

No. 844,871.

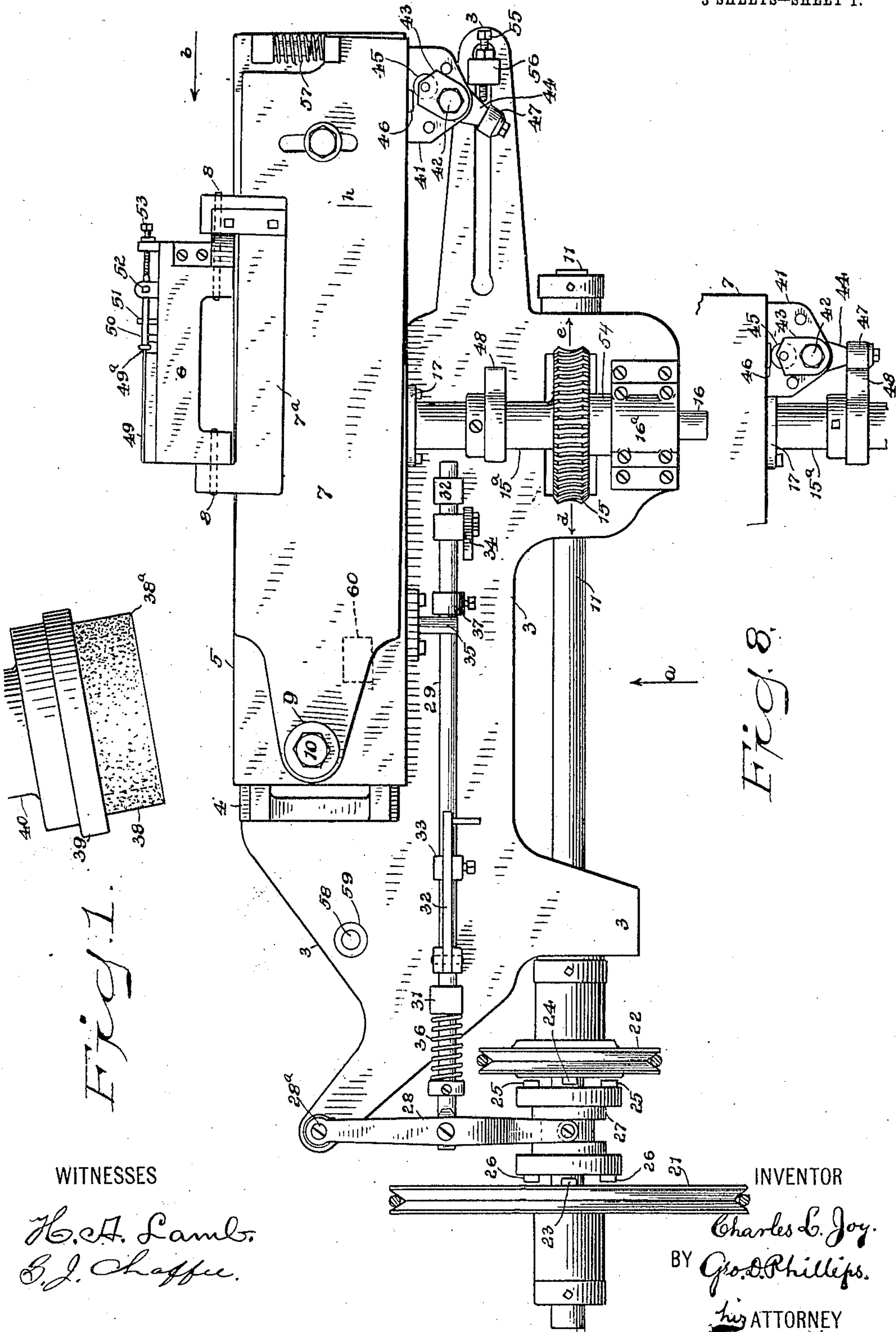
PATENTED FEB. 19, 1907.

C. L. JOY.

CUTLERY GRINDING MACHINE.

APPLICATION FILED OCT. 24, 1905.

