

No. 808,455.

PATENTED DEC. 26, 1905.

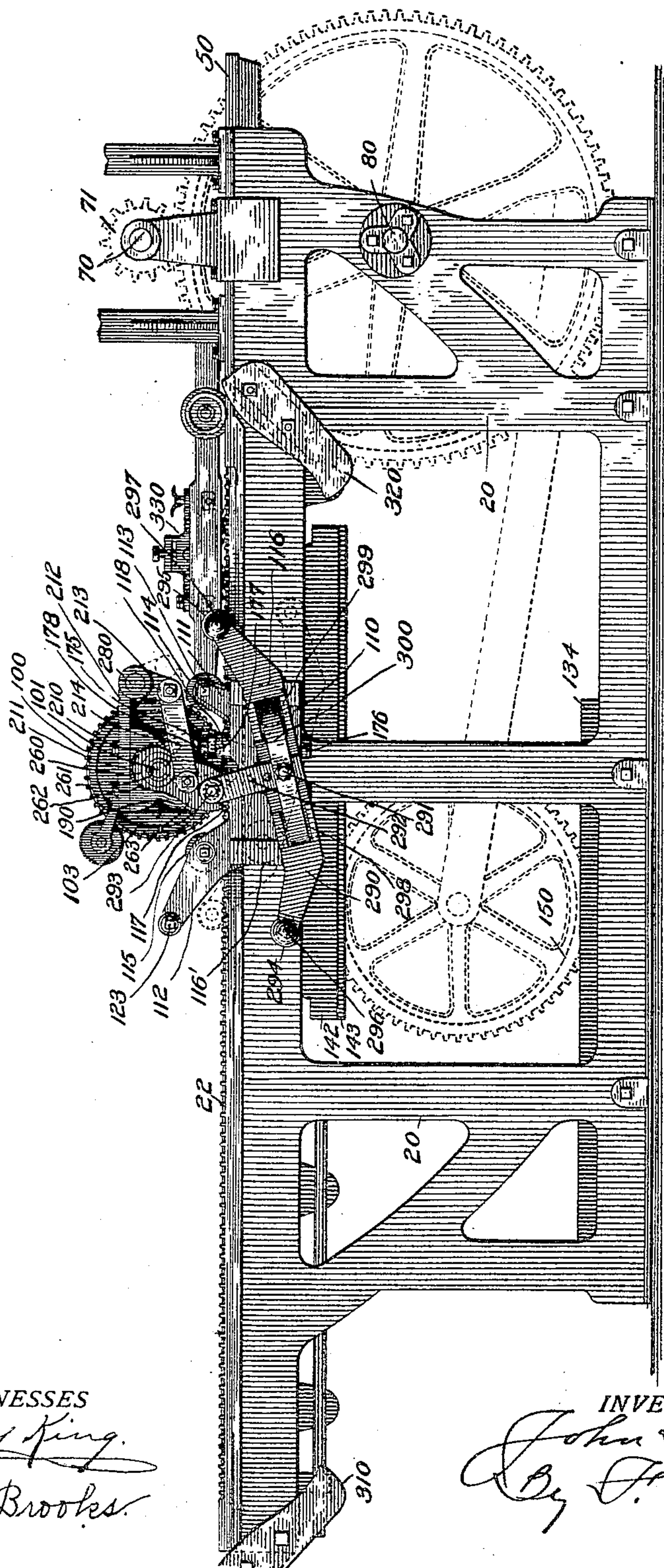
J. T. KING.

TRAVELING CYLINDER PRINTING PRESS.

APPLICATION FILED MAR. 7, 1904.

