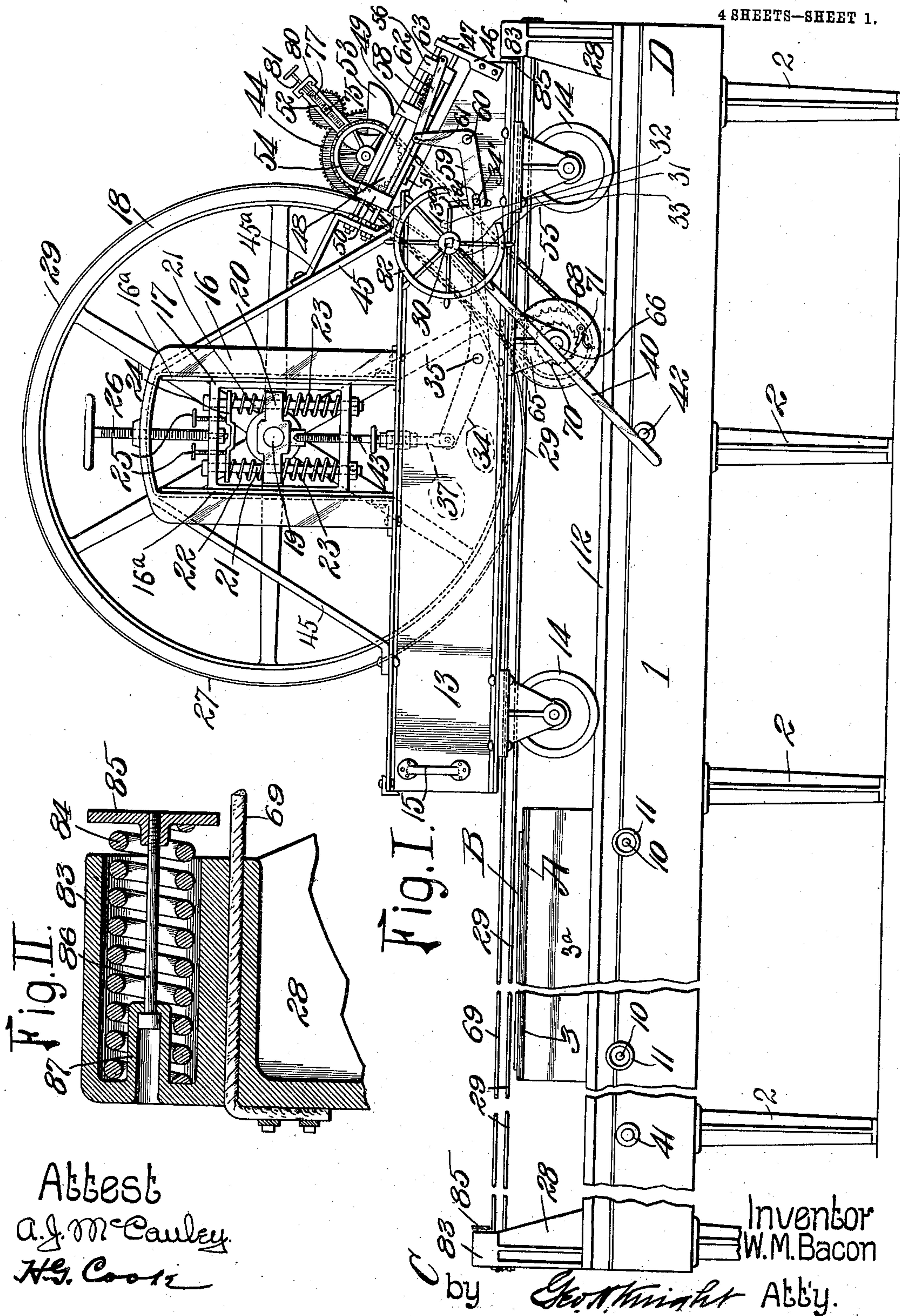


No. 860,181.

PATENTED JULY 16, 1907.

