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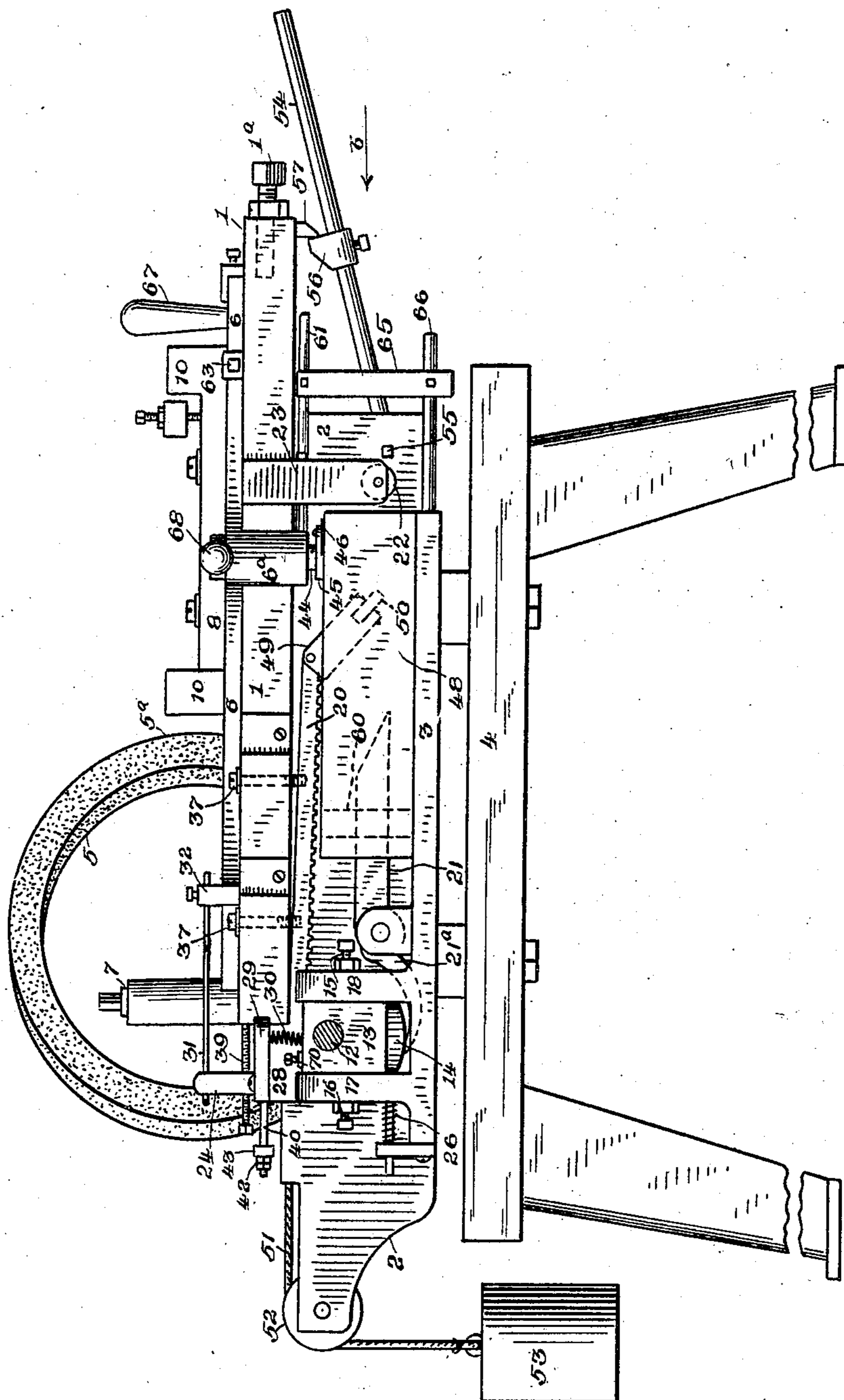
PATENTED JAN. 21, 1908.

C. L. JOY.
CUTLERY GRINDING MACHINE.

APPLICATION FILED SEPT. 23, 1907.

4 SHEETS—SHEET 1.

Fig. 1.