5 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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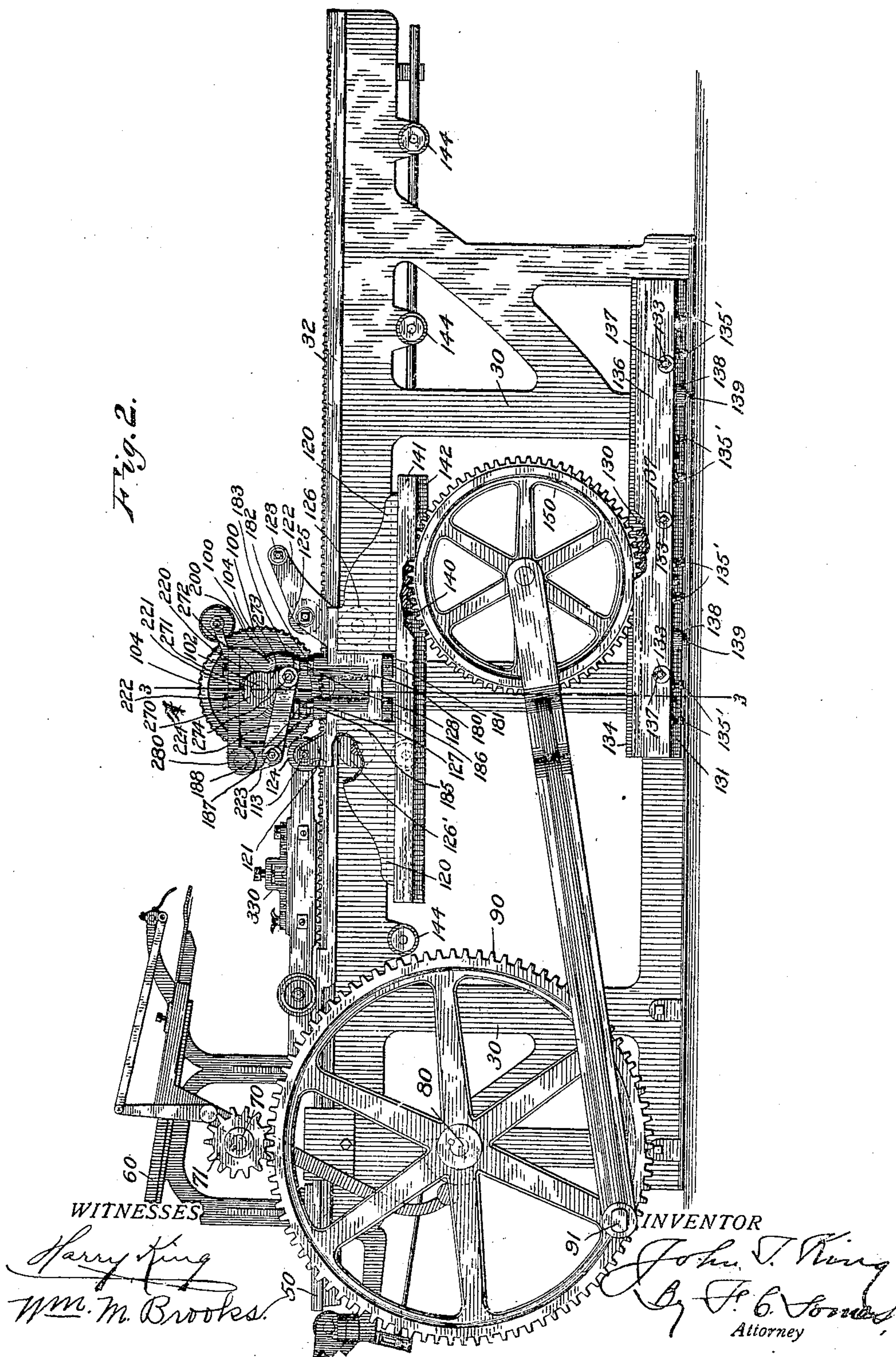
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5 SHEETS—SHEET 2.





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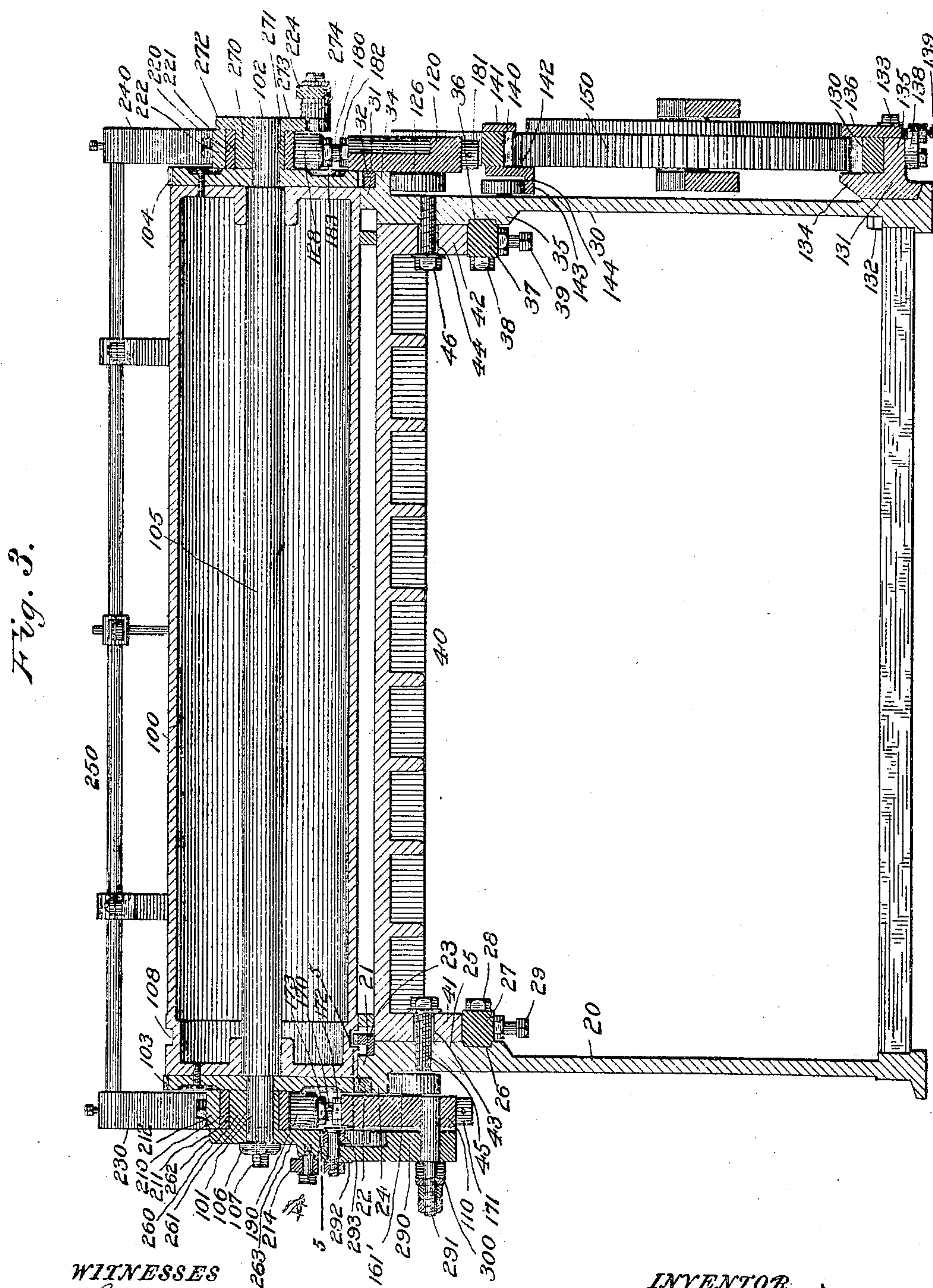
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5 SHEETS—SHEET 3.



