

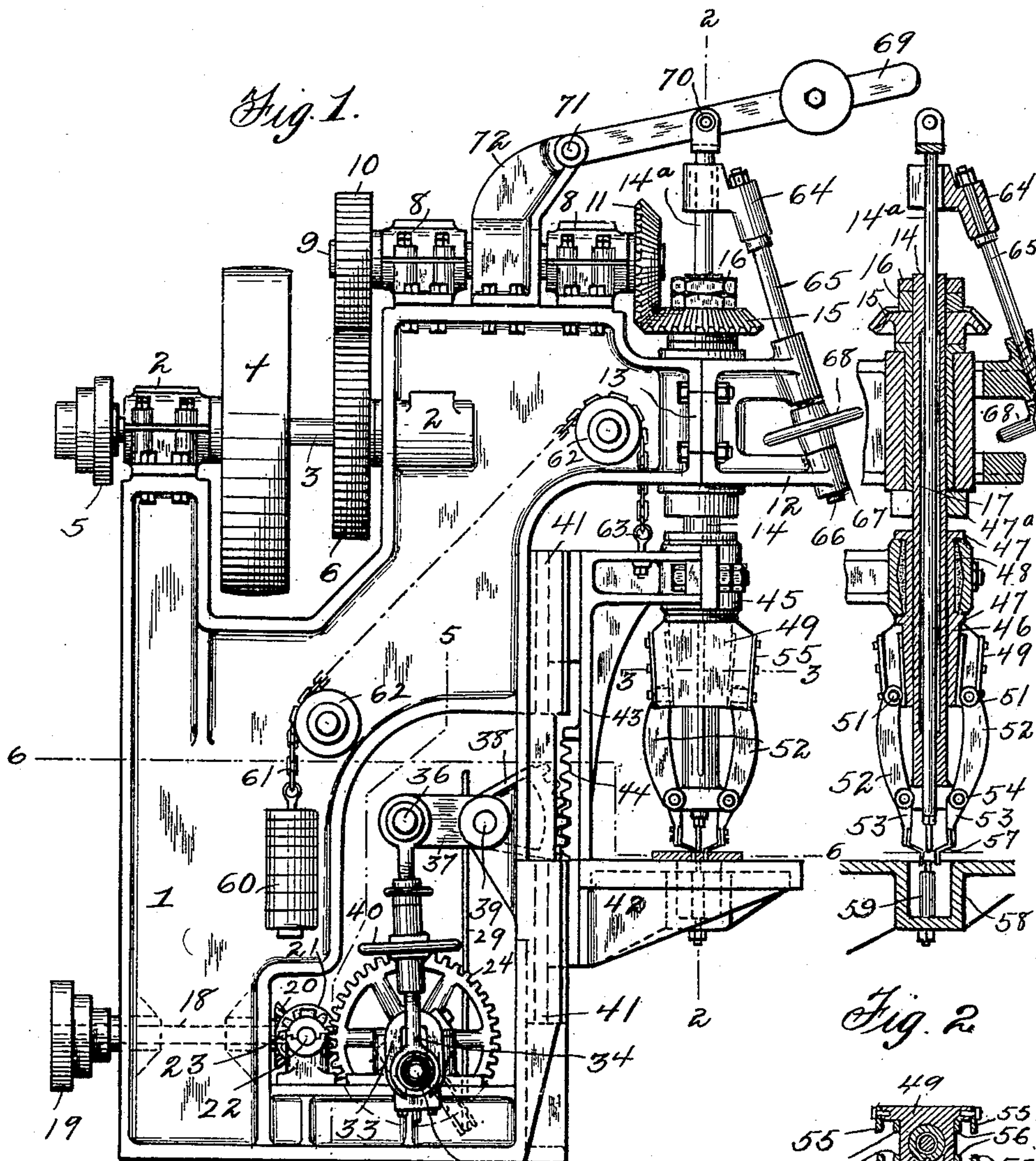
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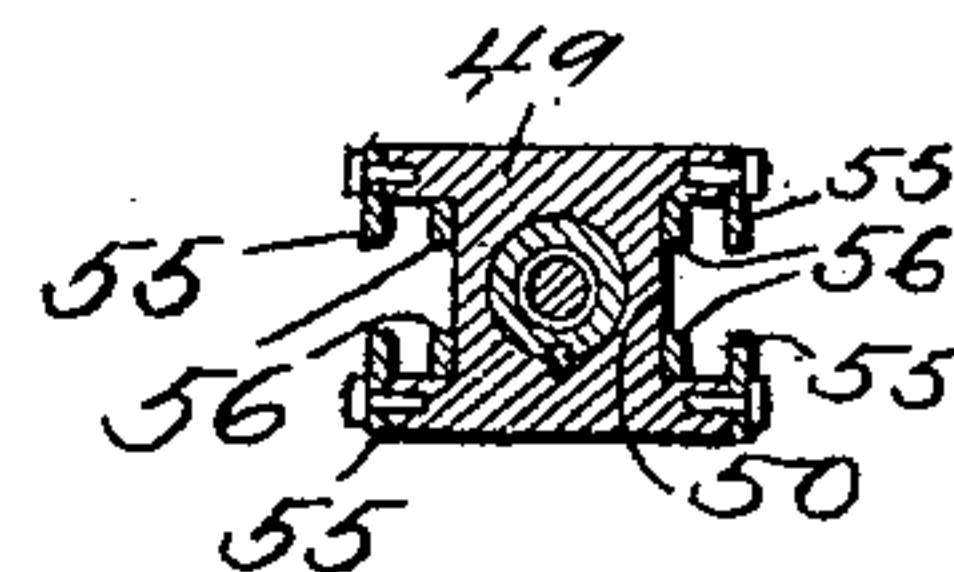
J. A. HELLSTROM & G. W. EXLER.  
CORK CUTTING AND TAPERING MACHINE.

APPLICATION FILED OCT. 31, 1905.