3 SHEETS—SHEET 1.



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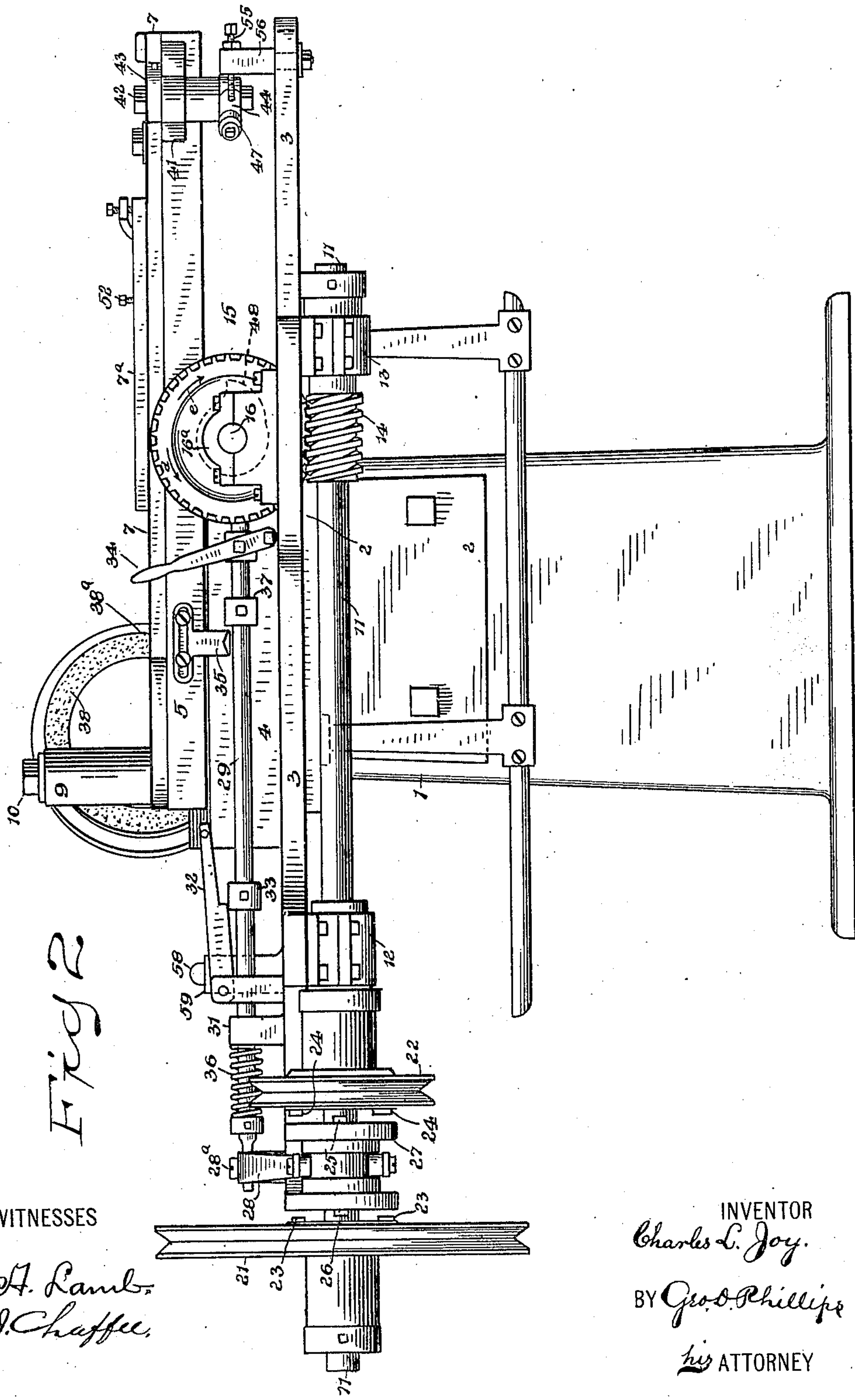


Fig 2

WITNESSES

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3 SHEETS—SHEET 3.

Fig. 3.

