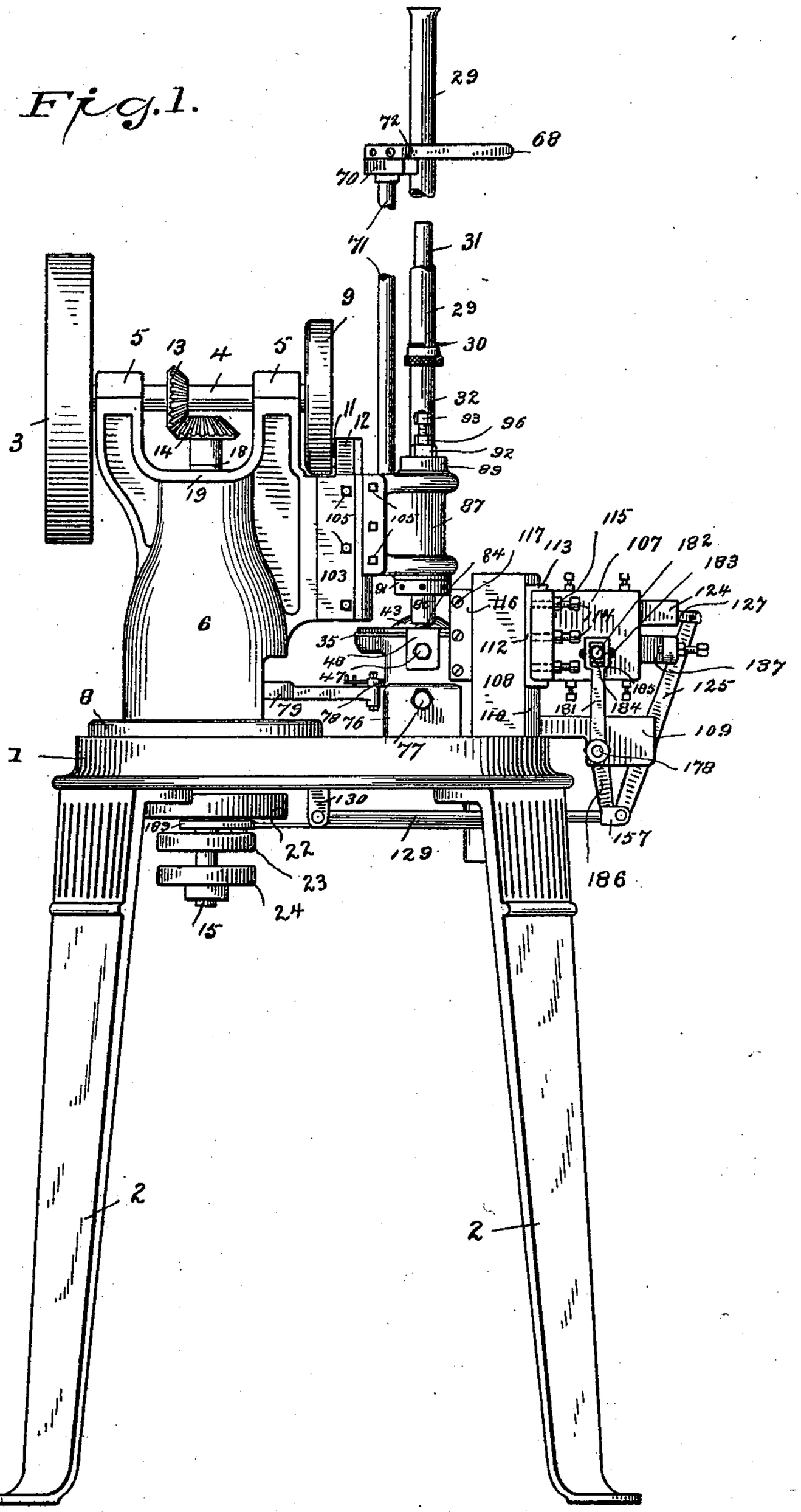
(No Model.) 8 Sheets—Sheet 1.

C. R. RICHARDS.

MACHINE FOR PRINTING WADS.

No. 506,374. Patented Oct. 10, 1893.

Fig. 1.



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By A. M. Wooster

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Fig. 2.

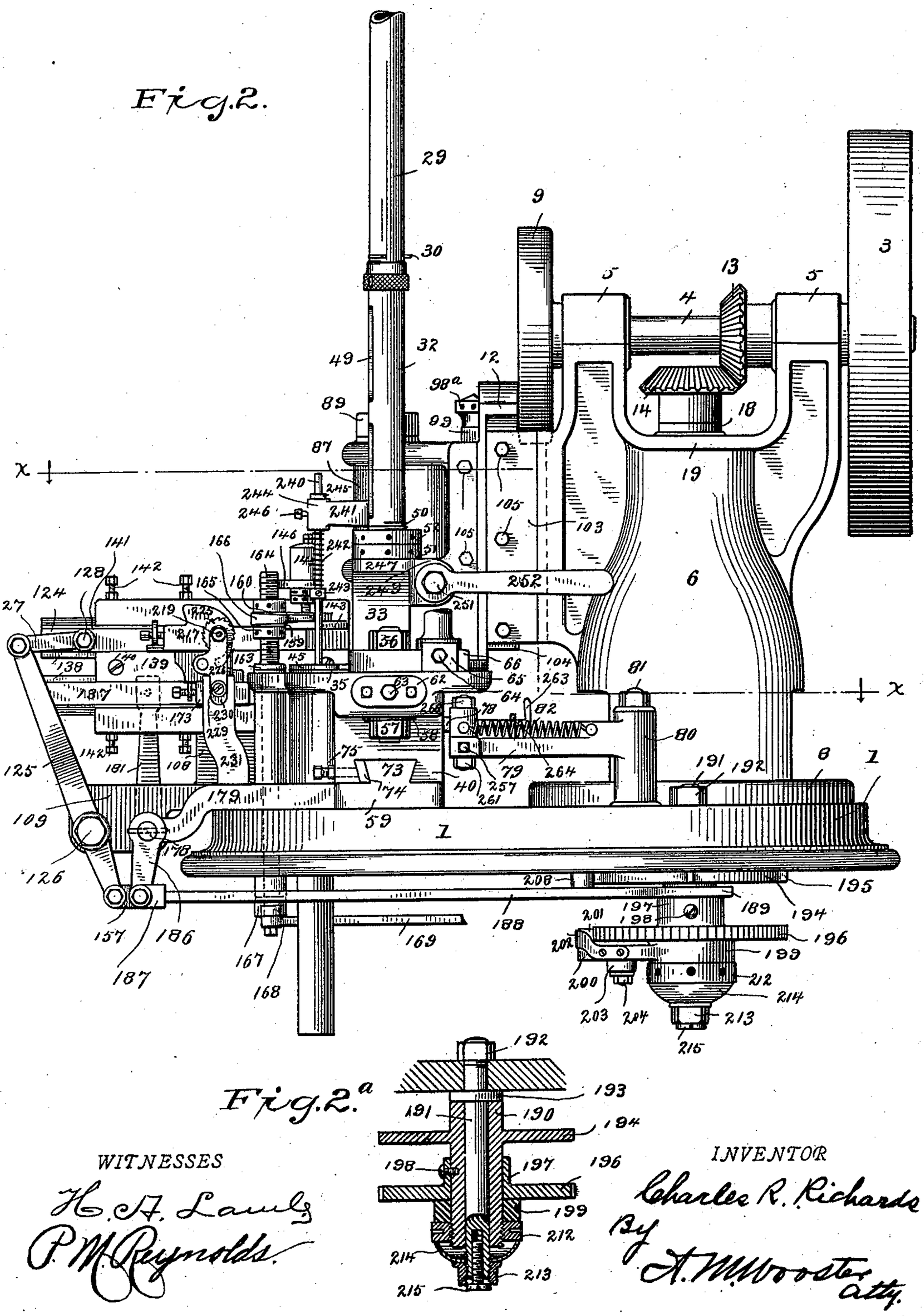

Fig. 2.a

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Fig. 3.

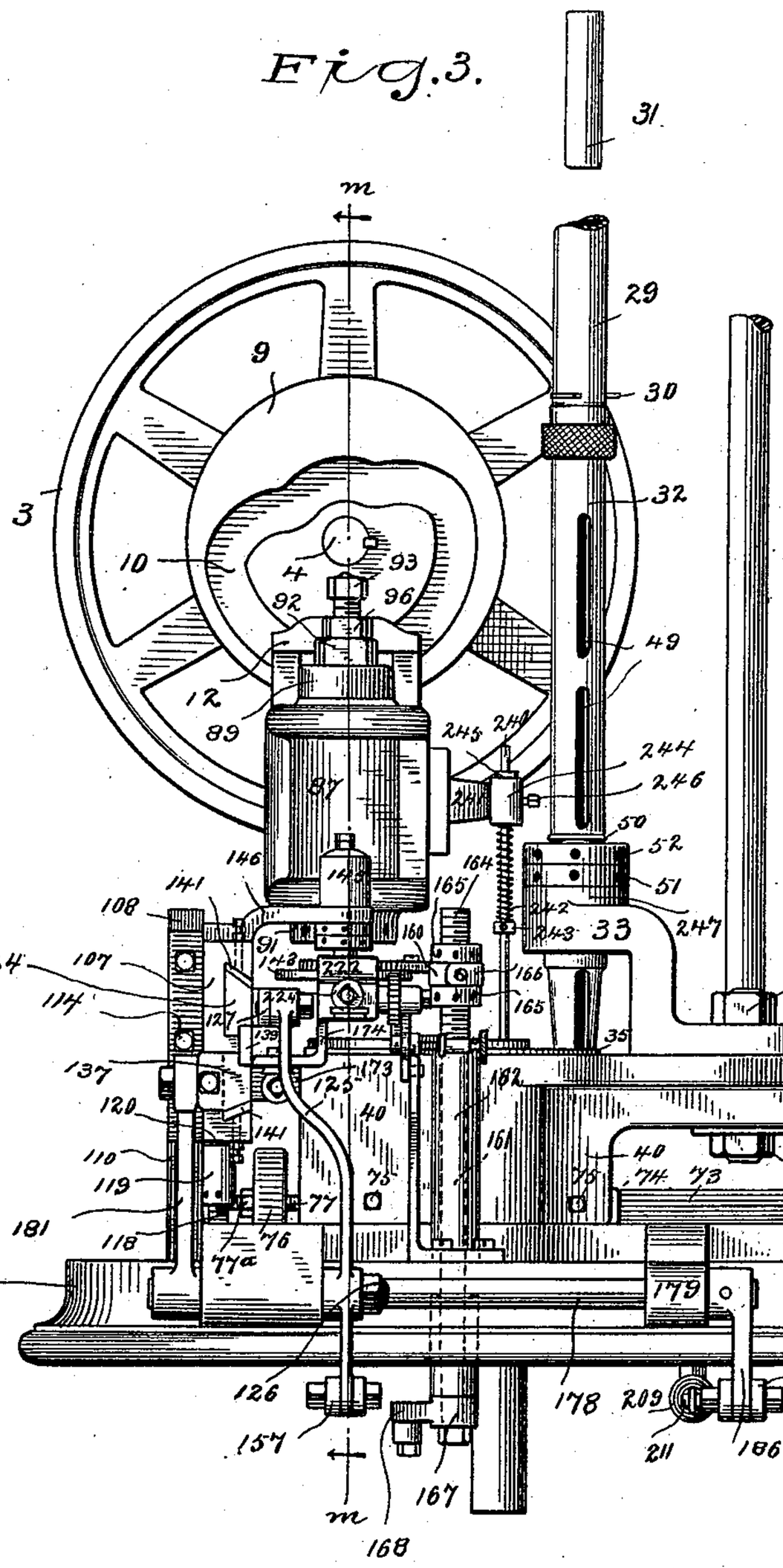

Fig. 4.