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By his Attorney Geo. D. Phillips

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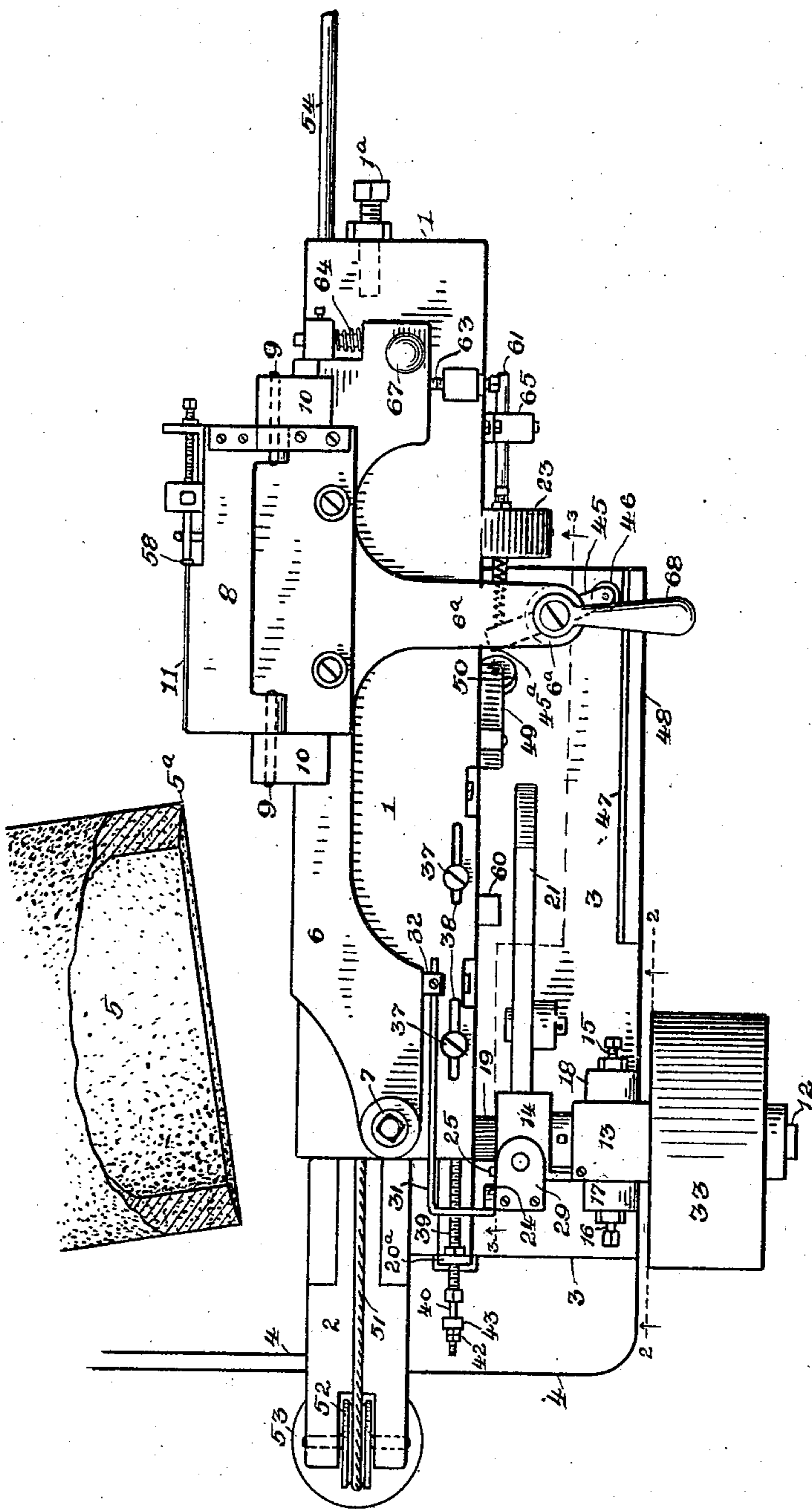
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

