

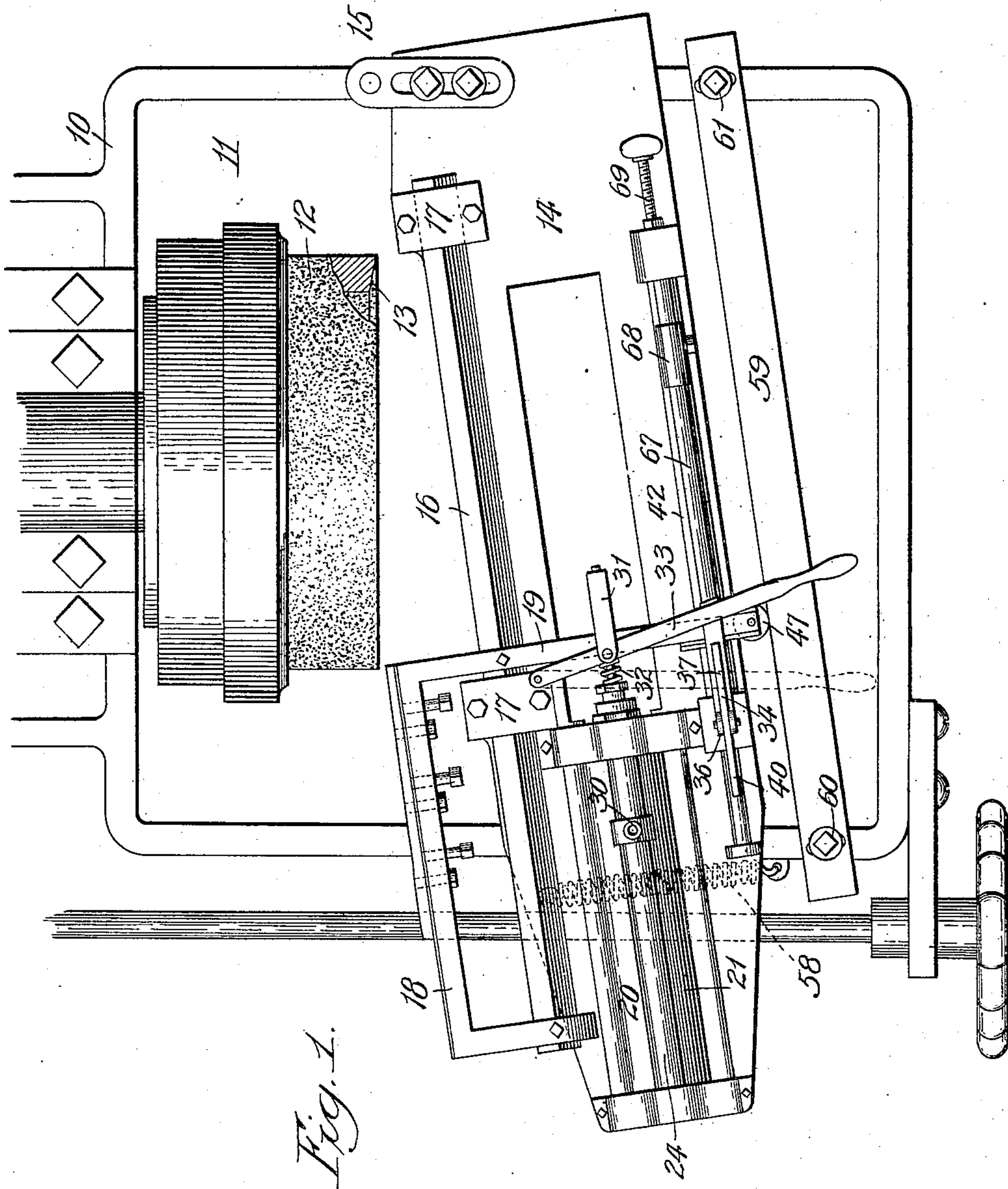
No. 886,754.

PATENTED MAY 5, 1908.

W. J. BASTIAN & F. GRANITZ.  
CUTLERY GRINDING MACHINE

APPLICATION FILED JULY 22, 1907.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

Fig. 2.