3 SHEETS—SHEET 1.



*Fig. 2.*



*Fig. 3.*

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*Fig. 3a*

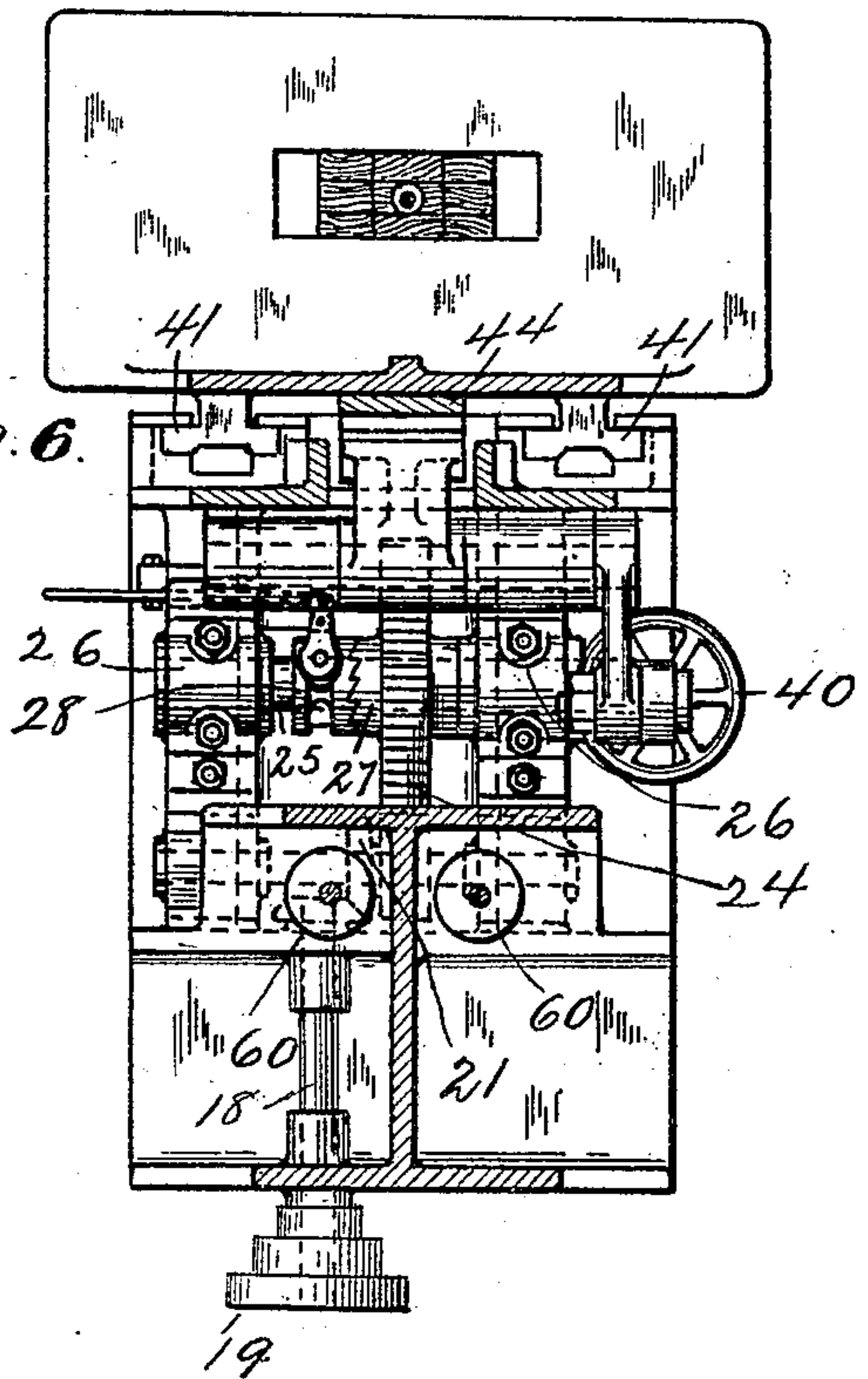
