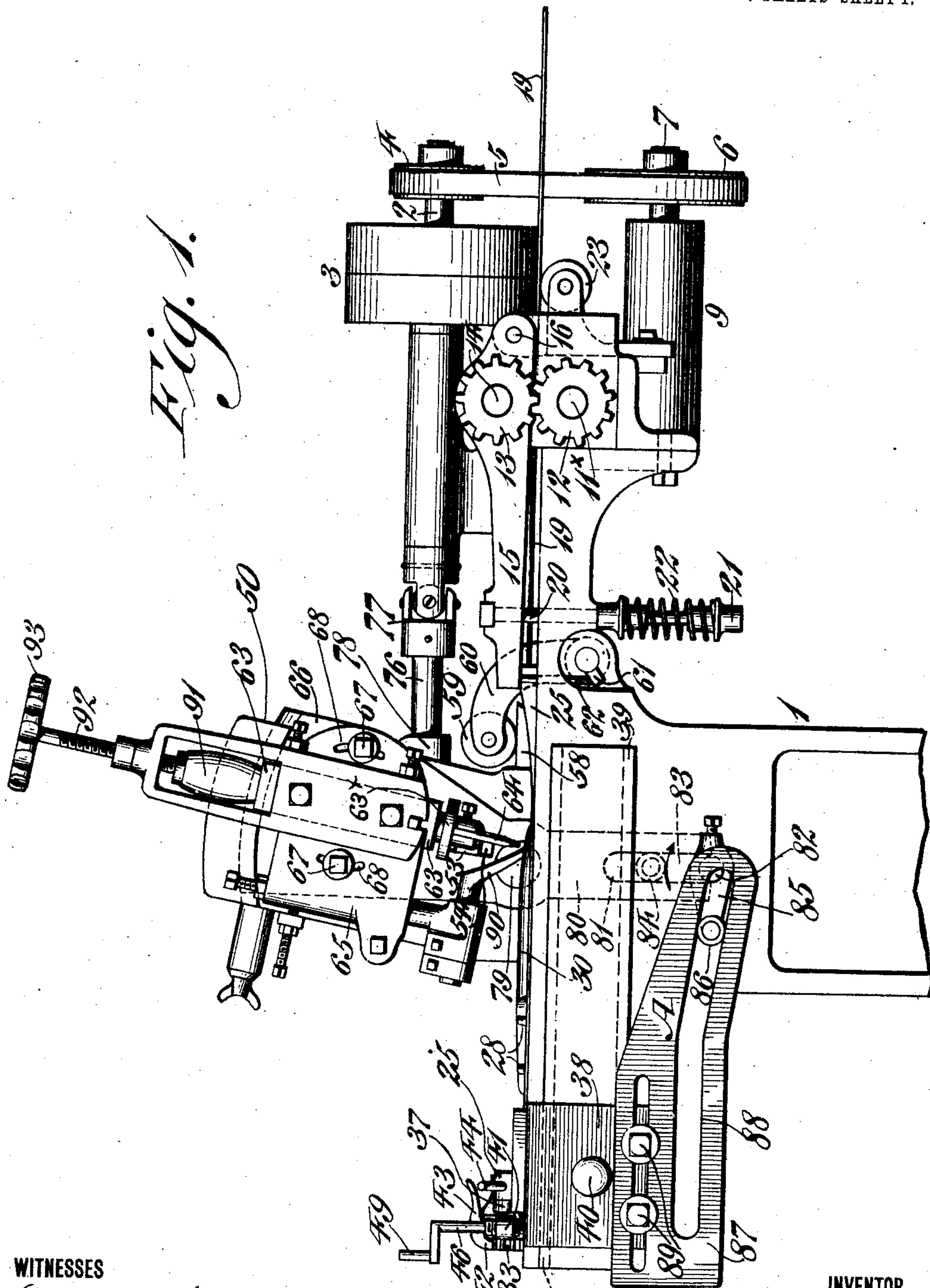


J. A. HESS.
FILE CUTTING MACHINE.
APPLICATION FILED DEC. 15, 1909.

975,236.

Patented Nov. 8, 1910.
7 SHEETS—SHEET 1.



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7 SHEETS—SHEET 2.

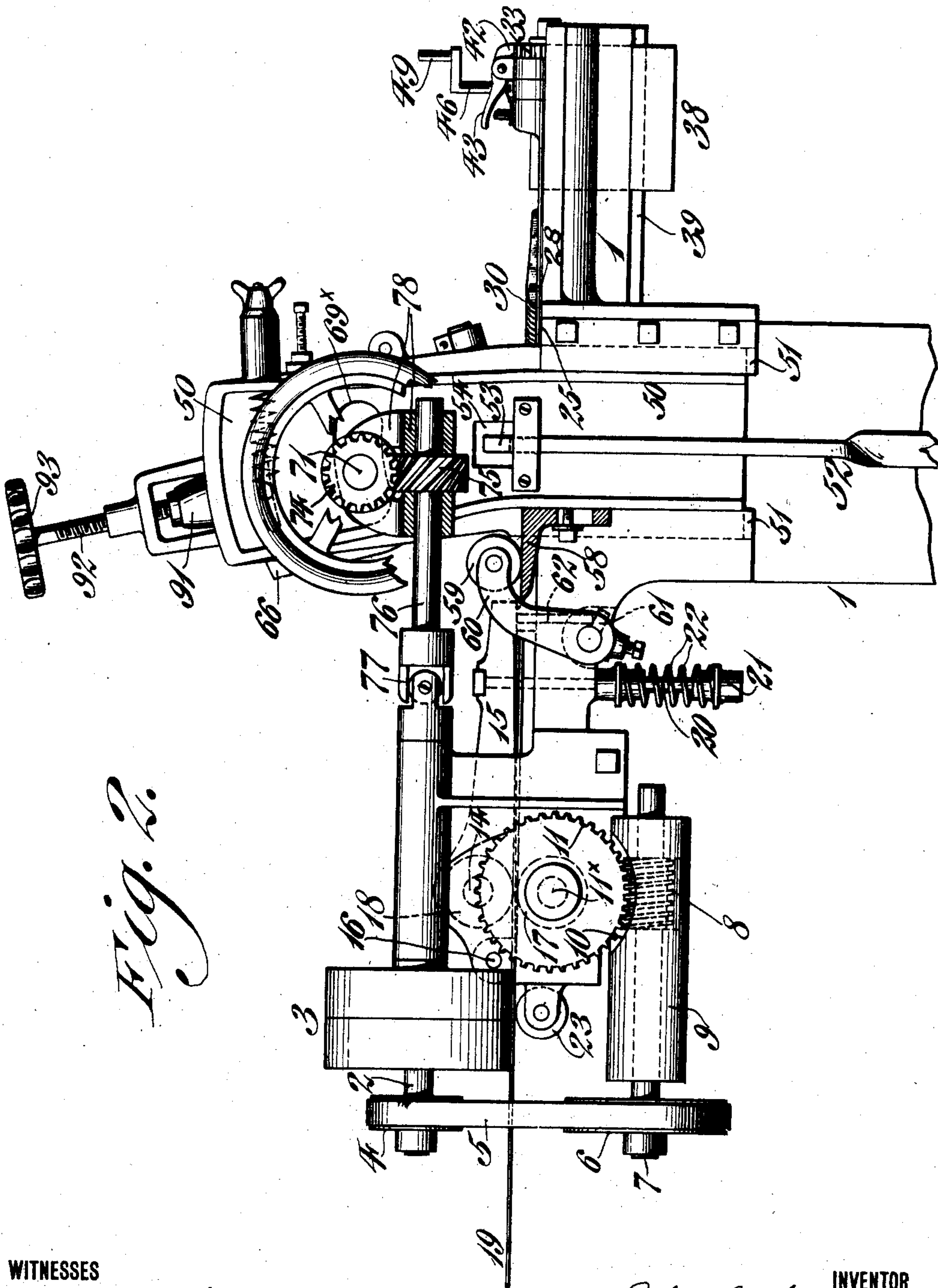


Fig. 2.

WITNESSES

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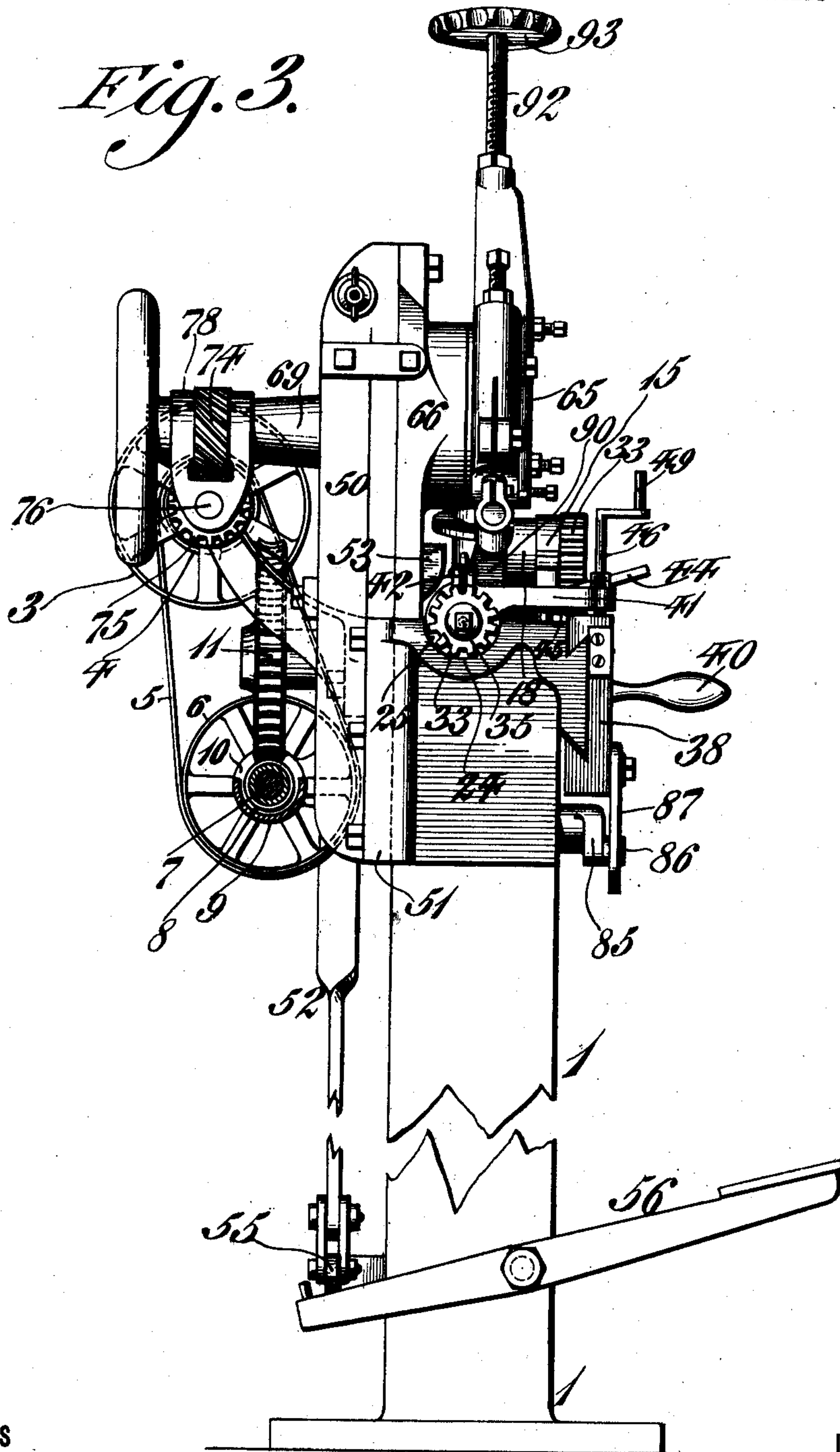
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7 SHEETS—SHEET 3.