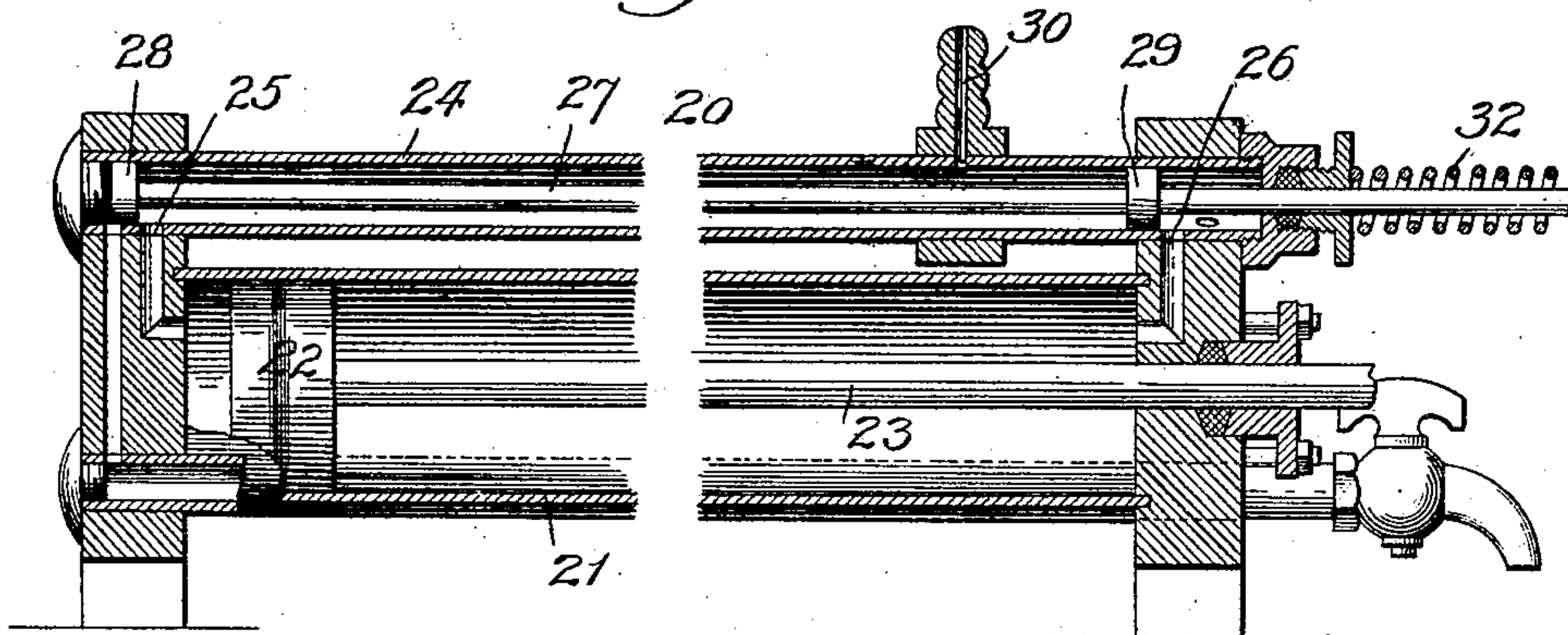


Fig. 3.