**WITNESSES**

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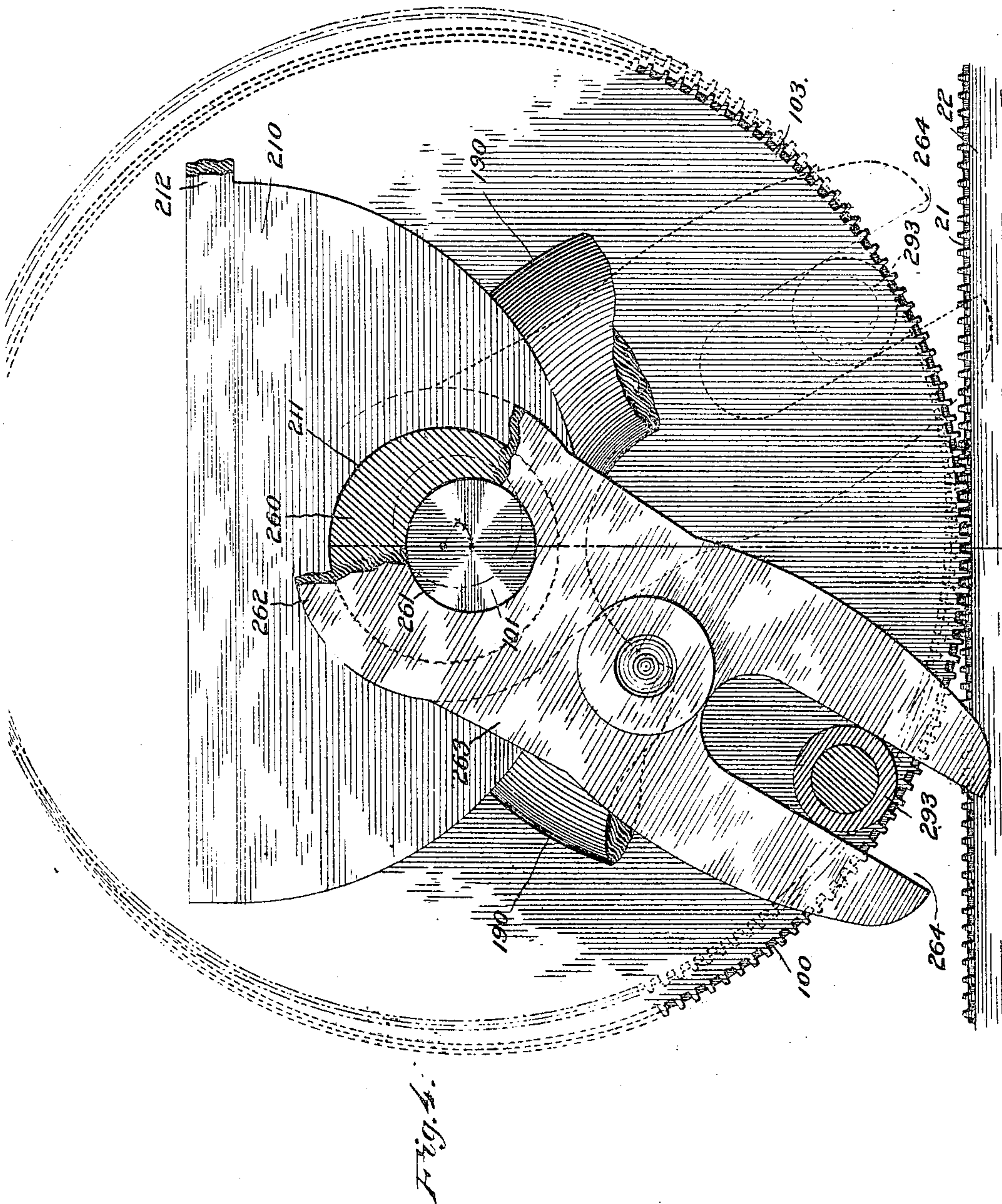
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5 SHEETS—SHEET 4.