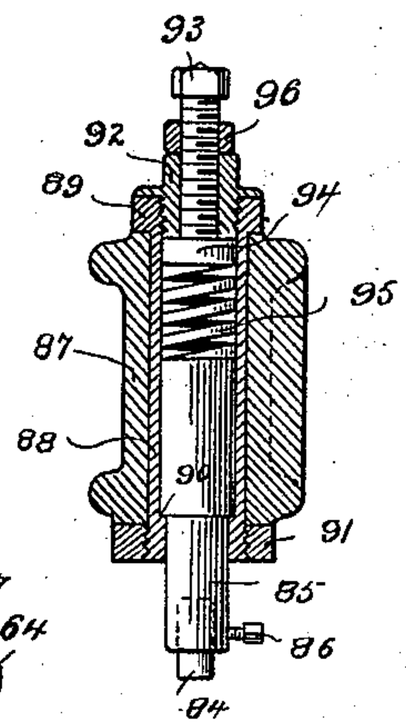

Fig. 3.b

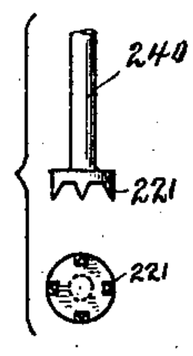

Fig. 3.a

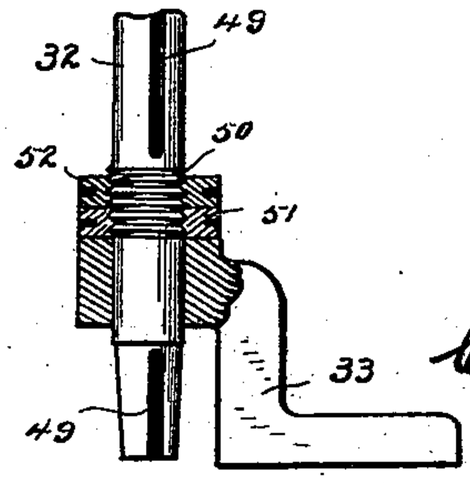

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Fig. 5.

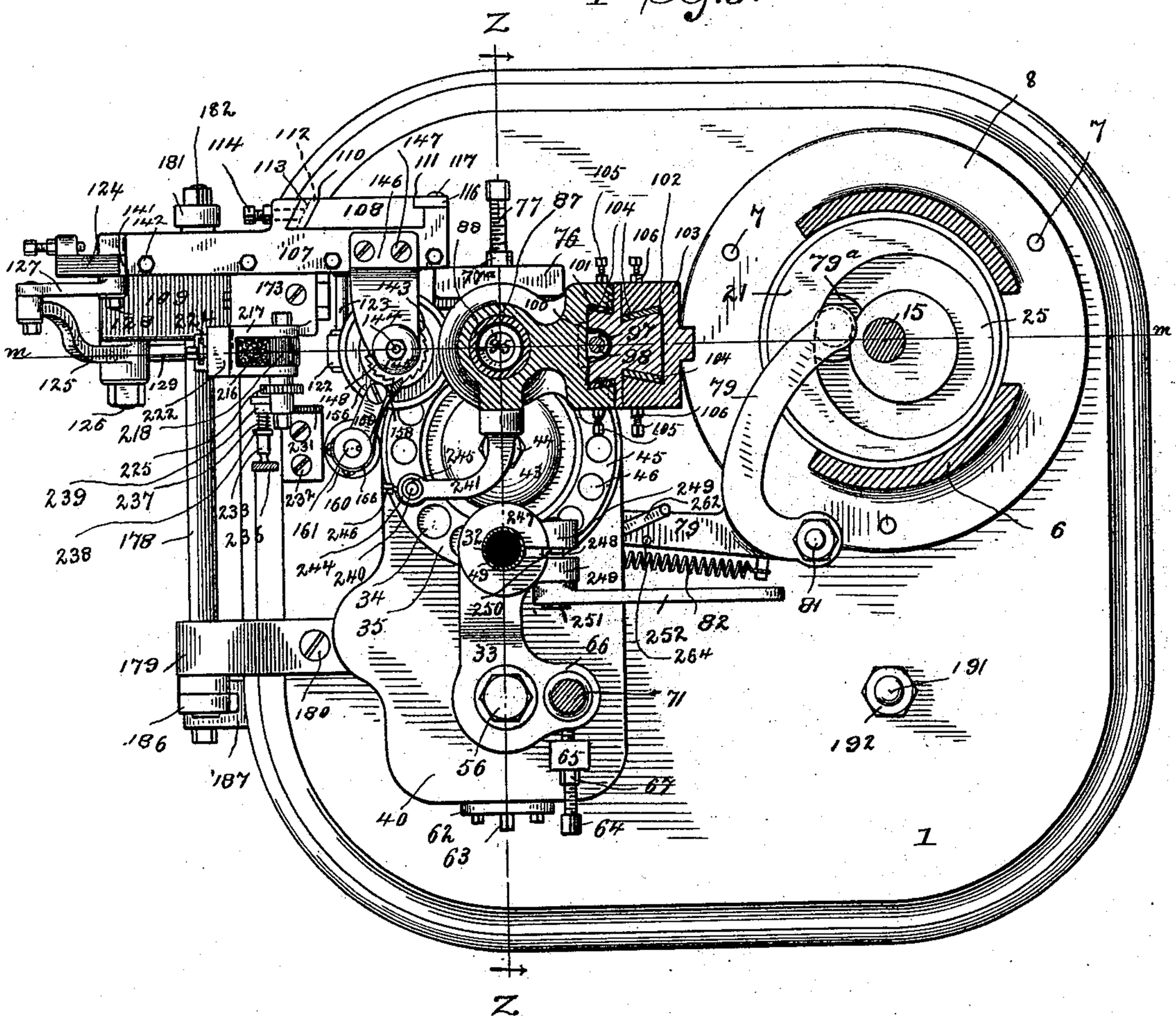

Fig. 6.

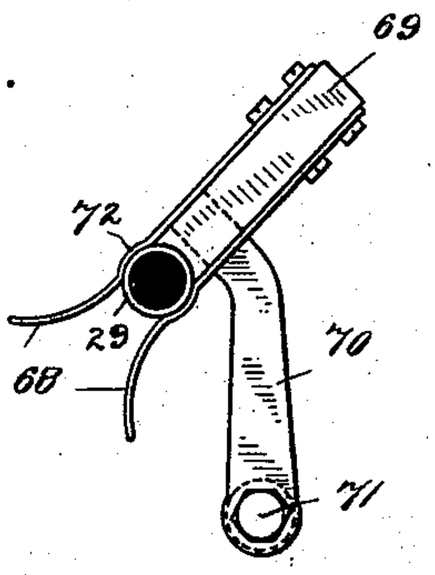

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Fig. 7.a

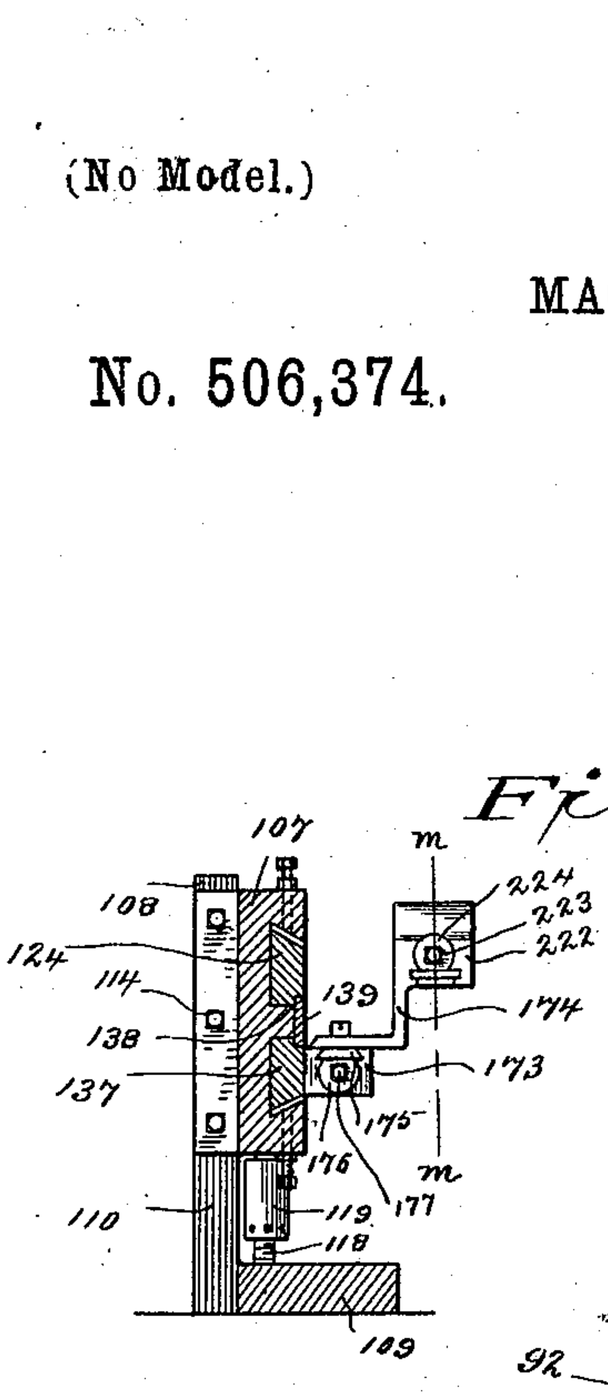

Fig. 7.

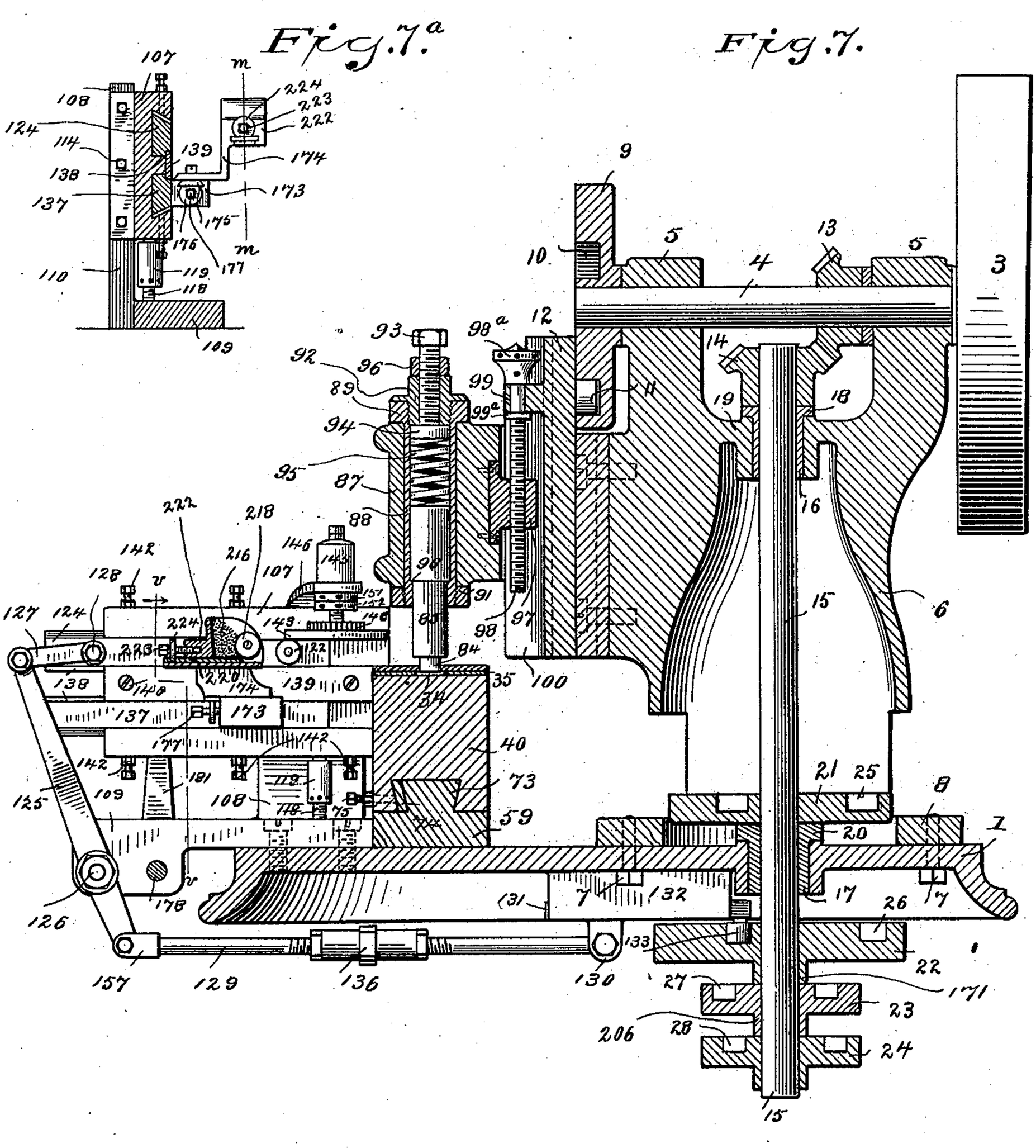

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Fig. 8.