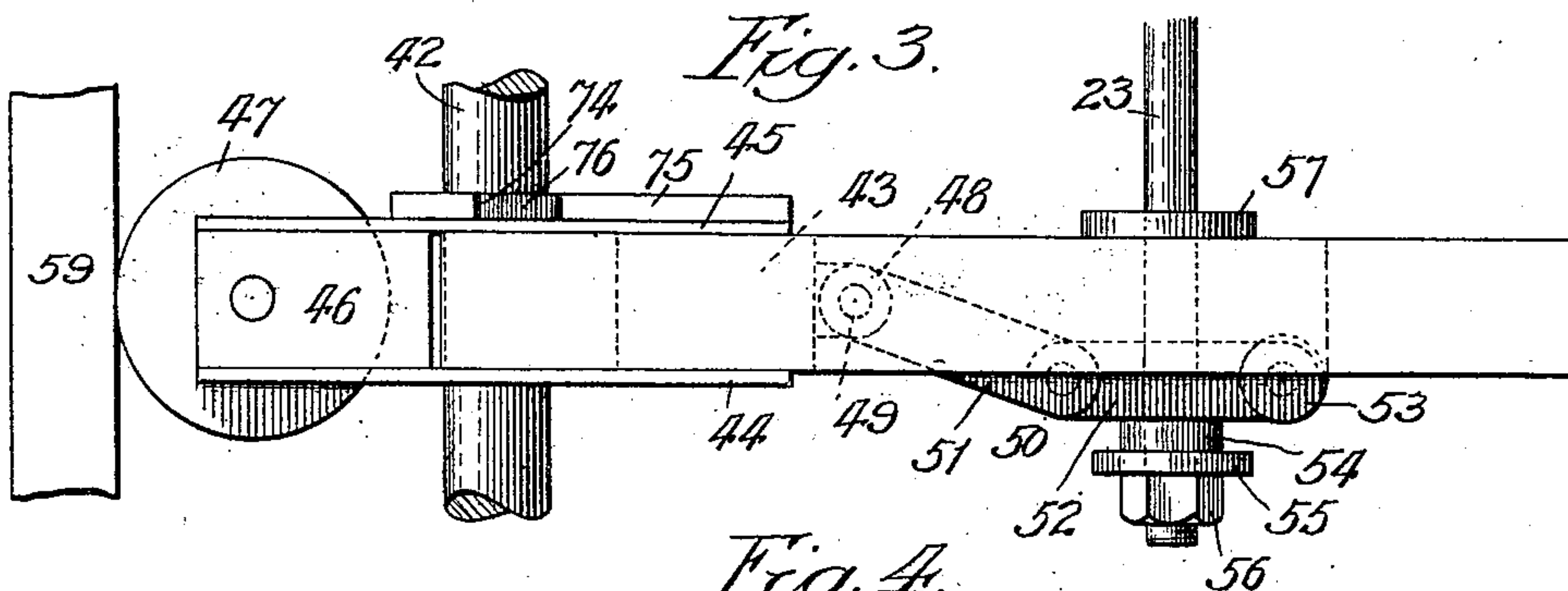


Fig. 4.

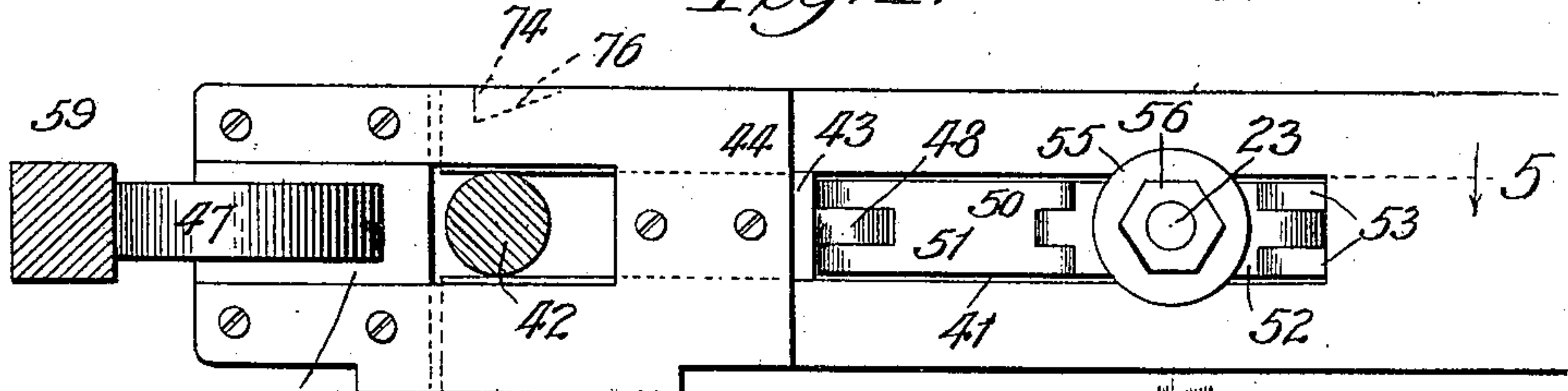
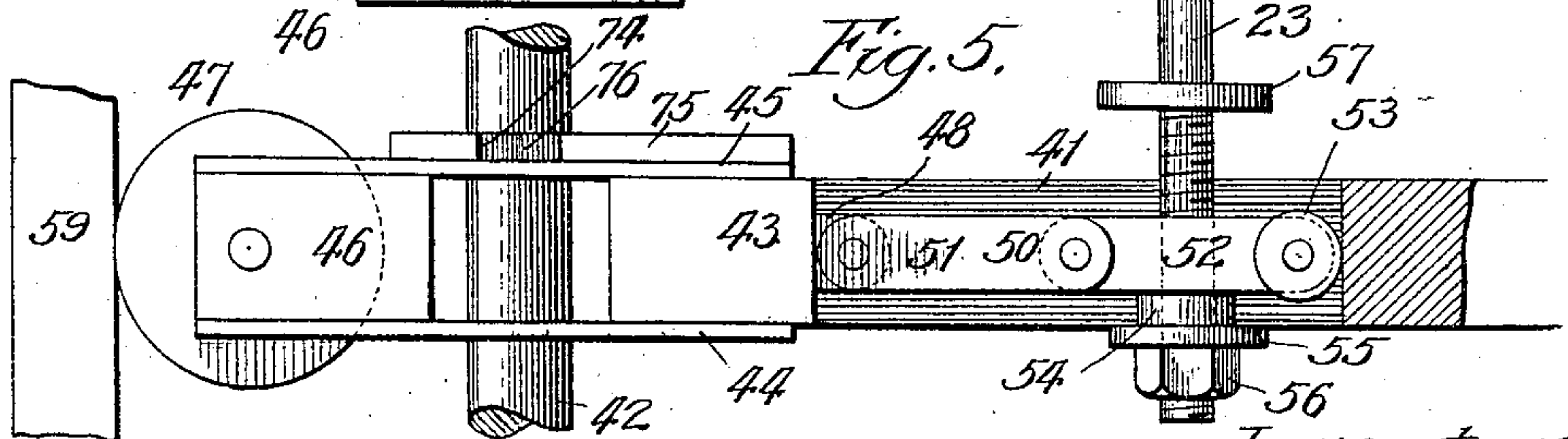