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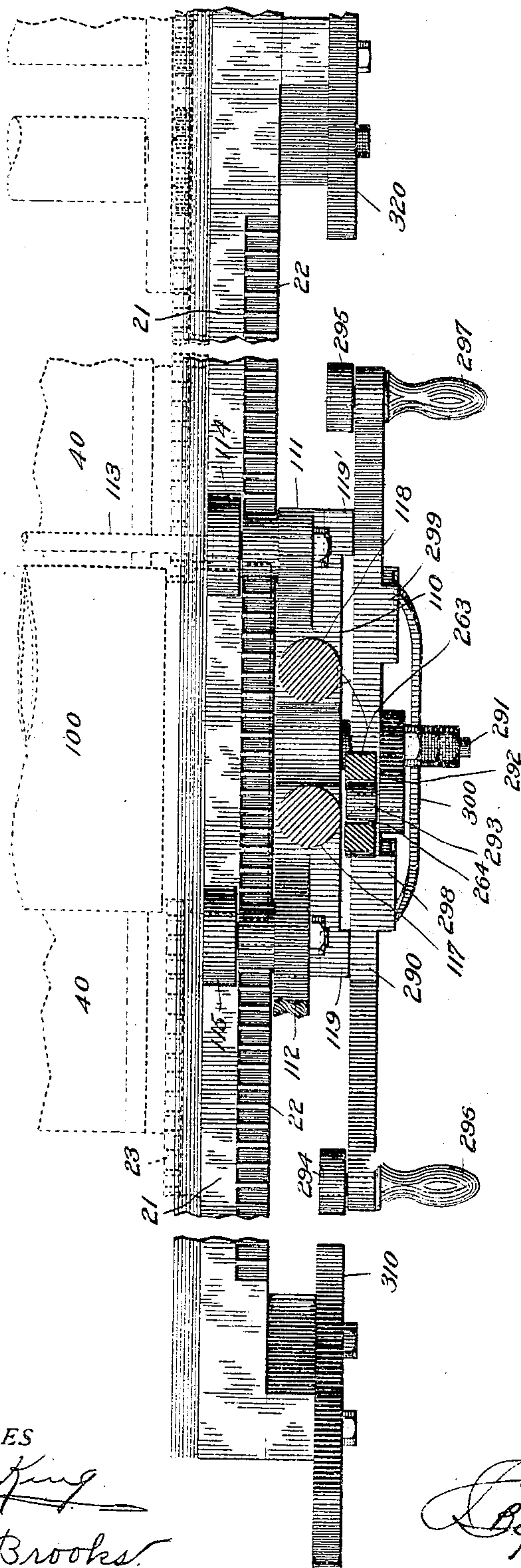
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5 SHEETS—SHEET 5.

Fig. 5.



WITNESSES

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# UNITED STATES PATENT OFFICE.

JOHN T. KING, OF MADISON, WISCONSIN.

## TRAVELING-CYLINDER PRINTING-PRESS.

No. 808,455.

Specification of Letters Patent.

Patented Dec. 26, 1905.

Application filed March 7, 1904. Serial No. 196,899.

*To all whom it may concern:*

Be it known that I, JOHN T. KING, a citizen of the United States of America, residing at Madison, in the county of Dane, in the State of Wisconsin, have invented certain new and useful Improvements in Traveling-Cylinder Printing-Presses, of which the following is a specification.

This invention relates to a traveling-cylinder printing-press, in which the type-bed is stationary and the traveling cylinder, which reciprocates over said bed, is lifted for its return stroke to an inoperative plane to escape the type and lowered for its impression-stroke to an operative plane for carrying the sheet to be printed into contact with the type on said bed.

Figure 1 of the accompanying drawings represents a front elevation of a printing-machine embodying one form of this invention, the feed-table, sheet-holding mechanism, and other parts not involved in this invention being omitted. Fig. 2 represents a rear elevation thereof, including the feed-table, parts being broken out for clearness of illustration. Fig. 3 represents a transverse vertical section on line 3 3 of Fig. 2 looking toward the right and including the sheet-holding mechanism for the traveling cylinder. Fig. 4 represents, on an enlarged scale, one embodiment of the means for raising and lowering the traveling impression-cylinder. Fig. 5 represents a horizontal section of one side of the machine on line 5 5 of Fig. 3 looking downward.