Fig. 3.



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7 SHEETS—SHEET 4.

Fig. 4.

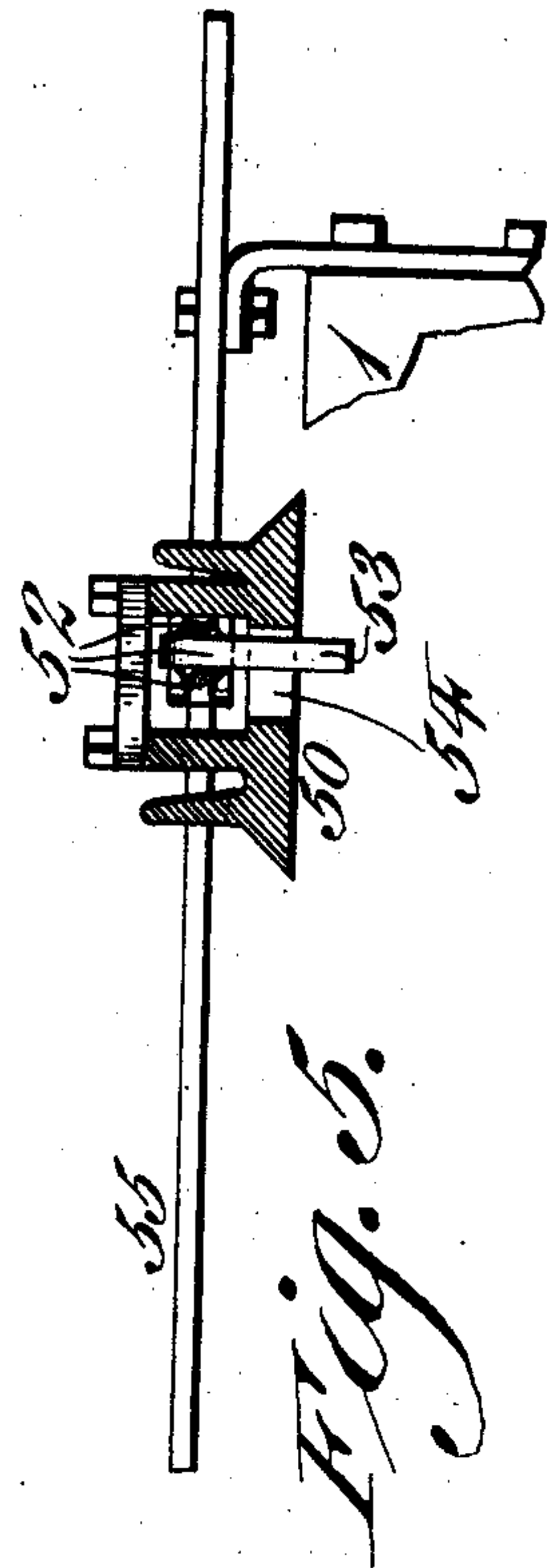
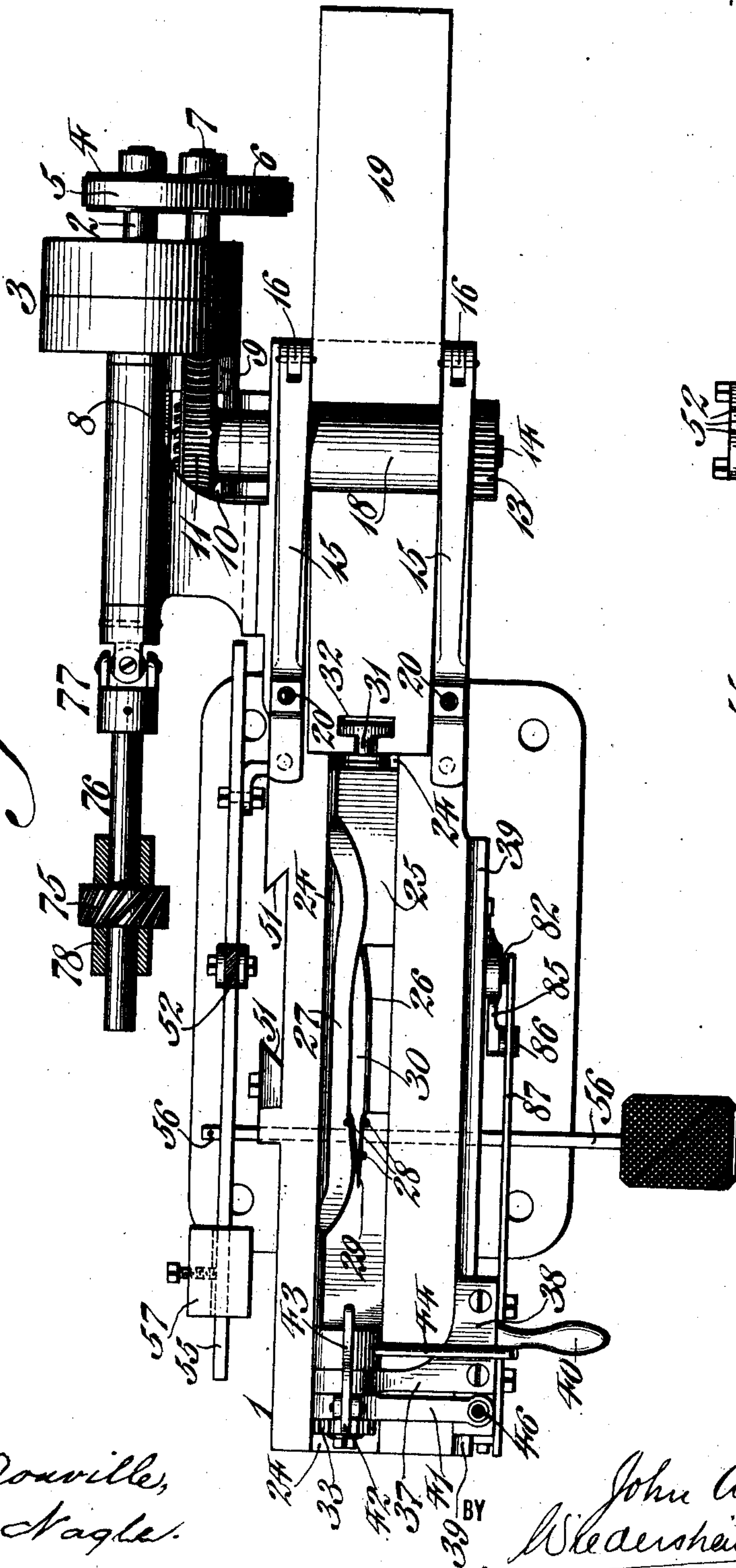


Fig. 5.

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7 SHEETS—SHEET 5.

Fig. 6.

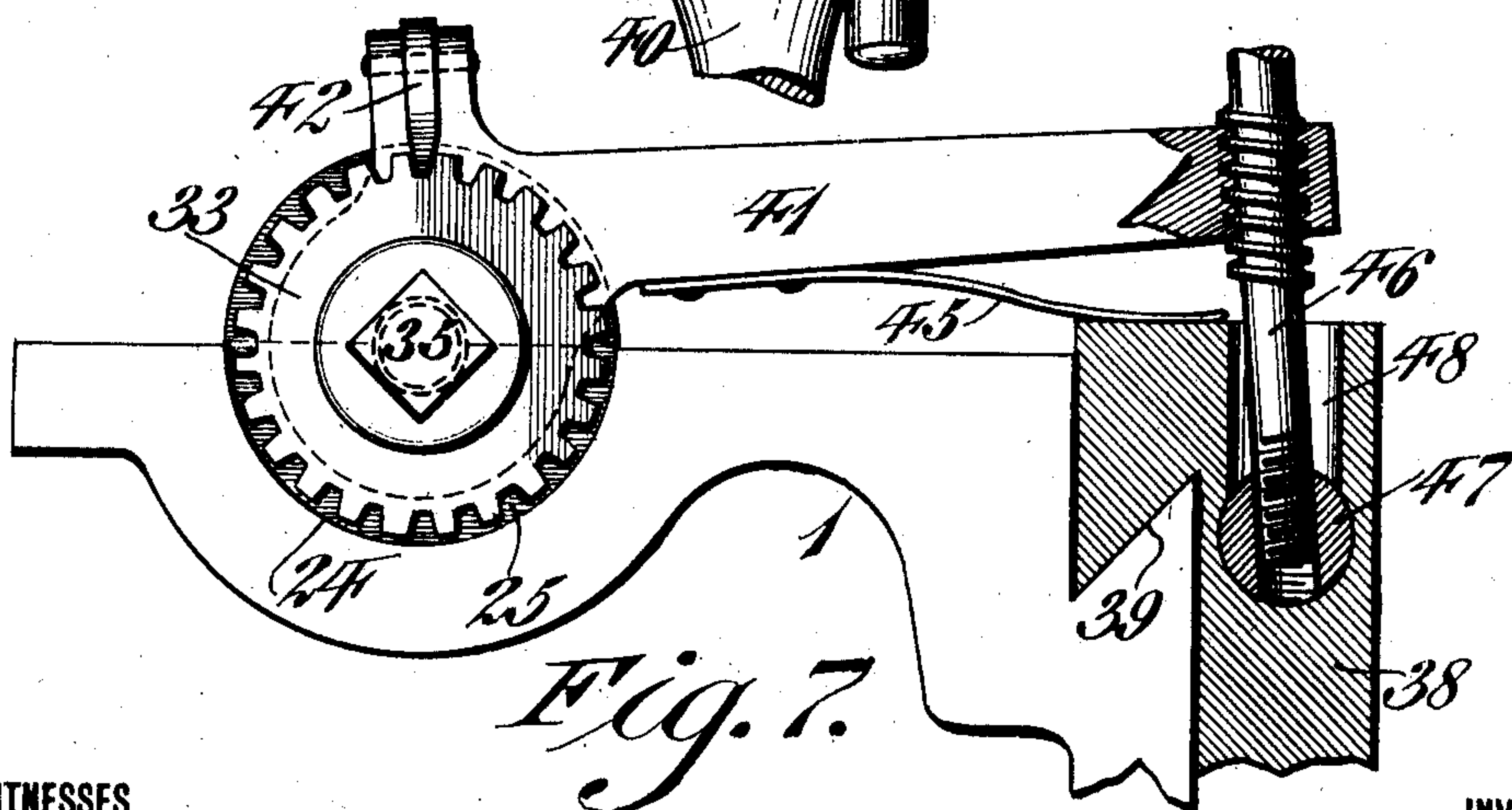
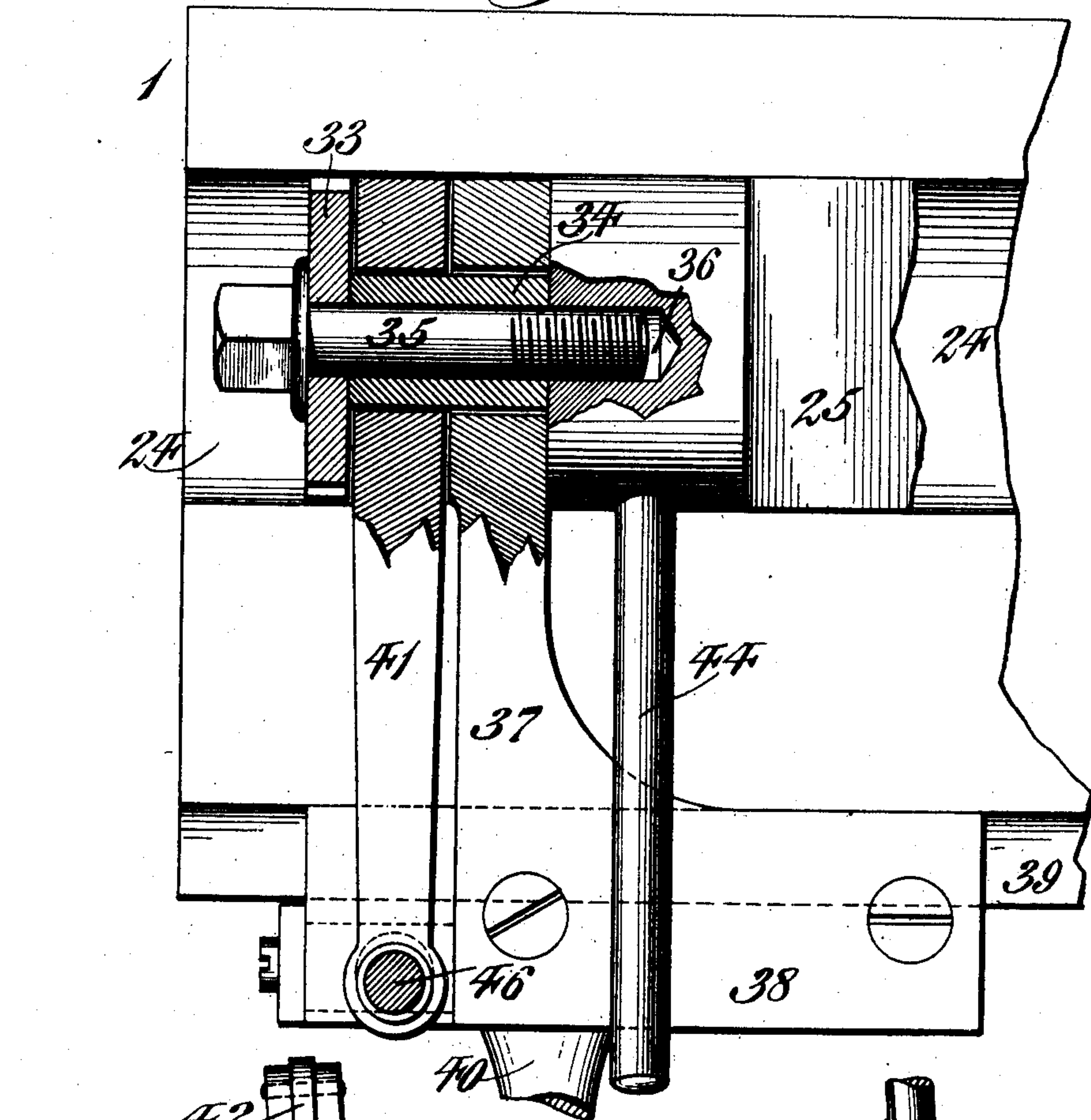