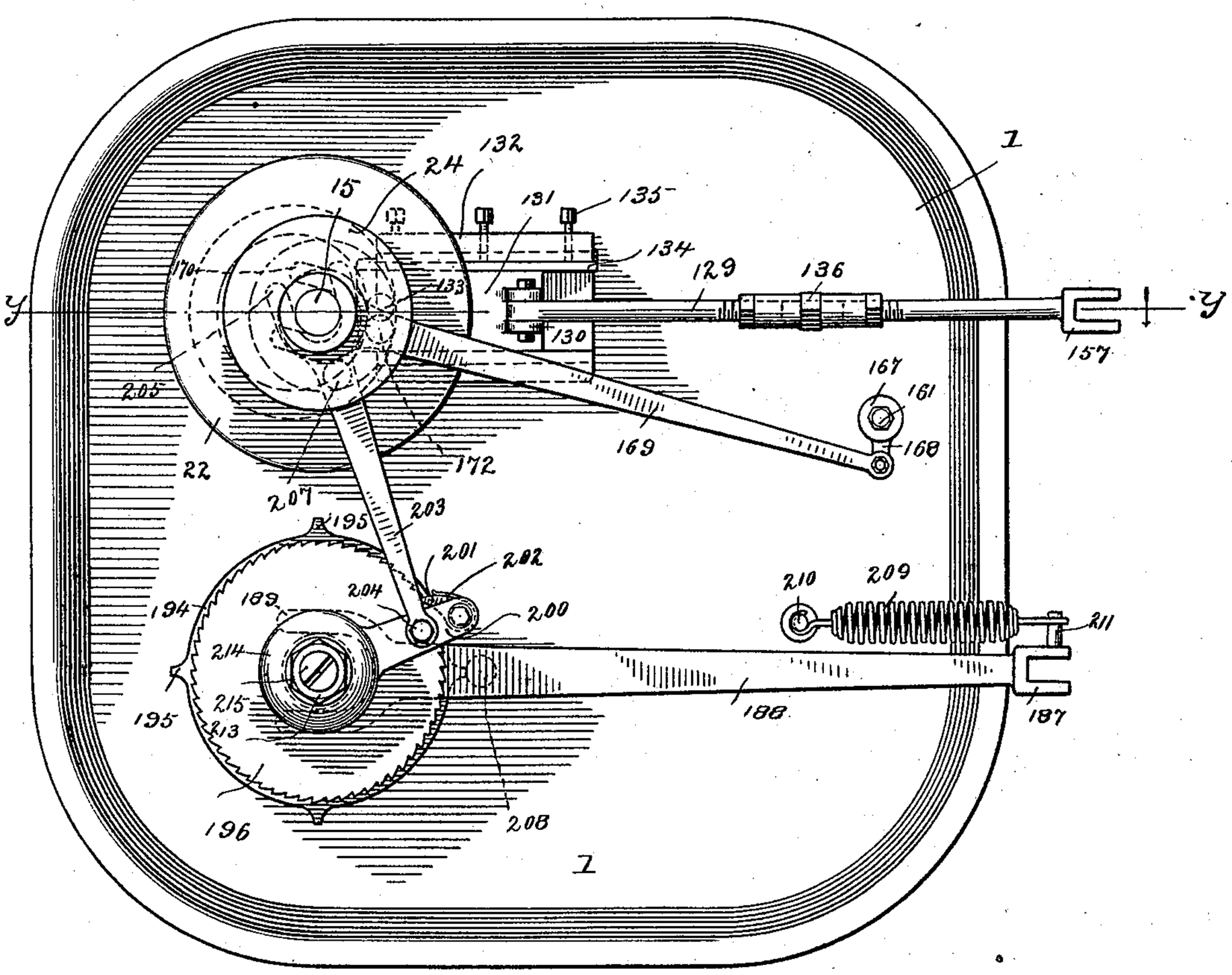

Fig. 9.

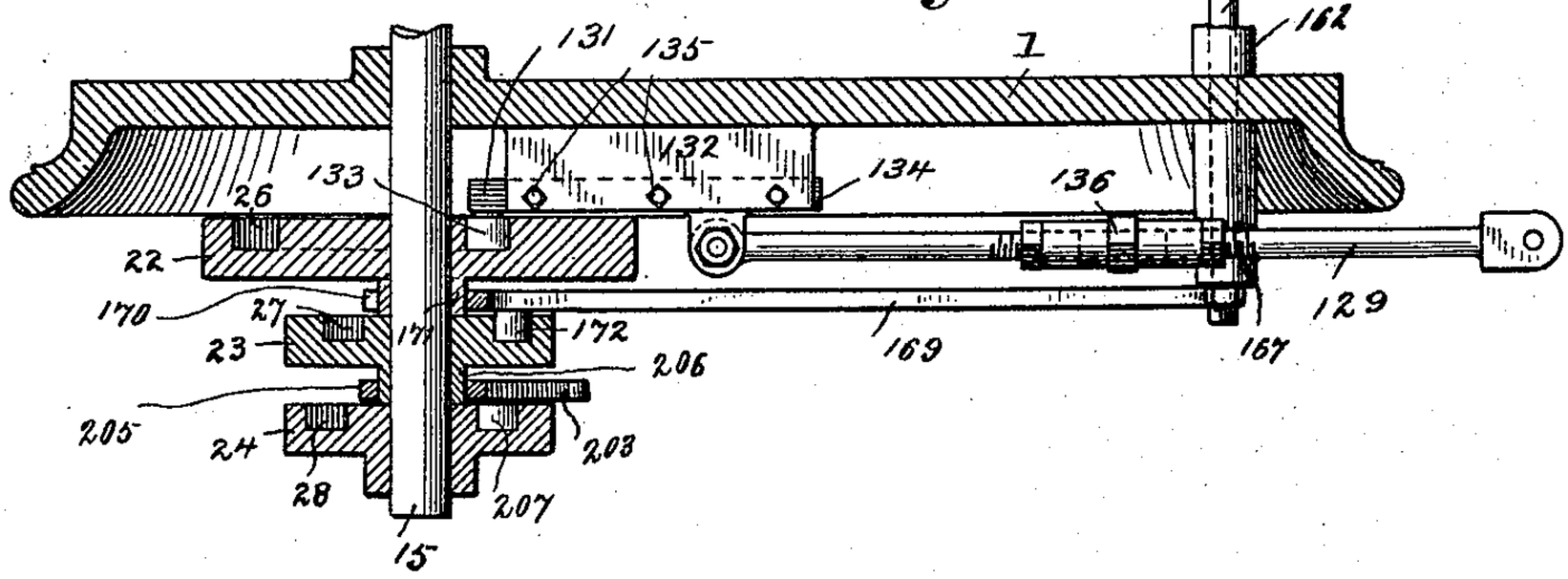

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Fig. 10.

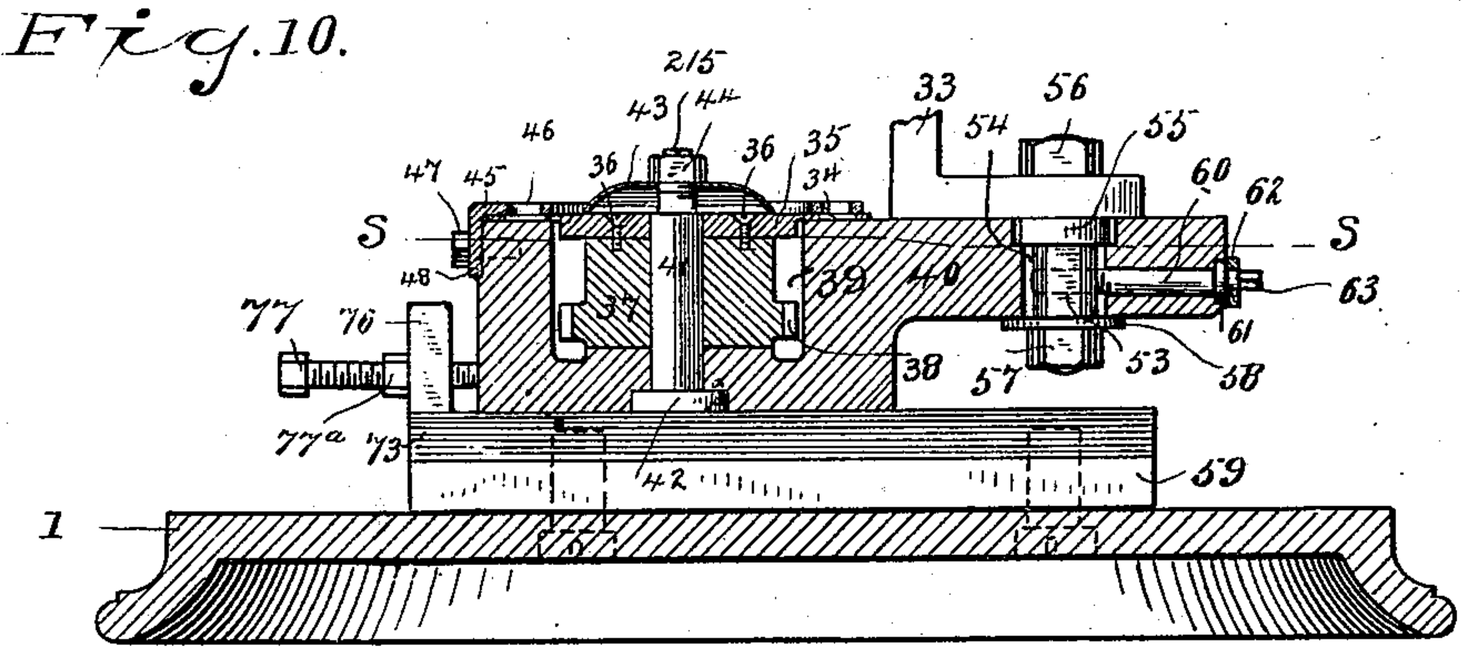

Fig. 11.

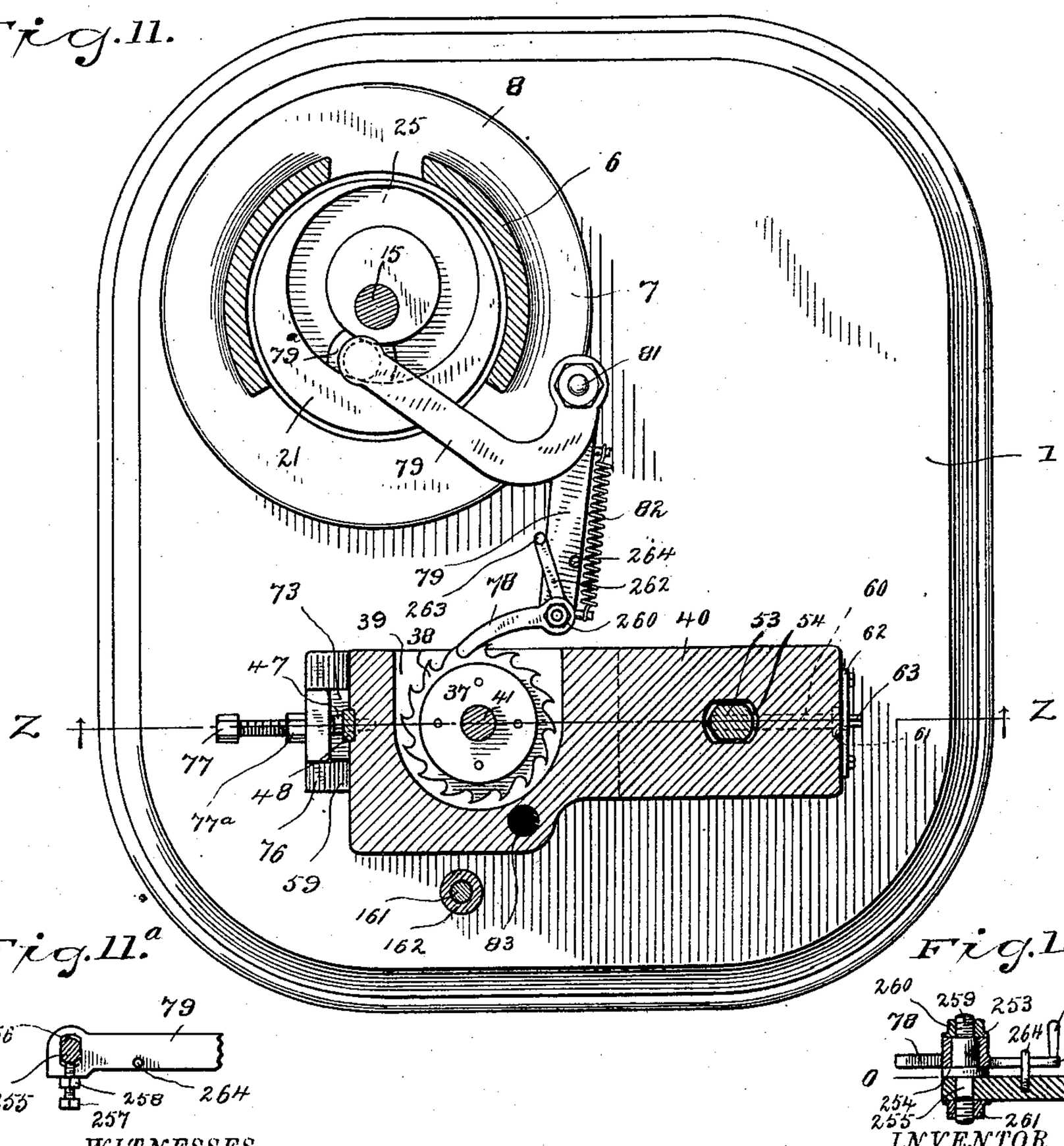

Fig. 11.a

Fig. 11.b

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Fig. 12.