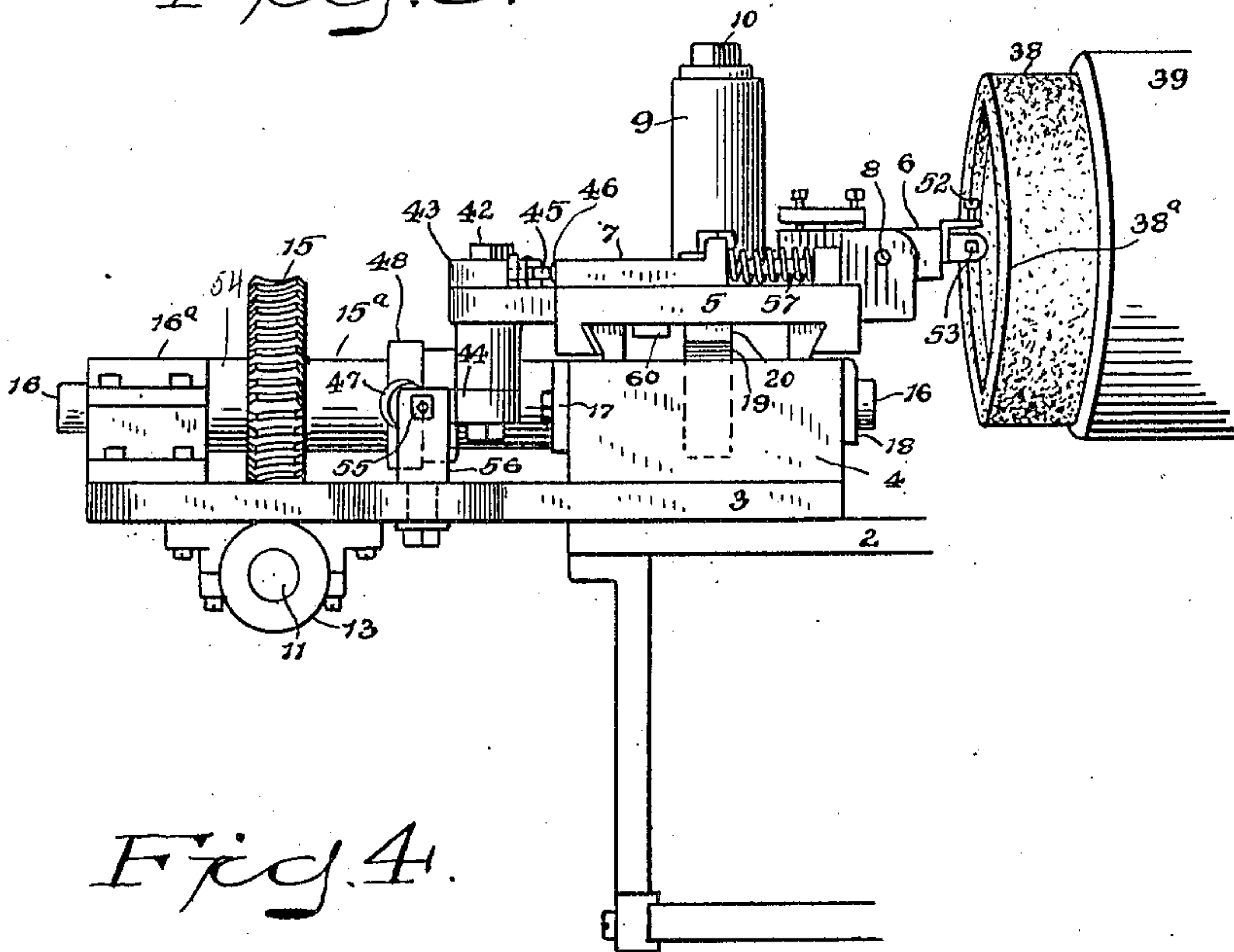


Fig. 4.