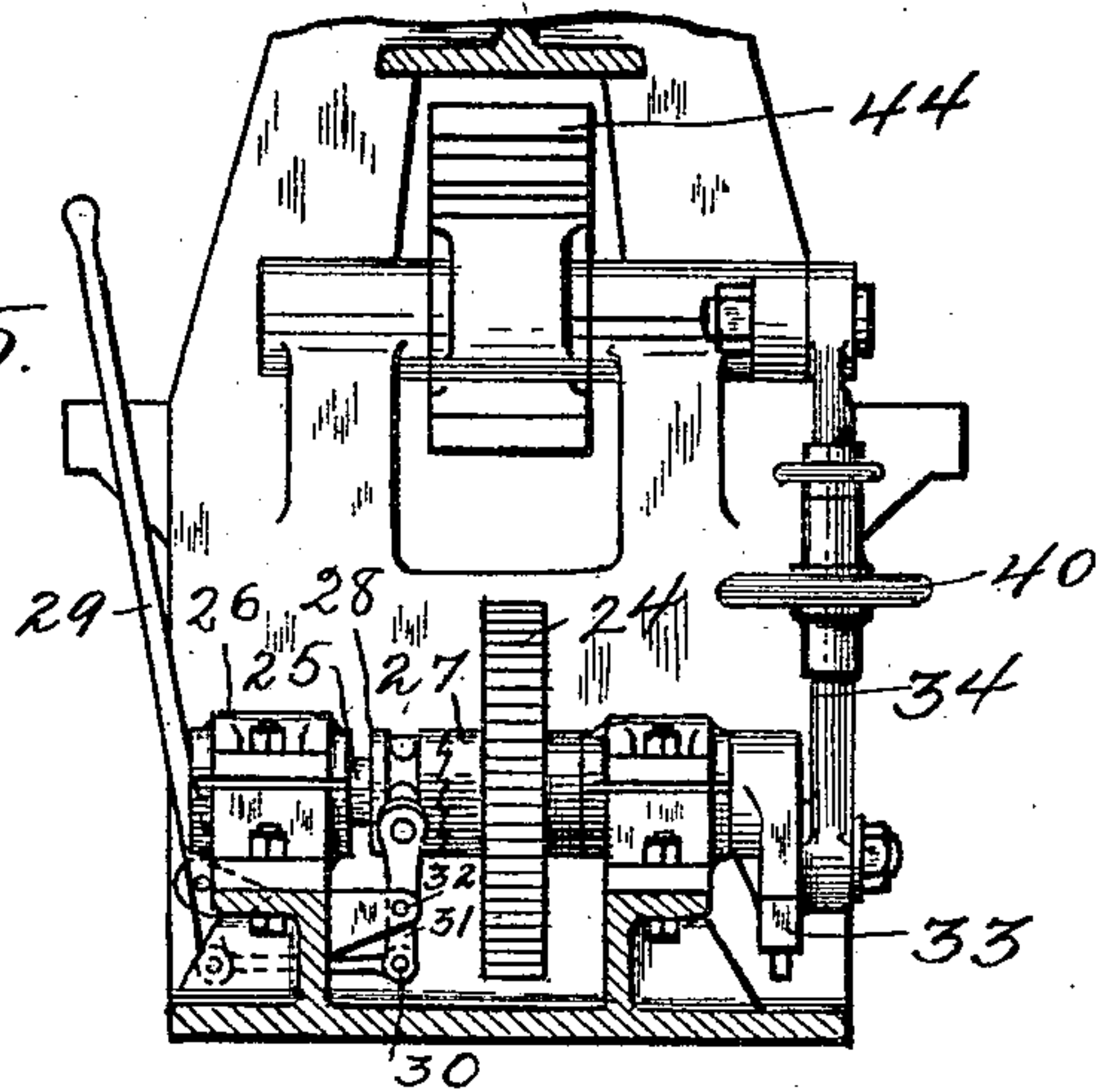
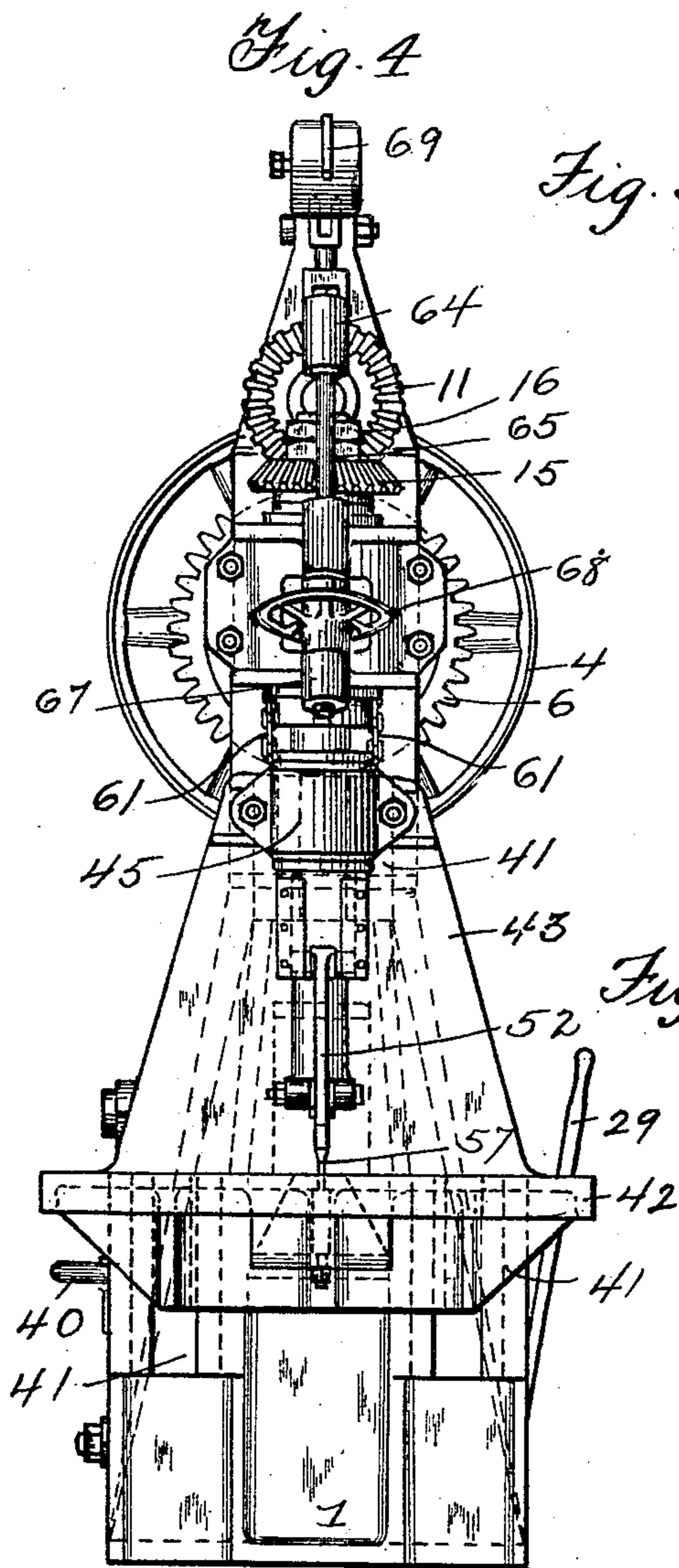
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