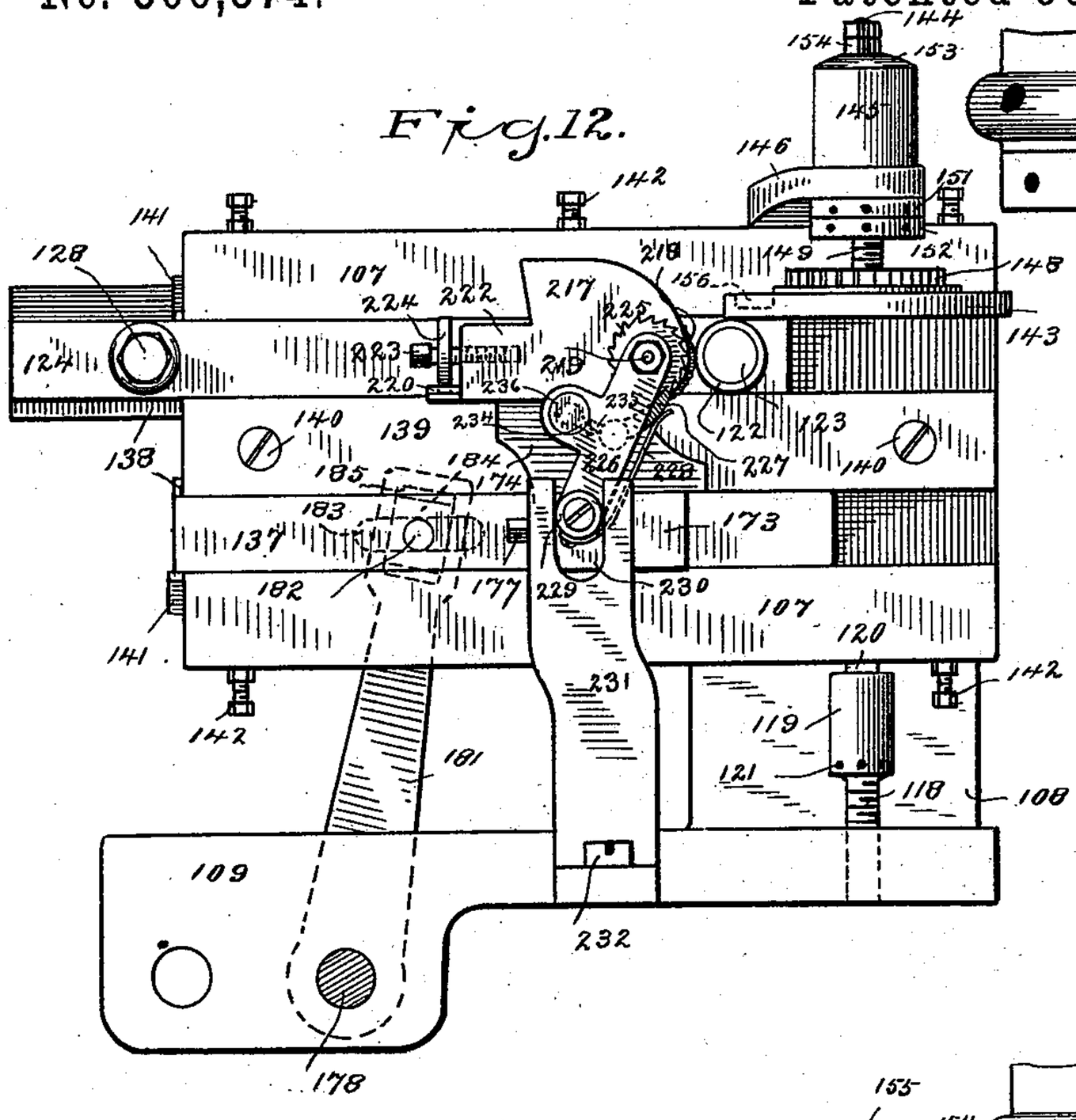


Fig. 12.a

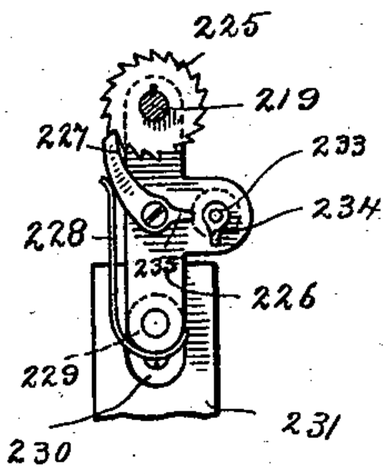
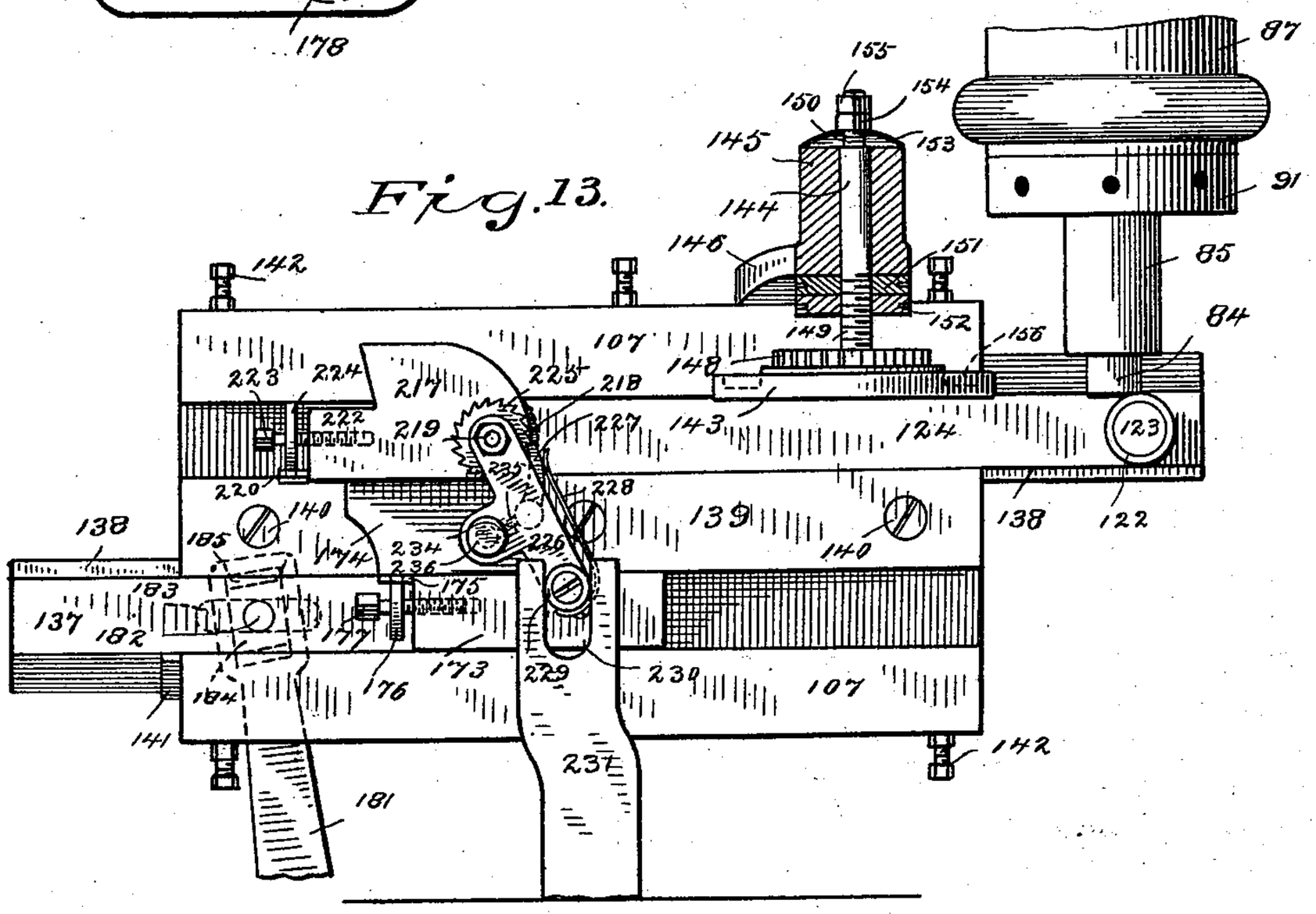


Fig. 13.



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UNITED STATES PATENT OFFICE.

CHARLES R. RICHARDS, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE UNION METALLIC CARTRIDGE COMPANY, OF SAME PLACE.

MACHINE FOR PRINTING WADS.

SPECIFICATION forming part of Letters Patent No. 506,374, dated October 10, 1893.

Application filed March 3, 1893. Serial No. 464,517. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. RICHARDS, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Printing Wads; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to produce a machine for printing wads, the special requirements being that the machine shall work rapidly, shall print the wads clearly, shall manipulate them in such a manner that no blurring shall take place, and that the machine moreover shall be capable of receiving the finest adjustments and at the same time be simple in construction and not liable to get out of repair.

With these ends in view I have devised the novel machine which I will now describe referring by numbers to the accompanying drawings, forming part of this specification in which—

Figure 1 is a side elevation of the machine complete; Fig. 2 a side elevation on an enlarged scale the point of view being opposite to that in Fig. 1; Fig. 2ª a detail sectional view corresponding with Fig. 2 illustrating the construction of mechanism under the bed; Fig. 3 an end elevation as seen from the left in Fig. 2; Fig. 3ª a detail sectional view of the lower end of the wad tube; Fig. 3ᵇ a detail view illustrating in side elevation and inverted plan the lower end of the expelling rod; Fig. 4 a detail sectional view of the type holder detached; Fig. 5 a section on the line *x x* in Fig. 2 looking down; Fig. 6 a detail plan view of the tube holder detached; Fig. 7 a vertical section on the line *m m* in Figs. 3 and 5; Fig. 7ª a detail sectional view on the line *v v* in Fig. 7; Fig. 8 an inverted plan view corresponding with Fig. 5; Fig. 9 a section on the line *y y* in Fig. 8; Fig. 10 a section on the line *z z* in Fig. 11, see also Fig. 5 in which the same line appears in a general view illustrating the dial feed mechanism; Fig. 11 a section on the line *s s* in Fig. 10 looking down; Figs. 11ª and 11ᵇ detail sectional views illustrating the adjustment of the dial feed pawl, the section line of Fig. 11ª being indicated by *o o* in Fig. 11ᵇ, and Figs. 12, 12ª and 13 are elevations on an enlarged scale illustrating the inking mechanism detached, Fig. 12 showing the position of the parts when the inking roller is taking ink from the ink supply roller, Fig. 13 showing the position of the parts when the inking roller is inking the type, and Fig. 12ª being a detail view illustrating the special mechanism for rotating the inking roller.

1 denotes the bed of the machine and 2 suitable legs by which it is supported.

Power is applied to drive the machine by a belt not shown running over a pulley 3 on shaft 4 journaled in boxes 5 upon a standard, *i. e.*, a heavy casting 6, which rests upon the bed, said standard being held in position by bolts 7 which extend upward through the bed and engage threaded holes in the base 8 of the standard.

9 denotes a disk at one end of shaft 4 provided with a cam groove 10 which is engaged by a roller 11 carried by a slide 12 which carries the printing die or types as will presently be fully explained.

