

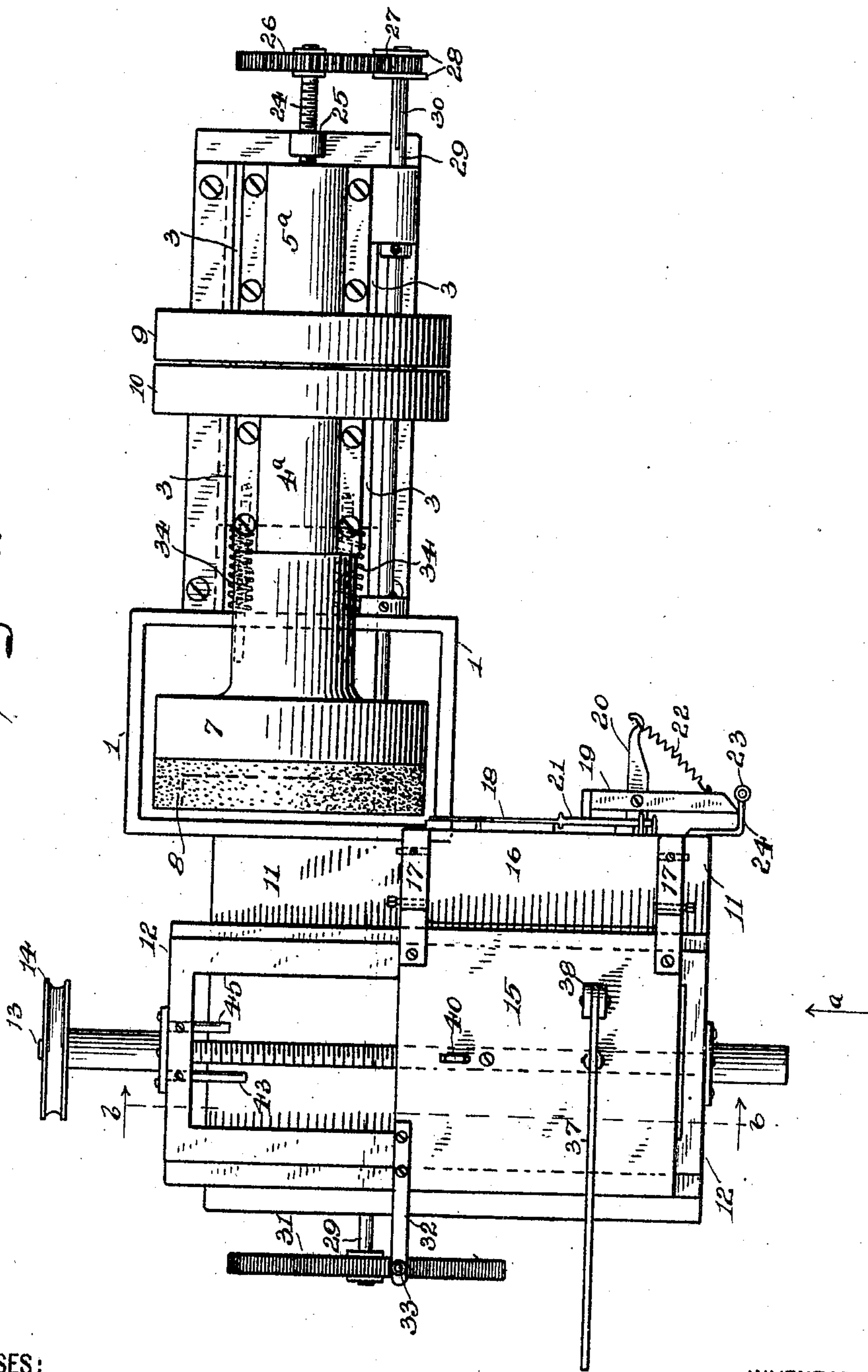
No. 804,234.

PATENTED NOV. 14, 1905.

