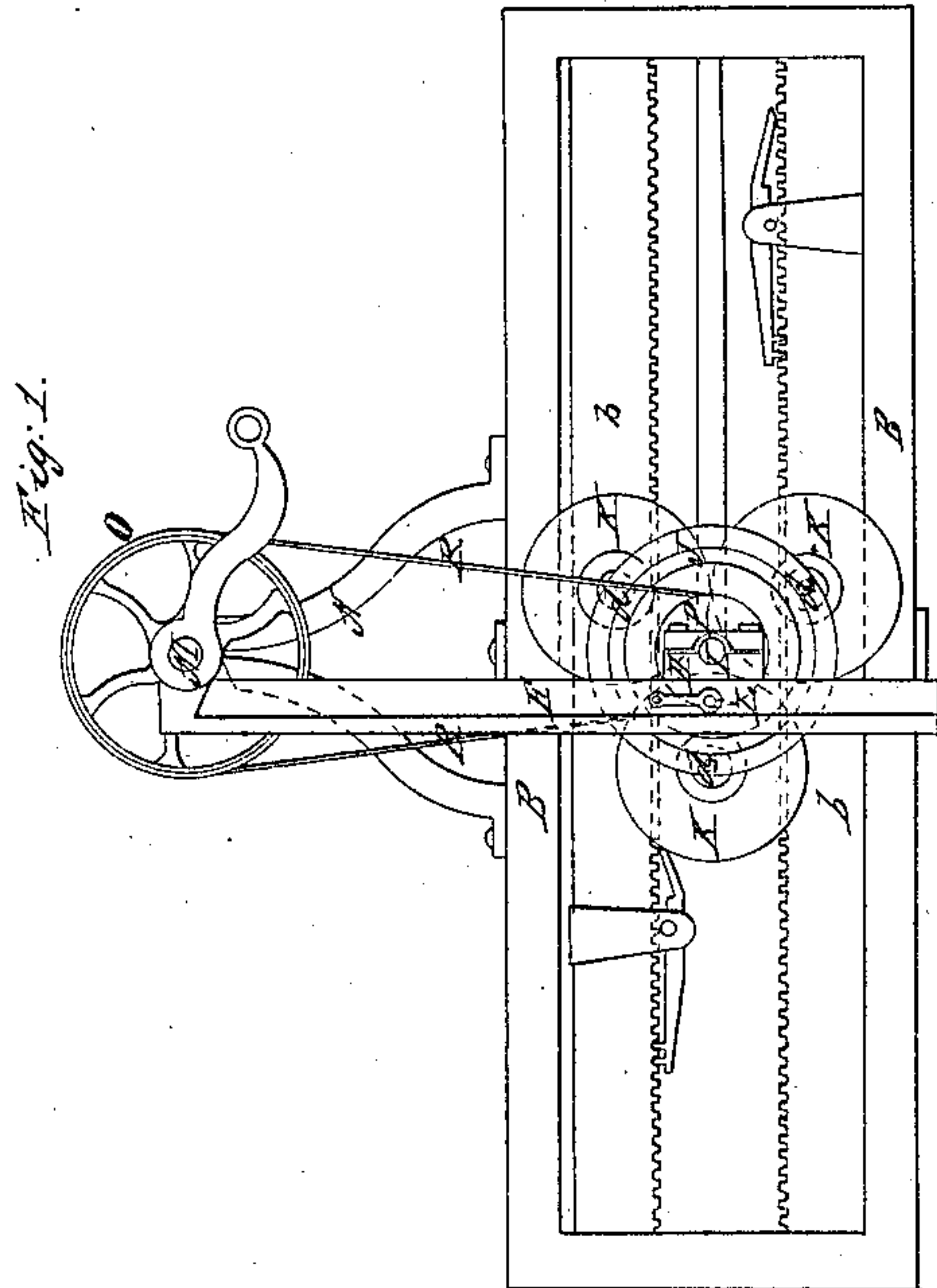
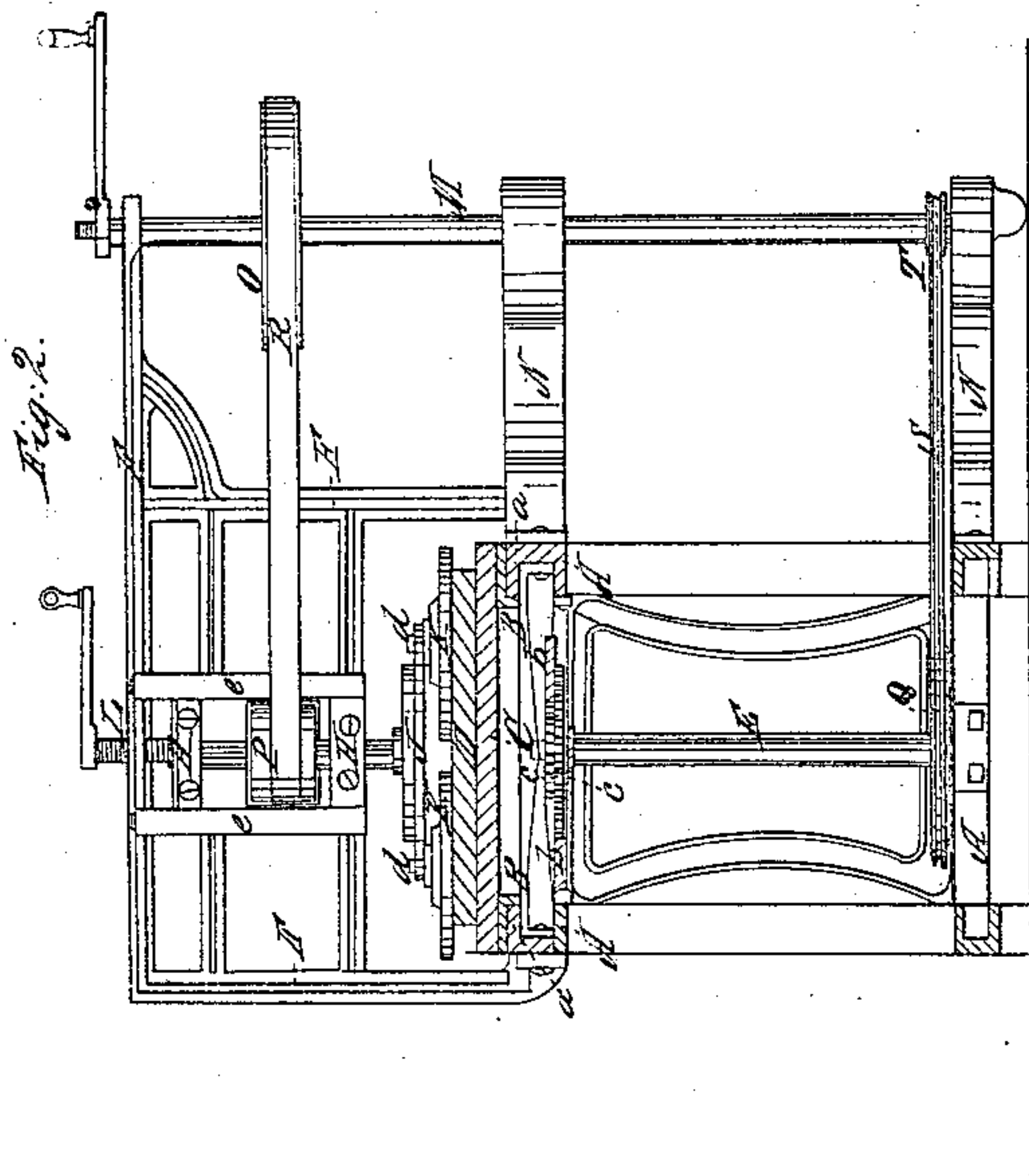