13 denotes a bevel gear on shaft 4 which engages a corresponding bevel gear 14 on a vertical shaft 15 which is journaled in upper and lower bushings denoted respectively by 16 and 17, bushing 16 being provided with a flange 18 which rests upon a web 19 in standard 6, the bushing extending through said web; and bushing 17 having a flange 20 which rests upon the top of the bed, the bushing itself passing through the bed as is clearly shown in Fig. 7.

The several mechanisms of the machine with the exception of the printing die are driven by means of disks 21, 22, 23 and 24 on shaft 15, disk 21 being above the bed, and disks 22, 23 and 24 being below the bed, and each of said disks being provided with a cam groove, said grooves being denoted respectively by 25, 26, 27 and 28, cam groove 25 being in disk 21, &c.

For convenience in description I will state here that the mechanism by which the wad carrying dial is moved is driven from disk 21, the inking roller is driven from disk 22, the

ink distributing table is driven from disk 23 and the ink supplying mechanism is driven from disk 24.

The wads are fed to the machine in tubes 29 each wad tube being provided with a cut-off 30 in its lower end and a weight 31 being placed above the wads in the tube to force them downward. The wads are placed in the tubes in any suitable manner and when a tube is exhausted another one is put in its place and the cut-off drawn out to let the wads pass downward. The machine does not require to be stopped in changing tubes. The wads as they leave the tubes pass into a wad receiver 32 which is carried by a bracket 33, see Figs. 3 and 3ª. At the inner end of this bracket is a head 247 having a slot 248 in one side, and on opposite sides of the slot ears 249, through which a screw 250 passes. One end only of this screw is threaded the other end passing loosely through the ear and being provided with a head 251 adapted to be engaged by a hand piece 252 for convenience in operation. The hand piece is made detachable, but is ordinarily allowed to remain on the head so that if necessary the wad receiver may be removed without an instant's delay and a new one substituted and clamped in place by a simple movement of the hand piece. From the wad receiver the wads pass into holes 34 in a dial 35. The edge of the dial, *i. e.*, the operative portion, is made the exact thickness of the wads themselves, the central portion of the dial being made thicker, see Fig. 10, and being attached by means of screws 36 to a drum 37 the periphery of which is provided with teeth comprising a ratchet 38. The drum and ratchet lie in a recess 39 in a casting 40 which is movable transversely of the bed in a manner which I will presently describe. The dial turns upon a standard 41 which extends upward from the bottom of the recess, said standard being provided with a head 42 and being locked in position by a set screw passing through the head and engaging the casting. The edge of the dial rests upon the top of the casting and when the wads have been placed in the holes in the dial they are carried over the top of the casting by the dial, the parts being fitted so accurately that but one wad can pass into a hole at a time, so that clogging of the wads is wholly prevented. The upper end of the standard is reduced and screw threaded to receive a curved spring disk 43 which bears upon the top of the dial, the pressure of the spring disk on the dial being adjusted by a nut 44 engaging the threaded end of the standard, and said nut being locked in position by a lock screw 215. This construction will be found clearly illustrated in Fig. 2ª. This spring disk is in practice so adjusted as to produce sufficient friction to stop the forward movement of the drum and dial the instant the application of power to the ratchet ceases.

45 is a stripper plate having holes 46 which register with the holes in the dial, but are smaller. This plate is held in position by a screw 47 which passes through a lip 48 and engages casting 40. This stripper is essential at the point where the printing is done as will be more fully described, and may or may not be extended around the dial to serve as a guard as shown in the drawings.

The construction of wad receiver 32 and bracket 33 by which it is carried will be clearly understood from Figs. 3, 3ª, 5 and 10. The wad receiver is provided with slots 49 in order that the operator may see if the wads are feeding properly, and with an external screw thread 50. The lower end of the wad receiver is passed through a hole in the bracket in which it is adjusted vertically by means of a nut 51 which engages the thread and rests upon the top of the bracket, being held therein by screw 250 engaging ears 249 as already described. After adjustment nut 51 is locked in position by a check nut 52. In addition to this vertical adjustment the wad receiver has an adjustment toward and from the dial and also a lateral oscillatory adjustment. The bracket by which the wad receiver is carried, is carried by a stud 53 which lies in an opening 54 in casting 40. The stud is made flat sided and the opening to correspond therewith so as to prevent the stud from turning therein. The stud is also provided with a collar 55 which rests on the bottom of an enlargement of the recess. The upper end of the stud is threaded and is engaged by a nut 56. The lower end of the stud is also screw threaded and is engaged by a nut 57 which bears against a washer 58, the latter engaging the under side of the casting, this portion of which overhangs the supporting plate 59 upon which the casting is adjustable as will be more fully explained.

The adjustment of the wad receiver toward or from the dial is effected by means of a screw 60 which turns freely in the casting and engages stud 53, said screw being provided with a collar 61 which lies in a corresponding recess of the casting, and being retained in position by means of a plate 62 secured to the outer side of the casting. The outer end of the screw is squared as at 63 to receive a wrench when it is required to adjust the wad receiver in or out relatively to the dial. The oscillatory adjustment of the wad receiver is effected by means of a screw 64 which passes through a block 65 on the casting and bears against an arm 66 extending outward from bracket 33.

Should it be required at any time to adjust the wad receiver toward or from the dial nut 57 is loosened and screw 60 turned toward the right or left as may be required to impart the required inward or outward movement to the bracket and wad receiver. After the parts have been adjusted they are locked in position by tightening up nut 57.

Should it be required to give to the wad receiver slight lateral adjustment nut 56 is loosened and screw 64 is turned either in or

out as may be required, it being of coure understood that the end of said screw bears at all times against arm 66. Having secured the desired adjustment of the wad receiver and bracket, the parts are locked in position by tightening up nut 56. In order to prevent the possibility of screw 64 moving to the slightest extent in use I provide a check nut 67 which must be turned backward before the screw can be turned. Having set the screw to give the required adjustment to the bracket it is locked there by tightening up the check nut. The lower ends of the wad tubes simply fit down into the upper end of the wad receiver which is made just large enough to receive them. The upper ends of the wad tubes are supported by springs 68 secured to a block 69 upon an arm 70 extending from the upper end of a rod 71, see Figs. 1 and 6, the lower end of said rod being rigidly secured in arm 66 of bracket 33. The springs are curved as at 72 to just receive and hold the tube locking it firmly in position but permitting it to be easily removed when exhausted and a filled tube substituted in its place.

In addition to the adjustments of the wad receiver just described casting 40 is movable bodily transversely of the bed, carrying with it the dial, wad receiver, wad tube and the various parts just described. Supporting plate 59 upon which the casting rests is rigidly secured to the bed and is provided with a dovetail 73, this dovetail engaging a corresponding way in the under side of the casting, a gib 74 being placed between the dovetail and the way, said gib being adjustable by set screws 75 which are provided with lock nuts as shown. This construction enables me to move the dial and all the parts operating in connection therewith out from under the type or die should it be necessary to remove any of said parts from the casting for any purpose whatever. At one end of supporting plate 59, see Fig. 10, is a block 76 through which a screw 77 passes. The inner end of this screw serves as a stop to determine the inward movement of casting 40 in moving it back to place. Having once given to screw 77 the proper adjustment it is secured in position by a lock nut 77ª. Intermittent rotary motion is imparted to the dial by means of a pawl 78 pivoted to one arm of a lever 79. This lever is practically a bell crank lever, the two arms being at approximately right angles to each other. The lever is provided with a sleeve 80 which turns on a stud 81 extending upward from the bed, said stud constituting the fulcrum of the lever. The pawl is retained in engagement with the ratchet by means of a spring 82 one end of which is connected to the pawl the other to the lever. The special construction of pawl 78 is clearly illustrated in Figs. 11ª and 11ᵇ in connection with Fig. 11. The stud 253 on which pawl 78 is pivoted is provided with a collar 254 which rests upon the top of lever 79, and below said collar is a portion 255 which is flat sided and of greater size one way than the other. This flattened portion passes through a slot 256 at the inner end of the inner arm of bell crank lever 79.

257 is a set screw in lever 279 the inner end of which passes into the slot and against which one edge or portion 255 of the stud rests. This set screw is locked in position after adjustment by check nut 258. The upper end of stud 253 is reduced and threaded as at 259, said threaded portion being engaged by a nut 260 which bears against the shoulder at the lower end of the reduced portion. The lower end of said stud is also threaded and is engaged by a nut 261. It will of course be apparent that nut 260, will retain the pawl in position on the stud and nut 261 will hold the stud in position in the slot in lever 79, the tightening up of the nut drawing the collar against the lever. Stud 253 is additionally held in position by the set screw 257 it being apparent that the pressure in use is all in the direction of the screw. This set screw affords a very fine adjustment in setting the pawl in position and also serves as a stop to prevent the stud which carries the pawl from being moved out of position after adjustment. At the inner end of the pawl is an angle arm 262 which is provided with a hand piece 263 for convenience in disengaging the pawl from the ratchet when it is desired to move casting 40 and the parts carried thereby out from under the type.

264 is a stop pin in lever 79 which prevents the possibility of the pawl being thrown far enough away from the ratchet under any circumstances to permit it to become permanently disengaged. Should the pawl be thrown violently away from the ratchet arm 262 will come in contact with the stop pin and the pawl will at once drop back to place. The outer end of the other arm of the lever is provided with a segmental slide block 79ª, see Figs. 5 and 11, which engages cam groove 25 in disk 21, each rotation of said disk causing an oscillation of the arm carrying the pawl and consequently producing a backward movement of the pawl over the face of the ratchet and a forward movement of the pawl which carries the ratchet and with it of course the drum and dial forward the exact distance that the pawl moves. As already stated the ratchet, drum and dial are prevented from moving any farther than the exact distance they are carried by the pawl, by the pressure of spring disk 43 upon the upper surface of the dial.

83, see Fig. 11, denotes a hole through the casting through which the printed wads are expelled, as I shall presently describe.

The wads after being dropped into the holes in the dial from the wad receiver are carried around into position to be acted on by the printing mechanism which I have arranged directly opposite the point at which the wads pass into the dial. The printing is done by a type or die 84 which is locked in a recess at

the lower end of a plunger 85 by a set screw 86. Vertical movement is imparted to the plunger by a carrier 87 in which the plunger is socketed. The construction of the carrier will be clearly understood from Figs. 4 and 7. Within a vertical recess in the carrier is a sleeve 88 which is externally screw threaded at its lower end and internally screw threaded at its upper end, and is provided with an enlargement 89 which rests upon the top of the carrier, and with an internal shoulder 90 which is engaged by a corresponding shoulder on the plunger to limit the downward movement of the plunger and type. The threaded lower end of sleeve 88 extends below the carrier where it is engaged by a nut 91. The internal thread at the upper end of the sleeve is engaged by a flanged nut 92. An adjusting screw 93 passes through the flanged nut and bears upon a washer 94 within the sleeve. A coil spring 95 is interposed between the plunger and the washer, this spring being sufficiently rigid to insure a perfect print upon a wad but at the same time yielding sufficiently to prevent the slightest injury to the type under any circumstances. In practice the flanged nut is screwed down tight upon the top of enlargement 89. Adjusting screw 93 is turned down forcing the washer down as far as may be required to give the required rigidity to the spring. When the screw has been properly adjusted it is locked in position by a set nut 96. On the inner side of the carrier is a lug 97 which may be cast separately and secured thereto as shown in the drawings, or may be cast integral therewith if preferred. This lug is internally screw threaded to receive a screw 98 by which the carrier and the various parts moving therewith may be adjusted vertically. The head of screw 98 rests upon, and said screw turns freely in, a lug 99 extending from slide 12, said slide being provided with a groove 100 to receive lug 97 on the carrier, lug 99 on the slide being directly above lug 97. The head of the screw, denoted by 98^a, is secured in place by a pin and is provided with holes to receive a turning rod. Below lug 99 is a collar 99^a which holds the screw against endwise movement except as carried by the slide. The upper portion of the screw which engages lug 99 on the slide being unthreaded and the portion engaging lug 97 on the carrier being threaded, it follows that rotation of the screw must necessarily move the carrier and accompanying parts upward or downward relatively to the slide and give to said parts the finest possible adjustment. The slide is provided on its inner face with a roller 11 which engages cam groove 10 in disk 9, each rotation of said disk acting to impart a complete reciprocation to the slide. The inner and outer sides of slide 12 are both shaped to form dovetails, the outer dovetail lying in a correspondingly shaped groove 101 in the carrier and the inner dovetail lying in a correspondingly shaped grooove 102 in a plate 103 which is itself rigidly secured to standard 6, as for instance by heavy screws as shown in dotted lines in Fig. 7. Gibs 104 are provided on both sides of both dovetails, said gibs being adjustable by means of set screws 105 which are locked in position after adjustment by check nuts 106.