C. L. JOY.
CUTLERY GRINDING MACHINE.
APPLICATION FILED JAN. 21, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



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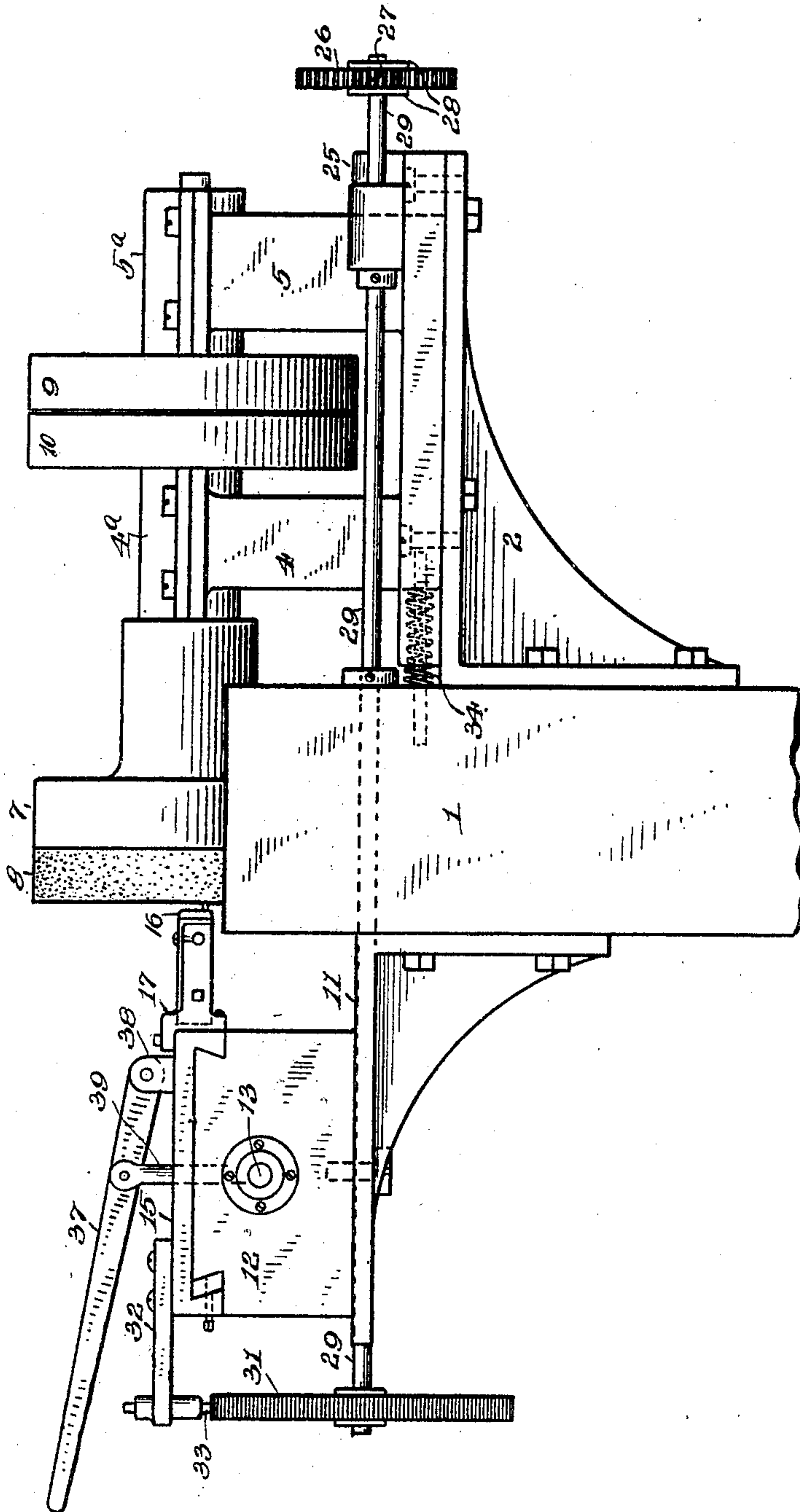
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

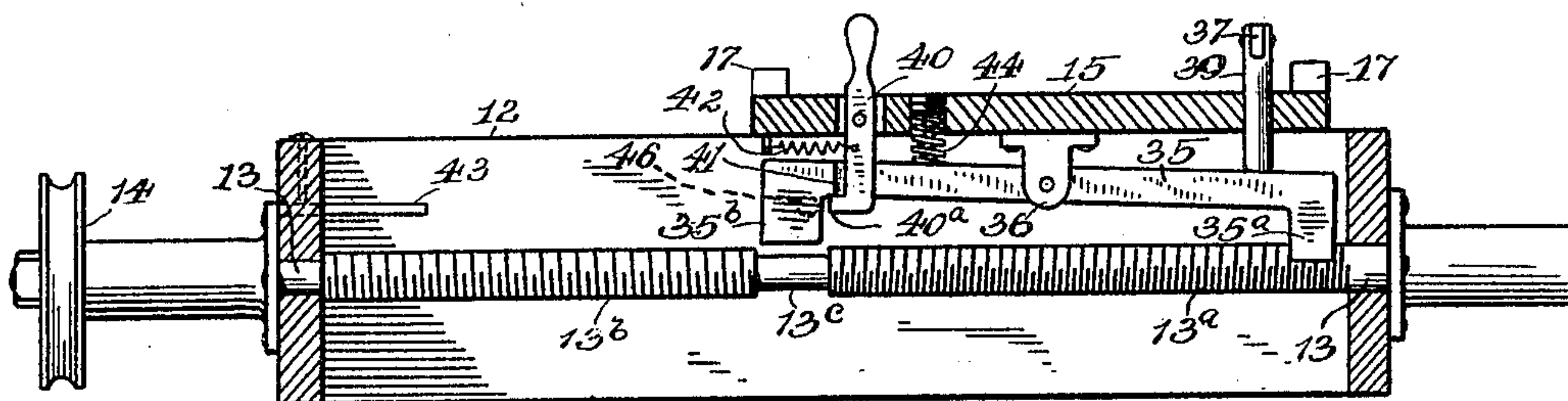


Fig. 4.