Fig. 5.



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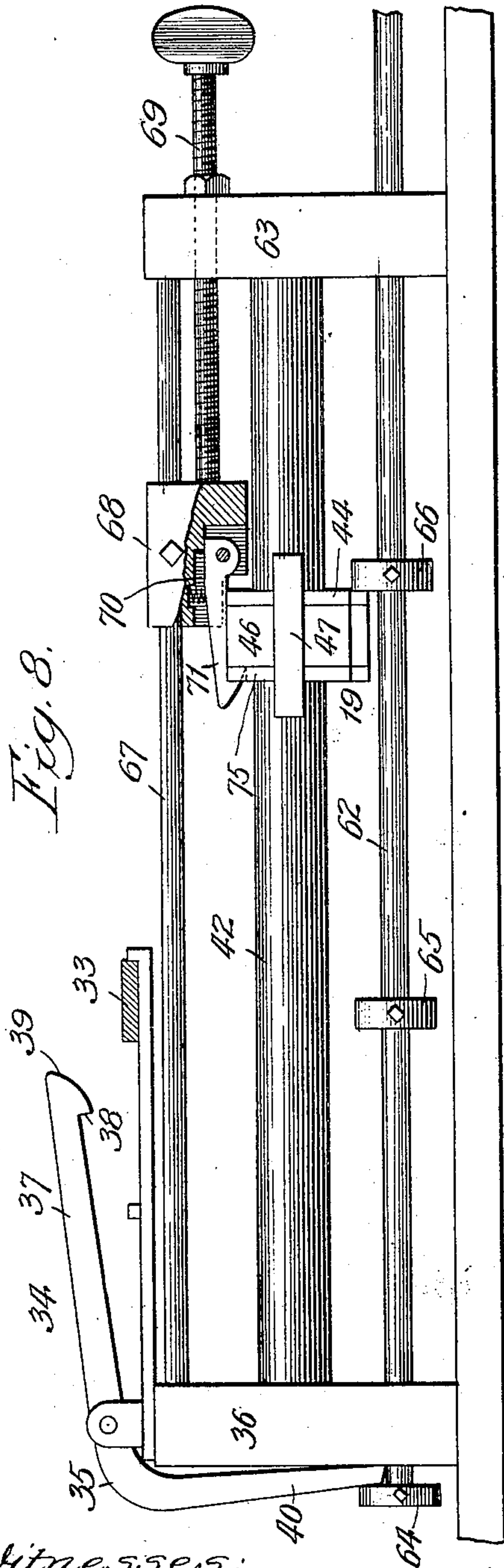
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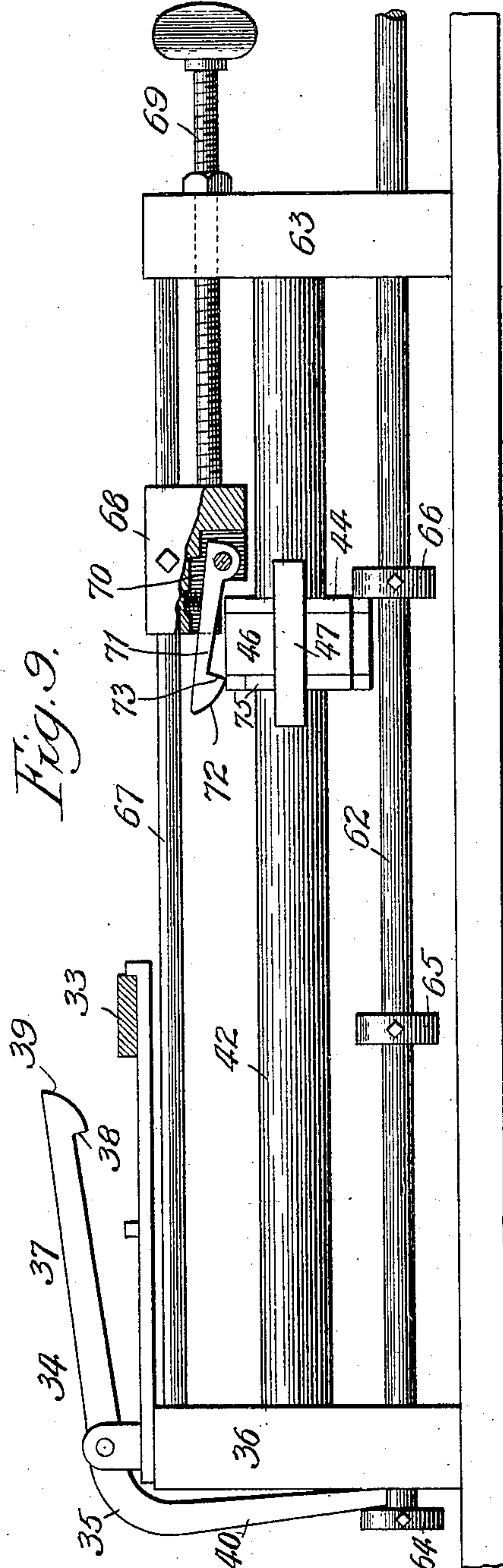
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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