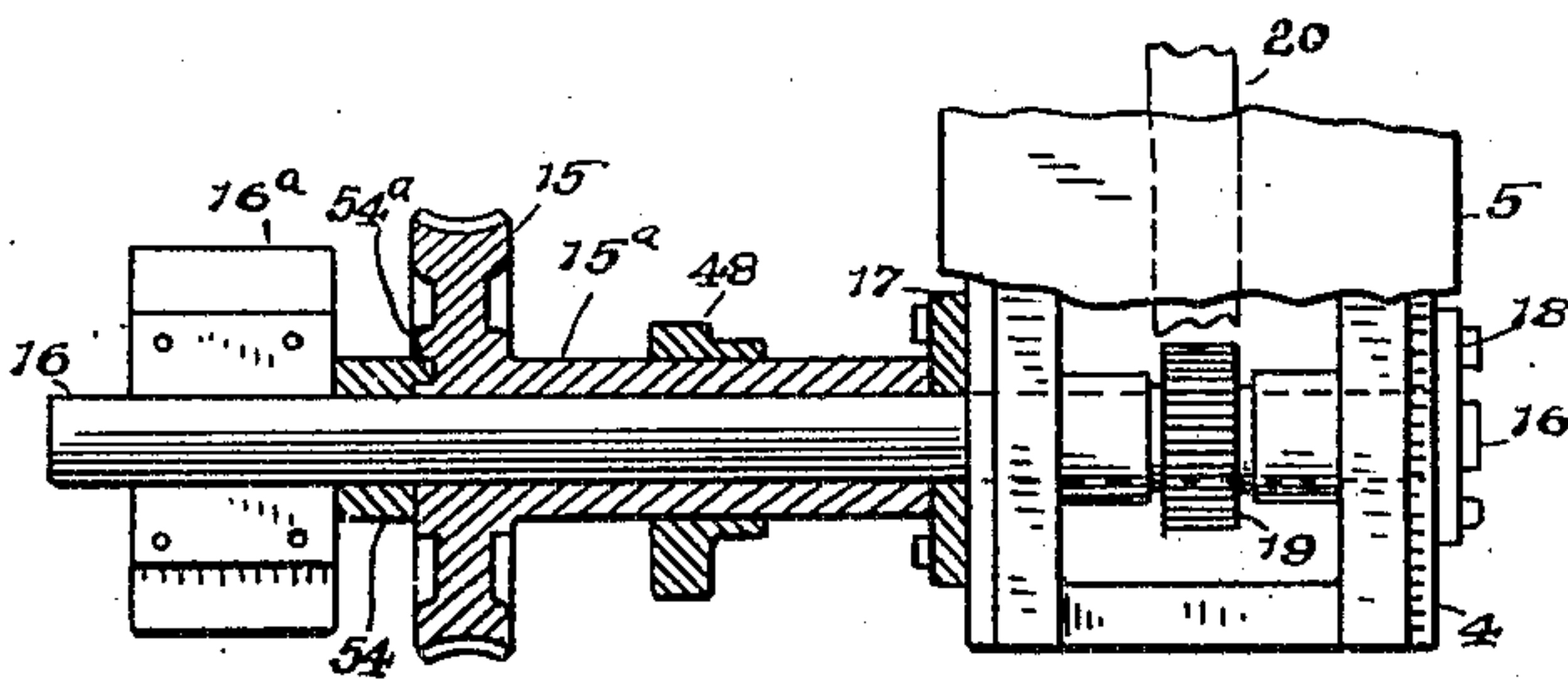


Fig. 5. Fig. 6.