A. Broughton,
Grinding and Polishing Machine.
N^o 28,532. *Patented May 29, 1860.*



Witnesses:
Mich. Hughes.
Chas. Hughes.

Inventor:
Albert Broughton

UNITED STATES PATENT OFFICE.

ALBERT BROUGHTON, OF MALONE, NEW YORK, ASSIGNOR TO HIMSELF, ALEX. LINDSEY,
AND JOHN R. PLATT, OF SAME PLACE.

MACHINE FOR GRINDING AND POLISHING GLASS, &c.

Specification of Letters Patent No. 28,532, dated May 29, 1860.

To all whom it may concern:

Be it known that I, ALBERT BROUGHTON, of Malone, in the county of Franklin and State of New York, have invented a new and useful Improvement in Machinery for Grinding and Polishing Glass, Stone, Metal, and other Substances; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan of a machine constructed according to my invention, having the bed on which the substance to be grooved or polished, omitted. Fig. 2 is a transverse vertical section of the machine.

Similar letters of reference indicate corresponding parts in both figures.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A is an oblong quadrangular frame; on the top of which are parallel horizontal ways *a, a*, to receive the carriage B, on which is placed the horizontal bed C, (Fig. 2) on which the material D, to be ground or polished is placed. The bed C, and the material are omitted in Fig. 1, to expose the frame and the mechanism below by which its rectilinearly reciprocating motion on the ways *a, a*, is produced, such mechanism being that which constitutes the subject of my Letters Patent dated Sept. 13th, 1859, consisting of two parallel toothed racks *b, b*, secured to the frame, and an upright shaft E, which is arranged within the frame, and carries two pinions *c, c*, and which has a rotary motion and a slight lateral motion to bring it into gear with each rack alternately. I do not, however, confine myself to the use of this mechanism to produce the reciprocating motion of the frame, but propose to use any known or suitable mechanism for this purpose.