W. M. BACON.
PRINTING MACHINE.
APPLICATION FILED AUG. 25, 1906.

4 SHEETS—SHEET 1.

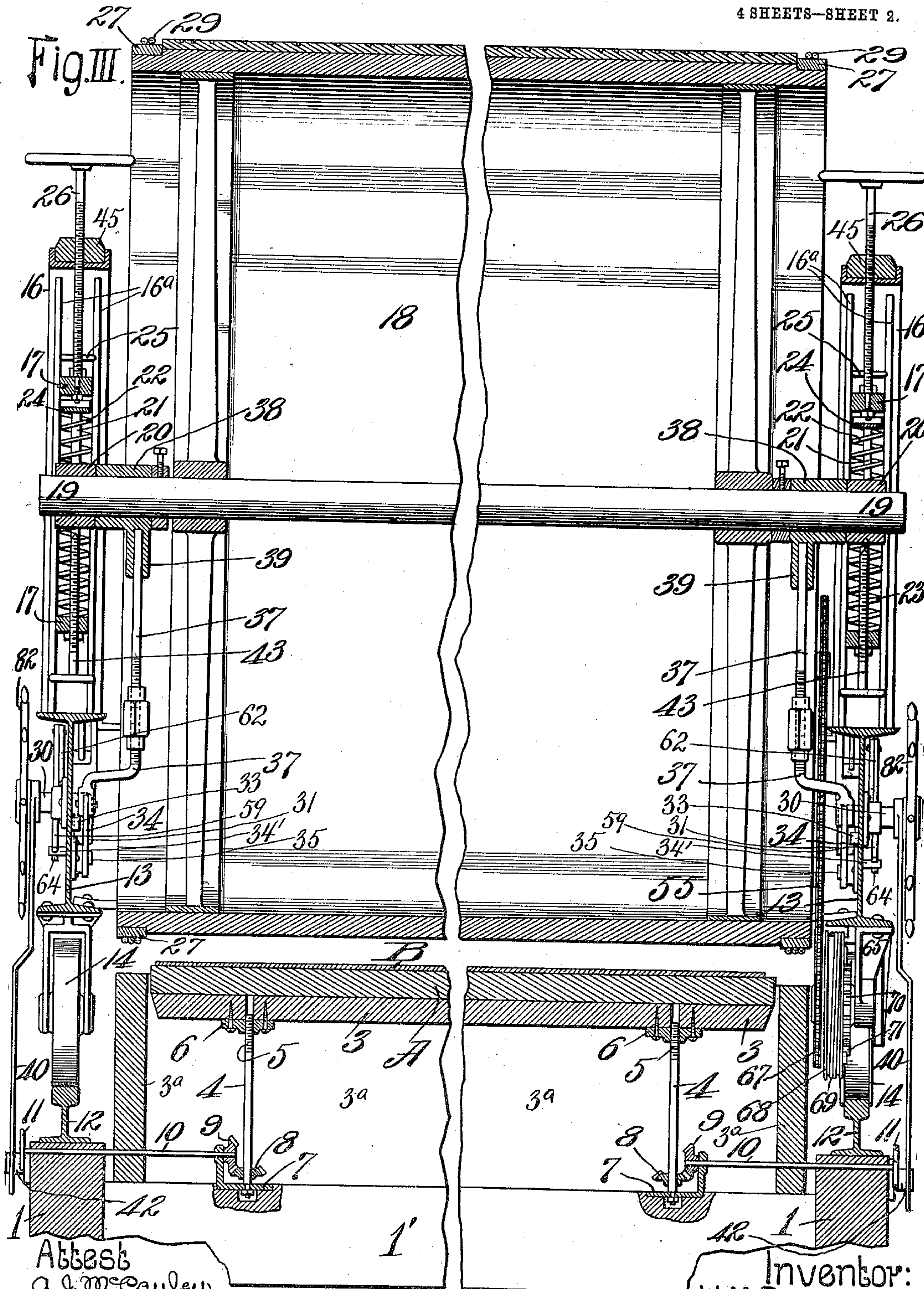


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4 SHEETS—SHEET 3.