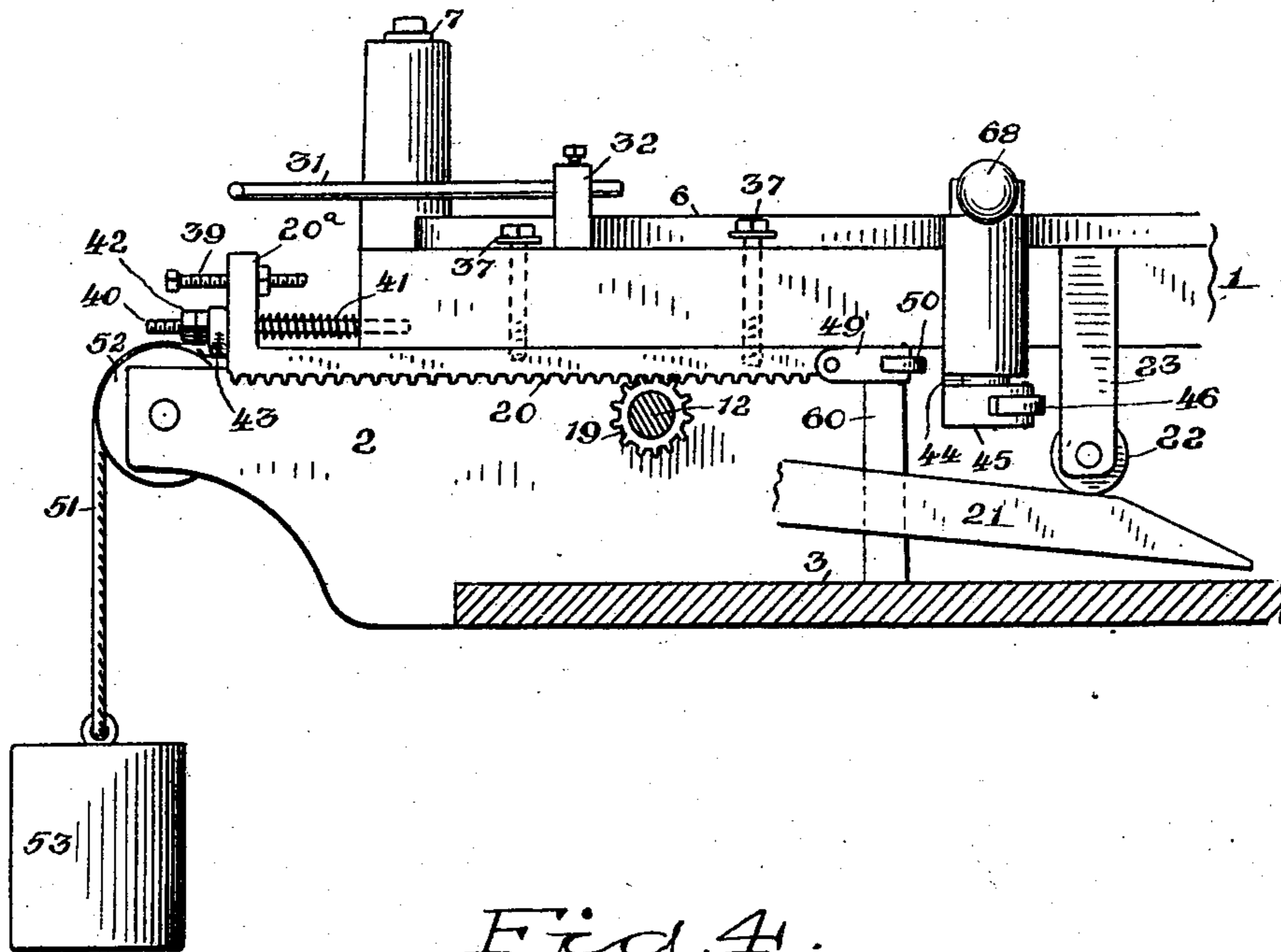
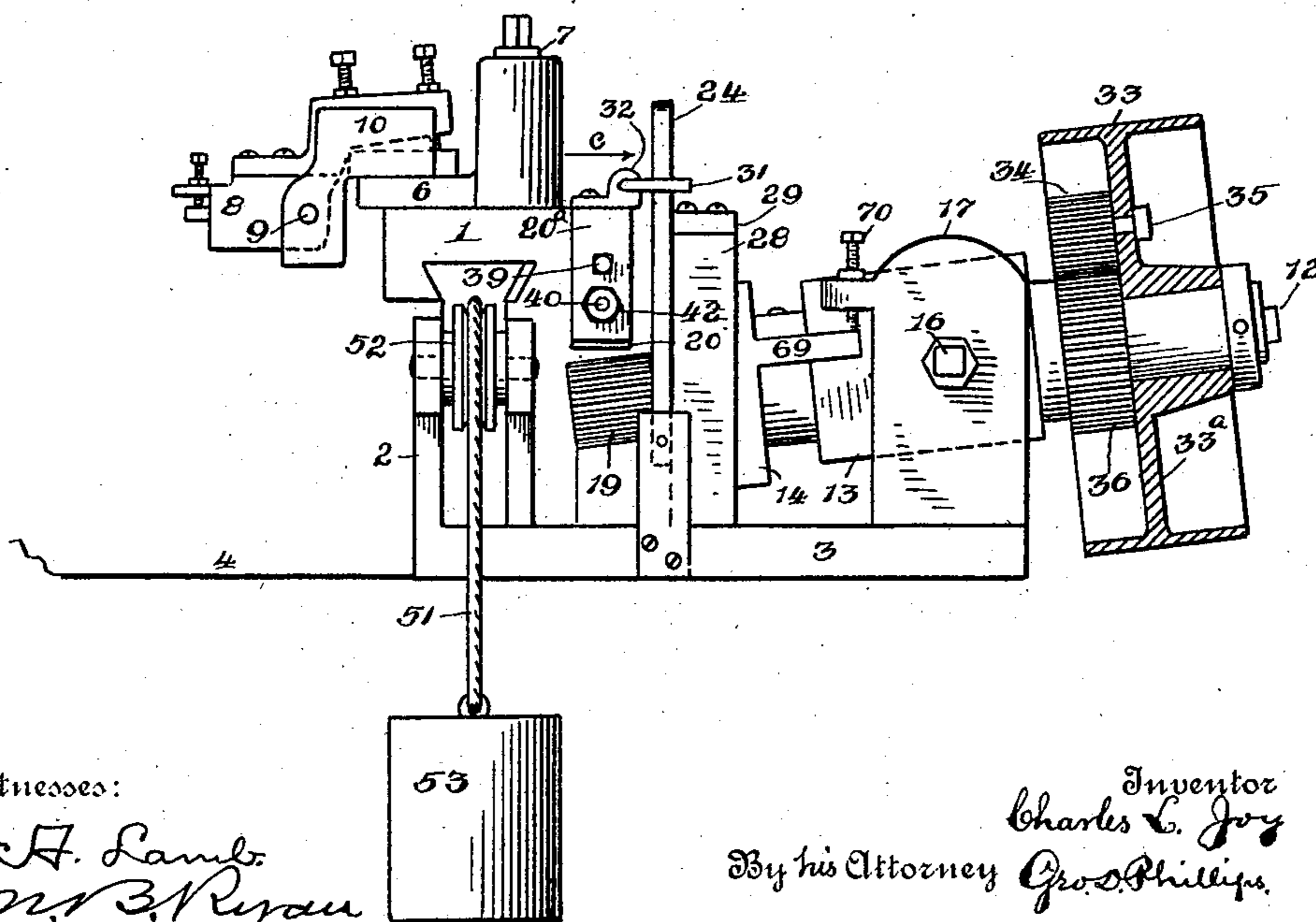