The same reference-numbers indicate the same parts in all the figures.

The frame of this machine, which may be constructed in any suitable form, is shown as composed of two side frames 20 and 30, connected by cross-bars and bolt-rods in such a manner as to form a rigid support for the moving parts. These side frames have top rails 21 and 31, respectively, which constitute a track on which the impression-cylinder may travel. Racks 22 and 32, engaged by the toothed wheels on said cylinder, are disposed parallel with said rails, preferably outside said rails, on flanges 24 and 34. A rack 23 is disposed in the frame 20 inside the rail 21. The side frames are provided with any suitable means for supporting the type-bed. For this purpose they may have on their inner faces, near the bed end of the machine, thickened portions or cheeks 25 and 35, having recesses 26 and 36. Blocks, as 27 and 37, may

be secured in said recesses by bolts, as 28 and 38, forming ledges for said bed to rest upon.

A stationary type-bed is preferably used in this machine. The type-bed 40 (shown in the drawings) is of this class, and it is disposed between the side plates of the frame and preferably between the cheeks 25 and 35 thereof and provided at its opposite sides with downward flanges 41 and 42, which rest on the blocks, as 27 and 37, secured to said cheeks. These flanges are provided with slots, as 43 and 44, and screw-bolts, as 45 and 46, passing through said slots and through holes in the side frames, operate to clamp the type-bed to the side frames.

Any suitable means may be employed for adjusting the type-bed vertically to bring the type-form into proper position. The means shown for this purpose comprise vertical adjusting-screws, as 29 and 39, passing through said blocks, the upper end of said screws engaging the lower edges of said flanges for adjusting the type-bed, the screw-bolts, as 45, being loosened for this purpose. In the construction shown the type-bed becomes practically a part of the frame of the press, serving as the top brace thereof.

An inking-table 50 is disposed at one end of the frame, and an elevated feed-table 60 is supported above said inking-table. A transverse driving-shaft 70 is journaled in the frame and provided with a driving-pulley (not shown) or other suitable means for receiving motion from the source of power. This shaft is provided with a pinion 71. A shaft 80 is disposed below the driving-shaft 70 and provided with a gear-wheel 90, with which the pinion 71 meshes. This shaft is provided with cams and other means for transmitting motion to the moving parts of the machine, and the gear-wheel 90 is provided with a wrist-pin 91, which adapts it to serve as a crank-wheel for a like purpose.

A traveling impression-cylinder 100, which carries the sheets to be printed, is moved back and forth on the frame, riding in its forward movement on the rails 21 and 31 thereof and coming in contact with the type-form on the type-bed and on its backward movement being elevated sufficiently to escape contact with the type-form. This cylinder is provided, as usual, with journals 101 and 102, which project from its opposite ends to be engaged by an actuating and supporting mechanism, and it is also provided with gear-wheels 103 and 104, secured to its opposite ends,



which on the forward stroke engage in the usual manner the racks 22 and 32, whereby slipping of the cylinder is prevented. The journals 101 and 102 are preferably reduced ends of an axle 105, extending through the cylinder, which is preferably hollow. The cylinder is provided with a peripheral recess 108 near one end to avoid contact with the rack 22'.

10 A carriage adapted to reciprocate longitudinally on the frame engages the traveling cylinder 100 for moving it back and forth and also supports said cylinder on the backward stroke. This carriage may be of any  
15 suitable construction. As herein shown, it comprises two side plates 110 and 120, suspended from the top rails 21 and 31 on opposite sides of the machine. These side plates are respectively provided with short arms 111  
20 and 121, disposed opposite each other and projecting above said rails at the front end of the carriage, and with longer arms 112 and 122, also disposed opposite each other and projecting higher above said rails at the rear  
25 end of the carriage. The short arms 111 and 121 are connected by a transverse rod 113, and the longer arms 112 and 122 are connected by a transverse rod 123. Wheels 114 and 124 are journaled on inwardly-projecting studs on  
30 the arms 111 and 121 at the front of the carriage, and wheels 115 and 125 are journaled on inwardly-projecting studs on the arms 112 and 122 at the rear of said carriage, these wheels traveling on the track 21 31. The  
35 plates 110 and 120 are also provided with wheels 116 and 116' and 126 and 126', disposed in a plane below said rails and adapted to engage the under side thereof and hold the carriage firmly on the track.  
40 Any suitable means may be employed for reciprocating the carriage forward and backward on the frame. The means shown for this purpose comprise a rack 130, disposed lengthwise of the machine in the lower part  
45 thereof, a rack 140, attached to the rear side plate 120 of the carriage, a traveling gear-wheel 150, running on said rack 130 and engaging the rack 140 on the carriage, and a pitman 160, connecting the wrist-pin 91 on the  
50 combined gear and crank wheel 90 with the traveling gear-wheel 150. The rack 130 is attached to an angular support or rail 131, secured to the side frame 30, preferably by means of bolts, as 132. This support has a vertical  
55 flange 134 and a shelf 135. The rack rests on the shelf with its inner face against the vertical flange, which extends above the top of the rack. Adjusting-screws 135' pass through said shelf and engage the rack for adjusting  
60 it in proper position. An adjustable plate 136 is secured on the outer face of the rack 130 and extends above said rack. The flange 134 and plate 136 serve as guides for the gear-wheel 150, the toothed rim thereof traveling  
65 between them. The plate 136 also serves as