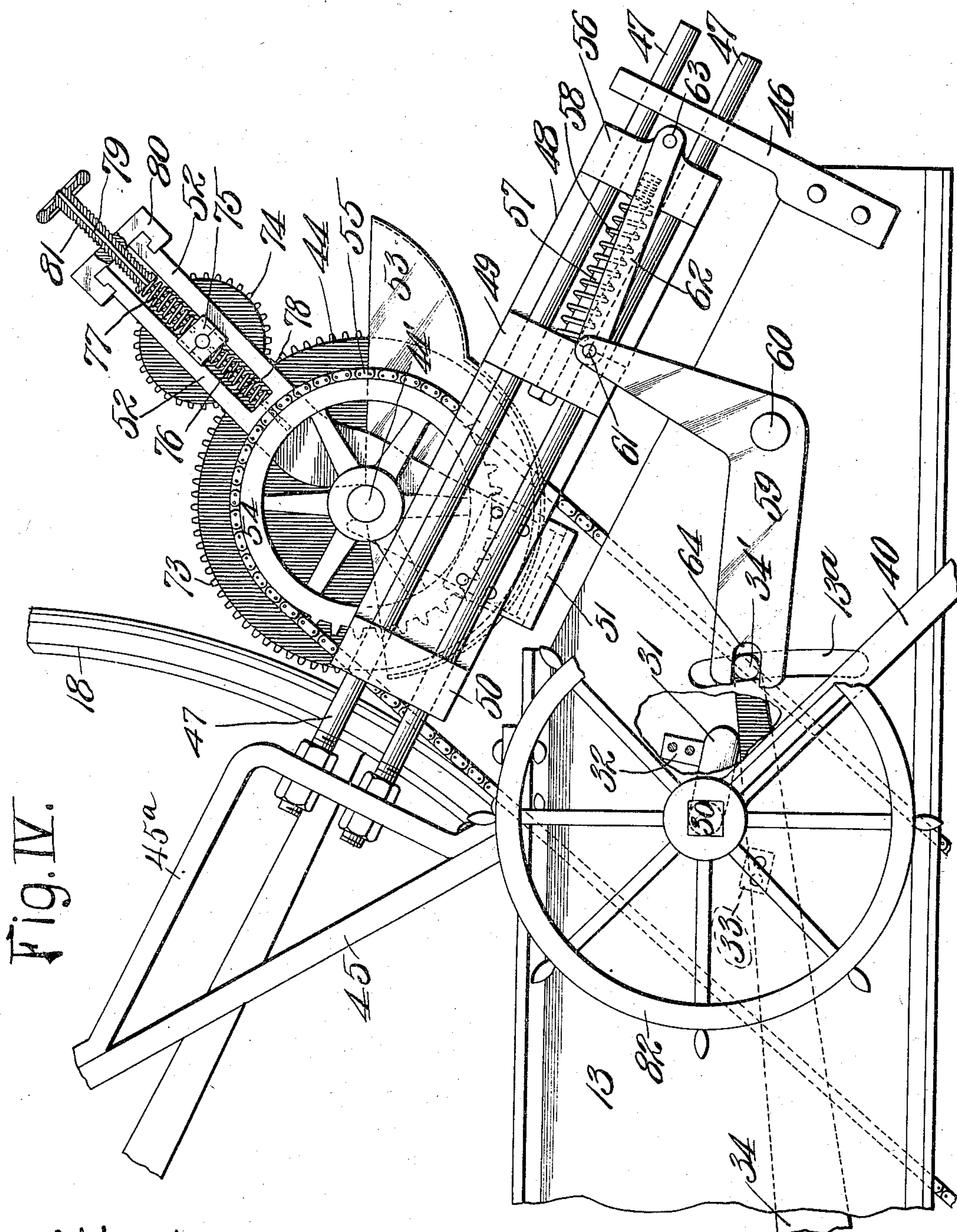


Fig. IV.