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 5.

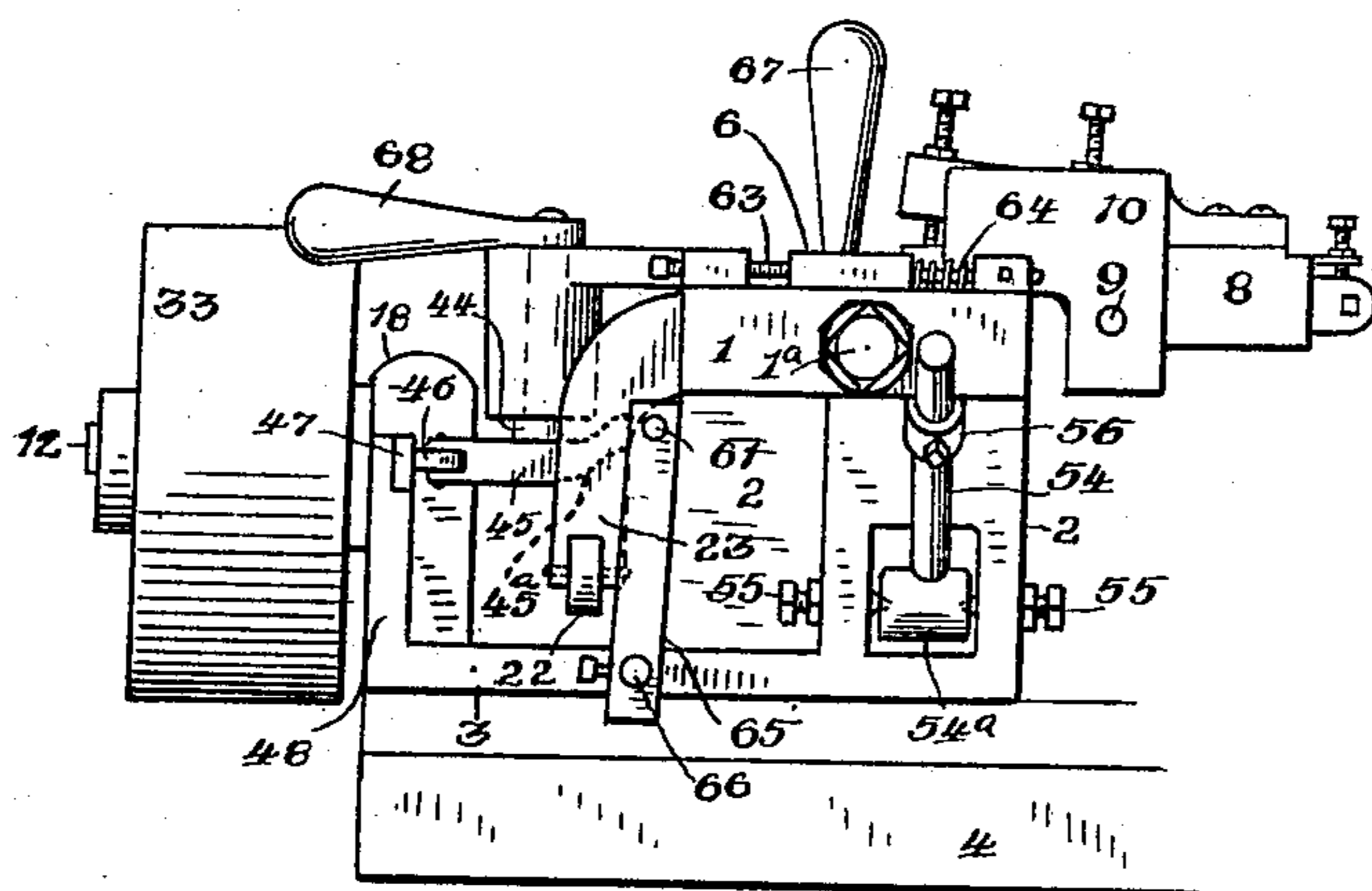
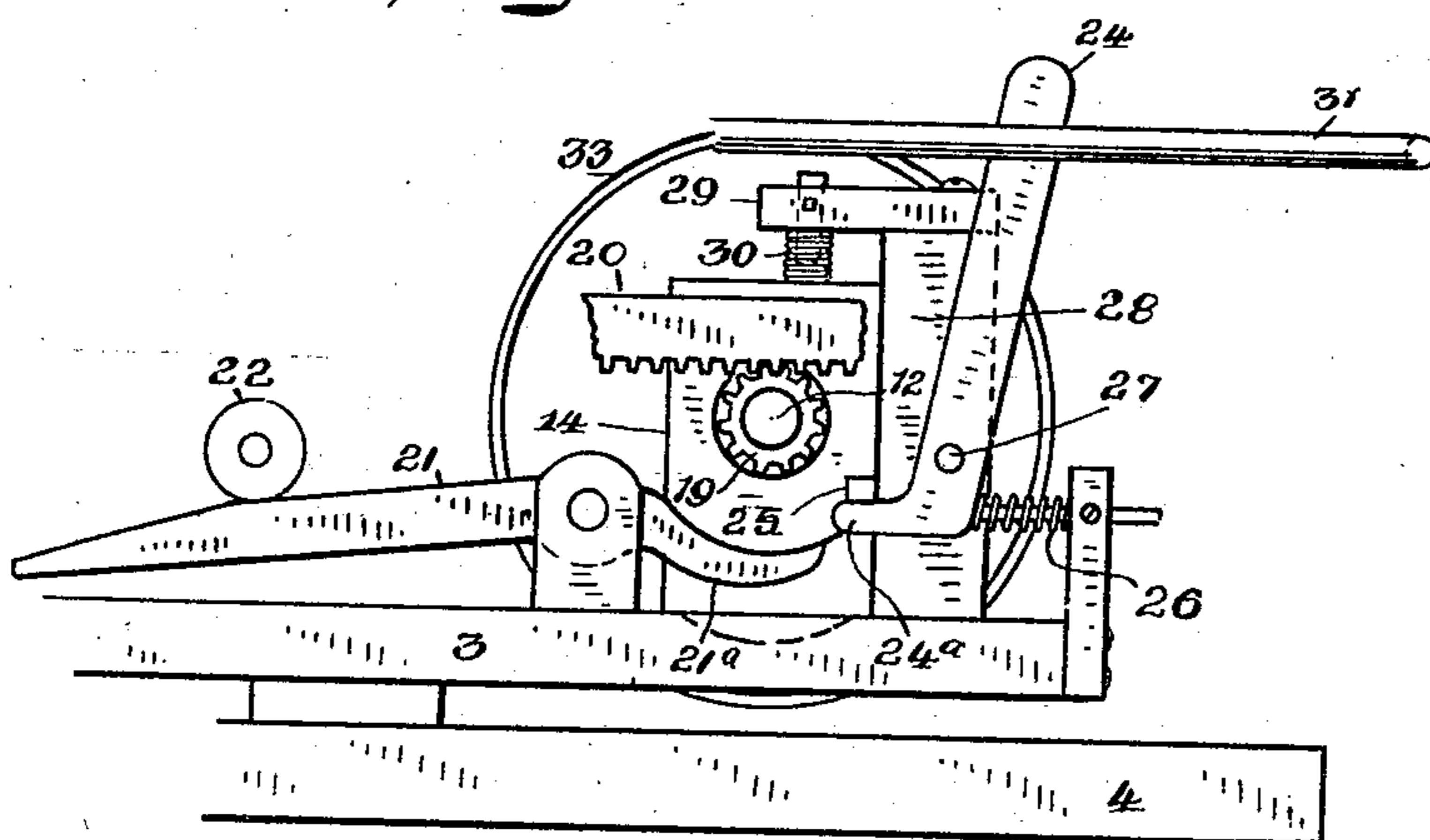