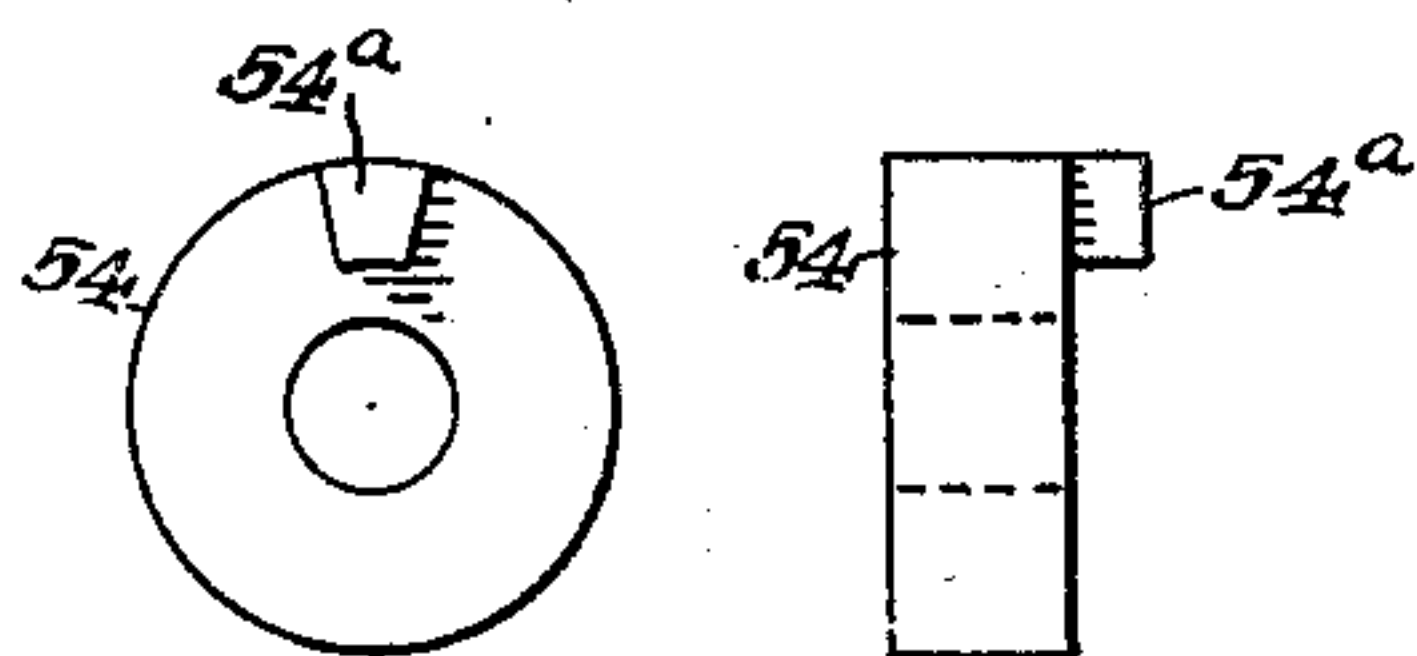
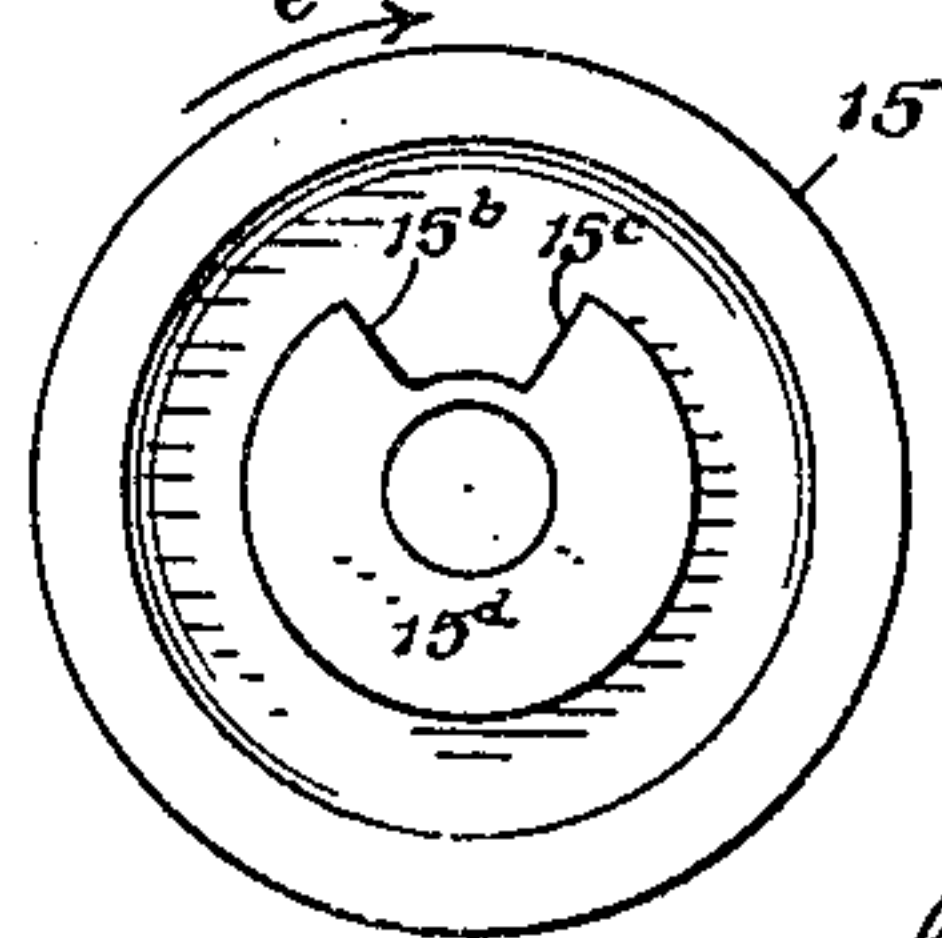


Fig. 7.