Attest
a. j. McCauley
H. S. Cook

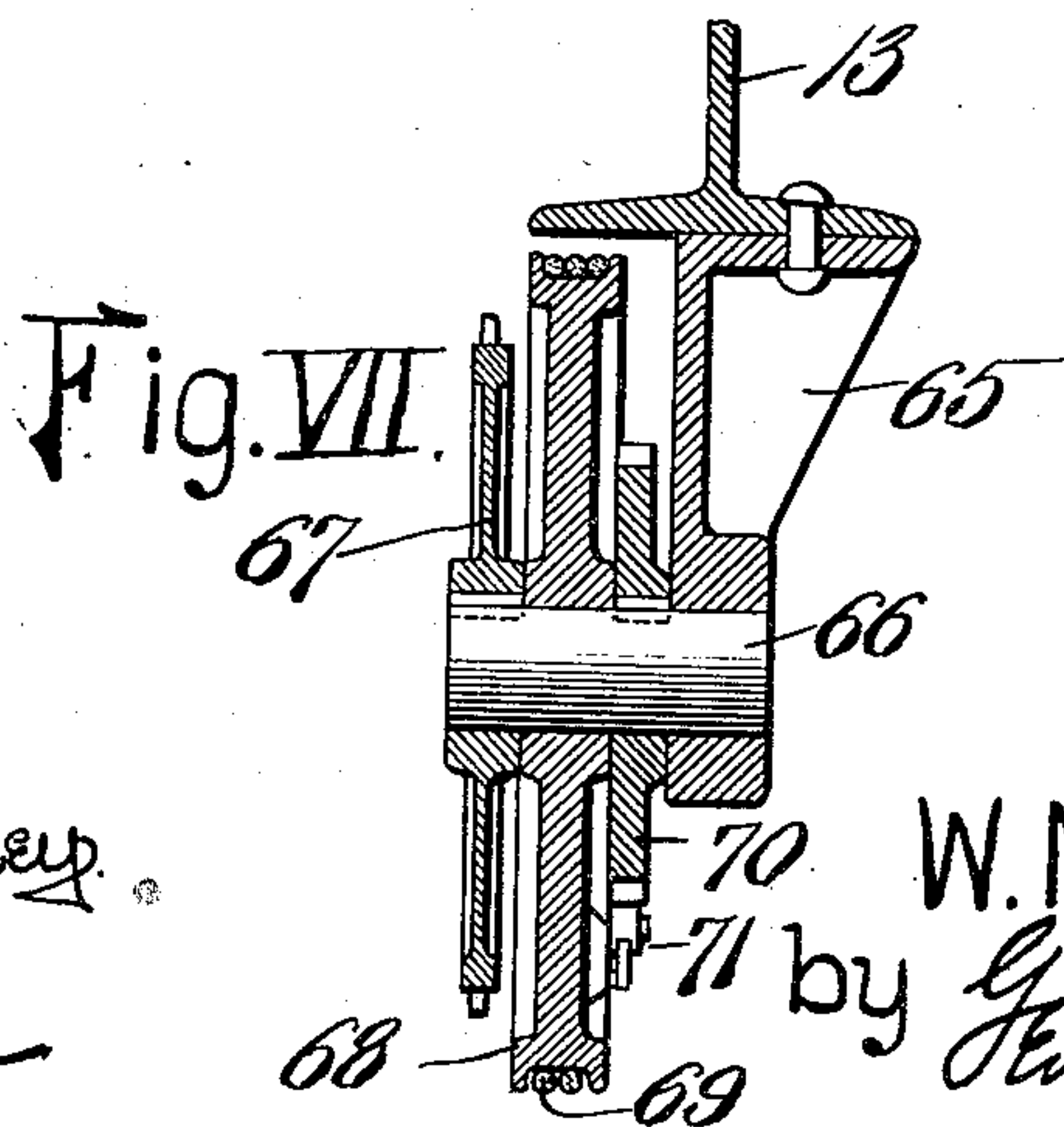
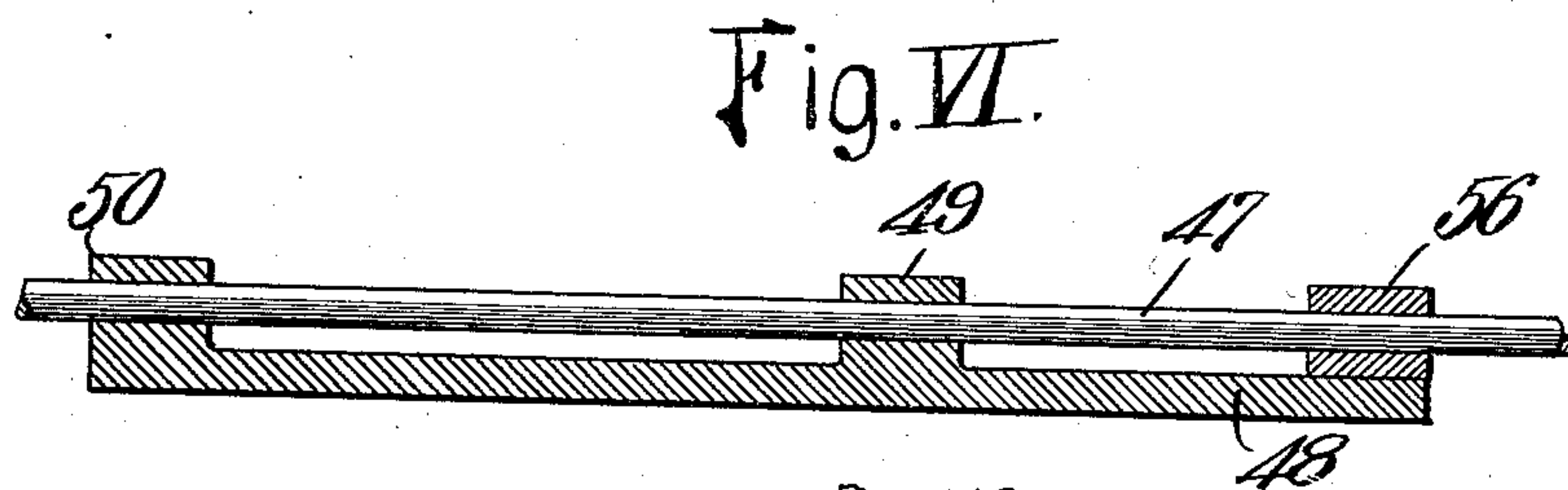
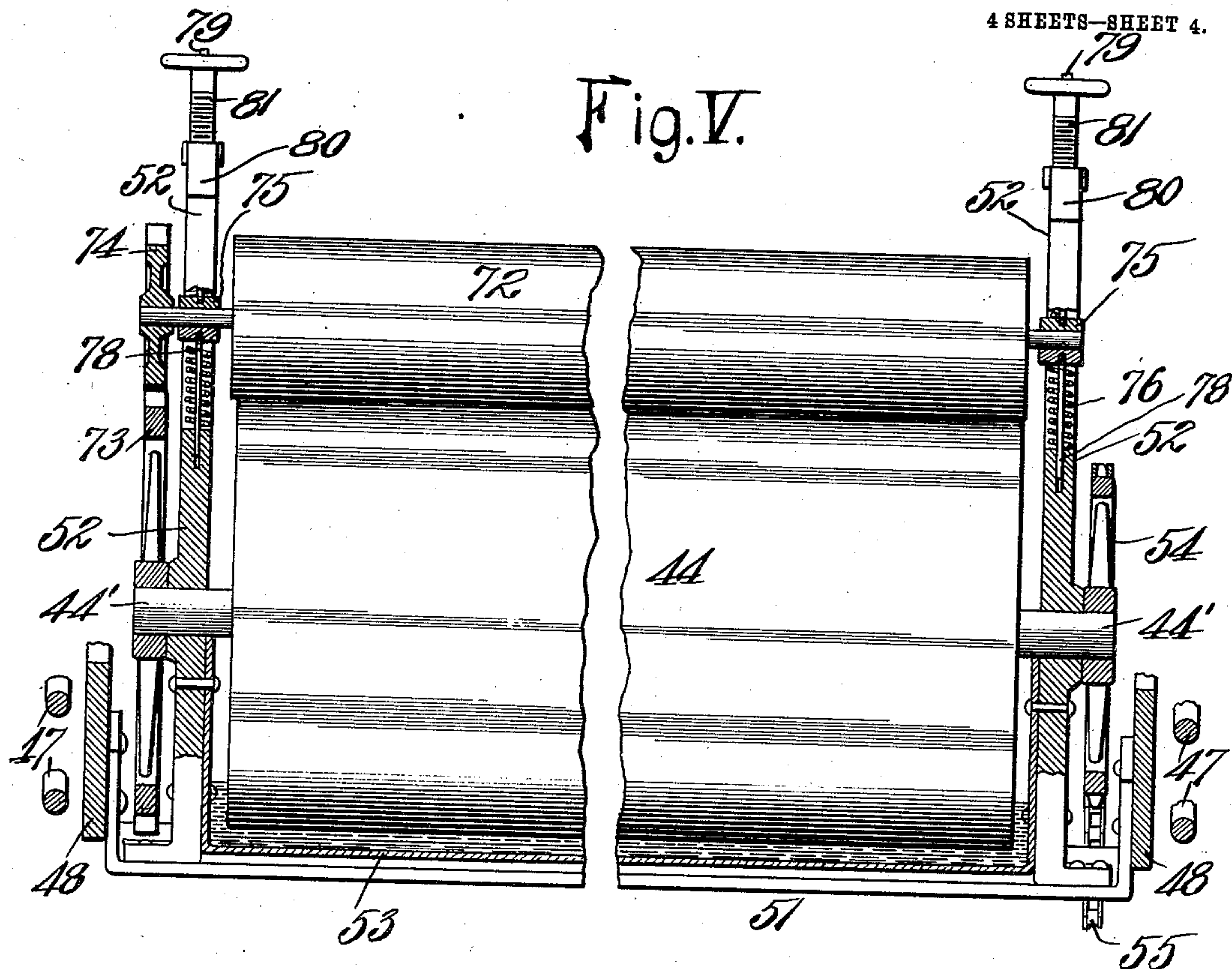
Inventor:
W. M. Bacon
by *Edw. M. Abbey*