Fig. 6.



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CHARLES L. JOY, OF NEW HAVEN, CONNECTICUT.

CUTLERY-GRINDING MACHINE.

No. 877,199.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed September 23, 1907. Serial No. 394,033.

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 improvements in cutlery grinding machines to be 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 a side elevation of the machine, and sectional view of the driving shaft on line 2 of Fig. 2; Fig. 2 is an upper plan view of the principal parts of the machine, broken view of the bed and grinding wheel; Fig. 3 is an enlarged sectional view on line 3 of Fig. 2; Fig. 4 is an enlarged end elevation of the machine with the grinding wheel removed, looking in the direction of arrow *a* of Fig. 1, also sectional view of the driving pulleys and broken view of that portion of the bed supporting the grinding wheel mechanism; Fig. 5 is an end elevation of the machine looking in the direction of arrow *b* of Fig. 1, also broken view of the bed of the machine; Fig. 6 is an enlarged end elevation of the driving shaft and its forward box locked in operative position, broken view of the carriage rack and bed of the machine looking in the direction of arrow *c* of Fig. 4.

1 represents the carriage adapted to have a longitudinal movement on the support 2.

3 is the bed-plate forming part of the carriage support.

4 is the machine bed. 5 the grinding wheel its shaft and other mechanism necessary for its operation being omitted.

6 is a knife holder support resting on the carriage and adapted to have a lateral movement thereon from its pivotal point represented by the stud 7 projecting from the carriage.

8 is the knife holder carried by the support 6 and is pivotally supported on the pins 9 of the standards 10 of said support 6.

11 is a knife in position on the knife holder to be ground. As this knife holder is old in the art any further description of its construction and operation will be unnecessary.

12 is the driving shaft journaled in the boxes 13 and 14. The box 13 is pivotally supported on the ends of the screws 15 and 16 projecting through the ears or standards 17 and 18, rising from the bed-plate 3, so that the forward end of the shaft, with its box 14, may have a vertical movement for the purpose presently to be described.

19 is a pinion on the forward or inner end of the driving shaft adapted to be brought into engagement with the carriage rack 20. The forward end of the shaft is elevated to bring about such engagement through the medium of the lever 21 (see more particularly Fig. 6), whose inner curved end engages with the underside of the box 14 when the opposite end of the lever is depressed by the roll 22 carried by the arm 23 (Figs. 1, 2 and 3) of the carriage 1. When the box 14 is sufficiently elevated to bring the pinion and rack into engagement, said box will be temporarily locked in its elevated position through the medium of the lever 24, whose toe 24^a is brought under the lug 25 of the box through the medium of the spring 26. The lever 24 is pivotally supported on the pin 27 projecting from the standard 28.

29 is an arm secured to this standard and between the underside of said arm and the top of box 14 is the spring 30 adapted to insure the dropping of the shaft and box 14 when the lever 24 is tripped by the rod 31 adjustably mounted in the support 32 of the carriage. The driving shaft is continuously rotated by means of the pulley 33, the planet pinion 34 journaled on the pin 35 projecting through the web 33^a of said pulley and the gear 36 secured to the shaft.