a tread-flange for the gear-wheel, the latter being provided with a flange 151, which rests on said tread-flange and prevents the teeth of the wheel from meshing too deeply with the teeth of the rack. The plate 136 may be secured to  
70 the angular support 131 by means of bolts 133, passing through vertical slots 137 in said plate. Lugs, as 138, are attached to the under side of said supports and provided with adjusting-screws, as 139, which engage the under side  
75 of said plate and serve as a means of adjustment therefor. The carriage-rack 140 has attached to its outer face a plate 141, which projects below the toothed edge of said rack, and attached to its inner face an angle-plate 142,  
80 which also extends below said toothed edge, these plates serving as guides for the upper edge of the traveling gear 150. The plate 142 has an inward flange 143, which engages roller-studs, as 144, disposed at proper intervals  
85 along the side frame 30, whereby a rocking or tilting motion of the rack is prevented, and the wheeled studs 116, 116', 126, and 126', engaging the under side of the track of the frame, are relieved of strain during the taking of the  
90 impression. By this actuating means the traveling carriage is made to move at double the speed of the traveling wheel, the motion imparted by the traversing motion of the gear-wheel being combined with that imparted by  
95 the rotary motion thereof. This traveling-gear mechanism enables short racks to be used and insures ease of motion and a steady horizontal movement of the cylinder.

The carriage is preferably provided with  
100 supports for the traveling cylinder which are vertically adjustable to regulate the elevation thereof for its backward stroke. Any suitable supports may be used. In the construction shown the side plate 110 is provided with  
105 two vertical sockets 117 and 118, and the corresponding side plate 120 is provided with similar vertical sockets 127 and 128. Spindles 170 and 175 are disposed in the sockets 118 and 117 of the side plate 110, and spindles 180  
110 and 185 are disposed in the sockets 126 and 127 in the side plate 120. Adjustable supports 190 and 200, preferably arc-shaped in form, carry the journal-boxes 210 and 220, respectively. The support 190 on one side of the  
115 machine is provided with sockets engaging the upper ends of the spindles 170 and 175, and the support 200 on the other side of the machine is provided with sockets engaging the upper ends of the spindles 180 and 185. The spindle  
120 170 is screw-threaded and provided with a perforated head 171 at its lower end for purposes of adjustment. A locking-nut 172 is disposed on the spindle 170 and engages the top of the socket 117, and a locking-nut 173  
125 on said spindle engages the bottom of one end of the arc-shaped support 190, and the spindle 175 is screw-threaded and provided with a head 176 and a locking-nut 177, which latter engages the top of the socket 118, and with a  
130



locking-nut 178, which engages the bottom of the other end of the arc-shaped support 200. The spindles 180 and 185 on the other side of the machine are respectively screw-threaded and provided with similar heads 181 and 186 and with similar locking-nuts 182 and 183 and 187 and 188 for engaging the sockets 126 and 127 and the arc-shaped support 200. These adjustable screws and locking-nuts permit the vertical adjustment of the arc-shaped supports 190 and 200, so as to secure by the eccentrics heretofore described a proper elevation of the cylinder on the backward stroke to disengage its gears from the racks and elevate its periphery above the plane of the type-form, and the locking-nuts prevent any lost motion or play of the spindles which would tend to prevent a proper lifting of the cylinder.

Standards 230 and 240 are attached to the journal-boxes, and a rod 250, passing over the top of the cylinder, connects said standards, as shown in Fig. 3. Paper-holding clips or fingers may be attached to this rod.