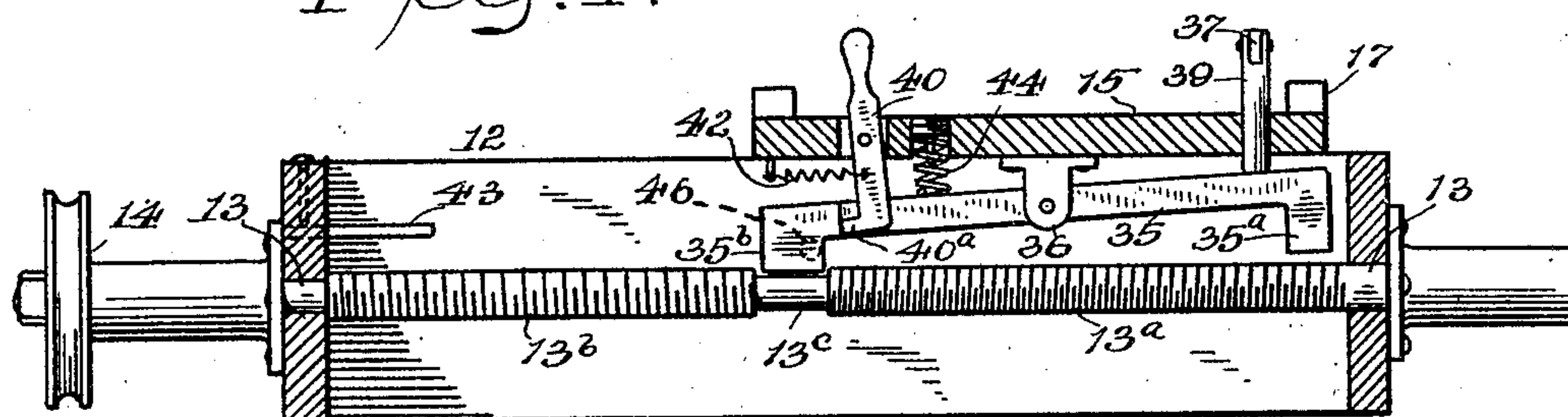


Fig. 5.

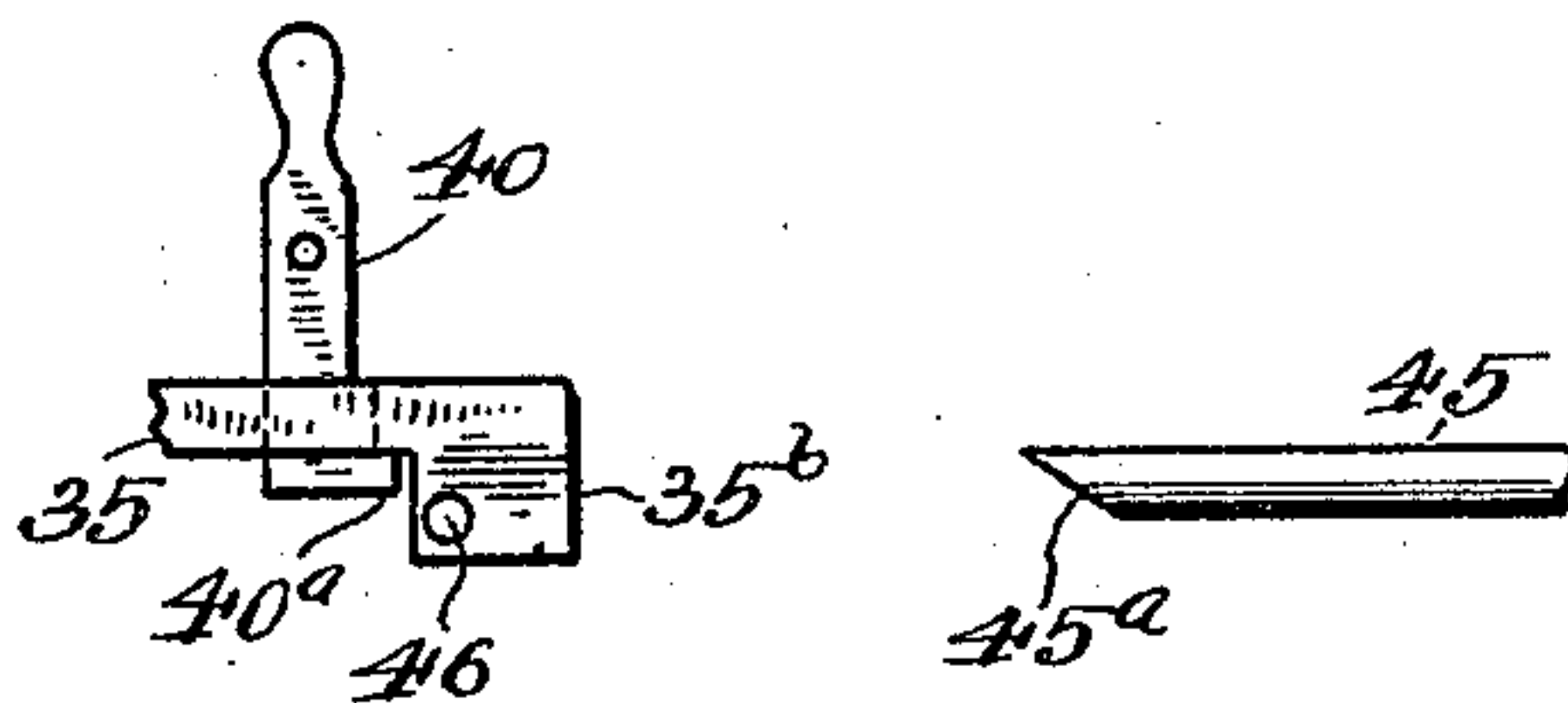
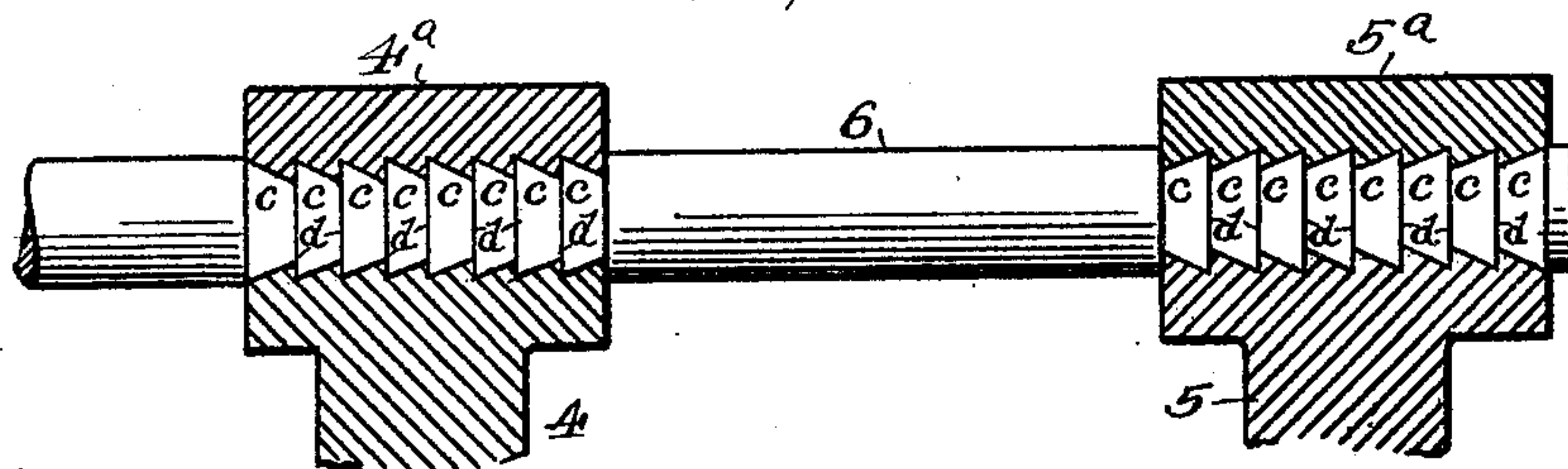