The rack 20 is held beneath the carriage by means of the screws 37, which screws, however, do not draw the rack firmly against the bed, there being sufficient play to allow the forward end of the rack to drop slightly when the carriage is at a stand-still and away from the grinding wheel so that when the shaft pinion engages the rack there will be no danger of breaking the teeth in either the pinion or rack. The slots 38 (Fig. 2) in the carriage are adapted to permit the screws 37 to travel with the rack for the purpose presently to be more fully explained.

20^a (Fig. 3) is an upturned portion of the rack carrying the adjusting screw 39, and is a rod anchored in the end of the carriage

carrying the spring 41 located between the end 20^a of the rack and the end of the carriage.

42 are adjusting nuts for the rubber buffer 43.

Referring to Fig. 1, 44 is a short vertical shaft journaled in the end of the arm 6^a of the support 6. 45 (see also Figs. 2, 3 and 5) is an arm secured to the lower end of this shaft carrying the roll 46 adapted to be brought into engagement with the former 47, mounted on the standard 48 rising from the bed-plate 3, so as to throw the support 6 toward the grinding wheel. On the inner end of the rack 20 is pivoted the arm 49 carrying the roll 50 by means of which the shaft 44 is rotated and said support 6 operated in the manner to be more fully explained.

51 is a wire rope attached to the end of the carriage and 52 is a pulley, journaled in the end of the carriage support, over which the rope runs to support the weight 53.

54 (Figs. 1 and 5) is a lever whose head portion 54^a is pivotally supported on the pointed screws 55 in the carriage support.

56 is a stop adjustably mounted on this lever adapted to be engaged by the lug 57 depending from the underside of the carriage so that, by means of said stop and lug, the carriage is held stationary against the weight when the carriage is away from the grinding wheel. The lever 54 is held normally in a position, for the lug and stop to engage, by means of a spring (not shown).

In Figs. 1, 2 and 4, all of the operative parts of the machine are idle except the driving pulley and the grinding wheel, with the carriage away from the grinding wheel, as shown. When the lever 54 is depressed to release the carriage and place it under the control of the weight 53, said carriage will be carried forward with great rapidity until halted by the engagement of the inner end of the adjustable stop screw 1^a with the end of the carriage support. This will bring the corner 5^a of the grinding wheel opposite the outer face of the shoulder 58 of the knife 11.

When the carriage is being carried forward as before mentioned, the spring 41 will force the rack 20 forward so as to carry the screw 39 the proper distance from the end of the carriage. This forward movement of the carriage will also cause the roll 22 to engage with and depress the long arm of the lever 21 and cause its shorter and curved end 21^a to engage the underside of the forward shaft box 14 and elevate the inner end of the driving shaft to bring about the engagement of the pinion 19 with the rack 20. The forward movement of the carriage will also cause the roll carrying arm 49 of the rack to engage with the upright 60 and thus place said arm in a horizontal position to engage the tail-piece 45^a of the arm 45. As the driving shaft is always rotating whether tilted or

dropped as shown at Figs. 1, 2 and 4, or elevated as shown at Figs. 3, 5 and 6, the instant the shaft pinion engaged with the rack, if said rack was secured to the carriage, the carriage would begin to travel back before the knife holder support 6 could be thrown around to bring the knife against the grinding wheel. To obviate this, the rack is allowed an idle travel, as represented by the distance between the end of the screw 39 and the end of the carriage. During the idle travel of the rack, the roll 50 will engage the tail-piece of the roll-arm 45 and rotate the vertical shaft 44 to throw the knife holder support 6 around and bring the knife blade against the grinding wheel. By the time this takes place, the end of the screw 39 will have been brought against the end of the carriage to start said carriage on its return or backward travel to grind the knife blade from the shoulder to the point.

As soon as the grinding is completed, the trip rod 31 will engage with and trip the lever 24 to release the box 14 and permit the inner end of the driving shaft to drop and thus disengage the shaft pinion from the rack. The carriage will then be at its extreme backward and locked position as shown at Fig. 1. Just previous, however, to the reengagement of the stop 55 with the lug 57 the tail-piece 45^a of the roll-arm 45 will have engaged with the rod 61 (Figs. 1 and 2), which will bring about a disengagement of the roll 46 with the former 47 and thus release the knife holder support 6, which support will then be forced back against the adjustable stop 63 by the spring 64. The rod 61 is adjustably mounted in the arm 65, which arm is adjustably mounted on the rod 66 projecting from the bed-plate 3. The handle 67 is used when necessary to pull the carriage back by hand, and 68 is a handle for operating the vertical shaft 44 by hand. 69 (Fig. 4) is a lug projecting from the box 14, which lug is adapted to engage the adjusting screw 70 carried by the standard 17 to limit the downward movement of the driving shaft.