Fig. 7.

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975,236.

Patented Nov. 8, 1910.
7 SHEETS—SHEET 6.

Fig. 8.

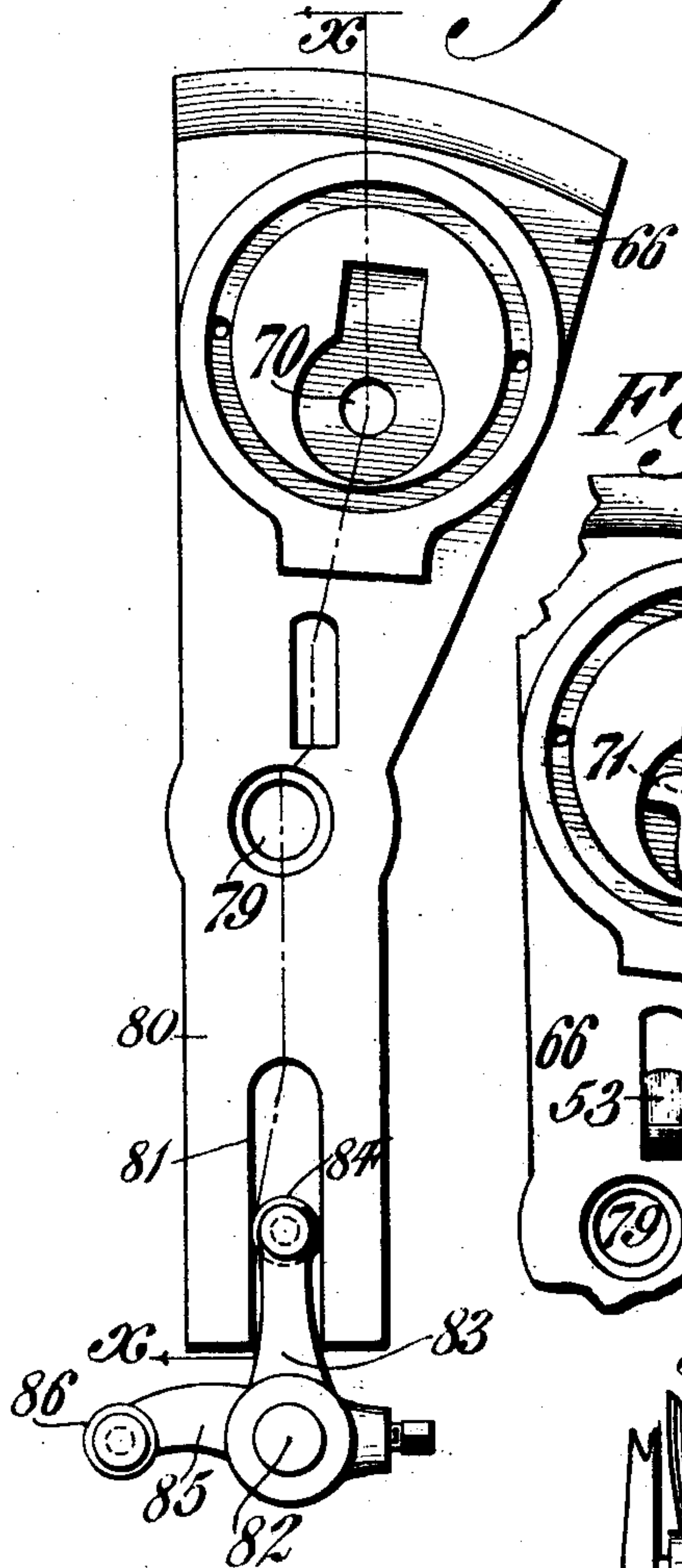


Fig. 9.

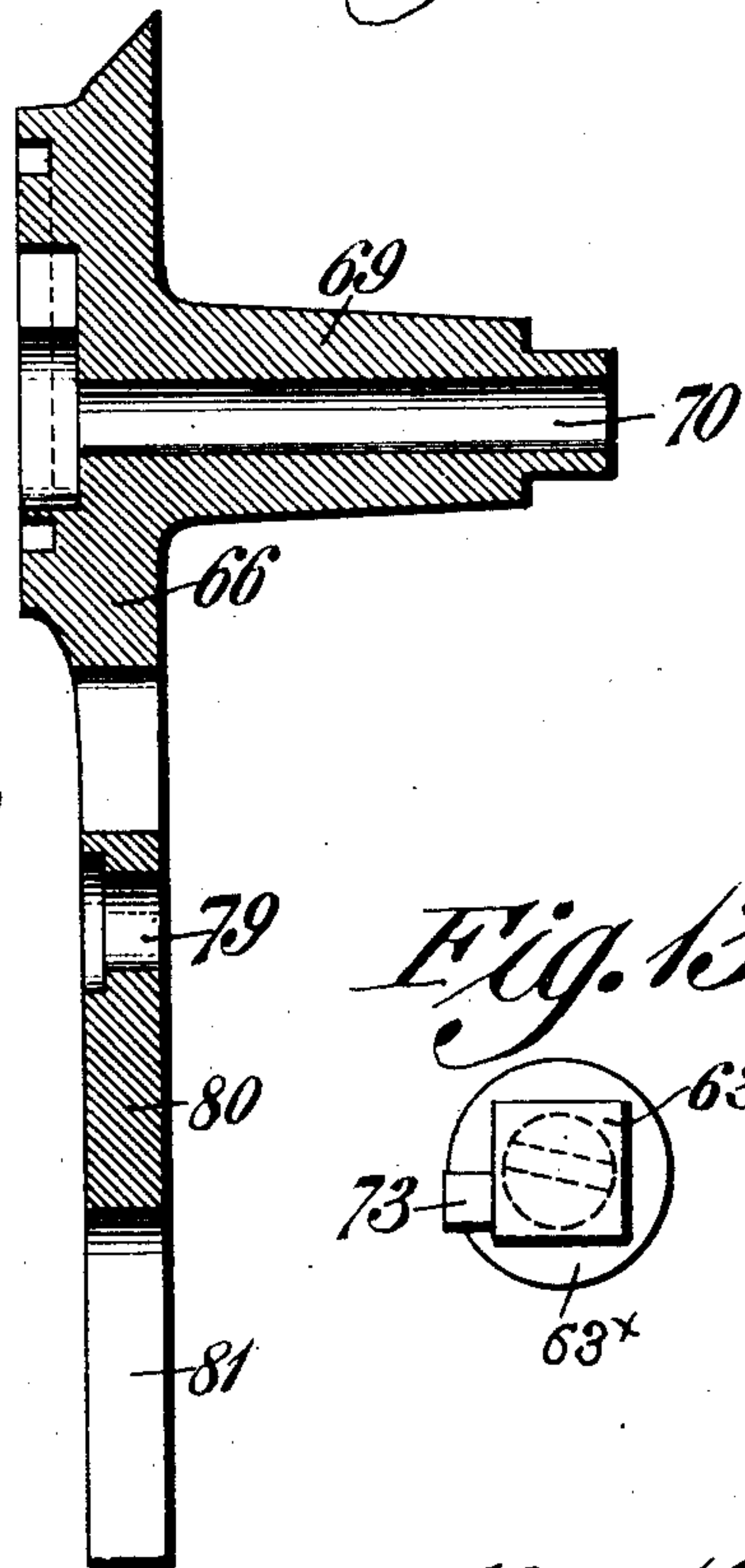


Fig. 10.