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4 SHEETS—SHEET 4.



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a. j. m. Cauley.
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UNITED STATES PATENT OFFICE.

WILLIAM M. BACON, OF ST. LOUIS, MISSOURI.

PRINTING-MACHINE.

No. 860,181.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed August 25, 1906. Serial No. 331,961.

To all whom it may concern:

Be it known that I, WILLIAM M. BACON, a citizen of the United States of America, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Printing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a printing machine in which a platen is supported in a fixed position and includes a reciprocating carriage which supports a form or type cylinder that is moved to and fro above the platen supporting means.

The invention also relates to an inking roller associated with said form cylinder and means for rotating said form cylinder and said inking roller automatically when the form cylinder carriage is reciprocated.

It also relates to an adjustable platen supporting bed and means for adjusting said bed; and to various adjustment devices associated with the working parts of the machine.

Figure I is a side elevation of my printing machine, parts being broken out. Fig. II is an enlarged vertical section of one of the buffers that receive the form cylinder carriage at the ends of its strokes. Fig. III is an enlarged vertical cross section taken through the machine. Fig. IV is an enlarged elevation of the inking roller and the parts by which said roller is shifted during the operation of the machine. Fig. V is an enlarged view partly in elevation and partly in section of the inking mechanism. Fig. VI is an enlarged horizontal longitudinal section taken through one of the side frames of the inking roller mechanism. Fig. VII is an enlarged cross section taken through the driving sheave of the inking roller operating mechanism and parts associated therewith.

1 designates the main frame of my printing machine which is preferably supported by legs 2.

3 designates a platen supporting bed that is located within a surrounding bed frame 3^a mounted upon cross members 1' of the main frame as seen in Fig. III. This bed is adapted to support a platen A (see Fig. I) on which the object to be printed, as indicated at B, is laid.