WITNESSES

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CUTLERY-GRINDING MACHINE.

No. 844,871.

Specification of Letters Patent.

Patented Feb. 19, 1907.

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To all whom it may concern:

Be it known that I, CHARLES L. JOY, a citizen of the United States, and a resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Cutlery-Grinding Machines, of which the following is a specification.

My invention relates to cutlery-grinding machines; and it consists in certain details of construction to be hereinafter more fully set forth in the following specification.

To enable others to understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 represents an upper plan view of the carriage and mechanism connected therewith and broken view of the grinding-wheel spindle. Fig. 2 is a side elevation of the machine looking in the direction of arrow *a*, Fig. 1. Fig. 3 is a broken end elevation of the machine looking in the direction of arrow *b*, Fig. 1. Fig. 4 is a broken upper plan view of the carriage and its support, sectional view of the worm-gear for operating the carriage, sectional view of the cam for operating the knife-holder support, and sectional view of the carriage-driver mounted on the rack-pinion shaft. Fig. 5 is a detail front elevation of the carriage-driver. Fig. 6 is a detail side elevation of the carriage-driver. Fig. 7 is a detail side elevation of the worm-gear connected with the carriage-operating mechanism. Fig. 8 is a broken upper plan view of the rack-pinion shaft of the carriage mechanism, broken upper plan view of the swinging knife-holder support, and mechanism for operating the same.

Its construction and operation are as follows:

1 is the supporting-standard of the machine; 2, a bracket projecting from the standard to support the adjustable bed-plate 3.

4 is the carriage-support secured to the bed-plate.

5 is the carriage slidably mounted on the support 4.

6 is the knife-holder; 7, the knife-holder support. The knife-holder is pivotally supported on the pins 8, located in the raised portion 7^a of the knife-holder support or knife-holder-supporting plate, which plate has the projection 9 at its forward end to form a long bearing for the retaining-bolt 10, on which the knife-holder support is adapted

to swing for the purpose presently to be described.

11 is the driving-shaft, journaled in the boxes 12 and 13, located on the under side of the bed-plate 3, as shown at Fig. 2. 14 is a worm on this shaft meshing with the worm-gear 15, which gear, with its hub 15^a, is loosely mounted on the rack-pinion shaft 16. The inner end of this shaft is journaled in the bearings 17 and 18, secured to the sides of the carriage-support 4, as shown at Figs. 3 and 4, while its outer end is journaled in the box 16^a, secured to the bed-plate. The inner end of this shaft carries the pinion 19 to engage with the rack 20 on the under side of the carriage 5. The driving-shaft is rotated through the medium of the pulleys 21 and 22 mounted thereon. The former pulley is adapted to drive the carriage during the grinding operation presently to be described and the latter when the carriage is running idle. 23 and 24 are clutch-pins carried on the inner faces of these pulleys to be alternately engaged by the clutch-pins 25 and 26 on the outer face of the clutch-sleeve 27, slidably mounted on the driving-shaft.

28 is a clutch-lever with one end engaging the clutch-sleeve and the opposite end pivotally supported on the body portion of the screw 28^a, Fig. 1, of the bed-plate.

29 is a shipper-rod slidably mounted in the supports 30 and 31 of the bed-plate 3. The forward end of this rod is connected to the clutch-lever 28.

32 is a pivotally-supported locking-lever adapted to be engaged with the collar 33 on the shipper-rod when the shipper-rod handle 34 is moved in one direction to transmit motion to the carriage in grinding, and 35 is a trip-arm adjustably secured to the carriage 5, adapted to engage the latch-lever 32 to release the latch-lever's engagement with the collar 33 and place the shipper-rod under the influence of the spring 36, which spring will actuate the clutch-lever 27 to throw the clutch into engagement with the clutch-pins of the driving-pulley for the return of the carriage, and 37 is an adjustable stop on the shipper-rod to be engaged by the arm 35 to bring the carriage to a standstill at the completion of its return movement.