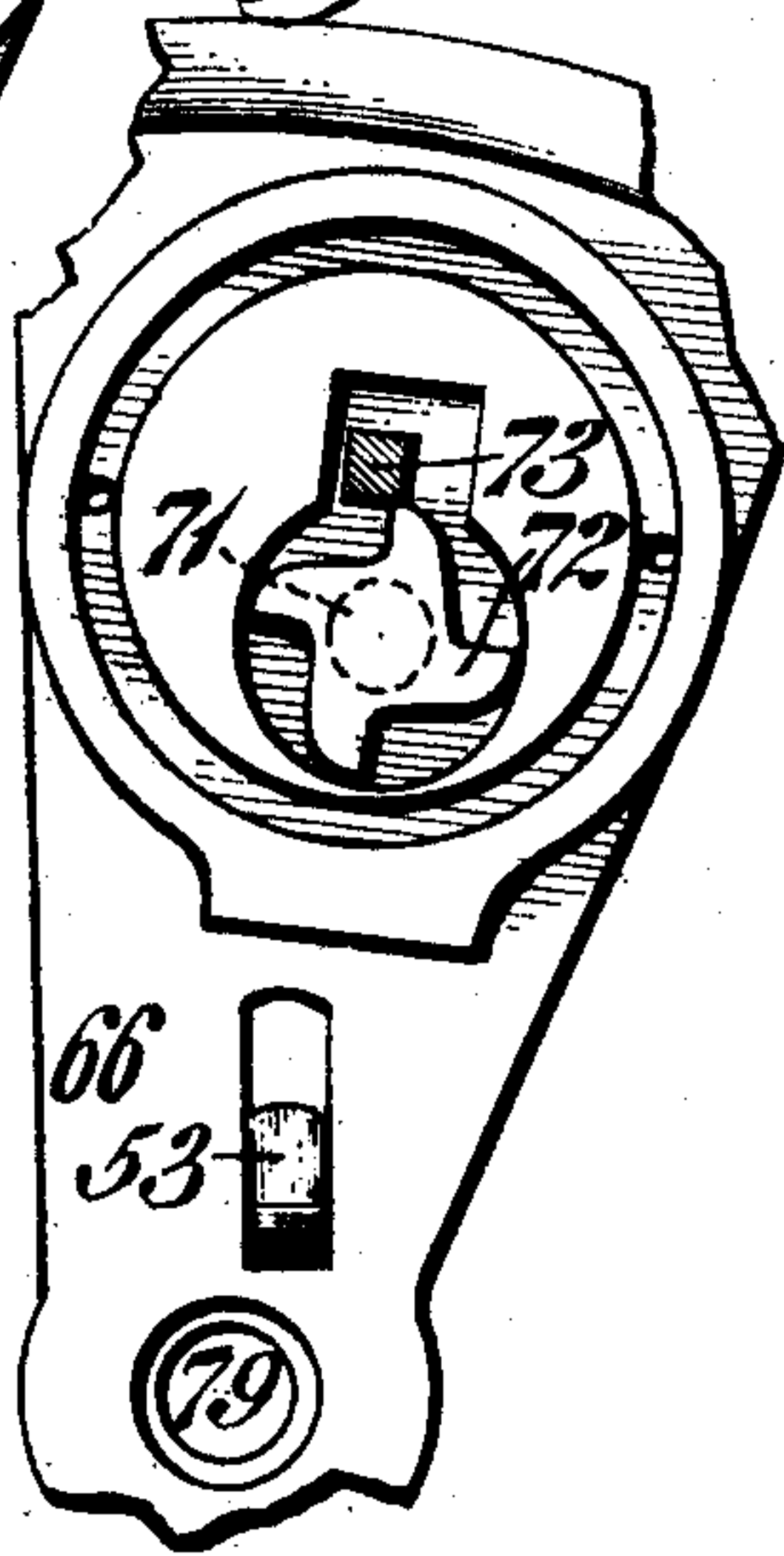


Fig. 13.

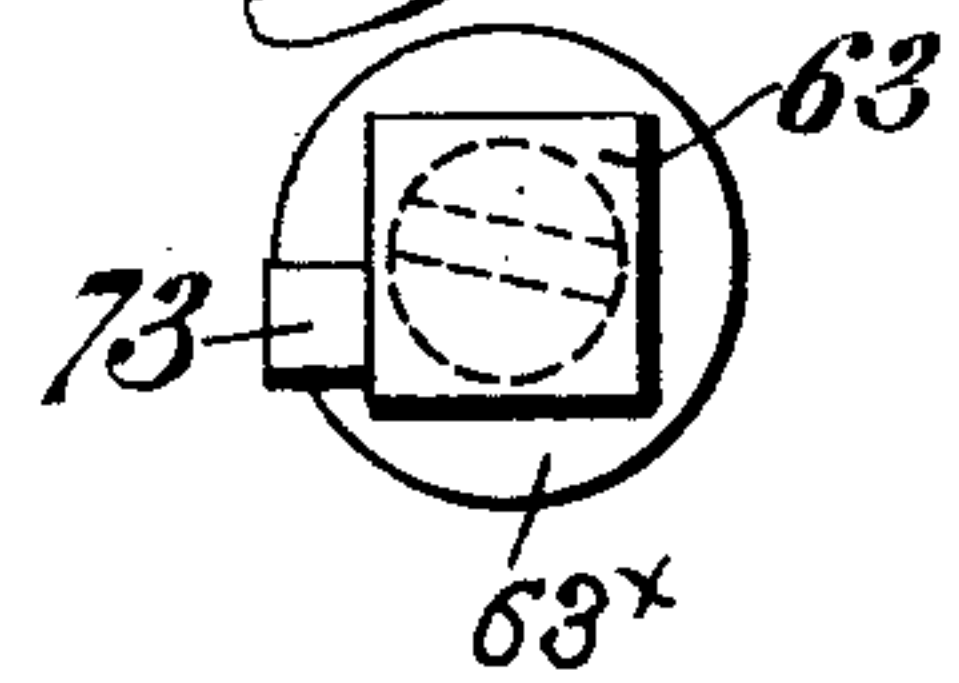


Fig. 12.

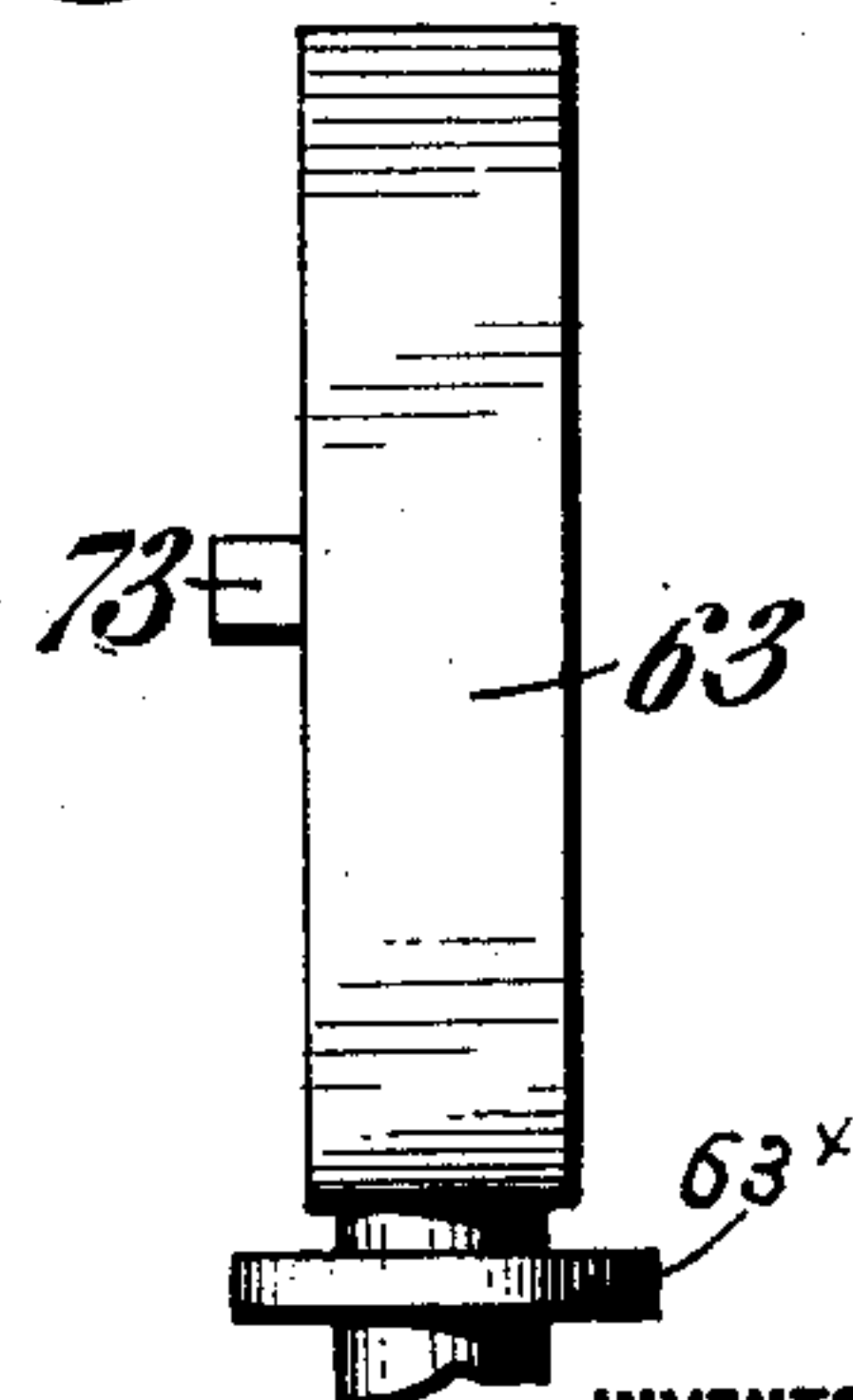
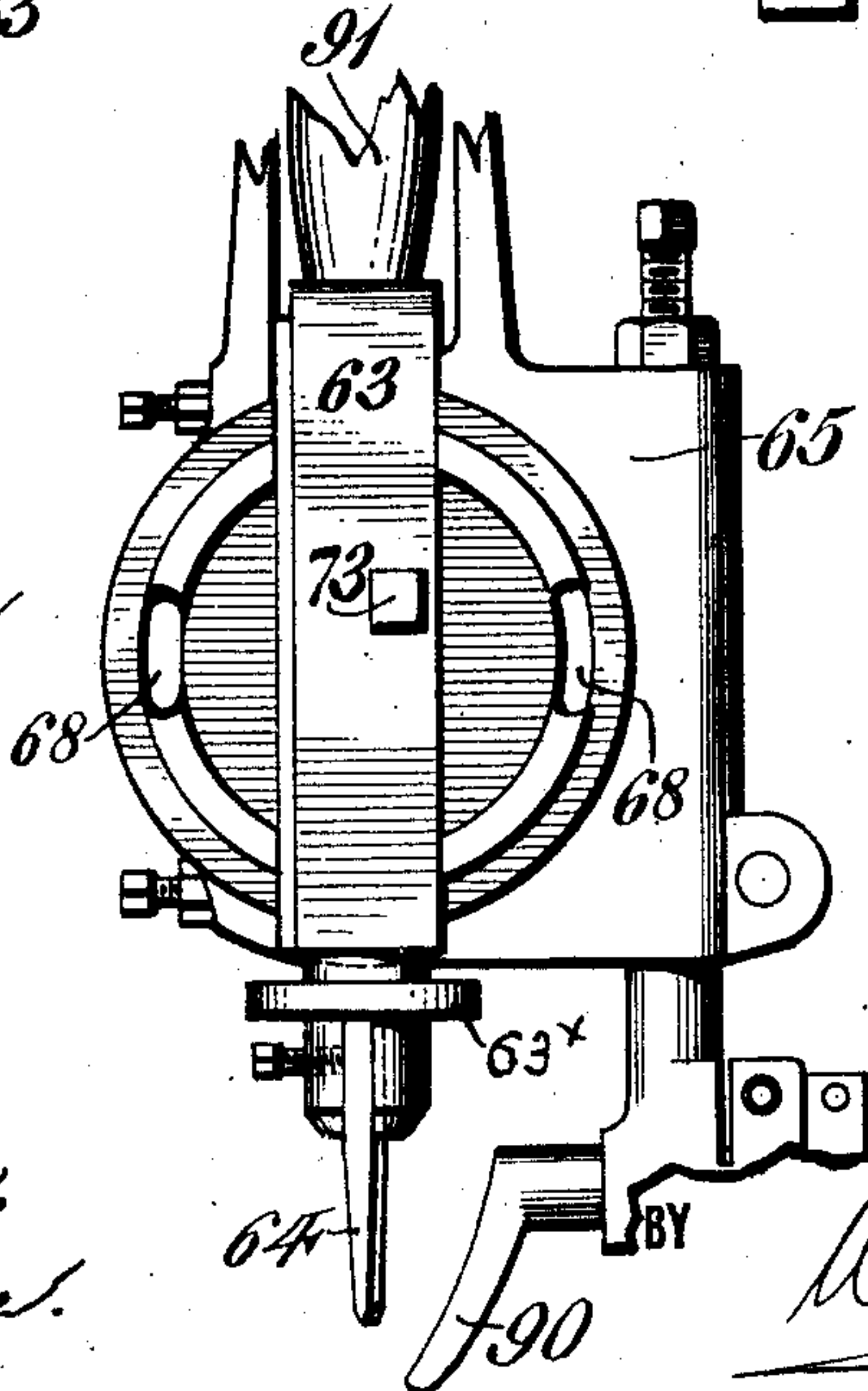


