

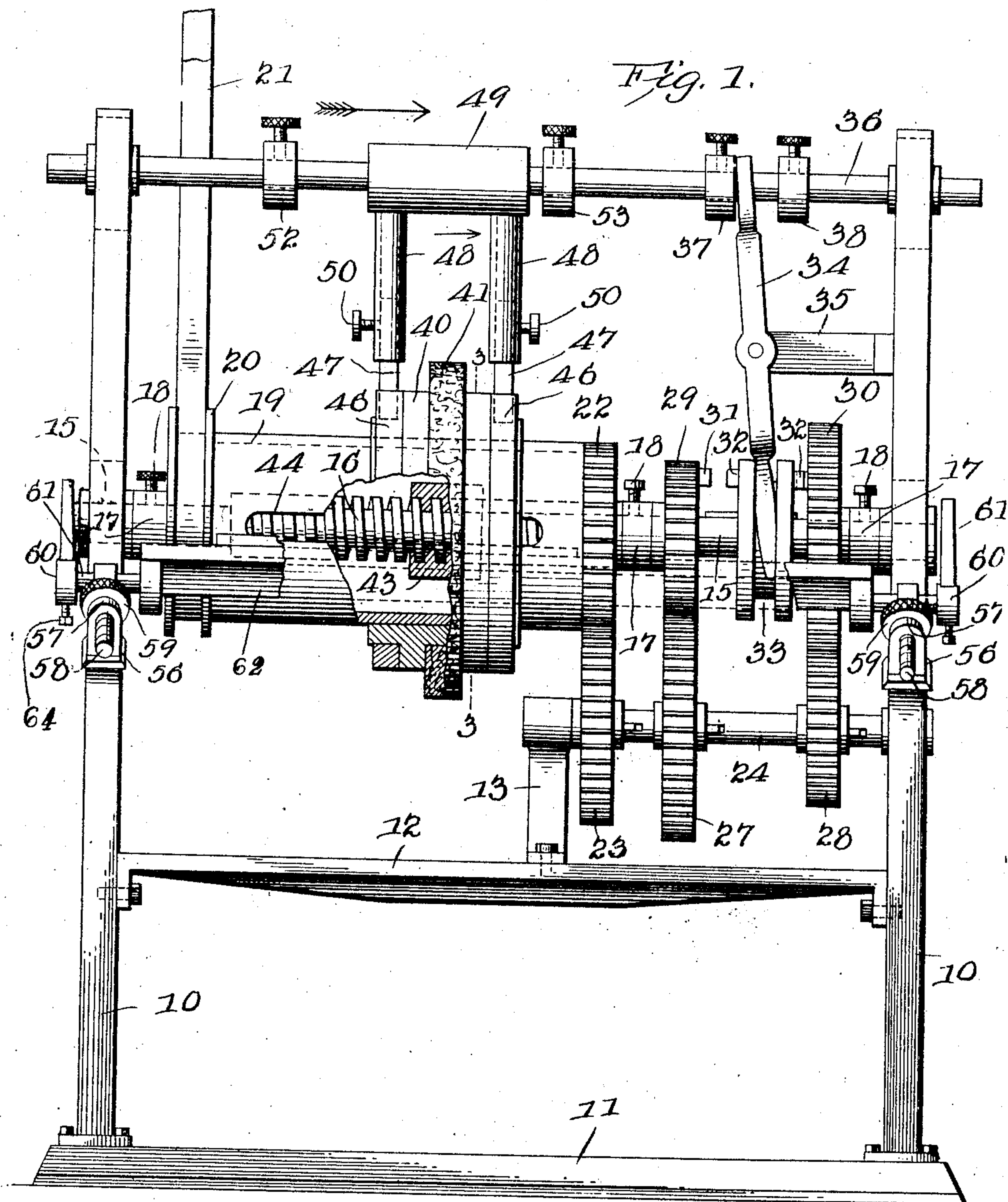
No. 840,072.

PATENTED JAN. 1, 1907.

J. LINTON.
CALENDER ROLL AND KNIFE GRINDING MACHINE.

APPLICATION FILED MAY 25, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

E. H. Stewart
Geo. E. Carter

Joseph Linton,
INVENTOR.