38 is a cup-shaped emery grinding-wheel attached to the head 39 of the spindle 40. This spindle is journaled in suitable bearings, which bearings, together with the pulley for driving the spindle and other mechanism

connected therewith, are not shown, as they form no part of my present invention.

41 is a bracket projecting from the carriage 5, in which is journaled the short vertical rock-shaft 42, carrying the upper and lower arms 43 and 44. The upper arm 43 carries the roll 45, adapted to be brought into engagement with the pin 46, projecting from the side of the knife-holder support 7, to swing said support around for the purpose presently to be explained. The lower arm 44 carries the taper roll 47, adapted to engage with the cam 48, secured to the hub 15^a of the worm-gear 15. The knife-blade 49 rests against the holder 6, with the handle portion 50 resting on the lower support 51, while the upper adjusting-screw 52 and the end adjusting-screw 53 adjust the position of the blade.

In grinding the knife is properly located on the holder when said holder is away from the grinding-wheel, as shown at Fig. 1. In this view, however, the holder is shown farther from the wheel than would be the case in actual practice. When the knife is in position, the carriage is set in motion to carry the knife toward the wheel by means of the shipper-handle lever 34, as before described. This will cause the carriage to travel idly forward until the edge 38^a of the grinding-wheel is directly opposite the neck 49^a of the knife-blade, when the carriage will be automatically reversed. In the forward movement of the carriage the worm-gear will rotate in the direction of arrow *d*, Fig. 1, and in the opposite direction, as shown by arrow *e*. When the neck of the knife is opposite the edge of the wheel, as before mentioned, and the driving-shaft is reversed to return the carriage, it is necessary to halt the carriage long enough to swing the free end of the knife-holder support 7 around to bring the neck of the knife in contact with the grinding-wheel. This is accomplished as follows: 54, Figs. 4, 5, and 6, is a collar secured to the rack-pinion shaft 16, and it has the projection 54^a on its inner face adapted to be alternately engaged by the faces 15^b and 15^c of the hub portion 15^d of the worm-gear (shown at Fig. 7) to rotate the rack-pinion shaft in either direction. The distance between these faces of the hub 15^d will represent the standstill of the carriage, so that when the reverse movement takes place, as before mentioned, the worm-gear will travel idle in the direction of arrow *e* until the face 15^b engages with the projection 54^a of the collar, when said collar and shaft 16 will also be reversed to travel with the worm-gear. The forward movement of the carriage 5 will bring the roll 47 within the operating influence of the cam 48 on the hub of the worm-gear 15, so that when the worm-gear is reversed said cam will engage with the roll 47 to actuate the rock-shaft 42 into the position shown at Fig. 8. This will bring the roll 45 into engagement with the pin 46 of

the knife-holder support 7 and cause said support to swing on its pivotal point in the direction of arrow *h*, Fig. 1, to force the neck of the knife into engagement with the grinding-wheel. By the time this engagement is effected the face 15^b, Fig. 7, of the worm-gear will contact with the projection 54^a of the collar 54 and cause the rack-pinion shaft to rotate with said gear and return the carriage to grind the knife-blade from the neck to the point. 55 is an adjusting-screw located in the movable block 56, mounted on the bed-plate 3, so that when the carriage has retreated far enough to effect the grinding of the knife-blade the lower arm 44 will strike this screw and rotate the rock-shaft to bring about the disengagement of the roll 45 with the pin 46 of the swinging knife-holder support and permit said holder to be carried back to its normal position by the spring 57, as shown at Fig. 1. By the time the return of the knife-holder support is effected the shipping mechanism will have brought the clutch-sleeve 27 into its normal intermediate position to bring the carriage to a standstill.

58, Figs. 1 and 2, is a pin mounted upon a coiled spring (not shown) in the support 59, adapted to be engaged by the block 60 (see also Fig. 3) on the under side of the carriage 5, so that when the neck of the knife is in position to be brought against the edge of the grinding-wheel the carriage will be in a position to bring said block and spring-pin into engagement with each other, and the tension of this spring-pin on the under side of the carriage will prevent the carriage moving during the reversing period and while the worm-gear is running idle. When, however, the knife-holder support has been swung around and the neck of the knife brought against the grinding-wheel, the carriage will be moved out of contact with this spring-pin by the engagement of the worm-gear with the collar on the rack-pinion shaft, as before mentioned.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a cutlery-grinding machine, a longitudinally-reciprocating carriage, a support therefor, a grinding-wheel, a knife-holder, a knife-holder support operatively mounted thereon and pivotally supported at one end thereto, means to swing the knife-holder support laterally on the carriage to bring the knife-holder into operative position with respect to the grinding-wheel, and means to automatically return said knife-holder support after the operation of grinding is completed, for the purpose set forth.