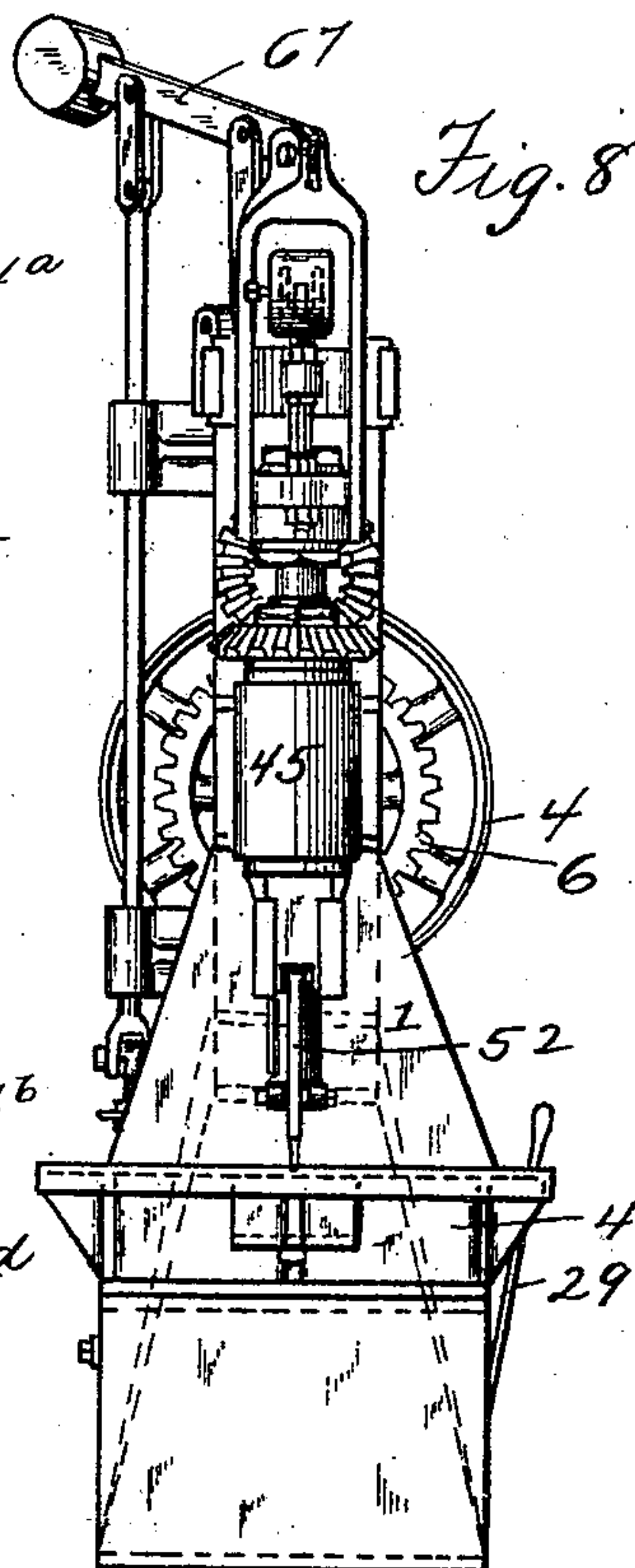
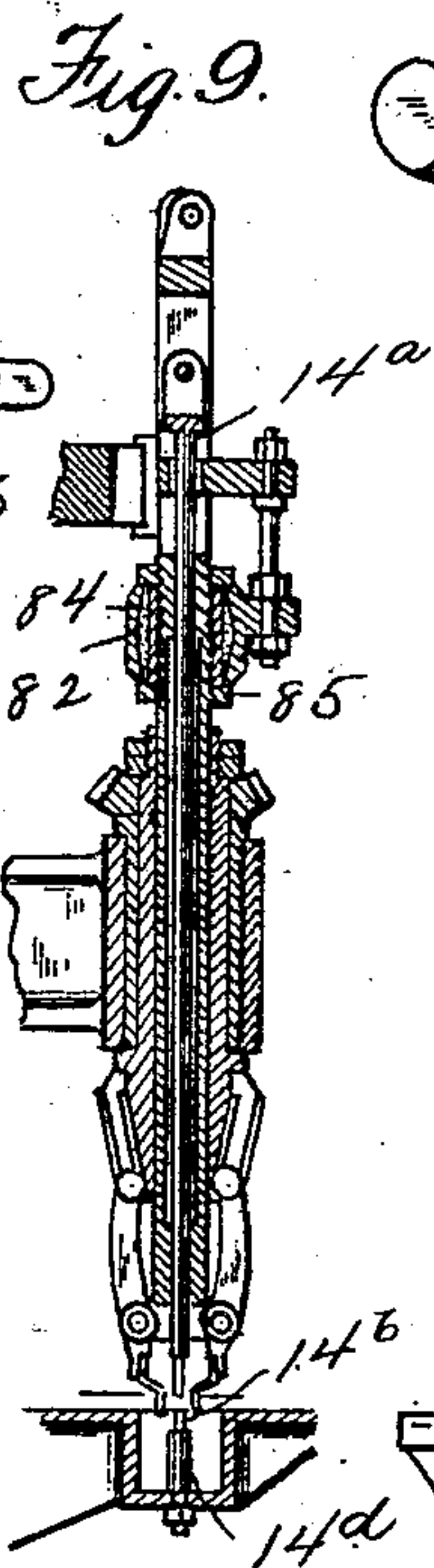
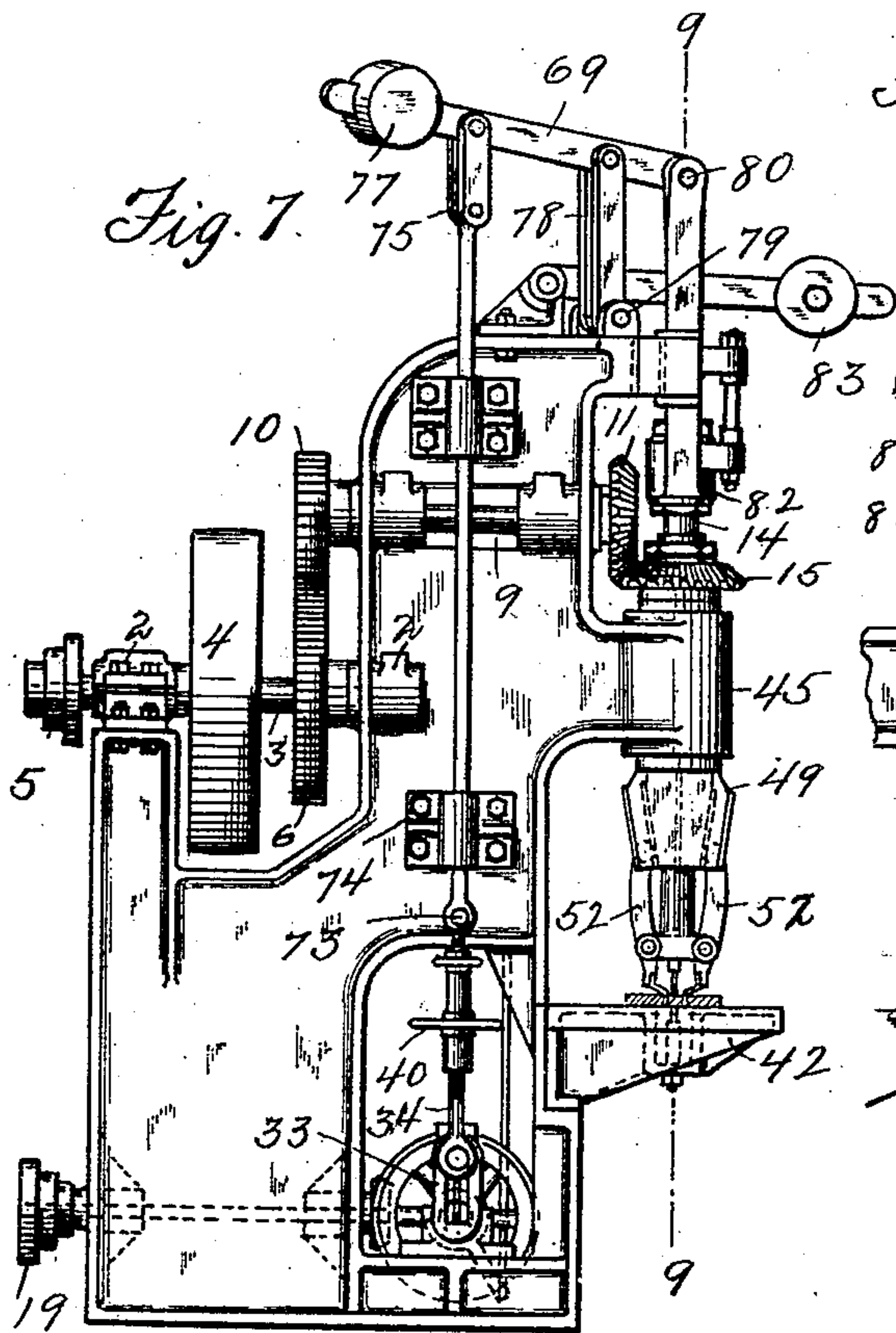