4 are lift rods arranged in pairs having at their upper ends feed screw portions 5 that are fitted in screw blocks 6 secured to the platen bed. The lower ends of the lift rods are stepped into the horizontal part of base brackets 7 which are seated on the cross members 1' of the main frame of the machine (see Fig. III). Each lift rod has fixed to it a bevel-pinion 8 and meshing with each of said pinions is a bevel-pinion 9 that is fixed to an operating rod 10 journaled in the vertical part of a base bracket 7. The operating rods 10 extend through the bed frame and sides of the main frame of the machine and are equipped with hand wheels 11

whereby the rods may be rotated to rotate the lift rods 4 through the described engagement between these parts, for the purpose of raising and lowering the platen bed 3 as may be desired.

12 designates a pair of track rails mounted on the side members of the main frame of the machine and extending longitudinally of said members.

13 is a carriage that includes track wheels 14 adapted to ride on the track rails 12, so that said carriage may be reciprocated longitudinally of the machine. The carriage is preferably provided with one or more handles 15 that may be readily grasped by the operator of the machine for the purpose of moving the carriage to and fro. 16 are inverted U-shaped channeled standards surmounting the sides of the carriage 13 and 17 are bearing box frames loosely seated within said standards and adapted to be moved vertically therein between guide-ribs 16^a.

18 designates a form or type cylinder having journals 19 which are mounted in bearing boxes 20, located within the bearing box frames 17 (see Figs. I and III). The bearing boxes 20 are slidingly fitted to guide rods 21 mounted in the frames 17 and said boxes are yieldingly held for vertical movement between upper cushion springs 22 and lower cushion springs 23. The desired degree of tension in said cushion springs is secured through the medium of presser bars 24 resting against the upper cushion springs and adjustment screws 25 that are fitted in the bearing box frames and bear against said presser bars. Vertical adjustment of the form cylinder 18 is secured through the medium of adjustment screws 26 that are seated in the cross bars of the standards 16 and loosely fitted to the bearing box frames 17 which are suspended therefrom. These adjustment screws provide for the lifting or lowering of the form cylinder in order that the perimeter of said cylinder may rotate through a proper plane to effect the desired impression on the object to be printed when the form cylinder carriage is reciprocated over the platen A.

The form cylinder is rotated during the reciprocation of its supporting carriage by means that will now be described.

At each end of the form cylinder is a sheave 27 extending throughout the perimeter of the cylinder (see Fig. III).

28 are posts located at the ends of the main frame of the machine.

29 are form cylinder operating ropes each having its ends fixed to the posts 28 and extending longitudinally of the machine. These ropes are wound around the sheaves 27 of the form cylinder, as seen most clearly in Figs. I and III, whereby when the carriage 13 is reciprocated the ropes will act to impart rotation to the form cylinder and the form on said cylinder will be-carried across and in contact with the object to be printed which is mounted upon the platen A.

The printing operation is accomplished while the carriage 13 is traveling from the end C of the machine to the end D (see Fig. I) and when the carriage is moved in the reverse direction the form cylinder is lifted to clear the platen and the object thereon.

The lifting of the form cylinder is accomplished by the following mechanism:

30 are crank shafts journaled to the sides of the carriage 13 and provided with cranks 31 which are adapted to play between stops 32 and 33 (see Figs. I and IV).

34 are bent levers pivoted at 35 to the inner sides of the carriage 13 and each having an outer arm located beneath the corresponding crank 31. The inner arms of the levers 34 are pivotally connected to lift rods 37 located beneath the spindles of the form cylinder.

38 are collars surrounding the spindles of the form cylinder and having legs 39 in which the upper ends of the lift rods 37 are seated. Each crank shaft 30 has fixed to it a trip lever 40 that is adapted to engage trips 41 and 42 located respectively adjacent to the ends C and D of the machine. When the trip levers are brought into engagement with the trips 42 after the printing operation the crank shafts 30 are rocked sufficiently to carry the cranks downwardly in engagement with the outer arms of the levers 34 until said cranks engage the stops 33. By this operation of the levers 34 the lift rods 37 are elevated to raise the collars 38 surrounding the spindles of the form cylinder and as a consequence the form cylinder is lifted sufficiently to cause it to clear the platen A during the return stroke of the form cylinder carriage. As the form cylinder carriage approaches the end C of the machine the trip levers 40 are brought into engagement with the trips 41, whereby they are thrown into their opposite positions and the crank shafts 30 are rotated from the stops 33 to the stops 32 (see Fig. IV), thereby relieving the levers 34 from the depressing action of the cranks and permitting the form cylinder to descend until it is in the proper position for printing action on the next movement of the carriage 13 from the end C of the machine to the end D. For the purpose of securing only a desirable amount of contact between the form cylinder and the object to be printed while resting on the platen A, I provide limitation screws 43 that are adjustably seated in the lower ends of the bearing box frames 17 and the upper ends of which occupy positions beneath the bearing boxes 20 in which the journals of the form cylinder operate (see Figs. I and III).