Fig. 11.



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975,236.

Patented Nov. 8, 1910.

7 SHEETS—SHEET 7.

Fig. 14.

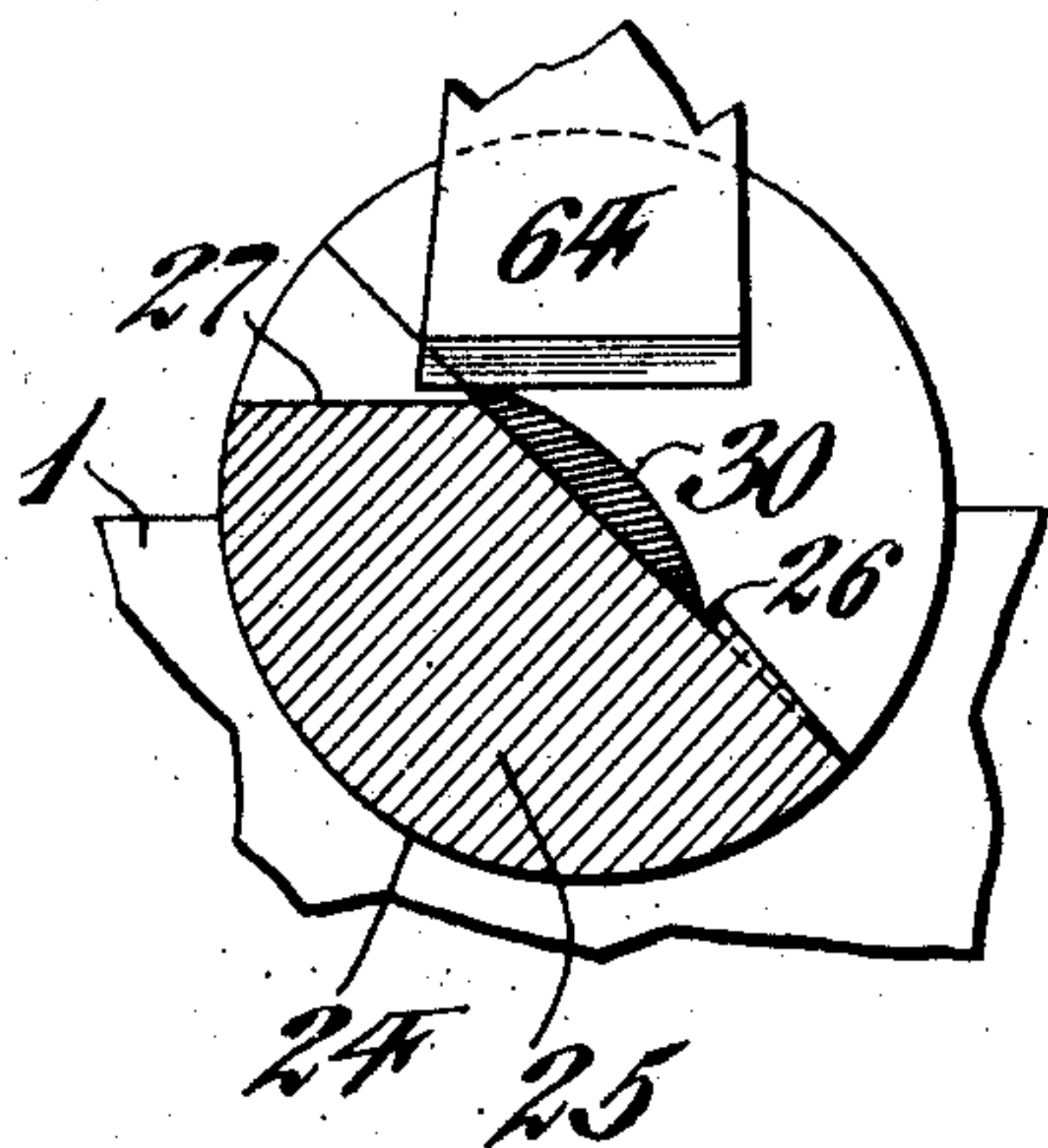


Fig. 15.

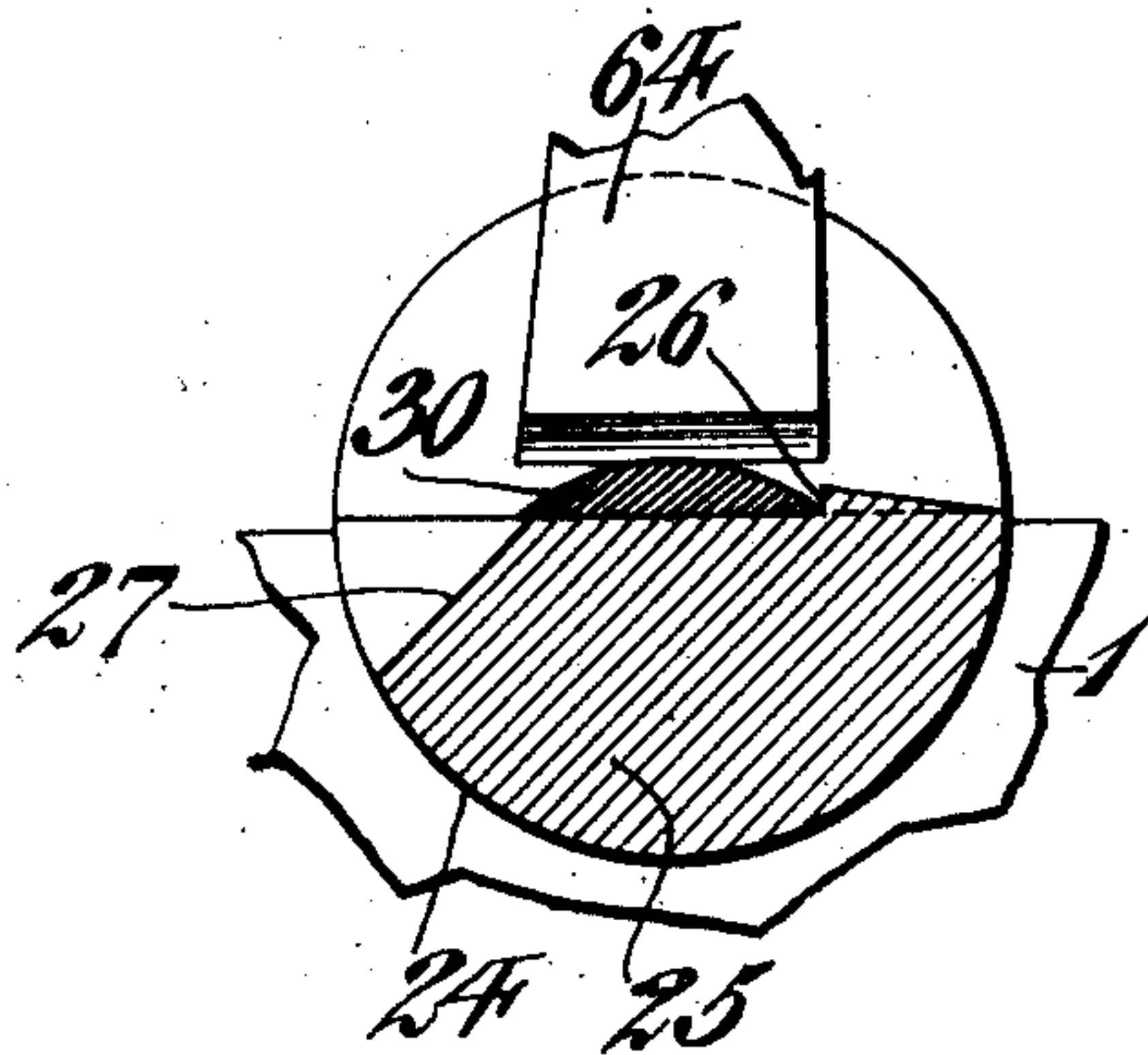
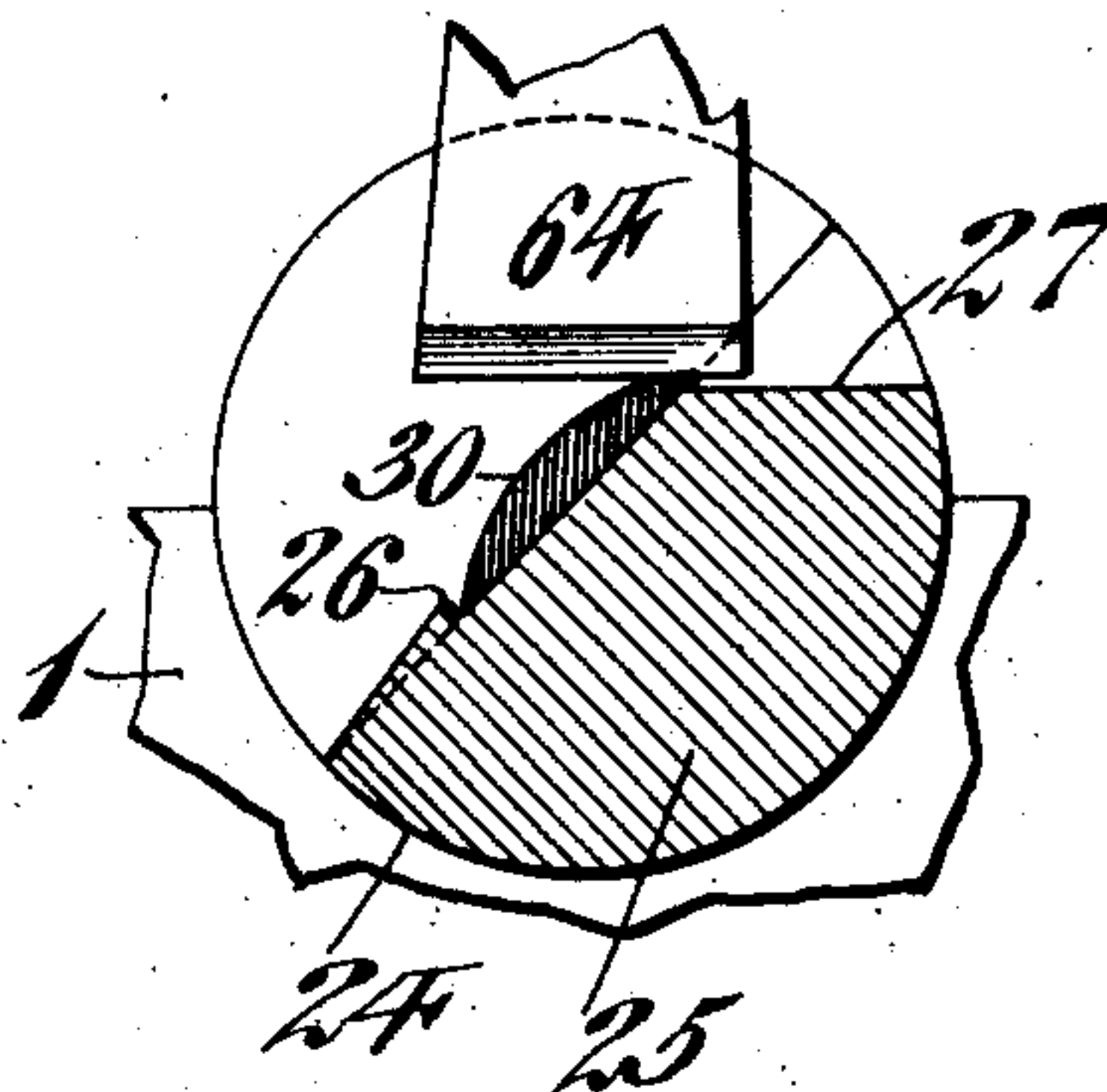
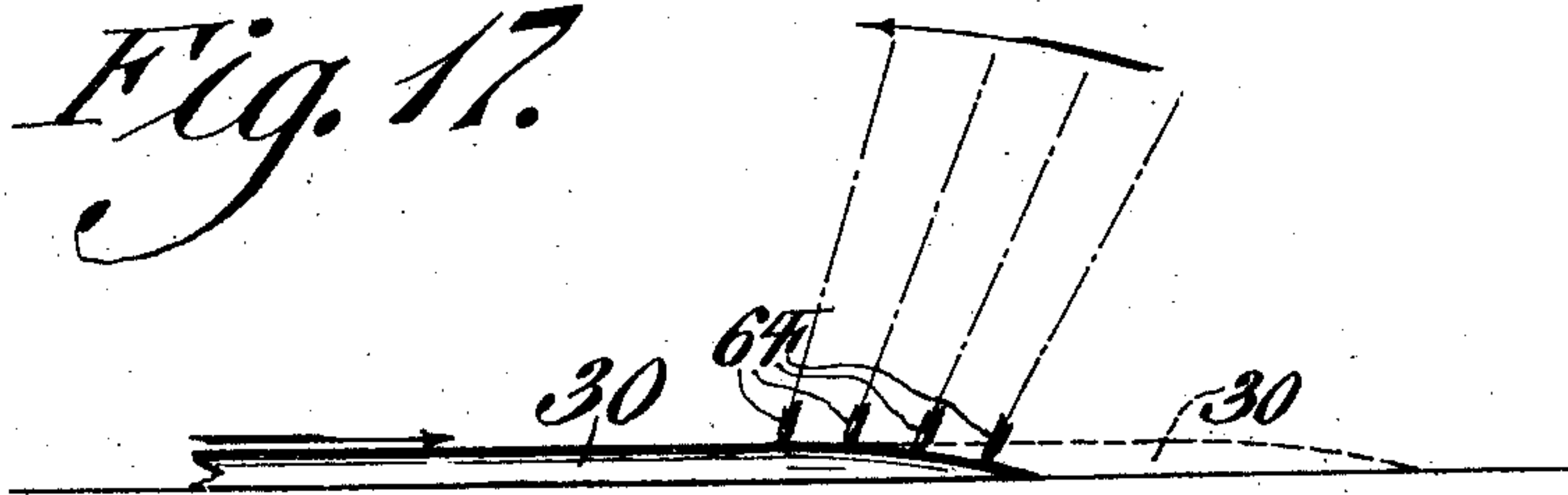