It will be seen that the several exceedingly fine adjustments just described enable me to secure what is practically absolute accuracy in adjusting the parts, it being practicable to take up wear from use in any portion of the machine so as to retain perfect accuracy of adjustment for any reasonable length of time.

It will of course be understood that the several parts of the machine are timed to correspond with each other, each rotation of shaft 4 causing a forward movement of the dial, presenting a new wad to be printed, and also causing a reciprocation of the slide, carrier, type, &c., whereby the wad is printed. After receiving the impact of the type in printing the wad is prevented from being lifted out of the hole in the dial by means of stripper plate 45, which may or may not be extended farther around the dial to serve as a guard plate as shown in Fig. 5.

Turning now to Figs. 8, 9, 12 and 13 in connection with the general views I will describe the inking mechanism which is driven from disks 22, 23 and 24. The entire inking mechanism is carried by a plate 107 which is vertically adjustable on a standard 108 cast integral with or rigidly secured to a plate 109 which is itself rigidly secured to the bed, as for example by heavy screws as shown in dotted lines in Fig. 7. The back of plate 107 is so shaped as to form a way to receive standard 108, the standard being preferably beveled upon one side as at 110, see Fig. 1, and provided with a shoulder 111 on the other side, see Fig. 5.

112 denotes a gib having angle pieces 113 which I place between plate 107 and the standard. These gibs may be set up to take up lost motion by means of set screws 114 which are provided with lock nuts 115. The angle pieces act to prevent the possibility of the gib becoming displaced in use. Plate 107 is retained in engagement with the standard by means of a plate 116 which engages shoulder 111 in the standard and is secured to the plate by screws 117.

118 denotes a screw engaging plate 109 and having a head 119 provided with a bearing 120 engaging the underside of plate 107, and with holes 121 to receive a turning rod. It will be seen that the entire weight of plate 107 and the inking mechanism rests upon bearing 120.

Should it be desired at any time to give vertical adjustment to the entire inking mechanism, this result may be accomplished by turning screw 118 either way as may be required to raise or lower plate 107 and the parts carried thereby.

As has already been fully explained slide 12, carrier 87 and the type or die receive in-

termittent reciprocatory motion through the engagement of roller 11, on the slide with cam groove 10 in disk 9. It will be seen in Fig. 3 that the shape of the cam groove is such that when the parts are at their highest position they will be held stationary for an instant. The relative position of the type at this moment is clearly shown in Fig. 13. While the type or die is temporarily stationary at the raised position it is inked by means of an inking roller 122 carried by a stud 123 extending outward from a slide 124 which reciprocates in a groove in plate 107, movement being imparted to said slide by means of a lever 125, see Figs. 2 and 7, said lever being fulcrumed on a stud 126 extending outward from plate 109. The lever is connected to the slide by means of a link 127 pivoted to the upper end of the lever and to the slide as at 128.

129 denotes a connecting rod one end of which is provided with a yoke 157 in which the lower end of lever 125 is pivoted, the other end of said rod being pivoted between ears 130 on a dove-tail slide 131 moving in ways in a block 132 which is cast integral with or is rigidly secured to the under side of the bed. At the inner end of slide 131 is a roller 133 which engages cam groove 26 in disk 22 carried by vertical shaft 15, see Figs. 7, 8 and 9.

It will of course be apparent that there must be no lost motion whatever or looseness of parts in a machine required to run with the absolute accuracy necessary in machines of this class. In order to insure the necessary perfection of adjustment even after long continued use I place a gib 134 between slide 131 and the block which may be set up at any time by set screws 135. Connecting rod 129 is made in two parts, one part being provided with a right and the other with a left hand screw thread, said threaded parts engaging a central nut 136. It will be seen that rotation of nut 136 will either lengthen or shorten the connecting rod as may be required thereby changing the position of slide 124 in its groove in plate 107 and of course changing the relative position of the inking roller. Below slide 124 in a similar groove in plate 107 is a slide 137. The shape of slides 124 and 137 in cross section is clearly shown in Fig. 7a. On the sides toward each other the slides are both provided with shoulders 138 which are engaged by a plate 139 which is itself secured to plate 107 by screws 140, the sides of the slide below the shoulders being parallel. The opposite sides of the slides are inclined, said slides being widest at the bottom, the grooves being of course correspondingly under-cut to receive them. Gibs 141 are placed between the slides and plate 107 and may be set up to compensate for wear in long continued use by screws 142. In Fig. 13 the position of the parts is shown at the instant the inking roller is inking the type or die and in Fig. 12 the position of the parts is shown at the instant the type is at its lowest position, as in the act of printing a wad. At this instant the inking roller is at its farthest position toward the left, that is away from the type. While the inking roller is moving backward and also when moving forward again toward the type, it passes over the surface of an ink distributing table 143, from which the inking roller receives sufficient ink to ink the type for each impression. I should state here however in order to avoid misunderstanding that in Fig. 12 the inking roller is also shown as receiving ink from the ink supplying mechanism this being a position of the parts that takes place only once during a pre-determined number of revolutions of shaft 15 and the operating disks, in the present instance, once in eighteen revolutions all of which will presently be fully explained.

Before proceeding to describe the manner in which the ink is supplied to the distributing table, I will describe the operation of the distributing table itself. This table is carried by a vertical shaft 144 which is journaled in a hub 145 carried by a bracket 146 which is rigidly secured to the top of plate 107 by screws 147, see Fig. 5. Just above the table on shaft 144, is a ratchet 148. Above the ratchet is a screw thread 149, and at the upper end of the shaft is another screw thread 150. The vertical adjustment of the table is determined by a nut 151 which engages thread 149. After the table has been fixed at the exact adjustment required it is locked there by means of a set nut 152. Nut 151 is held in contact with the lower side of the hub by means of a curved spring disk 153 which is provided with a central opening through which the upper end of shaft 144 passes, the tension of said spring disk being adjusted by a nut 154 engaging thread 150 and said nut being locked in position after adjustment by a set nut 155. The special purpose of the spring disk is to cause sufficient frictional contact between nut 151 and the hub to insure that the disk and ink distributing table shall be carried forward at each actuation of the machine the exact distance that the operating mechanism moves and no more, that is to say the friction being sufficient to stop the movement of the ratchet and ink distributing table the instant the forward movement of the operating mechanism ceases.

156, see Fig. 5, also dotted lines in Figs. 12 and 13, denotes a groove in the upper surface of the ink distributing table which receives any oil that may possibly collect upon the upper side of the table and renders it impossible for any oil to run over the edge of the table and mix with the ink on the under side thereof.

The position of the ink distributing table is shifted at each actuation of the machine by means of a pawl 158 pivoted to a crank arm 159, see Fig. 5, extending outward from a block 160 which is so secured as to oscillate with, but is vertically adjustable, on a vertical rock shaft 161, said rock shaft being inclosed in a tube or case 162 extending above and below the bed, see Figs. 2 and 3.

163 is a flange on rock shaft 161 which rests upon the top of tube 162, the weight of said shaft and the parts carried thereby being supported by said flange. Above the flange on shaft 161 is a screw thread 164. Block 160 from which arm 159 carrying the pawl extends is preferably connected to the rock shaft by a key and groove so as to permit it to be readily adjusted or removed if necessary. When the block has been properly adjusted it is locked in position by nuts 165 above and below the block, see Fig. 3.

166 denotes a spring secured to block 160, the free end of which bears against the pawl and acts to hold it in engagement with the ratchet. At the lower end of rock shaft 161 is a hub 167 having extending outward therefrom a crank arm 168 to which a connecting rod 169 is pivoted. At the inner end of this connecting rod is a yoke 170 which embraces a hub 171 which extends downward from disk 22 on shaft 15. This engagement of the yoke with the hub retains the connecting rod at all times in operative position. 172 is a roller on connecting rod 169 which engages cam groove 27 in disk 23.

It will be seen from the above that each rotation of shaft 15 and disk 23 produces a longitudinal reciprocatory movement of the connecting rod, which in turn through crank arm 168, produces an oscillation of the rock shaft, the backward movement of said shaft causing pawl 158 to move backward over one tooth or ratchet 148 and the forward movement thereof causing the pawl to move the ratchet forward one tooth, the forward movement of the ratchet being stopped as already stated the instant the forward movement of the pawl ceases by friction between nut 151 and hub 145 caused by spring disk 153.

Turning now to Figs. 5, 7, 12 and 13 I will describe the ink supplying mechanism.

173 is a block extending outward from slide 137. The ink supplying mechanism is carried by a bracket 174 which is rigidly secured to a slide 175, see Figs. 3 and 7ª, which is adapted to be adjusted in an under-cut groove in the block. This adjustment is effected by means of a disk 176 carried by a screw 177 which engages the end of the block. The edge of the disk engages a recess cut in the under side of the slide as clearly indicated in Figs. 7 and 7ª. The disk being rigidly secured to the screw, it follows that rotation of the latter will move the slide, bracket, and entire inking mechanism longitudinally relatively to the block. Slide 137 by which all of the parts just referred to are carried, receives motion in the manner I will now describe.

178, see especially Figs. 5 and 12, is a rock shaft, one end of which has its bearing in plate 109, and the other end in a bracket 179 which is secured to the bed by screws 180. At one end of this rock shaft is an arm 181 which extends upward, see Figs. 1, 3 and 12, and is connected to slide 137 by a stud 182 which passes through a slot 183 in the back of plate 107 and is rigidly fixed in said slide. The outer end of stud 182 turns freely in a block 184 which slides in a recess 185 at the upper end of arm 181, said block being shown in Fig. 1 and in dotted lines in Figs. 12 and 13. At the other end of rock shaft 178 is an arm 186 which extends downward and is pivoted in a yoke 187 at the outer end of a connecting rod 188. At the inner end of said connecting rod is a yoke 189, see Fig. 2, which embraces a short shaft 190 which turns on a stud 191 extending downward from the bed. The upper end of this stud passes through the bed and is threaded to receive a nut 192. Just under the bed is a collar 193 which is drawn up against the bed when the nut is tightened up, thereby locking the parts firmly in position.

194 denotes a disk on shaft 190 which is made integral therewith or rigidly secured thereto, and is provided with bosses 195. In the present instance four bosses are shown on said disk.

196 denotes a ratchet also carried by shaft 190. In the present instance I have shown the ratchet as provided with a hub 197 and as attached to the shaft by a set screw 198. Below the ratchet is a collar 199 which turns freely on the shaft and is provided with an outwardly extending arm 200.

201 denotes a pawl at the outer end of this arm which engages the ratchet, and 202 a spring secured to the outer end of the arm and acting to hold the pawl in engagement with the ratchet.

203 is a connecting rod one end of which is pivoted to arm 200 as at 204, see Fig. 8, the other end being provided with a yoke 205 which embraces a hub 206 extending downward from disk 23 on shaft 15. This engagement of the yoke with the hub retains the connecting rod at all times in operative position.

207 is a roller on connecting rod 203 which engages cam groove 28 in disk 24.

It will be seen from the above that each rotation of shaft 15 and disk 24 produces a longitudinal reciprocatory movement of the connecting rod which in turn, through the oscillation of arm 200 moves pawl 201 backward over one tooth of the ratchet and when the forward movement takes place carries the ratchet, shaft and disk 194, having bosses 195, forward a distance depending upon the number of teeth in the ratchet. In the present instance I have shown the ratchet as provided with seventy-two teeth. It therefore requires seventy-two actuations of the machine. By that I mean rotations of shafts 4 and 15 and the cam disks carried thereby, to produce one revolution of the ratchet and disk. Upon the upper side of connecting rod 188 is a roller 208 which is adapted to lie in contact with the surface of disk 194 and to be engaged by the bosses on said disk. A spring 209 one end of which is connected to a pin 210 on the under side of the bed, the other end being

connected to a pin 211 extending outward from yoke 187 at the outer end of the connecting rod, acts to hold the roller in contact with the periphery of the disk until said roller is engaged by one of the bosses 195. Each time one of these bosses comes in contact with roller 208 on connecting rod 188 said connecting rod is forced outward longitudinally against the power of spring 209. This movement swings arm 186 outward, oscillates rock shaft 178 and of course swings arm 181 which extends in the opposite direction from arm 186 inward, thereby moving slide 137 and the ink supplying mechanism carried by said slide inward toward the inking roller, this position of the parts being clearly shown in Fig. 12 as will presently be more fully explained. It will be apparent from the above that this inward movement of the ink supplying mechanism toward the inking roller takes place once in each eighteen actuations of the machine, there being seventy-two teeth in the ratchet and four bosses producing this movement on disk 194 which moves with the ratchet.