44 designates the inking roller of my machine (see Figs. I, IV and V). This inking roller is adapted to supply ink to the form on the form cylinder 18 and it is shiftably supported by means about to be described, in order that it may be moved intermittently to and from the cylinder to ink the form during the non-printing movement of the form cylinder, and be withdrawn from the form during the printing movement. The inking roller is driven by means to be also hereinafter set forth. 45 are inverted V-shaped brace bars extending over and seated in the channels of the cross bars of the inverted U-shaped standards 16 and carried by and bolted to the sides of the carriage 13.

45^a are angle supports bolted to the outer arms of the inverted V-shaped brace bars 45 and 46 are supports carried by the carriage 13 at the outer ends of its sides (see Figs. I and IV).

47 are guide rods immovably mounted in said supports and extending at right angles to the axis of the form cylinder 18.

48 are carrier bars provided with boxes 49, and 50 that are loosely fitted to the guide rods 47.

51 (see Fig. V) is a transverse supporting bar that is fixed to the carrier bars 48. 52 are standards mounted on the transverse supporting bar 51 and in which the spindles 44' of the inking roller 44 are journaled.

53 is an ink-well that is supported by the standards 52 and in which the inking roller operates to receive its supply of ink.

One of the spindles of the inking roller has fixed to it a driving chain or belt wheel 54 that receives the driving chain or belt 55 which is driven through the medium of a source of power to be hereinafter more particularly referred to.

56 designates one of a pair of pusher blocks loosely mounted upon the guide rods 47 and located alongside of the rear ends of the inking mechanism carrier bars 48 (see Figs. IV and VI). Each of these pusher blocks has fitted to it a guide rod 57 that is surrounded by an expansion spring 58, the rod being loosely seated in the box 49 of the carrier bar alongside of which the pusher block is located and the expansion spring surrounding the guide rod and being located between the pusher block and the box 49.

59 is one of a pair of bell crank levers pivotally connected to the sides of the form cylinder carriage 13 at 60. Each of these bell crank levers has an upwardly extending arm that is pivotally connected at 61 to a link 62 which is in turn pivoted at 63 to the pusher block 56 at the corresponding side of the machine. The other arm of each bell crank lever is provided with a slot 64 which receives a stud 34' located at the end of the outer arms of the levers 34 (see Figs. I and IV). The sides of the carriage 13 are provided with slots 13^a in which the studs 34' operate. Upon the completion of each printing operation and the actuation of the levers 34 through the medium of the cranks 31 operating against said levers for the purpose of elevating the form cylinder, the depressed outer ends of the levers 34 by engagement with the bell crank levers 59 through the medium of the studs 34', cause said bell crank levers to be rocked, their ends engaging the levers 34 being depressed and their upper ends being thrown in a direction toward the form cylinder 18. As a consequence the bell crank levers act to exert a pull upon the links 62, and the pusher blocks 56 are moved in a direction toward the form cylinder 18, thereby causing them to act upon the expansion springs 58 so that said springs will in turn press against the carrier bars 48 through the medium of the boxes 49 and carry the inking roller to the periphery of the form cylinder and apply ink to the form of type thereon. When the carriage 13 reaches the end of its non-printing stroke and the form cylinder is lowered for printing action on the return movement of the carriage and the levers 34 are permitted to return to their former positions due to the tripping of the cranks 31 into the position seen in Fig. IV, the studs 34' of said levers in moving upwardly act to return the bell crank levers 59 to their former positions and the pusher blocks 56 are retracted with the result of the carrier bars 48 being drawn outwardly or retracted, whereby the inking roller is removed from the periphery of the form

cylinder 18 to remain in such removed position until after the carriage 13 has partaken of its printing stroke.

65 designates a hanger which is suspended from the side of the carriage 13 at which the driving belt 55 of the inking roller mechanism is located (see Figs. II and VII). 66 is a shaft loosely mounted in said hanger and having keyed thereto a belt wheel 67 that receives the driving belt 55.

68 is a sheave loosely mounted on the shaft 66 adjacent to the belt wheel 67. This sheave has wound around it an operating rope 69 (see Figs. I, III and VII), the said rope being fixed at its ends to the posts 28 of the machine and extending longitudinally of the machine similarly to the operating ropes 29 by which the form cylinder 18 is operated.

70 is a ratchet wheel fixed to the shaft 66 alongside of the sheave 68 and 71 is a pawl carried by said sheave and engaging the teeth of said ratchet wheel (see Fig. VII).

It will be seen that when the carriage 13 of the machine is moved to and fro the sheave 68 will be rotated on the shaft 66, due to the wrapping of the operating rope 69 around said sheave and that said shaft will be rotated due to the pawl and ratchet members and furthermore that as the shaft is rotated it will carry therewith the belt wheel 67 and cause the belt 55 to drive the inking roller 44.