Fig. 16.

Fig. 17.



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FILE-CUTTING MACHINE.

975,236.

Specification of Letters Patent.

Patented Nov. 8, 1910.

Application filed December 15, 1909. Serial No. 533,269.

To all whom it may concern:

Be it known that I, JOHN A. HESS, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful File-Cutting Machine, of which the following is a specification.

My invention relates to a new and useful file cutting machine wherein I provide means for varying the angle of movement of the cutting tool, depending upon the position of the same with respect to the file which is being cut.

It further consists of novel means for cutting a file.

It further consists of novel means for positioning the bed plate or support for the file.

It further consists of novel means for feeding the file.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

I have found in practice in the cutting of files that it is essential to properly position the file with respect to the cutting tool and that it is of advantage to be able to vary the angle of the cutting tool with respect to the file, when a pointed file is being cut. My invention is designed to accomplish these results and in the drawings, I have shown an embodiment of my invention which I have found operates successfully in practice but it will be evident that changes may be made in the construction, the arrangement of the parts may be varied and other instrumentalities may be employed which will come within the scope of my invention and I do not therefore desire to be limited in every instance to the exact form as herein shown and described but desire to make such changes as may be necessary.

Figure 1 represents a side elevation of a file cutting machine embodying my invention. Fig. 2 represents a partial side elevation and partial sectional view from the opposite side of that shown in Fig. 1. Fig. 3 represents an end view thereof. Fig. 4 represents a plan view. Fig. 5 represents a partial plan view and partial sectional view of a portion of the device in detached position. Fig. 6 represents a partial plan view and partial sectional view of a portion of the bed plate with means for connecting the same to the index wheel on an enlarged scale.

Fig. 7 represents an end elevation of a portion shown in Fig. 6. Fig. 8 represents an elevation of a portion of the mechanism for changing the angle of movement of the tool in detached position and on an enlarged scale. Fig. 9 represents a sectional view on line $x-x$ Fig. 8. Fig. 10 represents a side elevation of a portion of the mechanism shown in Fig. 8 showing the actuating means for raising and lowering the tool. Fig. 11 represents an elevation of a portion of the tool holder which is connected with the supporting mechanism shown in Fig. 8. Fig. 12 represents a side elevation of the tool holder. Fig. 13 represents a top plan view thereof. Fig. 14 represents a sectional view of a bed plate showing a portion of the tool acting upon one side of the file. Fig. 15 represents a sectional view of the opposite side of the tool showing the same supported upon a different bed plate from that shown in Fig. 14. Fig. 16 represents a sectional view of a bed plate showing a portion of the tool acting upon the center of a file. Fig. 17 represents a diagrammatic view showing a portion of a file and the different angles into which the tool is placed in order that the action of the same will be varied depending upon the point at which the cutting is accomplished on the file.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates the frame of a file cutting machine which it will be understood is suitably formed and is supported in any suitable manner and that the parts are suitably connected or supported thereon in any suitable manner and are properly timed to operate with respect to each other.

Suitably mounted upon the frame 1 is the main drive shaft 2 to which motion is imparted in any desired manner, in the present instance the said shaft 2 is provided with the fast and loose pulleys 3 around which a belt is passed in order to drive the said shaft.

4 designates a pulley suitably mounted on the main drive 2, around which passes a belt 5 which also passes around a pulley 6 mounted on the shaft 7 which serves as the drive shaft for the feeding of the file through the machine, that is to say, it actuates the bed plate supporting the tool, as will be hereinafter described.

Suitably mounted on the shaft 7 is a worm or gear 8 which, in the present instance, is surrounded by a casing 9 suitably mounted on the shaft 7 which is adapted to contain
 5 oil in order to keep the parts properly lubricated, said casing 9 having a suitable opening or cut-away portion 10 in order to permit the gear 11 to mesh with the worm 8, as will be best understood from Fig. 2. The
 10 gear 11 is suitably mounted on a shaft 11^x journaled or supported in any desired manner in the frame 1 and is provided with a gear 12, see Fig. 1, adjacent its end opposite that upon which the gear 11 is mounted,
 15 said gear 12 meshing with a gear 13 carried upon a shaft 14 which is suitably journaled in any desired manner, in the present instance, upon the arms 15 one upon opposite sides of the machine, as best understood
 20 from Fig. 4, each of the said arms in the present instance being pivotally supported at 16 upon a suitable point of the frame 1. Carried on the shaft 11^x is the lower feed roll 17 while carried on the shaft 14 is the
 25 upper feed roll 18.

19 designates a suitable feed plate which is situated between the upper and lower rolls 17 and 18 and is gripped therebetween in order to be moved when the rolls are actuated and in order to provide a suitable gripping action for the rolls upon the plate 19, I have, in the present instance, connected
 30 adjacent the free end of the arms 15, the rods 20 which pass downwardly through a suitable portion of the frame 1, in the present instance, and are provided with a suitable head 21 at their lower ends upon which head is adapted to bear a spring 22 which
 35 also bears upon a suitable stationary or fixed point in order that a suitable tension is given to the free ends of the said arms 15 in order to hold the rolls 17 and 18 in proper position with respect to each other and to impart a proper gripping action thereof
 40 upon said feed plate 19, it being understood that in this way a resilient tension is given to the parts in order to provide for any inequalities or ease of action which may be required, it being understood that the tension
 50 of the said springs 22 can be varied or adjusted as may be necessary or desirable. The feed plate 19 is supported in any suitable or desired manner and in the present instance it moves upon a roller support 23. In the
 55 bed of the frame 1, I provide a suitable groove, recess or guide 24 which is adapted to receive a bed plate of the machine and which is adapted to be removably connected to said feed plate 19. It will be noted from
 60 Figs. 14, 15 and 16 that the groove, recess or guide 24 in the bed of the frame 1 is half round in order to receive the bed plate which is of suitable construction to conform to the curvature of the groove or recess 24 in order
 65 to rotate freely therein and it will be noted

and understood that I desire to employ a right and left-hand bed, depending upon which side of the file is to be cut and it being understood that I first insert the proper bed plate in the recess 24 and connect the
 70 same suitably with the feed plate 19 and operate with this for cutting one side of the file, after which this bed plate is removed and the oppositely formed bed plate is inserted for cutting the other side of the file.
 75 As these two plates are similar in construction, I have deemed it necessary only to describe one and I have applied the same reference numerals thereto, although it will be understood that the supporting shoulder
 80 against which the tool rests and the groove, in the bed plate, for accommodating the tool are upon opposite sides, depending upon whether the bed plate is a right or left-hand one.
 85

25 designates the bed plate which is provided with a shoulder or abutment 26 on one side on its upper face against which the file is placed and abuts and I provide a suitably formed recess or cut-away portion 27 upon
 90 the opposite side of the bed plate to accommodate the tool as it is cutting the file, as best understood from Figs. 14 and 15. I also provide, at a suitable point upon the bed plate, the pins or projections 28 which
 95 are adapted to engage with the tang 29 of the file 30, see Fig. 4, when the file is properly situated with respect to the abutment or shoulder 26 in order that said file 30 will be properly held in position on the bed plate 25.
 100

It will be noted and understood that the cut-away portion or groove 27 in the bed plate is varied depending upon the style and shape of the file to be cut and I have illustrated in Fig. 4 one form or shape of this
 105 groove although it will be understood, as previously stated, that this is varied or changed, depending upon requirements.