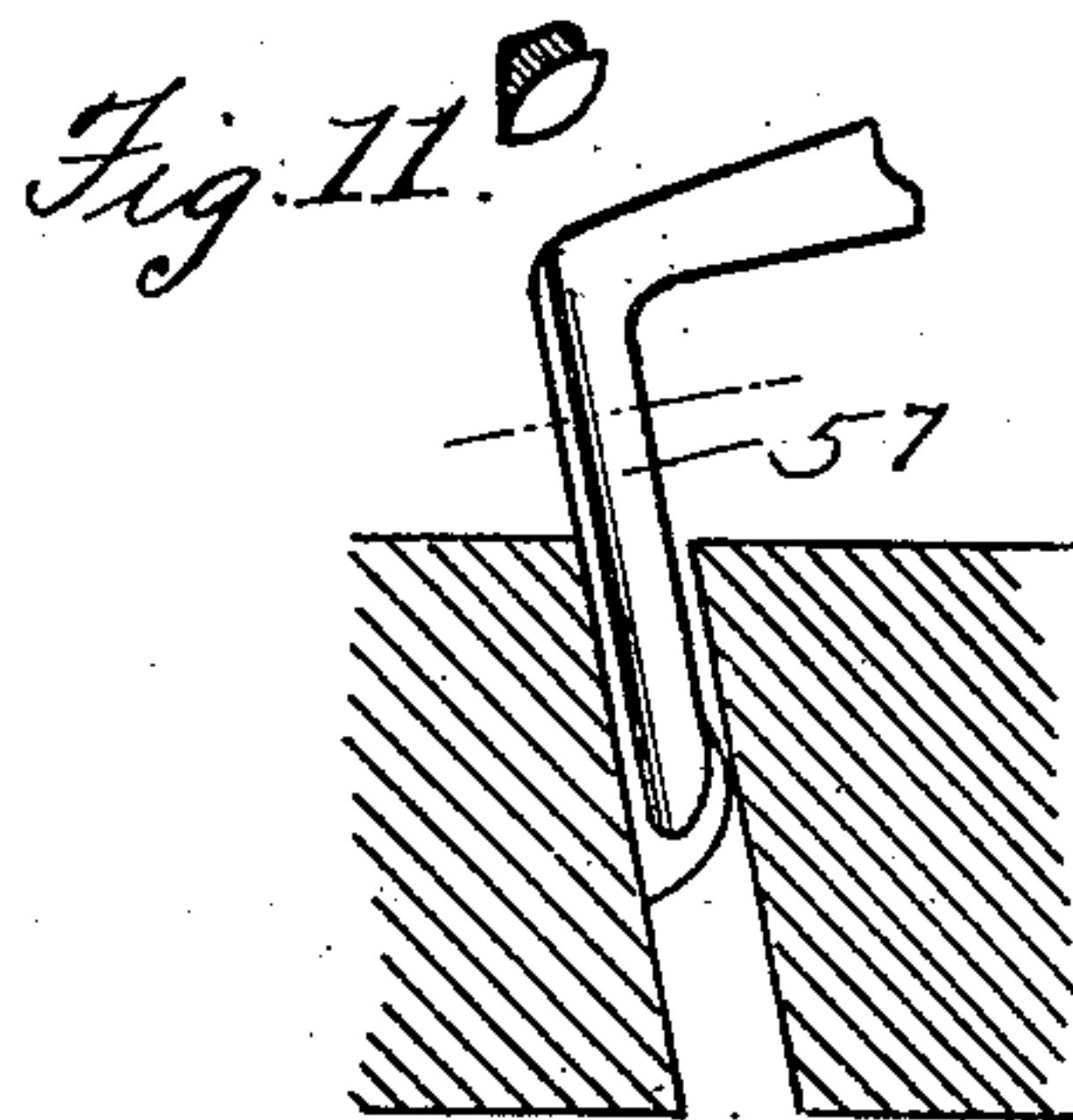
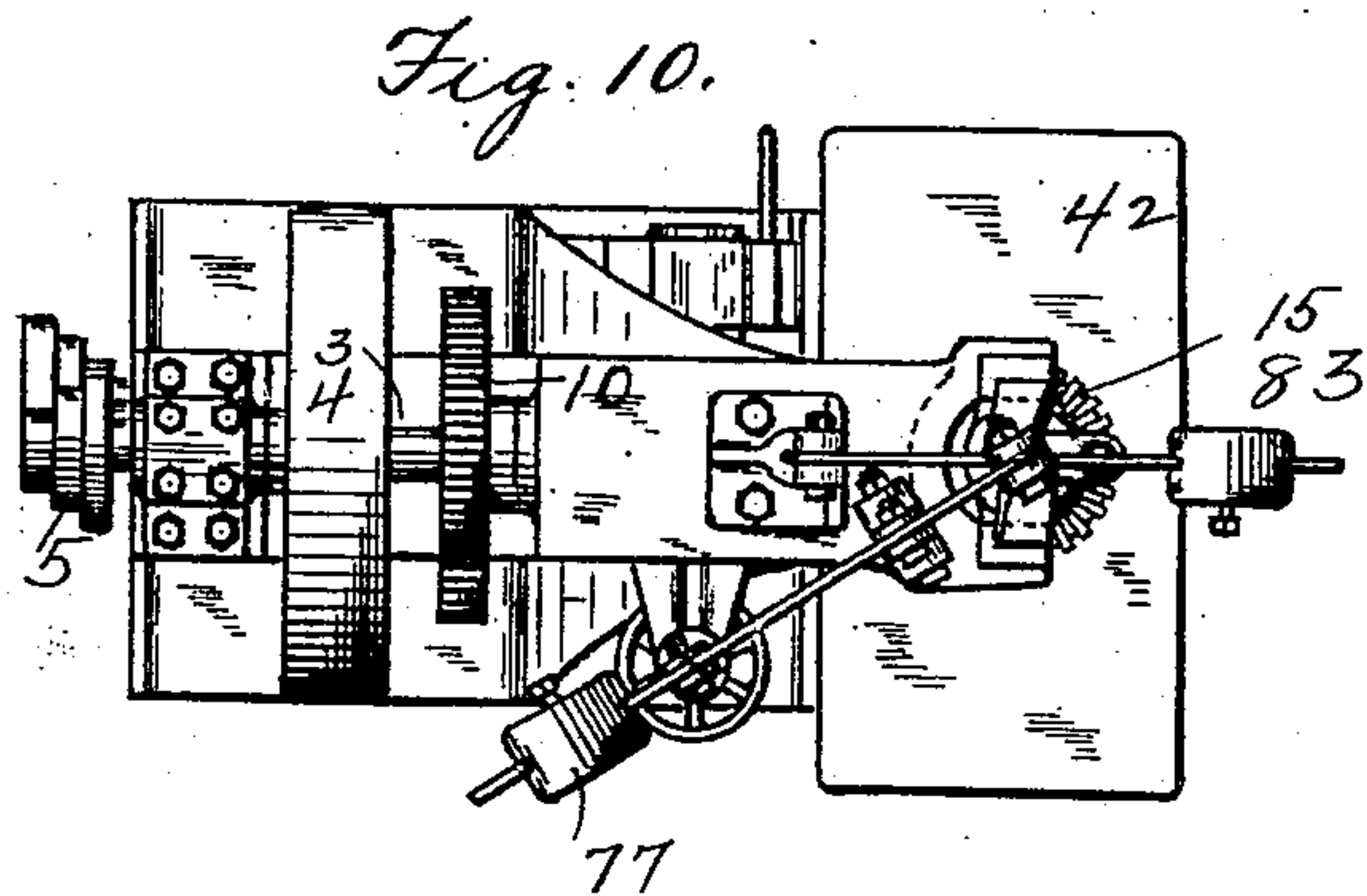
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