It will readily be understood that the former 47 can be of an irregular shape, when knives or other objects of an irregular shape are being ground, or the straight former shown can be tilted to give a taper to the blade.

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 grinding wheel, a traveling carriage carrying a knife holder, an adjustably supported driving shaft, a pinion thereon, a rack on the carriage, means on the carriage for automatically actuating the shaft to bring the pinion into engagement with the rack, and means on said carriage for automatically disengaging it therefrom, for the purpose set forth

2. In a cutlery grinding machine, a grinding wheel, a traveling weight operating carriage carrying a knife-holder, an adjustably supported driving shaft, a rack on the carriage, a pinion on the shaft, means on the carriage for automatically engaging the pinion with the rack, and means for automatically disengaging it therefrom, for the purpose set forth.

3. In a cutlery grinding machine, a grinding wheel, a traveling carriage, a support therefor, a knife-holder, a support therefor, said support mounted on the carriage and laterally movable thereon to and from the grinding wheel, a rack having an independent longitudinal movement on the carriage, means on the rack to effect the lateral movement of the knife-holder support toward the grinding wheel, means carried by the rack to engage the carriage at the expiration of said idle movement to actuate said carriage during the grinding operation, an adjustably supported driving shaft, a pinion thereon, means on the carriage for automatically actuating the driving shaft to bring the pinion into engagement with the rack, means for automatically disengaging the same, and means for locking the carriage at the completion of the grinding, for the purpose set forth.

4. In a cutlery grinding machine, a grinding wheel, a traveling weight actuated carriage, a support therefor, a knife-holder, a support therefor, said support adapted to have a lateral movement to and from the grinding wheel, a rack on the carriage adapted to have an idle movement thereon and independent of the movement of the carriage, an adjustably supported driving shaft, a pinion thereon, means on the carriage for actuating the shaft to engage the pinion with the rack, means for locking the shaft during such engagement, means carried by the rack to engage the carriage to actuate the same at the completion of the idle movement of the rack, means on the rack for actuating the knife-holder support toward the grinding wheel, means for automatically disengaging the pinion from the rack at the completion of the grinding, means for automatically retreating the knife-holder support, and means for locking the carriage, for the purpose set forth.

5. In a cutlery grinding machine, a grinding wheel, a traveling carriage, a support therefor, a weight for actuating the idle travel of the carriage in one direction, an ad-

justably supported driving shaft, a pinion thereon, a rack on the carriage, means on the carriage to actuate the shaft to bring the pinion into engagement with the rack to effect a return movement of the carriage, means for temporarily retaining said pinion in contact with the rack, means for disengaging said pinion, for the purpose set forth.

6. In a cutlery grinding machine, a grinding wheel, a traveling carriage, a support therefor, a knife-holder support, a rack on the carriage, an adjustably supported driving shaft and a pinion thereon adapted to be temporarily brought into engagement with the rack, for the purpose set forth.

7. In a cutlery grinding machine, a grinding wheel, a traveling carriage, a support therefor, a knife-holder, a weight to actuate the carriage in one direction, a rack on the carriage, an adjustably supported driving shaft carrying a pinion adapted to be temporarily brought into engagement with the rack to actuate the carriage in the opposite direction, for the purpose set forth.

8. In a cutlery grinding machine, a grinding wheel, a traveling carriage, a knife-holder support operatively mounted thereon, a weight, said carriage under the control of said weight to impart to the carriage an accelerated speed when traveling in one direction, a stop to limit said travel, a rack supported on the carriage and adapted to have an idle movement thereon and independent of the movement of the carriage, an adjustably supported driving shaft, a pinion thereon, means on the carriage to actuate the shaft to bring the pinion and rack into engagement to return the carriage, means on the rack to engage with the carriage at the completion of the idle movement of said rack, a former, means to connect the knife-holder support therewith, means on the rack to effect such connection to throw the said support toward the grinding wheel, and means to release said support, and means to return said support, and means to lock the carriage when a knife has been ground, for the purpose set forth.

Signed at New Haven in the county of New Haven and State of Connecticut this 29th day of August A. D. 1907.

CHARLES L. JOY.

Witnesses:

GEORGE A. TYLER,
CAROLINE STREIT.