The traveling cylinder is mounted on or connected with the carriage in any suitable manner which permits it to be lifted on the outer end of its forward stroke and lowered at the inner end of its backward stroke. The journal-box 210 is provided with an opening 211, and the journal-box 220 is provided with a similar opening 221. An eccentric disk or sleeve 260 is adapted to fit and turn in the journal-box opening 211 and is provided with an eccentric-opening 261 and preferably with a flange 262 at its outer end. An eccentric disk or sleeve 270 is adapted to fit and turn in the journal-box opening 221 and is provided with an eccentric-opening 271 and preferably with a flange 272 at its outer end. The journals 101 and 102 of the traveling cylinder rest in said eccentric-openings, and the sleeves thus serve as adjustable bearings for said cylinder. A cap 106 covers the end of the journal 101 and overlaps the end of the sleeve 260, being held in place by a screw 107, which passes into the cap and takes into the end of the journal. The eccentric-sleeve 260 is provided with a crank 263, having a slot 264 at its lower end, and the eccentric-sleeve 270 is provided with a shorter crank 273, having a wrist-pin 274 at its lower end. The journal-box 210 is provided with an arm 212, and the journal-box 220 is provided with an arm 222, and a transverse crank-shaft 280 is disposed in bearings at the outer ends of these arms. This crank-shaft is provided on the front side of the machine with a crank 213 and on the rear side thereof with a similar crank 223. A link 214 connects the slotted crank 263, attached to the eccentric 260, with the crank 213 on the shaft 280, and a link 224 connects the crank on the other end of the shaft 280 with the crank 273, attached to the eccentric 270, and through this or other mechanism both eccentrics at opposite sides of the ma-

chine are made to move in unison. The parts are so arranged that for the forward operative stroke or movement of the cylinder the center lines of the eccentric-sleeves are vertical, the thin portions thereof being underneath the journals and permitting the cylinder to roll on the track, and for the backward inoperative stroke the thicker parts of said sleeves are turned under said journals and lift the cylinder off the tracks and above the plane of the type-bed. The center lines of the eccentrics thus coinciding with the line of weight or pressure of the cylinder there is an absence of any tendency to accidentally move the eccentrics, and the friction of the shafts, connecting-links, and other parts is amply sufficient to hold the cylinder in its elevated position during its backward stroke, in which it has no work to perform.

Suitable tripping mechanism is provided for swinging the crank-arms automatically at opposite ends of the travel of the cylinder in such manner as to lift the cylinder at the rear end of its movement and to lower it at the front end thereof. Any suitable means may be employed for this purpose. The means shown comprise a rocker 290, supported on a pivot 291 at the front side of the machine and provided with a central arm 292, engaging, preferably by means of a roller-stud 293, the slot 264 of the crank 260 and cams 310 and 320, attached to the front side of the machine, at the opposite ends of the carriage movement. The outer ends of the rocker are preferably inclined or curved upward and provided with means for engaging the cams—such, for instance, as inwardly-projecting studs 294 and 295, preferably in the form of antifriction-rollers. The rocker is also provided with handles 296 and 297 to enable the pressman to operate it at will to trip the impression at any position of the carriage, most frequently, of course, when he misses a sheet just as the carriage comes to the feed-table.

Any suitable means may be employed for holding the rocker, and consequently the eccentric-bearings, in adjusted position. The means shown for this purpose are friction devices. The rocker is provided on its outer face with recessed cheeks 298 and 299. A bow-spring 300 is secured to the pivot 291 and bears against said recessed cheeks. The tension of the spring presses the rocker toward the carriage against friction-blocks 119 and 119' on the front plate 110 thereof with sufficient force to hold the rocker in the position to which it is adjusted by the action of the cams or by the pressman. The tripping mechanism described actuates the eccentrics with the utmost accuracy and avoids jar at the ends of the movement of the cylinder-carriage.

An inking-carriage 330 travels on the track 21 31 and carries the inking apparatus, being connected to the cylinder-carriage and traveling back and forth therewith. In this con-



struction the traveling cylinder is raised and lowered independently of the inking apparatus, and an ordinary inking system embracing top grinders and geared form-rollers driven  
5 by a rack 23, disposed inside the top rail 21, may be employed.

The shifting of the eccentrics to raise the cylinder at the end of its forward stroke operates also to throw the cylinder slightly forward on the carriage. The cylinder is thus  
10 moved away from the rolls which hold the sheet thereto during the impression, and wear of the tympan or blanket during its backward stroke is avoided. The cylinder is tripped  
15 back into place just before it reaches the feed-table preparatory to taking a sheet, and the sheet-holding rolls are thus brought into active position in relation thereto. The raising and lowering of the cylinder has no effect  
20 whatever on the cylinder-carrying carriage nor on any part of the inking apparatus. In practice the cylinder will usually be raised about one thirty-second of an inch, more or less.

25 It will not be necessary to describe other features common to printing-presses of this character. It will be understood that the features described may be varied without departing from the scope of this invention.

30 The operation of this printing-press as respects the features herein described will now be given. In the figures of the drawings the moving parts are shown in the positions which they assume when the traveling impression-  
35 cylinder is on its forward stroke, in downward position traveling on the track and taking an impression from the type-form. When the carriage which impels the traveling cylinder approaches the outer end of its forward movement, one end of the rocker 290 or the stud  
40 294 thereon engages the cam 310 and swings said rocker into the position shown in dotted lines in Fig. 1. This movement of the rocker-arm trips or operates the eccentrics 260 and  
45 270, shifting them into the position indicated in dotted lines in Fig. 4, whereby the cylinder is lifted above the plane of the type-form on the type-bed and thrown forward of the sheet-holding rolls. Then the motion of the  
50 driving mechanism is reversed, and the cylinder-carriage carries the impression-roller backward on its return stroke out of contact with the type-form and sheet-rolls. As said carriage approaches the end of its backward  
55 stroke the end of the rocker 290 or the stud 295 thereon engages the cam 320, whereby said rocker is shifted back into the position shown in full lines in Fig. 2. This movement of the rocker trips the eccentrics and lowers  
60 the impression-cylinder to an operative plane and into contact with the sheet-holding roll.