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ATTORNEYS

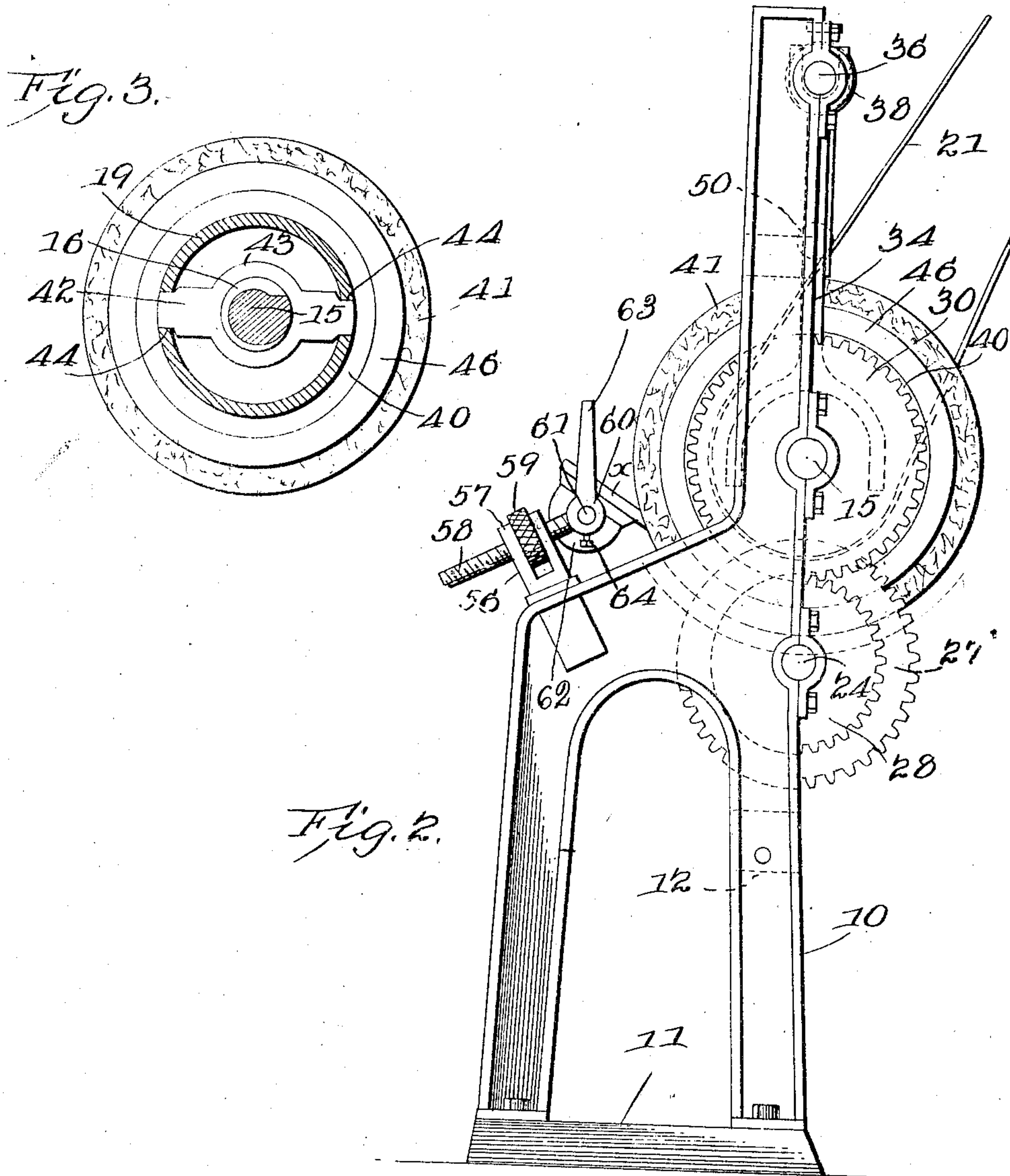
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WITNESSES:

E. J. Stewart
J. M. E. Parker

Joseph Linton,
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UNITED STATES PATENT OFFICE.

JOSEPH LINTON, OF MANCHESTER, VIRGINIA.

CALENDER-ROLL AND KNIFE-GRINDING MACHINE.

No. 840,972.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed May 26, 1906. Serial No. 318,626.

To all whom it may concern:

Be it known that I, JOSEPH LINTON, a citizen of the United States, residing at Manchester, in the county of Chesterfield and State of Virginia, have invented a new and useful Calender-Roller and Knife-Grinding Machine, of which the following is a specification.

This invention relates to grinding-machines, and has for its principal object to provide a continuously-operable grinder in which a revoluble grindstone, emery-wheel, or similar abrading element is arranged to travel slowly back and forth in constant engagement with the object to be ground.

