts V and W, as hereinbefore described, the position of the slot T can be exactly 70 adjusted.

The grinding operation is performed by the friction of the wheel B against the object ground. The great velocity of the wheel at once heats and removes the material, and leaves a finished surface upon the article placed 75 upon the rest. The large mass and rapid motion through the air of the grinding-wheel keep it cool, while the material of the object ground is heated to the melting-point at once.

What I claim as my invention is— 80

1. A metallic grinding-wheel, substantially as described, running at a high velocity, in combination with suitable mechanism for holding the object to be ground, whereby the surplus material of the said object is removed by 85 the friction of the metal of the wheel without the use of emery or other extraneous substance, substantially as herein set forth and described.

2. The metallic grinding-wheel B, having the rim B', provided with the grooves E, substantially as and for the purpose herein described. 90

3. The metallic grinding-wheel B, having the grooves E in that part of the rim projecting from its side beyond the central part of 95 the wheel, substantially as described.

HENRY HAMMOND.

Witnesses:

JAS. F. WHITNEY,
THEO. G. ELLIS.