2. In a cutlery-grinding machine, a longitudinally-reciprocating carriage, a support therefor, a grinding-wheel, a knife-holder, a knife-holder support mounted on the carriage and pivotally supported at one end to

said carriage, a rack on the under side of the carriage, a shaft for said carriage carrying a pinion to engage the rack, a driving-shaft, means for operating the same, a worm on said shaft, a worm-gear loosely mounted on the carriage-shaft to mesh therewith, a hub on said gear, a driver fixed to the carriage-shaft, means on the gear to enable it to rotate while the carriage-shaft remains idle, a cam on the hub of the worm-gear, a rock-shaft pivotally supported on the carriage, arms at each end thereof, said arms carrying rolls, one roll to engage the knife-holder support, the other roll to engage the cam on the worm-gear hub, so that, through the medium of said cam and rock-shaft, the knife-holder support is swung laterally on the carriage, for the purpose set forth.

3. In a cutlery-grinding machine, a longitudinally-reciprocating carriage, a support therefor, a knife-holder, a knife-holder support pivotally supported at one end to the upper surface of the carriage and operatively resting thereon, a shaft journaled in the carriage-support and at right angles thereto, a rack on the carriage, a pinion on the shaft to engage therewith, a driving-shaft, a worm thereon, a worm-gear on the carriage-shaft to engage therewith, a hub on said gear, a cam on said hub, means on the carriage to be engaged by said cam to actuate the knife-holder support in its forward movement toward the grinding-wheel, means to automatically return the same, means for temporarily checking the rotation of the carriage-shaft until after the forward movement of the knife-holder support has been completed, means for temporarily holding the carriage against a retrograde movement until after the completion of the forward movement of the knife-holder support, for the purpose set forth.

4. In a cutlery-grinding machine, a reciprocating carriage, a support therefor, a grinding-wheel, a knife-holder, a knife-holder support pivotally supported on said carriage, a rack on the under side of the carriage, a shaft journaled in the carriage-support, a pinion thereon to mesh with the rack, a worm-

gear loosely embracing said shaft, a cam controlled by said gear, means to be engaged by said cam to swing the knife-holder support toward the grinding-wheel, a driving-shaft, a worm thereon to mesh with the worm-gear, a driver on the carriage-shaft, means where- 55 by the rotation of the carriage-shaft is temporarily checked until after the forward movement of the knife-holder support has been effected, means also to temporarily check the return movement of the carriage, 60 for the purpose set forth.

5. In a cutlery-grinding machine, a reciprocating carriage, a support therefor, a knife-holder, a knife-holder support operatively mounted on the carriage, means for pivotally 65 supporting it thereto, a grinding-wheel, means to swing the knife-holder support laterally on the carriage toward the grinding-wheel, means to temporarily check the return movement of the carriage until after the 70 lateral movement of the knife-holder support, for the purpose set forth.

6. In a cutlery-grinding machine having a grinding-wheel and a longitudinally-reciprocating carriage and its support, of a knife- 75 holder support pivoted at one end to the carriage and adapted thereby to have a lateral movement thereon, means to effect a movement of the carriage across the face of the wheel until the edge of said wheel is opposite 80 the neck 49^a of the knife, means for automatically swinging the knife-holder support toward the grinding-wheel to bring the said neck of the knife against the wheel, means 85 for reversing the carriage while the knife and wheel are thus engaged, means for automatically returning the knife-holder support to its normal position after the carriage has been returned to its normal position at the completion of the grinding, for the purpose 90 set forth.

Signed at New Haven, in the county of New Haven and State of Connecticut, this 14th day of October, A. D. 1905.

CHARLES L. JOY.

Witnesses:

GEORGE A. TYLER,
JOHN H. CANNON.