Fig. 6.



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4 SHEETS—SHEET 4.

Fig. 7

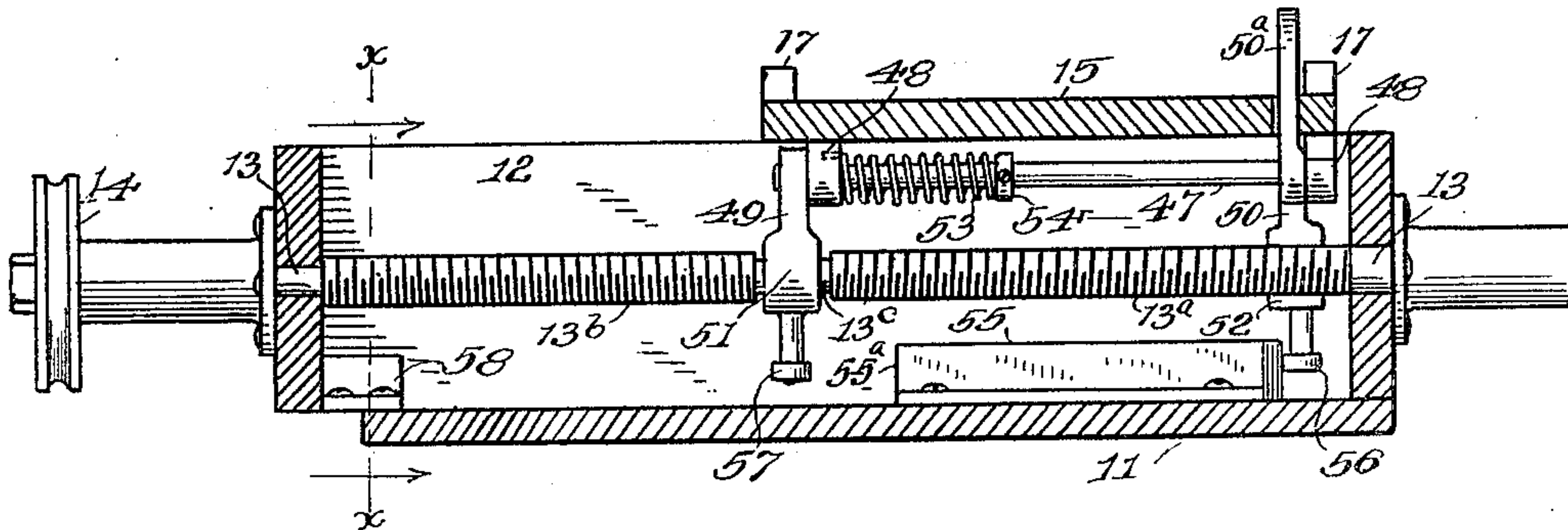


Fig. 8.