WILLIAM J. BASTIAN AND FRANK GRANITZ, OF CHICAGO, ILLINOIS, ASSIGNORS TO AMERICAN CUTLERY COMPANY, A CORPORATION OF ILLINOIS.

## CUTLERY-GRINDING MACHINE.

No. 886,754.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed July 22, 1907. Serial No. 384,866.

*To all whom it may concern:*

Be it known that we, WILLIAM J. BASTIAN and FRANK GRANITZ, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Cutlery-Grinding Machines, of which the following is a specification.

Our invention relates to improvements in cutlery-grinding machines and more particularly to those of the class in which the grinding is performed in a single reciprocation of the work-carrier; and our object is to provide novel and improved means for effecting the throw of the work-holder to produce grinding of the work being operated on, during the movement of the work-holder in one direction only.

Referring to the accompanying drawings, Figure 1 is a broken top plan view of a cutlery-grinding machine embodying our invention; Fig. 2, an enlarged broken view in sectional elevation of the fluid-pressure motor for reciprocating the work-holder; Fig. 3 is a broken plan view of the mechanism for moving the work-holder toward and away from the grinding-wheel showing its position when the work-holder is out of grinding position; Fig. 4, a view in side elevation of the same; Fig. 5, a broken section taken at the line 5 on Fig. 4 and viewed in the direction of the arrow; Fig. 6, an enlarged view in elevation, and partly broken, showing mechanism for controlling the forward and reverse movement of the work-holder, and mechanism for momentarily arresting the work-holder at the end of its forward stroke while it is being moved toward the grinding-wheel, the parts being shown in the positions they occupy immediately after the operating lever has been moved to operate the machine, but before the machine has commenced to operate; Figs. 7 and 8, views similar to that shown in Fig. 6, but showing the parts in two different positions they occupy intermediate the starting of the machine to move the work-holder forward, and the reversal of the movement of the work-holder; and Fig. 9 a view similar to those shown in Figs. 6, 7 and 8, showing the positions the parts occupy immediately after the movement of the operating lever for reversing the movement of the work-holder.