JOHN A. HELLSTROM, OF PITTSBURG, AND GEORGE W. EXLER, OF ALLEGHENY, PENNSYLVANIA, ASSIGNORS OF ONE - THIRD TO THOMAS H. FLYNN, OF PITTSBURG, PENNSYLVANIA.

## CORK CUTTING AND TAPERING MACHINE.

No. 841,646.

Specification of Letters Patent.

Patented Jan. 15, 1907.

Application filed October 31, 1905. Serial No. 285,345.

*To all whom it may concern:*

Be it known that we, JOHN A. HELLSTROM, a subject of the King of Sweden, residing at Pittsburg, and GEORGE W. EXLER, a citizen of the United States of America, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Cork Cutting and Tapering Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in cork cutting and tapering machines, and contemplates means for imparting simultaneous rotary and reciprocating movement to the cutting-knives and blank-supporting die in their opposed relation. Means are also provided for effecting the adjustment of the knife and die operating device, whereby the relative dimensions of the cut may be varied to suit the exigencies of the work to be performed. It is a desideratum in this type of machines that the cutting operation be quick and clean, and in the provision of the means above noted we attain these advantages more effectually than in the various constructions heretofore employed. This combination of rotary and reciprocating movement with the auxiliary adjusting elements possesses the above and various other advantages, which will be apparent as the description proceeds, in which reference will be had to the accompanying drawings, forming a part of this specification.