Shaft 190, the disk, ratchet, collar, &c., are retained upon stud 191 in the manner which I will now describe. Shaft 190 is threaded at its lower end and is engaged by a nut 212, collar 199 lying between the ratchet and this nut, the nut being screwed up tightly enough to prevent lost motion but without interfering with the free movement of the collar. It is of course essential however that the ratchet shall not be carried forward any more than the exact distance the pawl moves. This result I accomplish by a friction device similar to the ones used in connection with the dial feed ratchet, and the feed ratchet which carries the ink distributing table. The lower end of stud 191 is screw threaded and is engaged by a nut 213.

214 denotes a curved spring disk having a central opening through which the lower end of the stud passes. The edge of this disk bears against nut 212. It will be seen therefore that the action of this spring disk is to press nut 212, shaft 190 and all the parts carried thereby upward, the upper end of said shaft bearing against collar 193. Nut 213 is turned against the disk until sufficient friction is produced to stop the movement of the shaft, ratchet, &c., the instant the forward movement of the pawl ceases. After the parts have been correctly adjusted nut 213 is locked in position by lock screw 215 which engages the end of said stud, the head of said screw engaging the outer face of the nut.

216, see Figs. 5 and 7, denotes a mass of thick ink in a box 217, having at its forward end an ink supplying roller 218 which is preferably corrugated. This roller is carried by a shaft 219 journaled in the sides of the box. Within the box is a slide 220, the forward end of which extends partly under roller 218 and acts to determine the quantity of ink that can be taken up by the ink supplying roller, the slide when moved up in contact with the roller acting as a scraper and when moved back slightly permitting a limited quantity of ink to pass through the opening between the slide and the roller and to be taken up by the roller. At the rear end of the box is a block 222. The rear end of the slide extends through this block and is engaged by a screw 223 carrying a disk 224 which engages a recess cut in the rear end of the slide, see Fig. 7. The disk being rigidly secured to the screw, it follows that when the screw is turned in or out in the block the engagement of the disk with the slide will move the latter in or out relatively to the ink supplying roller thereby regulating the size of the opening and consequently the quantity of ink taken up by the roller. The position of roller 218 is changed axially at each backward movement of the box by the mechanism which I will now explain.

225, see Figs. 12 and 12ª, denotes a ratchet on shaft 219, this ratchet as well as the roller being rigidly fixed to the shaft.

226 denotes an arm which swings on shaft 219 and carries a pawl 227 which engages the ratchet, said pawl being held in engagement with the ratchet by a spring 228. At the lower end of arm 226 is a roller 229 which engages a slot 230 in an upright 231, the base of which is rigidly secured to the bed by screws 232.

233, see Figs. 5, 12ª and 13, denotes a shaft which is adapted to turn in swinging arm 226 and carries at its inner end a lug 234 which is adapted to engage a corresponding lug 235 extending outward from the rear end of pawl 227. Shaft 233 is provided with a thumb piece 236 for convenience in operation.

237 is a spring surrounding said shaft and bearing against a collar 238 on said shaft and against a boss 239 on the swinging arm through which the shaft passes to give increased bearing. This spring is strong enough to draw lug 234 tightly against the side of the swinging arm and to hold said lug in any position in which it may be placed. As shown in Fig. 12ª lug 234 is out of operative position and consequently each time slide 137 moves forward as in Fig. 12 the swinging arm will be held backward through the engagement of roller 229 with slot 230 and pawl 227 will be dragged backward over a tooth of the ratchet. When the backward movement of slide 237 takes place, that is when the parts are moved from the position shown in Fig. 12 to the position shown in Fig. 13, the pawl will carry the ratchet forward one tooth and with it of course the shaft and ink supplying roller 218.

Should it be preferred for any reason that roller 218 remain stationary while the machine is in use shaft 219 is turned until lug 234 engages lug 235 and throws the pawl out of engagement with the ratchet against the power of spring 228, spring 237 being strong enough to hold the parts in the position in

which they are placed and to retain the pawl out of engagement against the power of spring 228.

The wads are expelled from the machine after being printed by means of a rod 240 which is carried by an arm 241 extending outward from carrier 87. At the lower end of rod 240 is a head having engaging points 221, see Fig. 3[b], which engage the face of each wad near the edge so as to prevent the possibility of blurring the imprint before the ink is dry. At each downward movement of the carrier, type, &c., this head passes down through one of the holes in the stripper plate and the points engage a wad and force it out from the dial, expelling it from the machine through hole 83 in the bed, see Fig. 11, a suitable receptacle being placed under the bed to receive the printed wads. In order to prevent a solid blow being given by the expelling rod should any displacement or other accident happen to any of the parts of the machine, I provide a spring 242 which surrounds the rod, one end bearing against an adjustable collar 243, the other end bearing against the under side of an enlargement 244 at the outer end of the arm through which the rod passes. A collar 245 above the enlargement prevents the rod from dropping out. Should it be desired to lock the rod in a rigid position it may be done by tightening up set screw 246.

The operation of each mechanism in the machine has been so fully described in explaining the mechanism itself that detailed description of the operation of the entire machine is not thought to be necessary. It is sufficient to say in brief that a wad is fed to the dial at each actuation of the machine. The wads are carried around by the dial, one being printed at each actuation of the machine and a printed wad being expelled at each actuation of the machine. Each time the type moves upward it is inked by a roller which passes across its face, said roller during its backward movement passing twice across the face of an ink distributing table which is itself rotating in the horizontal plane. At a predetermined time, in the present instance at each eighteenth backward movement of the inking roller, the ink supplying mechanism as a whole moves forward and meets the inking roller, the inking roller receiving ink from an ink supplying roller in the ink box which is given a slight axial movement each time it moves backward so that at the next forward movement of the ink supplying roller another portion of its surface will be presented to the inking roller. The inking roller after receiving ink from the ink supplying roller passes under the ink distributing table so that the ink is spread evenly upon the surface of the inking roller and the greater portion of the ink received is left upon the ink distributing table. Mechanism is provided for preventing the rotation of the ink supplying roller if preferred so that but a very small quantity of ink will be transferred from said roller to the inking roller.

Having thus described my invention, I claim—

1. The combination with the dial having holes to receive wads, of a wad receiver by which wads are delivered to the holes in the dial, independent tubes 29 which engage the wad receiver each tube being provided with a cut-off 30 to hold the wads in place, and a weight for forcing the wads down when the cut-off is drawn out.

2. In combination the dial, the casting 40 carrying the same and having an opening 54, the wad receiver, the bracket 33 carrying the same, the stud 53 extending from the brackets into the opening in the casting, and the screw 60 engaging the stud to adjust the same with the bracket and wad receiver.

3. In combination, the dial, the wad receiver, the bracket 33 carrying said wad receiver, the pivot bolt for the bracket, the means for adjusting the bracket laterally about its pivot point, said bracket being adjustable toward and from the center of the dial and the means for effecting such adjustment independently of the lateral adjustment about the pivot point, substantially as described.

4. The combination with the dial and casting 40 by which it is carried, and which is provided with an opening 54, of the wad receiver, bracket 33 by which it is carried, stud 53 which carries the bracket, and suitable means for adjusting the stud so as to move the bracket and wad receiver in or out relatively to the dial.

5. The combination with bracket 33 having arm 66, stud 53 by which the bracket is carried, and the wad receiver carried by said bracket, of block 65 and a screw 64 in said block which engages arm 66 whereby the oscillatory adjustment of the bracket on the stud is determined.

6. The combination with the dial, bracket 33 having arm 66, stud 53 by which the bracket is carried, the wad receiver, wad tube, rod 71, and springs 68 carried by said bracket, of block 65 and a screw 64 in said block which engages arm 66 to determine the lateral adjustment of the wad receiver relatively to the dial.

7. The combination with the wad receiver, bracket 33 by which it is carried and which is provided with arm 66, and stud 53 by which the bracket is carried, of nut 56 engaging the stud by which the bracket is secured in place, and screw 64 engaging arm 66 by which the adjustment of the bracket on the stud is determined.

8. The combination with the type, of movable casting 40 having recess 39, dial 37 and ratchet 38 within said recess, a pawl operating in connection with the ratchet to impart intermittent rotary motion to the dial, and suitable means for limiting the movement of the casting so that said parts may be moved

from under the type and then returned to position without loss of time.

9. In combination in a wad printing machine, the type carrier the casting 40 having recess 39, and a dial and ratchet within said recess, in combination with bell crank lever 79, and spring actuated pawl 78 carried by said lever and engaging the ratchet said casting 40 with its dial and ratchet being movable to and from position beneath the type carrier.

10. The combination with the wad receiver, and the wad printing mechanism of casting 40, having a recess 39 and a dial journaled in said recess the operative portion of which extends over and rests upon the top of the casting, is made the exact thickness of the wads themselves, and is provided with holes to receive the wads from the wad receiver said recessed casting being adjustable and carrying the journal of the dial and the said dial itself, substantially as described.

11. The combination with reciprocating die the wad receiver, and casting 40 having a recess 39, of a dial in said recess the operative portion of which extends over and rests upon the top of the casting and is provided with holes to receive the wads, and a stripper plate 45 lying above the dial and having holes registering with those in the dial but smaller so as to retain the wads in the dial.

12. The combination with casting 40 carrying the wad receiver and dial and having a way in its under side and the die registering with the openings in the dial, of supporting plate 59 having a dovetail engaging the way, a block 76 at one end of said plate, and a screw 77 in said block the inner end of which serves as a stop to determine the movement of the casting and parts carried thereby in returning them to place.

13. The combination with casting 40 the dial the ratchet and bell crank lever 79 having a slot 256, of stud 253 having a collar resting upon the lever, a flat sided portion 255 lying in the slot, a pawl carried by said stud and engaging the ratchet, and a set screw 257 against which the stud rests thereby determining the adjustment of the pawl.

14. The combination with casting 40 the dial ratchet 38 and bell crank lever 79 having a slot 256, of pawl 78 engaging the ratchet, and a stud 253 lying in said slot and having a collar resting upon the top of the lever upon which the pawl is pivoted said stud being adjustable in said slot, the adjustment being determined by a set screw 257 against which the stud bears.

15. The combination with casting 40 the dial ratchet 38 and bell crank lever 79 having a slot 256, of pawl 78 engaging the ratchet, a stud 253 lying in said slot and having a collar resting upon the top of the lever, a set screw for determining the adjustment of said stud, and a nut 261 engaging the lower end of the stud whereby it is locked in position after adjustment.

16. In combination the die, the dial and ratchet, the pawl and operating lever therefor, and the movable casting 40 for supporting and adjusting the dial with its ratchet to and from the die said pawl being detachable from the ratchet to be swung aside therefrom to permit the movement of the casting with the dial, substantially as described.

17. The combination with casting 40 the dial ratchet 38, pawl 78 having angle arm 262, and a spring 82 for holding the pawl in operative position, of bell crank lever 79 having at its inner end a segmental slide block 79^a, a disk 21 having cam groove 25 which is engaged by said slide block whereby intermittent rotary motion is communicated to the ratchet and parts carried thereby.

18. The combination with the dial having its edge made the thickness of wads and provided with holes to receive wads, and suitable means for imparting intermittent rotary motion to the dial, of a stripper plate lying over the dial and having a hole adapted to register with the holes in the dial but made smaller, and a vertically movable type adapted to register with the holes in the stripper plate and dial.

19. The combination with the dial having its edge made the thickness of wads and having holes to receive wads, and mechanism for imparting intermittent rotary motion to said dial, of a vertically reciprocating type adapted to register with the holes in the dial by which the wads are printed, a movable casting 40 having a recess to receive the dial, and suitable means for determining the adjustment of the casting and dial relatively to the type.

20. The combination with the carrier having a vertical recess, of a sleeve 88 in said recess externally screw threaded at its lower end and internally screw threaded at its upper end and having an internal shoulder 90, a plunger within said sleeve having a shoulder engaging sleeve 90 and carrying the type, nuts 91 and 92, a washer 94 within the carrier, a spring between the plunger and the washer, and a set screw passing through nut 92 and engaging the washer by which the tension of the spring is adjusted.

21. The combination with casting 40 having hole 83 the dial and mechanism for imparting intermittent rotary motion thereto, of a vertically movable type adapted to register with the holes in the dial, a vertically movable expelling rod adapted to register with holes in the dial and also with hole 83, and a stripper plate having holes adapted to register with the type and the expelling rod and also with the holes in the dial but smaller than the latter so that wads are retained in the dial after being printed by the type until expelled by the expelling rod.