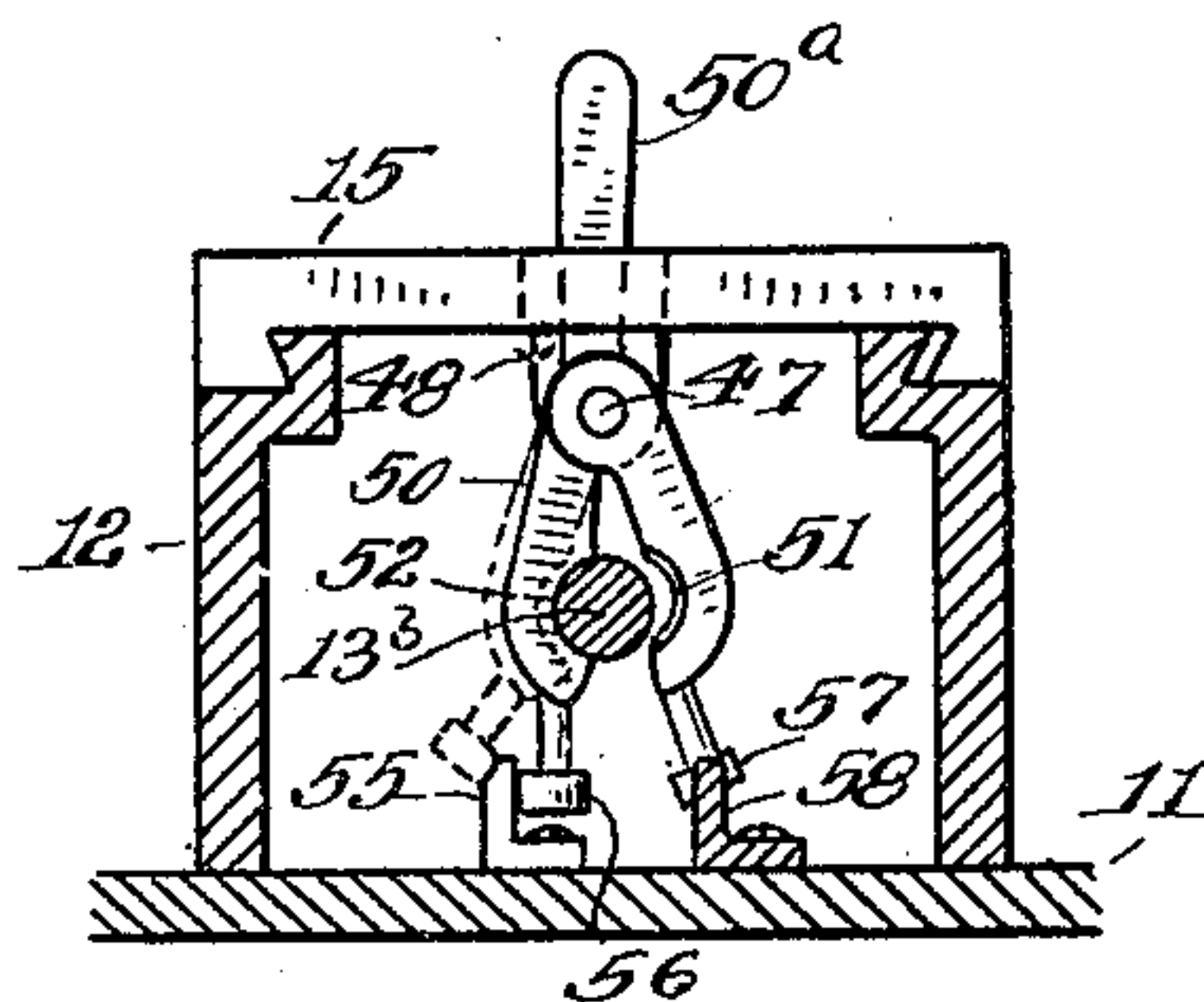


Fig. 9.

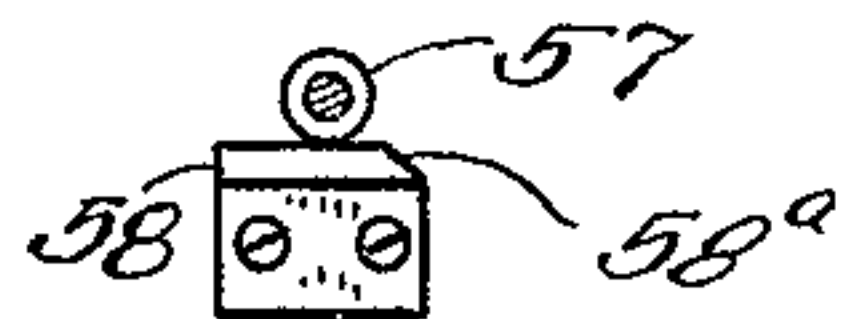
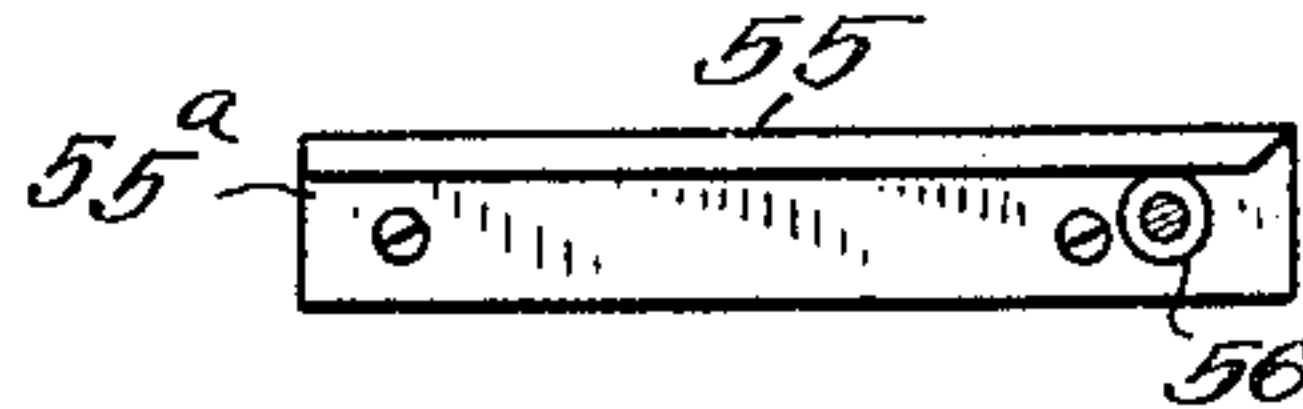


Fig. 10.