A further object of the invention is to provide a means for automatically reciprocating the grinding element without stopping or disturbing its rotative movement.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a front elevation, partly in section, of a continuous grinding-machine constructed in accordance with the invention. Fig. 2 is an end elevation of the machine looking from the right of Fig. 1. Fig. 3 is a transverse sectional view through a portion of the machine on the line 3-3 of Fig. 1.

Similar characters of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The working parts of the machine are supported on a suitable frame, including a pair of end standards 10 and a base or sole plate 11. The end members of the frame are connected by a horizontally-disposed cross-bar 12, which carries a short standard or brace 13 at a point approximately midway of its length.

The frame is provided with bearings for a horizontally-disposed shaft 15, that is provided for a portion of its length with a screw-thread 16, and said shaft is held from end-

wise movement by a pair of collars 17, which are secured to the shaft by set-screws 18.

Mounted loosely on the shaft and free to rotate independent thereof is a drum 19, that is provided at one end with a flanged pulley 20, that receives a driven belt 21, operated continuously in the same direction from any suitable source of power. At the opposite end of the drum is secured a gear 22, which intermeshes with a gear 23, that is keyed to a counter-shaft 24, arranged parallel with the shaft 15 and having suitable bearings in the frame. This shaft 24 carries a gear-wheel 27 and a pinion 28, and these intermesh, respectively, with a pinion 29 and a gear-wheel 30, that are mounted loosely on the unthreaded portion of the screw-shaft 15 and are free to rotate independently of said shaft. The pinion 29 and the gear 30 are provided with clutch-faces, represented in the present instance in the form of lugs 31, which may be engaged by similar lugs 32, carried by a grooved clutch-sleeve 33, that is feathered on the shaft 15 and constantly rotates therewith. The groove of this clutch-sleeve is engaged by a clutch-operating lever 34, that is pivoted to an arm 35, projecting inward from one of the frame-standards, and the upper end of the lever is bifurcated and partly embraces a longitudinally-movable rod 36, that is slidably mounted in supports near the top of the standards 10. This rod carries two adjustable collars 37 and 38, which are alternately moved into engagement with the clutch-operating lever for the purpose of locking the gear 30 and the pinion 29 to the shaft 15.

Mounted on the drum is a collar 40, which carries a revoluble grindstone or similar abrading member 41. This collar is provided with diametrically-opposed recesses for the reception of the opposite ends of a cross-bar 42, the central portion of which is in the form of a nut 43, that is mounted on the threads 16. The ends of the bar 42 pass through diametrically-opposed slots 44, which extend lengthwise of the drum in order to permit free longitudinal movement of the collar 40 and the revoluble abrading member, said collar and abrading member constantly rotating with the drum and being reciprocated from end to end of the slots 44 through connection of the nut 43 with the threads 16 of the screw-shaft.

Mounted loosely on the outer reduced end portions of the collar 40 are two non-revo-

luble rings 46, having upwardly-projecting pins 47, which enter sockets formed in a pair of arms 48, that depend from a slidable sleeve 49, mounted on the rod 36, the pins being firmly locked to the arm 48 by set-screws 50. The sleeve 49 is arranged to alternately engage a pair of adjustable collars 52 and 53, so that as the collar 30 and the abrading member reciprocate the rod 36 will be moved first in one direction and then in the opposite direction, the movement of the rod taking place near the end of the movement of the collar and abrading member in each direction.

The frame is provided with suitable supports for the object to be ground. In the present instance the frame carries small brackets 56, having spaced ears 57, provided with openings for the passage of a screw 58, which may be adjusted by means of a nut 59, mounted on the screw at a point between the ears. Each screw carries at its inner end a collar or ring 60, and these serve as supports for the end pintles 61 of a bar 62, which may be turned in order to adjust its angular position with relation to the revoluble abrading member. One of the end pintles carries a suitable adjusting-lever 63, and when the bar has been turned to the desired position it may be locked by suitable set-screws 64. The work-carrying bar is shown in the present instance as supporting a knife *x*, that is held in proper relation to the abrading member.