Like numerals designate like parts throughout the several views, in which—

Figure 1 is a side elevation of the machine. Fig. 2 is a vertical section through the knife and the die on the line 2 2 of Fig. 1. Fig. 3 is a transverse section on the line 3 3 of Fig. 1. Fig. 3<sup>a</sup> is a detail sectional view of a part of the table, showing how the cork-blank is held against rotation while the cork is being cut. Fig. 4 is a front elevation of the machine shown in Fig. 1. Fig. 5 is a section on the line 5 5 of Fig. 1. Fig. 6 is a section on the line 6 6 of Fig. 1. Fig. 7 is a side elevation of a modified form of construction embodying the same principles as the machine shown in Fig. 1. Fig. 8 is a front elevation thereof. Fig. 9 is a vertical section on the line 9 9 of Fig. 7. Fig. 10 is a top plan view, and Fig. 11 is a detail diagrammatic view,

showing the manner of operation of the cutting-knives.

The construction shown in Figs. 1 to 6 embodies a number of elements which are mounted on a frame 1. In the rear portion of the frame 1 are located bearings 2, in which is journaled transversely a shaft 3. Said shaft 3 carries a pulley 4, driven by a belt from a motor, (not shown,) and also carries a stepped pulley 5, adapted to be connected by a belt with another part of the machine hereinafter described, and said shaft 3 also carries a pinion 6. Bearings 8 are mounted upon the top of the frame 1, and a horizontal shaft 9 is journaled in said bearings, a pinion 10 being rigidly mounted upon one end of said shaft and being in mesh with the pinion 6 and a bevel-pinion 11 being rigidly mounted upon the other end of said shaft. The front portion of the frame 1 is formed with a concave surface, and adjacent said concave surface a bearing-section 12 is secured to said frame by bolts or in any other desirable manner. The concave surface of the front portion of the frame and the section 12 serve to constitute a bearing 13 for a vertical hollow shaft 14, carrying adjacent its upper end a rigidly-mounted bevel-pinion 15 in mesh with the pinion 11. The pinion 15 is further secured on the shaft 14 by virtue of superposed nuts 16, threaded upon the end of said shaft. For the purpose of reducing friction an antifriction-bushing 17, of any desirable material, is concentrically arranged within the bearing 13 and in sleeved relation to the shaft 14.

A horizontal shaft 18 is journaled in the lower portion of the frame 1 and is provided at its end with a rigidly-mounted stepped pulley 19, adapted to be driven from the pulley 5. Said shaft 18 carries at its other end a rigidly-mounted bevel-pinion 20 in mesh with a bevel-pinion 21, rigidly mounted upon a shaft 22, journaled in bearings in the frame 1. A pinion 23 is also rigidly mounted on said shaft 22 and is in mesh with a larger pinion 24, loosely mounted upon a transverse shaft 25, journaled in bearings 26 in the frame 1. The pinion 24 is formed with a toothed hub extension 27, which serves as one member of a clutch, the other member being embodied in a toothed collar 28, slidably keyed upon the shaft 25 and adapted to



be moved into and out of engagement with the toothed hub extension 27 by virtue of a suitable connection which, as shown, is constituted of a pivoted lever 29, connected by a link 30 with a yoke 31, having loose connection between its furcations with the collar 28 and fulcrumed at an approximately central point, as at 32, in bearings in the frame 1. The one end of said shaft 25 is formed with an integral slotted crank-arm 33. A pitman 34 has pivotal connection at its one end to said crank-arm 33 by virtue of a bolt 35, extending through the slot in said crank-arm, whereby said pitman is held from vertical movement in said slot, but is capable of revolving about its fulcrum and of being adjustably positioned along the radial line of said slot with relation to the shaft 25 as a center. The other end of said pitman 34 has pivotal connection, as at 36, with a link 37, formed at its end with an integral pinion-sector 38 and mounted adjacent said sector upon a shaft 39, fulcrumed in bearings in the frame 1. The pitman 34 is constituted of two oppositely-threaded members, which are united by a centrally-disposed turnbuckle 40, whereby an adjustment of the length of said pitman may be effected as well as the disposition of its fulcrum in the slotted crank-arm 33. The frame 1 is formed in its front portion with guideways 41 of conventional form, in which a table 42 is adapted to have vertical movement in either direction. Said table 42 is formed with a vertical extension 43, provided on its inner surface with a rack-face 44 in mesh with the sector 38, said extension 43 being formed at its upper end with an integral bearing 45, adapted to receive a collar 46, slidably keyed upon the shaft 14 and provided with peripheral flanges 47, by which said collar is retained in said bearing, so as to be moved therewith and yet at the same time be capable of rotary movement with said shaft 14 in its revolutions. A babbitt packing 48 is interposed between the wall of the bearing 45 and the collar 46, so as to reduce the friction arising from the movement of the latter in the former. The collar 46 is formed below said bearing with an integral guide-block 49, formed with downwardly-tapering recessed sides 50, which serve as guides for friction-rollers 51, mounted upon the ends of the arm extensions 52 of the knife-holders 53, which are fulcrumed, as at 54, to a lug formed upon the lower end of the shaft 14. The friction-rollers are retained in said block 49 by virtue of overlying side strips 55, secured to said block at the sides of said recessed guideways 50, and said friction-rollers 51 are adapted to travel on tracks 56, provided therefor in said guideways 50. The knife-holders 53 are designed to carry knives 57 of conventional form, which depend above a recess 58, formed in the table 42 and provided with a central core

59, disposed below said knives 57. The table 42 and the bearing 45 are adapted to have vertical movement in the guideways 41, as intimated above, in a manner to be described, and this movement is compensated in either direction by virtue of counterbalance-weights 60, mounted upon the end of a chain 61, trained over sheaves 62, journaled in the frame 1, said chain having connection at its other end with the extension 43, adjacent said bearings 45, as indicated at 63. The shaft 14, as stated, is hollow throughout its length to receive a longitudinal core 14<sup>a</sup>, which is adjustably positioned in said shaft by virtue of a movable supporting member 64, mounted upon a rod 65, provided with a threaded end 66, which extends through spaced apertured extensions 67, carried by the bearing-section 12. The rod 65 is moved in said extension by virtue of a nut 68, interposed therebetween, whereby said core 14<sup>a</sup>, which is designed to eject the cork cut from the blank, may be adjustably positioned with relation to said blank. The said cork while being cut is held between the core 14<sup>a</sup> and a pin 14<sup>b</sup>, mounted in core 59 in table 42, so as not to rotate with the knives, the said pin 14<sup>b</sup> being held against the bottom of the cork-blank by a spring 14<sup>c</sup> in core 59, mounted within the chamber of table 42. The core 14<sup>a</sup> is steadied by means of a weighted lever 69, fulcrumed, as at 70, and fulcrumed at its end, as at 71, to a bracket 72, secured to the frame 1 and interposed between the spaced bearings 8. To prevent the lifting of shaft 14 while cutting the cork, we employ a collar 47<sup>a</sup>, suitably keyed on said shaft below the bearing 13.