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UNITED STATES PATENT OFFICE.

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CUTLERY-GRINDING MACHINE.

No. 804,234.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed January 21, 1904. Serial No. 190,019.

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 machines for grinding cutlery, particularly table-knives; and it consists of certain improvements 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—

15 Figure 1 represents an upper plan view of the machine. Fig. 2 is a side elevation of the machine with the knife-holding clamp removed, also broken view of the machine standard. Fig. 3 is a longitudinal sectional view
20 of the carriage and its support through line b of Fig. 1, showing the right and left hand feed-screw and a feed-lever pivotally supported to the under side of the carriage and carrying at each end a half-nut or feed-nut
25 adapted to be alternately brought into engagement with the feed-screw. This view shows one of the feed-nuts of the lever engaged with the right-hand thread of the feed-screw to feed the carriage forward. Fig. 4
30 is a sectional view similar to Fig. 3, showing the carriage at a standstill with the forward threaded portion or feed-nut of the lever disengaged from the return or left-hand thread of the feed-screw. Fig. 5 is a broken detail
35 view of the forward end of the feed-lever, the locking-finger engaged therewith, also a broken detail view of the stop-pin adapted to insure the depression of the feed-lever at the completion of the forward travel of the carriage. Fig. 6 is a broken view of the main
40 driving-shaft, broken sectional view of the standards and caps in which said shaft is journaled, also a novel form for the shaft-journals to prevent end play of the shaft.
45 Fig. 7 is a longitudinal sectional view of the knife-supporting carriage and its support similar to Fig. 3, showing a modified construction of the mechanism for bringing the carriage under the influence of the feed-screw.
50 Fig. 8 is a sectional end elevation through line x of Fig. 7. Fig. 9 is a detail modified construction of the means for positively bringing one of the half-nuts into engagement with the left-hand portion of the feed-screw. Fig.
55 10 is a detail modified construction of the means for holding one of the half-nuts into

engagement with the right-hand portion of the feed-screw.

Its construction and operation are as follows:

1 represents the standard of the machine; 2, a bracket attached to the standard to form the bed; 3, a slide mounted on said bed and carrying the standards 4 and 5, in which is journaled the driving-shaft 6. 7 is a chuck
65 on the forward end of said shaft, and in this chuck is mounted the emery-wheel 8. 9 is the driving-pulley for said shaft, and 10 is the loose pulley.

11 is the table of bracket form secured to
70 the standard 1, and on this table is mounted the carriage-support 12. 13 is the feed-screw journaled in said support and carrying the pulley 14, by which it is driven.

15 is the traveling carriage; 16, the knife-
75 support adjustably supported to the brackets 17 of the carriage; 18, the knife-blade, Fig. 1, in position on the vertical face of the knife-support in readiness to be ground.

19 is a lever pivotally supported on the
80 bracket 20, which bracket is secured to a stationary part of the machine. The forward end of this lever 19 is held firmly against the knife-handle 21 by means of the spring 22 when the blade is being ground. The opposite end of the lever 19 is beveled, so that when
85 the carriage 15 has retreated this beveled end will engage the roll 23 on the bracket 24 and release the pressure of the lever on the knife-blade and when an unground knife is placed
90 against the support and the carriage started on its forward movement the lever will instantly reengage with the handle of the knife.

To compensate for the wear of the grinding-wheel on its vertical face, that portion
95 where the grinding is done, the slide 3 is actuated forward in the following manner, viz: 24, Fig. 1, is a screw at the rear of the machine passing through a threaded hole in the block 25 of the bed with its end abutting
100 against the end of the slide 3. 26 is a gear on the end of this screw adapted to mesh with the pinion 27. This pinion has the flanges 28 adapted to embrace the vertical faces of the gear. This pinion is slidably mounted on the
105 shaft 29 and is kept from turning on said shaft by means of the spline or key 30. By this arrangement the pinion will always follow the gear and continue in mesh therewith.

On the forward end of the shaft 29 is the
110 feed-wheel 31, provided with very fine teeth on its periphery.

32 is an arm secured to the forward end of the carriage 15, and it carries the pawl 33, (see also Fig. 2,) which pawl engages with the teeth of the feed-wheel on the forward movement of the carriage and actuates the shaft 29, and indirectly the slide 3, in the manner as before described.

34 represents springs interposed between the forward end of the slide 3 and the rear face of the standard 1. The tendency of these springs is to force the slide back, so that between the forward feed of the slide and the rearward pressure of these springs there can be no end play of the grinding-wheel. In grinding rough stock it is highly important in securing uniform work that all end play of the grinding-wheel be completely eliminated, and this has been done by means of the arrangement above described. As the carriage is forced against the springs so as to keep the grinding-wheel perfectly steady, the springs 34 will eliminate all the back lash or lost motion of the screw 24 and also in the gear and pinion.