22. The combination with the dial having holes to receive wads, and mechanism for imparting intermittent rotary motion thereto, of a vertically movable type adapted to reg-

ister with the holes in the dial by which wads are printed, and a vertically movable expelling rod having a head provided with points 221 also adapted to register with the holes in the dial whereby the wad is expelled from the machine without blurring the imprint of the type.

23. The combination with the dial having holes to receive wads and mechanism for imparting intermittent rotary motion thereto, of a vertically movable type adapted to register with the holes in the dial by which the wads are printed, vertically movable arm 241, expelling rod 240 carried by said arm and having a collar 243, and a spring lying between said collar and said arm which permits said rod to yield when necessary.

24. The combination with the dial having holes to receive wads and mechanism for imparting intermittent rotary motion thereto, of a vertically movable type adapted to register with the holes in the dial by which the wads are printed, vertically movable arm 241, expelling rod 240 having a collar 245 engaging said arm whereby the rod is held an adjustable collar 243 below said arm, and at its lower end a head provided with points 221, and a spring lying between the arm and collar 243 which permits the head and rod to yield if required at any time.

25. The combination with the dial having holes to receive wads, the plunger carrier therefor, the type, and a spring interposed between the carrier and plunger, of a stripper plate having holes registering with the holes in the dial but smaller, vertically movable arm 241, an expelling rod adapted to register with the holes in the dial and having a collar 243, and a spring interposed between said collar and the arm as and for the purpose set forth.

26. The combination with the carrier and sleeve 88 having an internal shoulder 90, an external screw thread at its lower end and an internal screw thread at its upper end, of plunger 85 within the sleeve and provided with an external shoulder engaging shoulder 90 to limit the downward movement of the plunger, washer 94, a spring between said washer and the plunger, nut 91 engaging the external screw thread, a flanged nut 92 engaging the internal screw thread adjusting screw 93 which passes through nut 92 and engages the washer, and a set nut 96 whereby the adjusting screw is locked in position after the tension of the spring has been adjusted.

27. The combination with an intermittently rotating dial having holes to receive wads, and a vertically reciprocating type adapted to register with the holes in the dial, of reciprocating slide 124 carrying an inking roller which passes over the face of the type while the latter is at the raised position, reciprocating slide 137 carrying ink supplying roller 218, and mechanism for reciprocating slide 137 once during a pre-determined number of reciprocations of slide 124 whereby the inking roller is caused to take ink from the ink supplying roller.

28. The combination with an intermittently rotating dial having holes to receive wads, and a vertically reciprocating type adapted to register with the holes in the dial, of reciprocating slide 124 carrying an inking roller which passes over the face of the type while the latter is at the raised position, ink distributing table 143 having a groove 156 in its upper side whereby oil is prevented from passing over the edge to mix with the ink, and mechanism for imparting intermittent rotary motion to the table.

29. The combination with the vertically adjustable ink distributing table, ratchet 148, and vertical shaft 144, by which said parts are carried, of rock shaft 161 having thread 164, block 160 carrying a pawl engaging the ratchet, said block oscillating with the shaft but being vertically movable thereon, and nuts 165 engaging the thread above and below the block whereby the block and pawl are adjusted relatively to the ratchet and are locked in position.

30. The combination with the vertically adjustable ink distributing table, ratchet 148, and vertical shaft 144 by which said parts are carried, of rock shaft 161 having crank arm 159, pawl 158 carried by said arm, a spring acting to hold the pawl in engagement with the ratchet, said block moving with the rock shaft but being vertically adjustable thereon, and nuts engaging the thread above and below the block whereby the latter is locked in position after adjustment.

31. The combination with the ink distributing table, ratchet 148, and shaft 144 by which said parts are carried and which is provided with threads 149 and 150, of bracket 146 having hub 145 through which the shaft passes, nut 151 engaging thread 149 by which the vertical adjustment of the table is determined, curved spring disk 153 through which the upper end of the shaft passes and the edge of which engages the top of the hub, and a nut 154 which adjusts the tension of the spring disk as and for the purpose set forth.

32. The combination with slide 137, bracket 174, the ink box carried by said bracket, the ink supplying roller, shaft 219 journaled in said box and carrying the roller and a ratchet 225 lying outside of the box, of swinging arm 226 carrying a pawl engaging the roller, and an upright 231 having a slot engaged by said swinging arm so that each time the slide and parts carried thereby move forward the pawl will move backward over a tooth of the ratchet, and when the slide moves backward the ratchet will be carried forward by the pawl, thereby imparting an axial movement to the roller.

33. The combination with slide 137, the ink box carried thereby and shaft 219 journaled in said box and carrying the ink supplying roller and a ratchet 225, of arm 226 pivoted on said shaft and carrying a spring controlled

pawl engaging the ratchet and a roller 229, and upright 231 having a slot 230 engaged by said roller whereby when the slide moves in one direction the pawl will move backward over a tooth of the ratchet, and when the slide moves in the other direction the ratchet will be carried forward by the pawl.

34. The combination with shaft 219, the inking roller, and ratchet 225 carried by said shaft, of swinging arm 226, a spring controlled pawl carried by said arm and having a lug 235, and spring controlled shaft 233 having a lug 234 adapted to engage lug 235 whereby the pawl may be thrown out of operative position.

35. The combination with shaft 219, the inking roller, and ratchet 225 carried by said shaft, of arm 226 swinging on said shaft and having a boss 239, pawl 227 adapted to engage the ratchet and having a lug 235, spring 228 which holds the pawl in contact with the ratchet, shaft 233 journaled in said boss and having a lug 234 adapted to engage lug 235 and a collar 238, and a spring 237 which bears against said collar and boss and acts to retain lug 234 in any position in which it may be placed.

36. The combination with bracket 174 and the ink box and ink supplying roller carried thereby, of slide 137, block 173 extending therefrom, and slide 175 in said block by which the bracket is carried.

37. The combination with bracket 174 and the ink box and ink supplying roller carried thereby, of slide 137, block 173 extending therefrom, slide 175 engaging a groove in said block, and a screw 177 engaging the block and carrying a disk engaging slide 175 whereby the latter and the parts carried thereby may be adjusted relatively to slide 137.

38. The combination with slide 124 carrying the inking roller, of slide 137, bracket 174 secured thereto, and the ink box and ink supplying roller carried by said bracket.

39. The combination with slide 124 carrying the inking roller, of slide 137 having block 173 extending therefrom. slide 175 engaging a groove in said block, bracket 174 secured to said slide, the ink box and ink supplying roller carried by said bracket, and screw 177 engaging the block and carrying a disk engaging slide 175 whereby the ink supplying roller may be adjusted relatively to the inking roller.

40. The combination with the printing mechanism and the inking roller with pawl and ratchet for turning the same of slides 124 and 137 having shoulders 138 on their inner sides, of plate 107 having grooves under-cut on the outer sides to receive said slides, plate 139 engaging the shoulders in said slide and secured to the block between the slides, gibs 141 between the under-cut sides of the groove and the slides, and screws for adjusting the gibs so that lost motion may be taken up and the slides caused to run accurately at all times.

41. The combination with the type, of the ink distributing table, slide 124, the ink supplying roller, slide 137, the ink distributing roller, plate 107 by which said parts are carried, standard 108 which carries said plate, and screw 118 engaging said plate whereby all of the parts carried thereby may be adjusted relatively to the type.

42. The combination with standard 108 beveled upon one side and provided with a shoulder upon the other, of plate 107, the inking mechanism carried thereby, plate 116 engaging shoulder 111 by which the plate is secured to the standard, and screw 118 engaging the under side of plate 107 by which said plate and the parts carried thereby may be adjusted vertically.

43. The combination with standard 108 beveled upon one side and provided with a shoulder upon the other, of plate 107 having a way to receive said standard the inking mechanism carried by the plate, a gib 112 lying between the bevel and the plate and having angle pieces by which it is held in position, plate 116 engaging the shoulder by which the plate is secured to the standard, screws 114 for setting up the gibs to take up lost motion, and screw 118 engaging the under side of the plate by which said plate and the parts carried thereby may be adjusted vertically.

44. The combination with the type, slide 124, and the inking roller, of slide 137 carrying the ink box and ink distributing roller, rock shaft 178 having arms 181 and 186 said arm 181 being connected to slide 137 and arm 186 to connecting rod 188 carrying a roller 208, and disk 194 having bosses 195 which engage said roller and cause oscillation of the rock shaft and reciprocation of slide 137.

45. The combination with slide 137 and the ink box and ink distributing table carried thereby, of rock shaft 178 having arms 181 and 186 one of which is connected to said slide the other to a connecting rod 188 having a roller 208 shaft 190 carrying disk 194 having bosses 195 adapted to engage said roller, and ratchet 196, collar 199 adapted to oscillate on said shaft and having an arm 200 carrying a pawl engaging the ratchet, connecting rod 203 pivoted to said arm and having at its other end a roller engaging groove 28 in disk 24 so that each rotation of said disk will produce a forward movement of the ratchet and disk 194, each lug on said disk acting by engagement with roller 208 to produce an oscillation of the rock shaft and a reciprocation of slide 137.

46. The combination with plate 107 having slot 183 and slide 137 carrying the ink box and ink distributing roller and having a stud 182 passing through said slot, of rock shaft 178, arm 181 extending therefrom and having a recess 185 at its outer end and a block 184 which turns on the stud and slides in said recess.

47. The combination with the slide 137 the ink box and roller carried thereby rock shaft

178 having arm 186 and connecting rod 188 pivoted to said arm and having at its inner end a roller 208, of shaft 190 carrying disk 194 having bosses 195 adapted to engage said roller and a ratchet 196, a collar adapted to oscillate on said shaft and having an arm, and a spring controlled pawl engaging the ratchet, connecting rod 203 pivoted to said arm and carrying a roller engaging cam groove 28 in disk 24, and a spring 209 which holds roller 208 in contact with disk 194, each rotation of disk 24 acting to move the ratchet and disk 194 forward, and each boss on said disk acting to move connecting rod 188 outward against the power of the spring whereby the rock shaft is oscillated.

48. The combination with connecting rod 203 and means for reciprocating said rod, of stud 191 having collar 193 and threaded at its lower end, shaft 190 journaled on said stud and threaded at its lower end, disk 194 having bosses 195 and ratchet 196 carried by said shaft, connecting rod 188 having roller 208 adapted to be engaged by said bosses to reciprocate said rod, the slide carrying the ink box and roller, the connection between the said slide and the rod 188 collar 199 having arm 200 which is engaged by connecting rod 203 and carries a pawl engaging the ratchet, nut 212 engaging the shaft and holding said collar in position, curved spring disk 214, nut 213 engaging the lower end of the stud by which the tension of the spring disk is adjusted, and screw 215 engaging the lower end of the stud internally, the head of said screw engaging the outer face of nut 213, whereby sufficient friction is produced to prevent the ratchet from moving forward after the movement of the pawl has ceased, and the parts are locked in position after adjustment.

49. The combination with connecting rod 203 and means for reciprocating said rod, of shaft 190 carrying disk 194 having bosses 195 and ratchet 196, connecting rod 188 having a yoke embracing shaft 190 and carrying a roller 208, spring 209 for holding said roller in contact with the disk and the bosses, and collar 199 adapted to oscillate on said shaft and having an arm 200 to which connecting rod 203 is pivoted and which carries a pawl engaging the ratchet, so that each movement of connecting rod 203 will impart an axial movement to the disk and ratchet and each engagement of a boss with roller 208 will impart a reciprocatory movement to connecting rod 188 against the power of the spring the ink supplying device and the connection between the same and the rods 188, substantially as described.

50. The combination with the ink distributing table and ratchet 148, of vertical rock shaft 161 carrying crank arms 159 and 168, a spring controlled pawl carried by arm 159 which engages the ratchet, connecting rod 169 pivoted to crank arm 168, and a roller carried by said rod which engages cam groove 27 in disk 23.

51. The combination with the ink distributing table and ratchet 148, of vertical rock shaft 161, tube 162 in which said rock shaft is inclosed, flange 163 which rests upon the top of the tube and supports the rock shaft, crank arms 159 and 168 on said rock shaft, pawl 158 carried by arm 159 and engaging the ratchet, connecting rod 169 pivoted to crank arm 168, and means for reciprocating said crank arm whereby the rock shaft is oscillated.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES R. RICHARDS.

Witnesses:
A. M. WOOSTER,
P. M. REYNOLDS.