The main frame 10 of the machine is formed with a water-receptacle 11 in which

a hollow cylindrical grinding-wheel 12, having an inwardly-tapering annular grinding surface 13, rotates, and adjustably pivoted at 15 to the frame 10 is a horizontal base-plate or bed 14. A rod 16 reciprocable longitudinally of the bed and preferably angular in cross-section slides in guides 17 thereon and carries a U-shaped work-holder 18 in position to reciprocate work, held therein, past the grinding surface of the wheel, the rear arm 19 of the holder extending across the bed and forming a cross-head, for a purpose hereinafter explained.

As means for reciprocating the work-holder, we have illustrated a fluid-pressure motor 20 secured on the swinging end of the bed. The motor illustrated in the drawings comprises, generally stated, a cylinder 21 containing a piston 22 on a piston-stem 23 operatively connected with the cross-head 19, as hereinafter explained; a valve-chamber 24 having inlets and outlets 25, 26, communicating with the cylinder at its opposite ends, and a valve-rod 27 in the chamber 24 provided with pistons 28 and 29, for controlling the introduction of fluid pressure to the cylinder, the pistons being so arranged as to cause the fluid admitted at 30 to enter the cylinder at its front end when the valve-rod 27 is moved inward to the position shown in Fig. 2, and to enter at its rear end when this rod is moved outward, as hereinafter explained. The valve-stem 27 carries on its outer end a plate 31 and encircling this stem and confined between an end of this plate and the valve-chamber 24, is a spring 32 for holding the valve-stem 27 in normally outwardly-pressed condition, in which condition the fluid pressure is free to flow into the forward end of the cylinder.

An operating lever 33, fulcrumed at one end to the guide 17 and pivotally connected with an end of the plate 31, serves, when moved to the position indicated by dotted lines in Fig. 1, to shut off the flow of fluid to the front end of the cylinder and to direct it into the rear end thereof, the position of the valve-pistons, when the operating lever is so moved, being that shown in Fig. 2. The lever 33 is releasably held in its spring-pressed condition by latch-mechanism 34 consisting of a bell-crank lever 35 pivoted to a standard 36 on the bed, and comprising a horizontally extending arm 37 provided with a shoulder 38 and a cam-surface 39 adjacent to it,



and a depending arm 40 in the path of tripping mechanism, hereinafter explained. The end of the cross-head 19 is provided with a horizontal recess 41, through which the outer end of the piston-stem 23, and a guide-rod 42 for the outer end of the cross-head, extend. A block 43 slidably confined in the recess 41 has slotted plates 44 and 45 secured on its opposite sides, flush with the top surface of the cross-head, and confined between the plates at their outer ends is another block 46 in which a horizontally-disposed roller 47 is journaled. The block 43 is provided on its inner end with a stud 48 having an eye 49, and pivotally connected with this stud, at its eye, is a knuckle 50 composed of two links 51 and 52 pivotally connected together, the link 52 having a roller 53 at one end for engagement with the inner end wall of the recess 41. The outer end of the piston-rod 23 is rigidly fastened to the link 52 and carries on its outer end beyond the link a sleeve 54, a washer 55 and a nut 56, and, a slight distance in the rear of the link, a washer 57. Both of the washers 55 and 57 are of greater diameter than the width of the recess 41, so that the movement of the piston-stem 23 in the recess 41 is limited in both directions, as represented in Figs. 3 and 5. The roller 47, by reason of a spring 58 connected at one end to the swinging end of the bed and at its other end to the frame 10, is maintained in constant engagement with the side surface of a guide-bar 59 adjustably mounted at both ends on the frame, as indicated at 60, 61. Thus the work-holder is moved toward or away from the grinding wheel depending on the straightening or collapsing of the knuckle. A rod 62 slidably mounted in the standards 36 and 63 carries three adjustable tappets 64, 65 and 66, one on its extreme forward end in position to engage with the arm 40 of the lever, and the others between the standards 36 and 63 and spaced apart to be engaged by the cross-head 19, for a purpose hereinafter explained.