The carriage 15 is actuated to move forward and back as follows: 35 (see Fig. 3) is a feed-lever pivotally supported in the bracket 36, secured to the under side of the carriage 15. The semicircular ends or half-nuts or feed-nuts 35^a and 35^b are threaded to engage with the threaded portions 13^a and 13^b of the feed-screw 13. The coarse thread 13^b is left hand and is employed for a quick return of the carriage, and the finer thread 13^a is for feeding the carriage forward. The feed-screw 13 runs continuously, and to feed the carriage forward the rear end of the feed-lever 35 is depressed until its rear feed-nut 33^a is brought into mesh with the right-hand-threaded portion 13^a of the feed-shaft, as shown at Fig. 3. This is done by means of the handle-lever 37, (see also Fig. 2,) which lever is pivotally supported in the standard 38 of the carriage. 39 is a pin pivotally supported on this handle-lever, which extends through the carriage and engages with the rear end of the feed-lever 35. When the rear end of the feed-lever is depressed, as shown at Fig. 3, it is held down temporarily by means of the locking-lever 40 through the medium of its toe 40^a, engaging with the under side of the projection 41 of the feed-lever. 42 is a spring connecting said locking-lever with the carriage. When the carriage has advanced far enough to grind the full length of the knife-blade, the locking-lever will be brought against the pin 43, projecting from the inside forward end of the carriage-support, and release said locking-lever from its hold on the forward end of the feed-lever 35. When thus released, the spring 44 will disengage the feed-lever from the threaded portion 13^a of the feed-screw and bring the forward feed-nut of the lever into engagement with the threaded portion 13^b for the quick return movement of the carriage. Owing to

the fact that the grip of the feed-lever 35 is firmer when engaging the right-hand thread 13^a of the feed-screw, while the grinding-wheel is in contact with the knife-blade, the spring 44 may fail at times to depress said lever after the locking-lever 40 has been disengaged.

To insure the depression of the feed-lever 35 in time to prevent accident by feeding the carriage too far and damaging the feed mechanism as well as spoiling the work, the second pin or stop 45 (see also Figs. 1 and 4) is provided with the inclined beveled face 45^a, which will engage with the pin 46, projecting laterally from the forward end of said lever, and by means of this positive engagement the rear end feed-nut of said lever is sure to be forced out of its engagement with the right-hand thread of the feed-screw and the feed-nut in the forward end of said lever brought into engagement with the left-hand portion of said screw for the quick return movement of the carriage, and when the feed-nut 35^b of the lever 35 has reached the central threadless portion 13^c of the feed-screw the carriage will be at a standstill and in its extreme rear position, ready for another forward movement as soon as another knife is placed on the knife-support and the feed-lever again depressed, as before mentioned.

The locking-lever 40 has a handle portion extending above the upper surface of the carriage 15, as shown, so that the carriage may be manually arrested at any point of its forward movement.

The modification of the feed-lever (shown at Figs. 7 and 8) comprises the rock-shaft 47, journaled in the brackets 48, projecting from the under side of the carriage 15. 49 and 50 are arms secured to this shaft, and they carry at their free ends the feed-nuts 51 and 52. 53 is a spring on the rock-shaft 47, having one of its ends anchored in one of the brackets 48 and the other in the collar 54 on said shaft. This imparts a torsional strain to the shaft 47 and tends to throw the feed-nut 52 away from the feed-screw 13 and the feed-nut 51 toward said screw. The arm 50 has the extension 50^a, projecting through a slot in the carriage, to serve as a handle for throwing the feed-nut 52 in mesh with the right-hand thread of the feed-screw for a forward movement of the carriage 15. To insure the engagement of the feed-nut 52 with the feed-screw, the projection 55 stands in such relation with the feed-nut and feed-screw that when said nut is thrown into mesh with said screw the roll 56, carried by said nut, will be on a line with the inner face of said projection (see also Fig. 10) and will travel along such face while a knife-blade is being ground and when the roll 56 has cleared the end 55^a of said projection the spring 53 will throw the feed-nut 52 out of engagement with the feed-screw and at the same time will throw the feed-nut 51 into

mesh with said screw for a quick return of the carriage. Should, however, the engagement of the feed-nut 52 be so firm with the feed-screw that this spring cannot dislodge it readily, the positive means comprising the roll 57 of this left-hand feed-nut engaging with the inner face of the projection 58 (see also Fig. 9) will carry this nut into mesh with the left-hand portion 13^b of the feed-screw and at the same time will be sure and disengage the feed-nut 52 from the right-hand portion 13^a of the feed-screw. 58^a is an incline on the end of said projection 58 to render the engagement easy and sure between said projection and the roll carried by nut 51. As the rolls 56 and 57 serve no other purpose than to reduce the frictional contact of the feed-nuts with the projections 55 and 58, they may, if desired, be dispensed with.

While I show the feed-nuts integral with the feed-lever, (shown at Figs. 3, 4, and 5 and in the modification of said lever at Figs. 7 and 8,) it will be understood that detachable nuts may be employed.