A sheet to be printed is fed to the cylinder, the machine is reversed, and the operation repeated. The mechanism for lifting and lowering the traveling cylinder is actuatable at

any position of either stroke by the pressman, who may grasp the handle 296 or 297 and swing the rocker 290. This tripping means, independent of the automatic trip, enables the  
70 pressman to stop the cylinder in case of accident and is most frequently and conveniently utilized when a sheet is missed in the feeding.

I claim as my invention—

1. In a printing-machine, the combination of a frame, a type-bed, a traveling impression-  
75 cylinder movable over said type-bed, a reciprocating carriage on said frame, means on said carriage for supporting said cylinder, a lifting mechanism disposed on said carriage and provided with a handle for actuation by the  
80 pressman, and automatic actuating devices disposed on said frame on opposite sides of said type-bed for actuating said lifting mechanism to shift said cylinder to an operative plane for the impression-stroke and to an in-  
85 operative plane for the return stroke.

2. In a printing-machine, the combination of a frame, a type-bed, a traveling impression-  
cylinder, means for impelling said traveling cylinder to and fro over said type-bed, means  
90 for lifting and lowering said cylinder on opposite sides respectively of said type-bed to shift it to an operative plane for the impression-stroke and to an inoperative plane for the return stroke, and a friction device for hold-  
95 ing said cylinder in raised or lowered position.

3. In a printing-press, the combination of a frame, a type-bed, a traveling impression-  
cylinder movable over said type-bed, a reciprocating carriage on said frame, eccentrics on  
100 said carriage supporting said cylinder and provided with cranks, an adjustable rocker pivoted on said carriage and provided with an arm engaging one of said cranks, and means connecting said cranks.  
105

4. In a printing-press, the combination of a frame, a type-bed, a traveling impression-  
cylinder movable over said type-bed, a reciprocating carriage on said frame, eccentrics on  
110 said carriage supporting said cylinder and provided with cranks, means connecting said cranks, and an adjustable rocker pivoted on said carriage and provided with an arm engaging one of said cranks and with a handle for actuation by the pressman.  
115

5. In a printing-press, the combination of a frame, a type-bed, a traveling impression-  
cylinder movable over said type-bed, a reciprocating carriage on said frame, eccentrics on  
120 said carriage supporting said cylinder and provided with cranks, a rocker supported on said carriage and provided with an arm engaging one of said cranks, means connecting said cranks, and cams on said frame for engaging said rocker at opposite ends of the carriage  
125 movements.

6. The combination of a frame, a type-bed thereon for supporting a type-form, a traveling impression-cylinder movable on said frame  
over said type-form, a reciprocating carriage  
130



on said frame engaging said impression-cylinder and provided with a rack, a rack on said frame, a traveling gear engaging said racks, and means for reciprocating said gear, the rack on the carriage being provided with a flange engaging roller-studs on the frame for holding the carriage in position during the traverse thereof.

7. In a printing-press, the combination of a frame, a type-bed, a traveling impression-cylinder movable over said type-bed, a reciprocating carriage on said frame, eccentrics on said carriage supporting said cylinder and provided with cranks, an adjustable rocker supported on said carriage and provided with an arm engaging one of said cranks, means connecting said cranks, friction devices between the inner faces of said rocker and said carriage, and a spring for holding said rocker in contact with said friction devices for maintaining said rocker in adjusted position.

8. The combination of a frame, a type-bed on said frame for supporting a type-form, a traveling impression-cylinder movable on said frame over said type-form for taking an impression, a reciprocatory carriage on said frame, journal-boxes mounted on said carriage, eccentrics adapted to turn in said jour-

nal-boxes and provided with cranks, arms attached to said journal-boxes, a crank-shaft journaled in said arms and provided with cranks, links connecting the crank-shaft cranks with the eccentric-cranks, and means for engaging one of said eccentric-cranks for shifting the eccentrics to lift and lower said cylinder.

9. The combination of a frame, a type-bed on said frame for supporting a type-form, a traveling impression-cylinder movable on said frame over said type-form for taking an impression, a reciprocatory carriage on said frame, journal-boxes mounted on said carriage, eccentrics adapted to turn in said journal-boxes and provided with cranks, arms attached to said journal-boxes, a crank-shaft journaled in said arms and provided with cranks, links connecting the crank-shaft cranks with the eccentric-cranks, and a rocker on said carriage provided with means for engaging one of said eccentric-cranks for shifting said cranks to lift and lower said cylinder.

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Witnesses:

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