Any suitable means for connecting the bed plate 25 with the feed plate 19 may be employed in order that, when the feed plate 19 is actuated or moved, it will move the bed plate 25 therewith and will also permit a suitable rotary movement to the bed plate
 110 25. In the present instance, I have shown a headed bolt 31 projecting from the bed plate 25 which is adapted to be seated in an offset or recess 32 in the feed plate 19 whereby it will be understood that the longitudinal movement of the feed plate 19 will carry
 115 the bed plate therewith while at the same time rotary motion may be imparted to the bed plate 25 without affecting the plate 19.

It will be noted with respect to Figs. 14 and 15 that, as the tool is cutting upon one
 125 side of the file 30, the shoulder or abutment 26 forms a holding means for the file 30 and in order that the tool can operate properly upon the said file 30. As will be understood, the bed plate 25 is placed in proper
 130

position in order that one edge of the file will be properly positioned to be acted upon by the cutting tool and the said bed plate must be held in this position as it moves longitudinally carrying the file therewith and holding the same in proper position until one edge of the file has been entirely acted upon by the cutting tool. The bed plate 25 is then moved longitudinally back to its former position and rotated a proper distance in order to place the file so that another section thereof when moved longitudinally, will be in line to receive the cutting action of the tool and this movement of the bed plate occurring until a proper amount of the file has been cut. In order to hold the bed plate in its adjusted position and in order to adjust the same, I have provided an index wheel 33 at one end of the machine, see Fig. 4, which is provided with suitable notches or teeth as will be evident. I desire to removably connect this index wheel with the bed plate 25 and as seen in Fig. 6, I have provided a collar 34, which abuts the inner side of the index wheel 33 and the end of the bed plate 25 and I pass a screw or other fastening means 35 through the index wheel 33 and collar 34 and cause the same to engage with a suitably threaded recess 36 in the bed plate 25 so that by tightening the said screw properly, the index wheel 33 is secured to said bed plate 25 and will move therewith. Around said collar 34 I place a bracket 37 provided with a slide head 38 which moves in a suitable guide 39 upon the side of the frame 1, said slide head being provided with a handle 40 which projects therefrom. Also surrounding said collar 34 is an adjustment lever 41 which carries a pivotally mounted pawl 42 having an arm 43 thereon for actuating said pawl 42, it being noted that said pawl 42, see Figs. 3 and 7, is adapted to be seated in one of the grooves or to engage with the teeth on the index wheel 33, in order to lock the said wheel 33 against rotation and so lock the bed plate 25 in its proper position, said pawl being adapted to be removed from the recess, or its engagement with the teeth, on said index wheel in order to permit proper rotation of the bed plate 25 to properly position the file 30 with respect to the cutting tool. For this purpose, I have provided on the bed plate 25 an operating handle 44, it being understood in order to rotate or change the position of the bed plate 25 to move the same that the operator presses down upon the arm 43 which removes the pawl 42 from its engagement with the teeth of the index wheel 33 and by grasping the handle 44 and turning the bed plate 25, the same can be properly positioned, which at the same time, will move the index wheel 33 causing the next recess or groove or the proper one, depend-

ing upon the amount of rotation desired to be given to the bed plate 25, to be placed in line with the pawl 42, which is then released and caused to engage with the proper teeth in order to again lock the index wheel 33 in position and so the bed plate 25, this locking occurring by reason of the fact that the tooth or pawl 42 is normally stationarily supported and will prevent rotation or rocking of the bed plate until removed from engagement with the index wheel 33. By these means I have provided a lock for holding the bed plate 25 in its proper position and by releasing the lock the bed plate can be rotated or moved into its proper place and again locked in order to permit suitable action of the cutting tool in a proper line upon the file 30.

In some instances and where I am cutting a flat file it is not necessary to rock or rotate the bed plate 25 but it may sometimes be necessary to slightly adjust the position of the bed plate in order that the file will be properly presented to the cutting tool. For the purpose, I have provided an adjustment lever 41 which is provided with a spring to assist in holding the same in its proper position and I have provided a rod 46 in threaded engagement with the adjustable lever 41 and also in engagement with a suitable portion of the slide head 38, in the present instance, by means of the ball or cylinder 47 seated in a suitable recess 48 in said slide head, it being understood that I have mounted on said rod 46 the operating handle 49 so that by operating said handle 49 the rod 46 is rotated slightly raising or lowering the end of the adjustment lever 41, depending upon the direction of rotation of said rod 46, and, as the pawl 42 carried by the adjustment lever is in engagement with the teeth of the index wheel, it will be understood that the said wheel will be suitably moved or rotated in one direction or the other, carrying the bed plate 25 therewith in order that the same will be adjusted into its proper position to present the file to the cutting tool in a suitable or proper manner.

It will of course be understood that the slide head 38 and the parts carried thereby will move with the bed plate 25 but that by reason of the form of connection which I have employed the bracket carrying the slide head and the adjustment lever will permit rotation of the bed plate without movement of these parts.

It will be understood from the above that as the feed rolls 17 and 18 are properly actuated the feed plate 19 is moved to the right in Figs. 1 and 4 and will carry over with it the bed plate 25 carrying the file 30 and all the parts connected with said bed plate 25 so that the file will be suitably cut. In order to return the parts to their starting position again, I have provided means for

releasing the gripping action or tension of the feed rolls upon the feed plate, as will be described hereinafter, in order that the operator may, by grasping the handle 40 and pulling upon the same, return the bed plate, the parts carried thereby and the feed plate, back into position to be again moved forward to subject the file to the action of the cutting tool.

As I have described the movement of the feeding of the tool through the machine, I will now describe the means for varying the angle of movement of the cutting tool in order that the same will be presented properly to the file to be cut.

50 designates the support for the tool holder and operating parts which support is movable in suitable guides 51 on the frame 1 of the machine and said support being capable of vertical movement only. In order to raise the support and with it the tool, I have provided a bar 52 having an off-set portion 53 seated in a recess 54 in said support 50, said off-set 53 being adapted to engage with the wall of said recess or opening 54 when elevated in order to raise the support 50. Connected with said bar 52 in a suitable or desired manner is a lever 55 which is suitably connected with a treadle 56 which is pivotally supported in order that the said lever 55 may be operated, it being understood that by depressing the treadle 56 the lever 55 is suitably actuated to raise the bar 52 and thus the support 50, an adjustably mounted weight 57 on the lever 55 assisting in returning the parts to their normal position. Carried on the support 50 is an adjustable bracket 58, as best seen in Fig. 2, which is in engagement with a roller 59 carried on a pivotally mounted lever 60 which is mounted on a shaft which carries lugs or projections 61, each in engagement with a pin 62 which is in engagement with the free ends of the arms 15 whereby it will be understood that as the support 50 is elevated to carry up the tool holder and tool, the lever 60 is thrown over to the left of its position seen in Fig. 2, thus rotating the lugs 61 and elevating the pins 62 which bear against the lower portion of the free end of the arms 15, whereby it will be understood that the springs 22 are compressed and the upper feed roll 18 is removed from its engagement with the feed plate 19 so that the said feed plate and the bed plate 25 can be quickly and easily returned to its proper position by the operator, as previously described.

The tool holder 63 is formed in any suitable or desired manner and the tool 64 is connected therewith, as may be desired, said tool holder being provided with a flange 63* which is adapted to be engaged by the offset portion 53 and elevated before the support 50 is elevated and said tool holder being car-

ried on a head or plate 65 which is in suitable or adjustable connection with a rocking member or support 66, in the present instance by means of the bolts 67 movable in the slots 68 in said plate 65 and in screw-threaded engagement with said rocking support 66, whereby the angle of the tool holder 63 is initially adjusted, depending upon the work to be done and is locked in its adjusted position. The rocking support 66 is pivotally mounted on the support 50 and is provided with a sleeve 69, which is seated in a slot 69* in the support 50, whereby the sleeve 69 can freely move with the rocking support and said sleeve 69 is provided with a suitable bore 70 adapted to receive the shaft 71 on which is mounted the cam 72 which is seated in a suitable recess or chamber in said rocking support 66 for this purpose, it being noted that the tool holder 63 is provided with a lug 73 which is situated in a suitable position to be engaged by the arms of said cam 72 at proper intervals in order to raise and lower the same, whereby the tool holder 73 is reciprocated. The shaft 71 is provided with a gear 74 which meshes with a gear 75 mounted on a shaft 76 which is suitably connected with the main drive 2, said shafts, in the present instance, being connected by a suitable universal joint 77, as best understood in Fig. 2, and as said shaft 76 is supported by a collar 78 mounted upon the sleeve 69 on the rocking support 66, the said parts move together and the universal joint will permit the proper movement of the shaft 76 with respect to the shaft 2, so that the gears 75 and 74 will always be in engagement, whereby it will be understood that as the gear 75 is rotated it will impart motion to the shaft 71 and so to the cam 72 to rotate the same and this will impart the reciprocating movement to the tool 64. It will thus be seen that I have now described the reciprocation of the tool and I will now describe the means for varying the angle of movement of the tool with respect to the file in order that the same will be properly presented thereto.

The rocking member 66, is pivoted at 79, to the support 50 and I have provided a downward extension 80 thereof in which I provide a slot 81. Pivotally mounted at 82 to the frame 1 of the machine is a bell crank lever, one arm 83 of which is provided with a roller 84 which is seated and movable in said slot 81, while the other arm 85 of which, is provided with a roller 86 which is adapted to move in and be actuated by the walls of a cam slot formed in a suitable guide, which is of suitable shape and extent depending upon the character of the file to be acted upon, it being understood that in this manner I am enabled to vary the position of the rocking support 66 and also the angle of the tool with respect to the file, as may

be necessary, or I can lock the rocking support 66 in position when a straight file is to be acted upon.