During the operation of the machine the drum 19 is continuously revolved in the direction indicated by the arrow, and this movement is transmitted through the gears 22 and 23 to the counter-shaft 24. At this time the gear 30 is connected to the shaft 15 by the clutch 33, and as the shaft 24 is revolved the movement is transmitted from pinion 28 and gear-wheel 30 to said shaft 15, rotating the shaft in the same direction as the drum, but at a slower speed, so that as the drum revolves the nut 43 will be carried around the screw-shaft and the collar 40 and abrading member 41 will be slowly moved toward the right, or in the direction indicated by the arrow, until near the completion of the movement the sleeve 49 engages the adjustable collar 53 and moves the rod 36 toward the right. This movement brings the collar 37 into engagement with the upper end of the clutch-operating lever, and the clutch-sleeve 33 is moved into engagement with the pinion 29. The first step of course is to release the gear-wheel 30, and after pinion 29 is clutched to the shaft the movement will be transmitted from the counter-shaft through the gear 27 to the pinion 29 and thence to the screw-shaft, rotating said screw-shaft in the same direction as before, but at a much higher rate of speed. The speed at this time is greater than the speed of rotation of the

drum 19, so that the screw will act to travel the nut 43 toward the left, and the collar 40 and abrading member will be carried toward the left until the sleeve 49 engages the collar 52, the movement being transmitted to the clutch and forcing the latter from engagement with the pinion 29 into engagement with the gear-wheel 30.

The operation may be kept up as long as necessary to completely grind the knife or other object, and the abrading member will be reciprocated slowly in the direction of the length of the drum without stopping or interfering with its revoluble movement.

I claim—

1. In a grinding-machine, the combination with a revoluble grinding member, of a nut connected to and rotating therewith, a threaded shaft with which the nut engages, means for alternately revolving the shaft at high and low speeds and in the same direction to thereby effect reciprocatory movement of said nut and grinding member.

2. In a grinding-machine, a revoluble grinding member, a nut carried thereby, a supporting-drum on which the grinding member is free for rotative, and reciprocatory movement, a threaded shaft with which the nut engages, and means for alternately rotating the shaft at high and low speed, and in the same direction, to thereby effect reciprocatory movement of the nut and grinding member.

3. In a grinding-machine, a revoluble grinding member, a nut carried thereby, a threaded shaft with which the nut engages, a shaft-revolving means, and means for automatically changing the speed of said shaft to revolve the same first at the slower speed than the nut, and then at a higher speed than the nut.

4. In a grinding-machine, a revoluble grinding member, a drum on which the grinding member is free for reciprocatory movement, means for revolving the drum and grinding member, a nut carried by said grinding member, a threaded shaft extending through the drum and with which said nut engages, means for revolving the shaft, and means for automatically changing the speed of said shaft as the grinding member nears the limit of its reciprocatory movement in both directions.

5. In a grinding-machine, a revoluble grinding member, a drum on which said member is mounted, means for revolving the drum, a counter-shaft having a geared connection with the drum, a gear and pinion on the counter-shaft, a nut carried by the grinding member, a threaded shaft with which said nut engages, a pinion and a gear mounted loosely on the threaded shaft and intermeshing respectively with the gear and the pinion on the counter-shaft, a double-clutch sleeve feathered to the threaded shaft, and

means for automatically moving said sleeve to alternately engage the gear and the pinion of said threaded shaft.

6. In a grinding-machine, a shaft having a threaded portion, a drum mounted on an unthreaded portion of the shaft and arranged to rotate independently thereof, said drum being provided with diametrically-opposed longitudinal slots, means for revolving the drum, a collar slidably mounted on the drum, a grinding member carried by the collar, a nut engaging the threaded portion of the shaft and having arms extending through the slotted portion of the drum and engaging the collar, a counter-shaft having a gearing connection with the drum, a gear and pinion on the counter-shaft, a pinion and a gear mounted loosely on the threaded shaft and intermeshing, respectively, with the gear and pinion of the counter-shaft, a double-clutch sleeve fitted to the threaded shaft, a clutch-operating lever, a slidable clutch-operating rod, adjustable collars mounted

thereon, and arranged to engage the clutch-operating lever, a sleeve carried by the rod, a pair of collars with which said sleeve engages, arms depending from said sleeve, a pair of rings encircling the grinder-carrying collar, pins extending from said rings and engaging said arms, and means for supporting the article to be ground.

7. In apparatus of the class described, the combination with a revoluble grinding member, of a pair of brackets, screws extending therethrough, nuts mounted on said screws, a work-supporting bar having end pintles supported by the screws, means for turning said work-supporting bar, and means for locking said bar in adjusted position.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOSEPH LINTON.

Witnesses:

STUART BOWE,
WALLACE F. BROWN