In the modification shown in Figs. 7 to 10 the same principle of construction is involved, with slight changes of the operating elements, since vertical movement is imparted to the cutters instead of to the table. In the modified form of construction the pitman 34 has pivotal connection at its upper end with a slidable rod 73, which is retained in bearings 74, secured to the frame 1. The rod 73 has pivotal connection at its upper end with link members 75, which are in turn pivoted, as at 76, to a weighted counterbalancing-lever 77, fulcrumed off center to link 78, said link being in turn fulcrumed to the frame 1, as at 79. The end of the lever 77 is fulcrumed, as at 80, to a yoke-shaped extension 81, carried by a bearing 82, rigidly suspended from the frame 1 and having positive connection with the shaft 14. The bearing 45 in this construction is formed integral with the frame 1 or is rigidly connected thereto, and the block 49 is stationary; but said bearing and said block possess the same construction as in the preferred form heretofore described. The central core 14<sup>a</sup>, passing through the shaft 14, is steadied by a weighted counterbalance-lever 83.



In the operation of the preferred type of construction illustrated in Figs. 1 to 6 power for operating the machine is transmitted to the pulley 4, which through the system of gearing described serves to rotate the shaft 14. Power is transmitted from the pulley 5 to the pulley 19, which through its gear-train rotates the pinion 24 and the shaft 25, thereby through the medium of the connecting-pitman 34 oscillating pinion-sector 38 in mesh with rack 44 and imparting reciprocatory movement alternately in opposite directions to the table 42, carrying the blank from which the cork is to be cut and the bearing 45. As the table 42 and bearing 45 move upwardly the rollers 51, traveling along the tracks 56 in the inclined guideways 50 in the block 49, will move together, thereby drawing the arms 52 toward one another and spreading apart the knives 57, so as to gradually increase the diameter of the circular cut of the cork-blank and imparting a tapered surface to the cork formed. A single movement of the table 42, with the coöperation of the rotating knives 57, is sufficient to form a cork, and as said table moves up at the completion of the work of said knives the blank cut will be engaged by the core 14<sup>a</sup> and forced down into the recess 58, from whence it is delivered in any desirable manner. Any well-known type of blank-feeding means may be employed in connection with the apparatus.

In the modified form of construction reciprocating movement is imparted to the knives instead of the table by virtue of the rod 73, the lever 77, fulcrumed thereto, and the connecting-yoke 81. While the shaft 14 is rotatable in the bearing 82, it has positive connection therewith, preferably by being threaded to a flanged bushing 84, as shown in Fig. 9, the flanges 85 of said bushing serving to form a positive connection with the bearing 82. Instead of the block 49 being moved along the arm extensions 52 of the knife-holder, as in the preferred form, the arrangement is reversed, and the arm extensions ride along the tapering surface of said block 49.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a cork-cutting machine, a frame, a rotatable and vertically-movable shaft mounted on said frame, means for imparting rotary and vertical movement to said shaft, a vertically-movable blank-supporting table mounted upon the frame, means for imparting vertical movement to said table, a collar carried by said table and surrounding said shaft and rotatable therewith and slidable thereon, a guide-block carried by said collar, said guide-block being formed with inclined guides, knife-holders pivotally mounted upon said shaft, the ends of said knife-holders working in said guides, and knives carried by said knife-holders.

2. In a machine of the type described, a frame, a movable blank-holder mounted upon said frame, means for imparting movement to said blank-holder, a rotary shaft mounted in bearings carried by the frame, knife-holders pivotally attached to said shaft, knives carried by said holders, means carried by the blank-holder for moving the knife-holders on their pivotal points to move the knives toward and from one another simultaneously with the movement of said blank-holder.

3. A machine of the type described, embodying a frame, a blank-supporting means movably mounted on said frame, a rotatable shaft journaled in bearings carried by said frame, knife-holders pivotally attached to said shaft, means for imparting rotary movement to said shaft, simultaneously-operated means for imparting reciprocating movement alternately in opposite directions to said blank-supporting means, means carried by the blank-supporting means for adjusting the knife-holders, and adjusting means for regulating the length of the travel of said blank-supporting means.

4. A machine of the type described, embodying a frame, blank-supporting means movably mounted on said frame, means for moving said blank-supporting means, a rotary shaft mounted in bearings carried by said frame, knife-holders pivotally attached to said shaft, means for imparting rotary movement to said shaft, and means carried by said blank-supporting means and contacting with said knife-holders, said last-named means being adapted when the blank-supporting means is moved to move the free ends of the knife-holders gradually toward or from one another according to the direction of movement of the blank-supporting means.

5. A machine of the type described embodying a frame, blank-supporting means movably mounted thereupon, a rotary knife-supporting means mounted in bearings carried by said frame, means for imparting rotary movement to said knife-supporting means, knives carried by said knife-supporting means, simultaneously-operated means for imparting reciprocating movement to said blank-supporting means, alternately in opposite directions, and means carried by said blank-supporting means for moving the cutting-knives mounted upon the knife-supporting means in opposite directions with relation to one another.

In testimony whereof we affix our signatures in the presence of two witnesses.

JOHN A. HELLSTROM.  
GEORGE W. EXLER.

Witnesses:

H. C. EVERT,  
T. H. FLYNN.