F is a stationary upright frame secured to and extending across the top of the frame A, over the carriage B, and bed C, and containing upright ways *e, e*, to which is fitted an upright adjustable frame H, which contains the bearings for an upright shaft I, to the lower end of which is rigidly secured a circular plate or disk J, to which are secured the three upright studs or axles *d, d, d*, to which the polishing disks K, K, K, of which

there may be any number, are fitted in such manner as to be capable of rotating freely.

F, is a stationary upright frame secured to and extending across the top of the frame A, over the carriage B, and bed C, and containing upright ways *e, e*, to which is fitted an upright adjustable frame H, which contains the bearings for an upright shaft I, to the lower end of which is rigidly secured a circular plate or disk J, to which are secured the three upright studs or axles *d, d, d*, to which the polishing disks K, K, K, of which there may be any number, are fitted in such manner as to be capable of rotating freely. These studs *d, d, d*, may be made adjustable nearer to or farther from the center of the shaft I, by fitting them to radial slots in the disk J. Instead of fitting the disks K, K, K, to studs secured fixedly in the disk J, they may be keyed to short upright axles fitted to rotate in bearings in the disk J. The disks K, K, K, may be of metal or other material and may be composed of, or faced with any substance suitable for grinding or polishing or for holding sand or other grinding or polishing material.

L, is a screw connected with the adjustable frame H, and fitted to the stationary frame F, in such manner as to be capable of raising and lowering the latter and with it the shaft I, and disks in such manner as to adjust the latter at various heights according to the thickness of the substance to be ground or polished and to make the disks K, K, K, bear upon such substance with any degree of pressure that may be desirable.

M is the main shaft of the machine arranged vertically in suitable bearings in side frames N, N, secured to the frame A, and carrying a pulley O, from which a belt R, runs to a pulley P, on the shaft I, and a chain wheel Q; from which a chain S, runs to a chain wheel T, on the shaft E, said belt and chain driving the said shafts I, and E. This shaft M, may be driven by any suitable means.

The operation of the machine is as follows: The piece of material D, to be ground or polished having been placed upon the bed C, the shaft M, is set in motion, and by the rotary motion it imparts to the shafts E, and I, the bed and the substance upon it are caused to have a horizontal reciprocating

motion on the ways a, \bar{a} , and the disk J, is
 caused to rotate and carry with it the disks
 K. The frame H, H, is then adjusted to
 bring the faces of the disks K, K, into con-
 5 tact with, or sufficiently near to the upper
 surface of the piece D; and the sand or other
 grinding or polishing material, when any is
 necessary, having been applied either with
 or without water, the grinding or polishing
 10 operation commences, and the disks K, K, K,
 are caused to rotate each upon its own axis,
 by the friction between their faces and the
 piece D, and hence the said disks have a
 complete planetary or compound rotary mo-
 15 tion, by which, as the piece D, moves back
 and forth beneath them, every part of its
 surface is ground or polished to a plane sur-
 face. When one side of the piece is finished
 and the other side is required to be ground
 20 or polished it is turned over and a similar
 operation proceeded with on that side, which
 is also brought to a perfectly plane surface,
 and as each surface is made parallel with
 the plane of motion of the bed and the plane
 25 of revolution of the disk J, both of which
 are positive and parallel with each other, the
 two surfaces produced are perfectly parallel
 and the substance is of perfectly uniform
 thickness throughout. By the combination
 30 of the positive rectilinear motion of the bed

the positive rotary motion of the axes of
 the disks M, M, and the rotary motion of
 the said disks on their axes produced by fric-
 tion a peculiar compound relative movement
 is obtained between the operating surfaces 35
 and the surfaces operated upon which is
 found in polishing to produce a very supe-
 rior effect.

I do not claim applying and operating a
 series of grinding or polishing disks in such 40
 manner as to have a planetary motion, as
 such a series of disks is described in the Let-
 ters Patent of Alexander Lindsey, dated
 March 9, 1858; but

What I claim as my invention, and desire 45
 to secure by Letters Patent, is—

The combination of the rotary adjustable
 shaft I, revolving disk J, and independent
 pivoted disks K, K, K, with the horizontally
 reciprocating bed C and mechanism for ef- 50
 fecting the intermittent oscillating motion of
 gear shaft E, which reverses the movement
 of the traveling bed, arranged and operating
 in the manner and for the purpose herein
 shown and described.

ALBERT BROUGHTON.

Witnesses:

MICH. HUGHES,

CHARLES M. HUGHES.