Another very important feature for preventing end play of the driving-shaft is to provide serrated journals for the shaft and serrated bearings for said journals, as shown at Fig. 6. The serrated journals have correspondingly-serrated bearings in the standards 4 and 5 and in the caps 4^a and 5^a for said standards. If the shaft is driven from above, the upward strain will tend to draw the incline faces *c* of the journals against the corresponding incline faces of the caps. This will tend to crowd the vertical faces *d* of the journals against the corresponding vertical faces of the caps, and in view of there being a plurality of these vertical faces the amount of wear and end play is reduced to a minimum and, in fact, may be said to be entirely eliminated. If the shaft is driven by a belt from below, the inclines will draw into the standards and the same effect produced as just described for the caps. This serrated journal is applicable for any shaft where it is desired to avoid end play or wear, as there are so many square shoulders or faces throughout the journal that wear may be said to be practicably eliminated.

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

1. In a cutlery-grinding machine of the character described, the combination, comprising a slide carrying a driving-shaft having a grinding-wheel thereon, a support for said slide, means for feeding said slide forward, springs to flexibly resist said forward movement, so that all back lash is eliminated in said slide, for the purpose set forth.

2. The combination, in a cutlery-grinding machine of the character described, comprising a slide carrying a driving-shaft having a grinding-wheel thereon, a support for said slide, a knife-supporting carriage, means

thereon to effect the forward movement of said slide sufficient to compensate for the wear of the grinding-wheel, springs to flexibly resist this forward movement, so as to eliminate all back lash in said slide, for the purpose set forth.

3. The combination, in a cutlery-grinding machine of the character described, comprising a slide carrying a driving-shaft having a grinding-wheel thereon, a support for said slide, a feed-screw for said slide carrying a gear, a driving-pinion for said gear, a shaft on which said pinion is slidably mounted, means on said pinion to maintain the engagement of said pinion and gear with respect to the longitudinal travel of the feed-screw, a ratchet-wheel on said pinion-shaft, a knife-supporting carriage, means thereon to engage and actuate said ratchet-wheel to feed forward said slide, springs in advance of said slide in which power is stored up by said forward movement so that, the said grinding-wheel is kept steady and up to its work and all back lash is eliminated in said slide, for the purpose set forth.

4. The combination, in a cutlery-grinding machine of the character described, comprising a grinding-wheel, a support therefor, a knife-supporting carriage, a support therefor, a continuously-running right and left hand feed-screw journaled in said support, a feed-lever pivotally supported to said carriage and carrying right and left hand threaded feed-nuts adapted to engage said feed-screw, means on said carriage to bring about the engagement of one of the feed-nuts with the feed-screw for the forward movement of the carriage, a locking-lever to maintain said engagement, means for releasing said locking-lever at the completion of its forward movement, means to bring about the engagement of said feed-lever with said feed-screw to effect the return movement of the carriage, for the purpose set forth.

5. In a cutlery-grinding machine of the character described, the combination with the grinding-wheel, of a knife-supporting carriage, a support therefor, a continuously-running right and left hand feed-screw journaled in said support, a feed-lever having right and left hand threaded feed-nuts, said lever pivotally supported to said carriage, means on said carriage to bring about the engagement of one of the feed-nuts with the feed-screw to effect the forward movement of said carriage, a locking-lever to maintain the forward end of the feed-lever in an elevated position, means for releasing said locking-lever, a spring for depressing the forward end of said feed-lever to bring about the engagement of the feed-nut thereon with the feed-screw to effect a return movement of said carriage, means for positively depressing said feed-lever to secure the engagement of said feed-nut with the feed-screw, the feed-screw having a threadless

portion to limit the backward movement of the carriage, for the purpose set forth.

6. The combination, in a cutlery-grinding machine of the character described, comprising a carriage, a support therefor, a knife-support on said carriage, a continuously-running feed-screw journaled in said carriage-support and having right and left hand threaded portions, a feed-lever pivotally supported on said carriage and carrying threaded feed-nuts on its ends adapted to be alternately brought into engagement with the threaded portions of the feed-screw, means for manually engaging one of the feed-nuts of said feed-lever with said feed-screw to effect the forward movement of said carriage, a locking-lever to maintain such engagement, a stop to release said locking-lever, a second stop adapted to tilt said feed-lever sufficient to arrest the forward movement of said carriage and bring about the engagement of the feed-nut in the forward end of said feed-lever with the feed-screw for a return movement of said carriage, the feed-screw having a central threadless portion to limit the backward movement of the carriage, for the purpose set forth.

7. The combination, in a cutlery-grinding machine of the character described, comprising a traveling knife-supporting carriage, a support therefor, a continuously-running right-and-left feed-screw journaled in said support, right and left feed-nuts for said

screw, said nuts adapted to be alternately brought into engagement with their respective portions of said screw, said screw having a central threadless portion to limit the backward movement of the carriage, for the purpose set forth.

8. The combination, with a knife-supporting carriage, a support therefor, a continuously-running right-and-left feed-screw journaled in said support, right and left feed-nuts adapted to be alternately brought into engagement with their respective portions of said screw, means for bringing about such engagement, said screw having a central threadless portion to limit the backward movement of the carriage, for the purpose set forth.

9. The combination, in a cutlery-grinding machine of the character described, comprising a traveling carriage, a support therefor, a knife-support on said carriage, a spring-actuated clamping-finger adapted to engage a knife-handle, means for disengaging said finger when the carriage has returned to its normal position, for the purpose set forth.

Signed at New Haven, in the county of New Haven and State of Connecticut, this 29th day of December, A. D. 1903.

CHARLES L. JOY.

Witnesses:

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