72 designates a wiper roller that surmounts the inking roller 44 and which serves to remove the surplus ink gathered by said roller. The wiper roller is driven through the medium of a gear wheel 73 fixed to one of the spindles 44' of the inking roller and a gear wheel 74 fixed to one of the spindles of the wiper roller. The spindles of the wiper roller are mounted in movable boxes 75 loosely seated in the standards 52 and located between a set of lower springs 76 and a set of upper springs 77. The springs 76 surround lower guide rods 78 that seat in the standards 52 and the upper springs 77 surround the guide rods 79.

80 are caps mounted on the upper ends of the standards 52.

81 are adjustment screws seated in the caps 80 and bearing against the upper springs 77, the said screws being tubular as seen in Fig. IV, to permit of the upper guide rods 79 extending therethrough. It will be seen that when the adjustment screws are moved inwardly and outwardly in the caps 80, the springs 76 and 77 are either compressed or permitted to expand, whereby the boxes 75 in which the wiper roller spindles are mounted will be moved to vary the degree of contact between the wiper roller and the inking roller.

For the purpose of providing for the operation of the shafts 30 and their cranks 31, in order that the form cylinder may be raised or lowered or the inking mechanism shifted when the form cylinder carriage is at rest, I provide each of the shafts 30 with a hand wheel 82 which may be readily grasped for the actuating of said shafts.

83 are buffer blocks surmounting the posts 28 at each end of the machine. Each of these blocks contains a spring seat in which is located a cushion spring 84 (see Fig. II).

85 is a buffer head that is carried by a guide 86 and against which the spring 84 bears. The guide rod is loosely seated in a neck 87 forming a part of each buffer block.

I wish to direct particular attention to the fact that the form cylinder and inking roller are operated by the two rope mechanisms herein described in a manner entirely independent of each other and that therefore there is no conflict between the operation of these parts and either of the two mechanisms may have slippage occur therein for freedom of operation without the other being in the least affected.

I claim:—

1. In a printing machine, the combination of a support, a carriage reciprocatorily mounted upon said support, a form cylinder carried by said carriage, boxes in which the journals of said cylinder are journaled, levers having associated therewith means for engaging said boxes, and means for automatically operating said levers previous to the non-printing stroke of said cylinder, substantially as set forth.

2. In a printing machine, the combination of a support, a carriage reciprocatorily mounted upon said support, a form cylinder carried by said carriage, boxes in which the journals of said cylinder are journaled, levers having means associated therewith for engaging said boxes, and means for automatically operating said levers previous to the non-printing stroke of said cylinder; said last named means comprising cranks arranged to engage said levers and trip levers associated with said cranks and adapted to engage a fixed part of the machine, substantially as set forth.

3. In a printing machine, the combination of a form cylinder, bearing boxes in which the journals of said cylinder are mounted, frames in which said bearing boxes are loosely fitted, inverted U-shaped standards in which said frames are movably mounted having guide-ribs whereby the frames are guided vertically, and means whereby the frames are suspended from the cross bars of the standards for raising and lowering said frames, substantially as set forth.

4. In a printing machine, the combination of a form cylinder, bearing boxes in which the journals of said cylinder are mounted, frames in which said bearing boxes are loosely positioned, standards in which said frames are movably fitted, guide rods in said frame for said bearing boxes, springs above and beneath said bearing boxes, and means seated in said frames for adjusting said springs, substantially as set forth.

5. In a printing machine, the combination of a support, a carriage reciprocatorily mounted on said support, a form cylinder carried by said carriage, an inking roller carried by said carriage and located in proximity to the periphery of said cylinder, slidable supports on said carriage for said inking roller, and means for automatically shifting said slidable supports at the ends of the strokes of said carriage; said last named means consisting of levers having connection with said slidable supports, levers engaging said first named levers, cranks carried by said carriage, and levers associated with said cranks and adapted to engage a fixed portion of the machine, substantially as set forth.

6. The combination of a main frame having cross members, a platen supporting bed provided with screw blocks, brackets mounted upon the cross members, lift rods having threaded ends connected with the screw blocks and stepped into the horizontal parts of the brackets, operating rods journaled in the vertical parts of the brackets, and gearings connecting the lift and operating rods.

7. The combination of a main frame having cross members, a platen supporting bed provided with screw blocks, brackets mounted upon the cross members, lift rods having threaded ends connected with the screw blocks and stepped into the horizontal parts of the brackets, a bed frame within which the platen supporting bed is located, mounted upon the cross members, operating rods journaled in the vertical parts of the brackets and extending through the bed frame and sides of the main frame.

WILLIAM M. BACON.

In presence of—

E. S. KNIGHT,

WM. H. SCOTT.