Adjustably mounted on a bar 67 above the rod 42 is a locking device 68, a rod 69 screwing into the standard and engaging the locking device being provided for adjustment purposes. The locking-device has a recess 70 in its under side and pivoted in this recess and normally downwardly spring-pressed is a catch 71 having a cam-surface 72 and a shoulder 73. The catch, when the knuckle is collapsed as shown in Fig. 3, is in a plane to drop at its shoulder 73 into the lowermost portion of a recess 74 provided in a plate 75 secured on the forward plate 45 and having its bottom inclined as represented at 76 in the drawings.

Assuming the machine to be at rest, as represented by full lines in Fig. 1, to operate it the handle 33 is drawn forward against the tension of the spring 32 to the position rep-

resented in dotted lines in Fig. 1 whereupon the lever is releasably locked by engagement with the locking lever 35, as represented in Fig. 6. Movement of the lever 33 to this position causes the fluid pressure to enter the front end of the cylinder, thereby forcing the piston and stem backward, the first movement of the piston stem causing the knuckle 50 to collapse to the position shown in Fig. 3, in which the washer 57 abuts against the front face of the cross-head 19. Collapsing of the knuckle shortens the distance between the rollers 53 and 47 and thus, through the action of the spring 58, causes the bed to move toward the roller 47 and guide-bar 59 and away from the wheel 12, in which position the work to be ground is out of engagement with the grinding-wheel. As the cross-head nears the end of its outward stroke it engages at its lower edge with the tappet 66 and at its upper edge with the cam-surface 72 of the catch 71, raising the latter and causing it to ride upon the upper surface of the cross-head. Continued movement of the cross-head moves the tappet 66 forward, and with it the rod 62, until the tappet 64 has swung the lever 35 to the releasing position represented in Fig. 9 whereupon the lever 33 springs back to normal position, thereby operating the valve-mechanism to direct the flow of fluid pressure into the forward end of the cylinder to return the piston 23 and with it the work-holder.

Immediately preceding the tripping of the lever 33, as explained, the catch 71 at its shouldered end drops into the recess 74, and thus when the piston-rod 23 begins its return stroke the cross-head is held against movement with it until released from the catch 71. The first effect, therefore, of the initial return movement of the piston is to straighten the knuckle 50 and thereby cause the distance between the rollers 47 and 53 to be lengthened, with the effect of causing the bed 14 to be moved toward the grinding-wheel to a position in which the work in the work-holder will bear against the grinding-surface of the wheel. As the bed carrying the catch 71 moves toward the grinding-wheel, the catch 71 rides upon the inclined bottom 76 of the recess 74 and by the time the knuckle has straightened out and the piston 23 has thus become rigid with the cross-head, the catch 71 has been withdrawn from the recess, releasing the cross-head and permitting it to be returned to normal position with the piston. As the cross-head nears the end of its return stroke it engages the tappet 65, moving the rod 62 with it to the position represented in Fig. 6 in which position the machine is in condition to be again operated as described.

While we have illustrated and described our invention in connection with a certain construction of machine, we do not thereby



intend to limit our invention to its use in connection with such machine.

What we claim as new and desire to secure by Letters Patent is—

5 1. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a work-holder, means for reciprocating the work-holder, a guide on the frame, and means carried by said work-holder, slidable toward and away from said work-holder and transversely of the path of movement thereof, and bearing against said guide, for moving the work-holder into and out of grinding position.

15 2. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a work-holder, means for reciprocating the work-holder, a guide on the frame, roller-mechanism constructed and arranged to bear against the guide and to travel with the work-holder in its reciprocating movements and to be independently movable toward and away from said work-holder, and means for moving the work-holder relative to the roller-mechanism, for the purpose set forth.

3. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a swinging bed on the frame, a work-holder reciprocably mounted on the bed, means for reciprocating the work-holder, a guide on the frame, an arm connected with the work-holder and composed of relatively movable telescoping sections, constructed and arranged to bear at one of its sections against the guide, and means for moving the sections relative to each other, for the purpose set forth.

4. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a work-holder, means for reciprocating the work-holder, a guide on the frame, and means slidably connected with the work-holder, movable against said guide and constructed and arranged to be moved toward and away from said work-holder against the guide in the travel of said first-named means for moving the work-holder into and out of grinding position.

5. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a work-holder, means for reciprocating the work-holder, a guide on the frame, and roller-equipped means slidably connected with the work-holder, movable against said guide and constructed and arranged to be moved toward and away from said work-holder against the guide, in the travel of said first-named means, for moving the work-holder into and out of grinding position.

6. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a work-holder, means for reciprocating the work-holder, a guide on the frame,

roller mechanism slidably connected with the work-holder, movable against said guide and constructed and arranged to be moved toward and away from the work-holder, and a spring for maintaining said roller mechanism in contact with said guide during the movement of the work-holder, for the purpose set forth.

7. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a swinging bed on said frame, a work-holder on said bed, means for reciprocating the work-holder, a guide on the frame, means movable with the work-holder and adapted to bear against said guide for moving the work-holder toward and away from said guide, and means for maintaining said second-named means in contact with said guide during the movement of the work-holder, for the purpose set forth.

8. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a swinging bed on the frame, a work-holder reciprocably mounted on the bed, means for reciprocating the work-holder, and means for swinging the bed with reference to the grinding-wheel comprising a guide on the frame, a roller carried by the work-holder and bearing against said guide and constructed and arranged to travel with the work-holder and to be movable relative to it, the connection between said reciprocating means and work-holder being constructed and arranged to arrest the movement of the work-holder during a portion of the movement of the reciprocating means, and during such arresting to cause the roller to move relative to said work-holder, for the purpose set forth.

9. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a swinging bed on the frame, a work-holder reciprocably mounted on the bed, means for reciprocating the work-holder, a guide on the frame, an arm operatively connected with the work-holder and carrying a roller bearing against said guide and movable with relation to the arm, and means for moving the roller relative to said arm during a portion of the movement of the reciprocating means.

10. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a swinging bed on the frame, a work-holder reciprocably mounted on the bed, a guide on the frame, roller mechanism carried by said holder, bearing against said guide and movable with relation to said work-holder, and means for reciprocating said work-holder having flexible connection with said roller mechanism, for the purpose set forth.

11. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a swinging bed on the frame, a work-holder reciprocably mounted on the bed,



means for reciprocating the work-holder, a guide on the frame, a cross-head connected with the work-holder and carrying a knuckle connected with the reciprocating means, a  
 5 roller movable relative to the cross-head operatively connected with the knuckle to bear against said guide, for the purpose set forth.

12. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a swinging bed on the frame, a work-holder reciprocably mounted on the bed, means for reciprocating the work-holder, a  
 10 guide on the frame, a cross-head connected with the work-holder and carrying a knuckle connected with the reciprocating means, a roller operatively connected with the knuckle to bear against said guide and movable relative to the cross-head, and means for holding  
 15 said roller against the guide, for the purpose set forth.

13. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a swinging bed on the frame, a  
 20 work-holder reciprocably mounted on the bed, means for reciprocating the work-holder, a guide on the frame, a cross-head connected with the work-holder and carrying in a recess in its end a knuckle connected  
 25 with the reciprocating means, a sliding block operatively connected with the knuckle, plates secured to said block, a second block embraced by said plates and a roller journaled in said second block to bear against the  
 30 guide, for the purpose set forth.

14. In a grinding-machine the combination of a frame, a grinding-wheel journaled

thereon, a swinging bed on the frame, a work-holder reciprocably mounted on the frame, means for reciprocating the work-holder, a  
 40 guide on the frame, a roller operatively connected with the work-holder and movable relative thereto during a portion of the operation of the reciprocating means, the connection between said reciprocating means being  
 45 constructed and arranged to move the roller relative to the holder during the operation of the reciprocating means, and latch-mechanism for arresting the movement of the work-holder during a portion of the movement of  
 50 the reciprocating means.

15. In a grinding-machine, the combination of a frame, a grinding-wheel journaled thereon, a swinging bed on the frame, a work-holder reciprocably mounted on the bed, means for reciprocating the work-holder, a  
 55 cross-head movable with the work-holder, a sliding-knuckle connection between said reciprocating means and work-holder, a guide on the frame, a roller operatively connected  
 60 with the knuckle and bearing against the guide, a locking-shoulder having a cam-surface carried by the cross-head, a locking device constructed and arranged to engage  
 65 with said locking-shoulder at the end of the forward movement of the work-holder, and to engage said cam-surface in the movement of the cam transversely of the locking-device, for the purpose set forth.

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 FRANK GRANITZ.

In presence of—

J. H. LANDES,  
 SOL SALIUS.