87 designates a guide which is provided with the cam groove 88, said guide 87, in the present instance, being formed of a plate which is adjustably mounted, by means of the bolts 89, upon the slide head 38, so that said plate moves with said slide 38 and with the bed plate 25, as it is carried across the machine by the action of the feeding means, in order that the shape or character of the cam groove will actuate the roller 86 to move the arm 85 of the bell crank lever to adjust the position of the rocking support 66. In the present instance, I have shown one form of a pointed file and as will be seen from Fig. 1, the cam groove 88 is situated at an angle up to a point marked "A" so that as the slide head 38 moves to the right in Fig. 1, the arm 85 will be gradually elevated, depending on the movement and will force over the arm 83 of the bell crank in the direction indicated by the arrow in said Fig. 1, so that the lower portion 80 of the rocking support 66 is moved in the same direction, which rotates the same on its pivot 79 to move the upper portion thereof in the opposite direction so that the tool holder 63 and the tool 64 carried thereby will be gradually moved into different positions or angles, as best seen in diagrammatic view, Fig. 17, in order that the cutting edge of the tool will be presented at the proper angles to the pointed or beveled end of the file 30, and when the point A of the cam groove 88 is reached, the remainder of the cam groove is in a straight line so that the angle of the tool will not be further changed and the tool holder will be locked in position and the rest of the file will be properly cut. From this it will be seen that I have provided means for varying the angle or line of movement of the cutting tool in order that the same will be changed, depending upon the character of the file to be operated upon and at the same time by different forms of cam grooves 88 by inserting different guides 87, I can vary the time and amount of movement of the adjustment of the tool holder or I can provide a straight groove 88 which will result in locking the tool holders in one position.

90 designates a presser foot which is carried by the plate 65 which is adapted to rest upon the file and hold the same as it is being operated upon while said presser foot is elevated with the other portions of the device carried on the support 50 in order that the tool and bed plate can be moved to a position to again start the cutting.

The tool holder, as previously stated, can be formed in any suitable or desired manner in order to accomplish the desired results

and I have shown a suitable spring 91, in the present instance, of rubber for bearing upon the tool holder for holding the same and returning it to its normal position and I have provided a set screw 92 on the operating wheel or lever 93 for adjusting the tension of said spring 91.

The operation of the machine is as follows:—The proper tool 64 having been inserted in the tool 63 and the position of said tool holder with respect to the rocking support 66 having been adjusted by loosening the bolt 67 and again locked, the tool holder is ready for operation. The proper bed plate 25 having been inserted in the bed, as for example, the bed plate of the form shown in Fig. 14, the file 30 is placed in position on this bed plate, the right edge of the file bearing against the shoulder 26 and the tang of the file properly engaged by the pins 28. By depressing the arm 43 on the pawl 42 the latter is released from engagement with the teeth of the index wheel 33, which in the meantime it will be understood has been suitably connected with the bed plate 25 and by proper actuation of the handle 44 on the bed plate, the latter is turned to the proper position in order to cause the left-hand edge of the file 30 to be in proper position to be acted upon by the tool 64, as seen in Fig. 14. The arm 43 is released, causing the pawl 42 to again engage with the teeth of the index wheel 33 so that the bed plate 25 is locked in the position seen in Fig. 14. As the file 30 in this instance is provided with a point and as it is of advantage to vary the angle of movement of the tool 64, I provide a guide 87 having a suitable slot 88 therein, said guide being suitably connected with the head 38 and the roller 86 being suitably seated in the end of the cam groove 88. The operating belt is connected with the proper pulley 3 and the main drive 2 is actuated. This rotates the pulley 4 and through the medium of the belt 5, the pulley 6 and also the shaft 7, motion is imparted to the upper and lower feed rolls 17 and 18 and moves the feed plate 19 therebetween, with which plate the bed plate 25 is connected and which is thus moved, to position the file 30 properly beneath the tool 64, the movement in Fig. 1 being from the left to the right. As the bed plate 25 moves forwardly it carries with it the guide 87 and as previously stated the inclination of the right-hand portion of the cam groove 88 properly moves the arm 85 of the bell crank lever in order to move the arm 83 thereof in the direction indicated by the arrow in Fig. 1, which moves the lower portion or extension 80 of the rocking support 66 in the same direction and moves the upper portion thereof in the opposite direction, thus gradually decreasing the angle at which the blow

is struck to the file 30 by the tool 64, as best understood from Fig. 17. In this way the point of the file is properly cut and when the straight portion of the file is reached the roller 86 is seated in the straight portion of the cam groove 88 so that the position of the tool holder 63 is locked and the tool 64 always moves at the same angle with respect to the file 30, it being understood as previously stated, that the tool holder 63 is properly reciprocated by the action of the cam wheel 72 striking the lug on said tool holder 63. When the edge of the file 30 has been cut the operator depresses the treadle 56, which elevates the offset portion 53, which will engage with the flange 63* on the tool holder 63 and so elevate the same sufficiently to remove the cam 73 carried thereby from its position to be engaged by the cam 72, so that the reciprocation of the tool 64 ceases, after which the offset portion engages with the wall of the opening in the support 50 and so elevates the same and the parts carried thereby and thus the presser foot 90, which previously has been in engagement with the file 30 to hold the same in proper position, and at the same time it elevates the arms 15, by means of the bracket 58 rotating the lever 60, in order to remove the upper roll 18 from its engagement with the feed plate 19, at which time the operator by grasping the handle 40 can return the bed plate 25, the feed plate 19 and the guide 87 to their starting position ready for the next operation. The arm 43 is again depressed and the bed plate 25 is given a proper turn in order that the next portion of the file will be placed in proper position to be acted upon by the tool 54 and the arm 43 is again released to cause the pawl 42 to again engage with the teeth of the index wheel 33 to lock the bed plate in its position. The treadle 56 is lowered after which the machine is again started and the proper cut to the file 30 is imparted, this operation taking place until substantially one-half of the half round file 30 has been cut. At this time the bed plate 25 shown in Fig. 14 is removed and a bed plate similar to that shown in Fig. 15 is inserted so that the opposite half of the file 30 can be cut in the same manner as before described.

As previously stated, where a flat file or file, which is not pointed, is to be cut it is not necessary to vary the angle of the tool holder 63, in which case I insert a guide 87 with a straight groove 88, which thus locks the position of the tool holder 63 at the proper angle in order that the tool 64 will be properly presented to the file. Where a straight flat file is being cut it is not necessary to vary the angle of the bed plate 25 but it may in some instances be necessary to slightly adjust the bed plate 25 in order that

the face of the file will be in proper position to receive the cut of the tool 64 on its surface. This adjustment can be easily and quickly accomplished by rotating the handle 49 which raises or lowers the adjusting arm 41 and so turns the index wheel a proper amount by reason of the engagement of the pawl 42 with the teeth thereof, since the index wheel 33 is locked with respect to the bed plate 25, as previously stated. Any desired angularity of movement may be imparted to the tool holder 63 by varying the cam groove 88 in the guide 87, as previously set forth.

From the above it will be understood that I have provided means for adjusting the position of the bed plate; that I have provided means for feeding a file properly through a machine to receive the cut from the tool, that I have provided means for varying the angle of the movement of the tool which can be varied depending upon the kind of file to be cut and that I have provided a new and novel means for turning the bed plate or support of the file and for locking the same in its different positions whereby the different portions of the file are properly presented to the tool.

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

1. In a device of the character stated, a support for the file, means for moving said support to feed the file to a cutting tool, a tool holder, a support for said tool holder pivotally mounted, a guide carried by and movable with said file support and having a groove therein, and means engaging with said groove and with said support beneath its pivotal point whereby the latter is moved, for varying the angle of movement of the tool during the cutting of the tapered end of the file and is then locked so that said tool is maintained in one position.

2. In a device of the character stated, a support for the file, means for moving said support to feed the file to a cutting tool, a tool holder, a rockable support for said tool holder having a slot therein, a guide carried by said file support and having a groove therein, and means seated in said groove and in said slot for controlling said rockable support.

3. In a device of the character stated, a support for the file, means for moving said support to feed the file to the cutting tool, a tool holder, a rockable support for said tool holder pivotally mounted, a guide carried by said file support and a bell crank engaging said support and said guide for moving said rockable support on its pivot and for locking the same in a desired position.

4. In a device of the character stated, a support for the file, means for moving said file support to feed the file to the cutting

tool, a tool holder, a rockable support for said tool holder, a guide carried by and movable with said file support, and means engaging said support and said guide for varying the angle of said tool holder whereby the tool will be properly presented to the file as it is fed thereto.

5. In a device of the character stated, a tool holder, means for reciprocating the same, a rotatably mounted bed plate for carrying the file, a support for said bed plate, an index wheel connected and movable with said bed plate, an adjustment lever fulcrumed at one end on the axle of said index wheel, means for adjusting the other end of said lever, and a pawl pivotally mounted on said lever for engagement with the teeth of the index wheel for locking the bed plate in its various positions.

6. In a device of the character stated, a tool holder, means for reciprocating the same, a rotatably mounted bed plate for carrying the file, means for moving said bed plate to present the file properly to the cutting tool, an index wheel connected and movable with said bed plate, a pawl pivotally mounted on a member of said moving means and in engagement with the teeth of said index wheel, an adjustable support for said pawl, and a support for said bed plate movable therewith but permitting rotation thereof.

7. In a device of the character stated, a tool holder, means for reciprocating the same, a rotatably mounted bed plate for carrying the file, a support for the bed plate, means for moving said bed plate to present the file properly to the cutting tool, an index wheel connected and movable with said bed plate, a pawl adapted for engagement with the teeth of said index wheel, and an adjustment lever fulcrumed on the axle of the index wheel and carrying said pawl and movable with said bed plate but permitting rotation thereof.

8. In a device of the character stated, a tool holder, means for reciprocating the same, a rotatably mounted bed plate for carrying the file, a support for the bed plate, means for moving said bed plate to present the file properly to the cutting tool, an index wheel connected and movable with said bed plate, a pawl adapted for engagement with the teeth of said index wheel, an adjustment lever fulcrumed on the axle of the index wheel carrying said pawl and movable with said bed plate but permitting rotation thereof, and means for actuating said adjust-

ment lever for imparting movement to said index wheel and bed plate.

9. In a device of the character stated, a tool holder, means for reciprocating the same, a rotatable bed plate suitably supported for carrying the file, means for moving said bed plate for presenting the file properly to the cutting tool, an index wheel suitably connected with said bed plate, a sleeve between said index wheel and said bed plate, a pawl adapted for engagement with the teeth of said index wheel, an adjustment lever carrying said pawl and having a portion thereof surrounding said sleeve, and means for raising or lowering the free end of said adjustment lever for rotating said index wheel.

10. In a device of the character stated, a tool holder, means for reciprocating the same, a rotatable bed plate suitably supported for carrying the file, means for moving said bed plate for presenting the file properly to the cutting tool, an index wheel suitably connected with said bed plate, a pawl adapted for engagement with the teeth of said index wheel, an adjustment lever carrying said pawl, and means for raising or lowering the free end of said adjustment lever for rotating said index wheel.

11. In a device of the character stated, a support for the file, means for moving the support to feed the file to a cutting tool, a tool holder, a support for said holder, means for raising and lowering said support, a shaft carried by said support for actuating said holder, a gear on said shaft, a power shaft, and an intermediate shaft having a movable connection with said power shaft and having a spiral gear in mesh with the gear on said first mentioned shaft.

12. In a device of the character stated, a tool holder, means for reciprocating the same, a rotatable bed plate suitably supported for carrying the file, means for moving said bed plate for presenting the file properly to the cutting tool, an index wheel suitably connected with said bed plate, a pawl adapted for engagement with the teeth of said index wheel, an adjustment lever carrying said pawl, and means for raising or lowering the free end of said adjustment lever and for holding it in the different positions, whereby the index wheel may be rotated and held.

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Witnesses:

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