

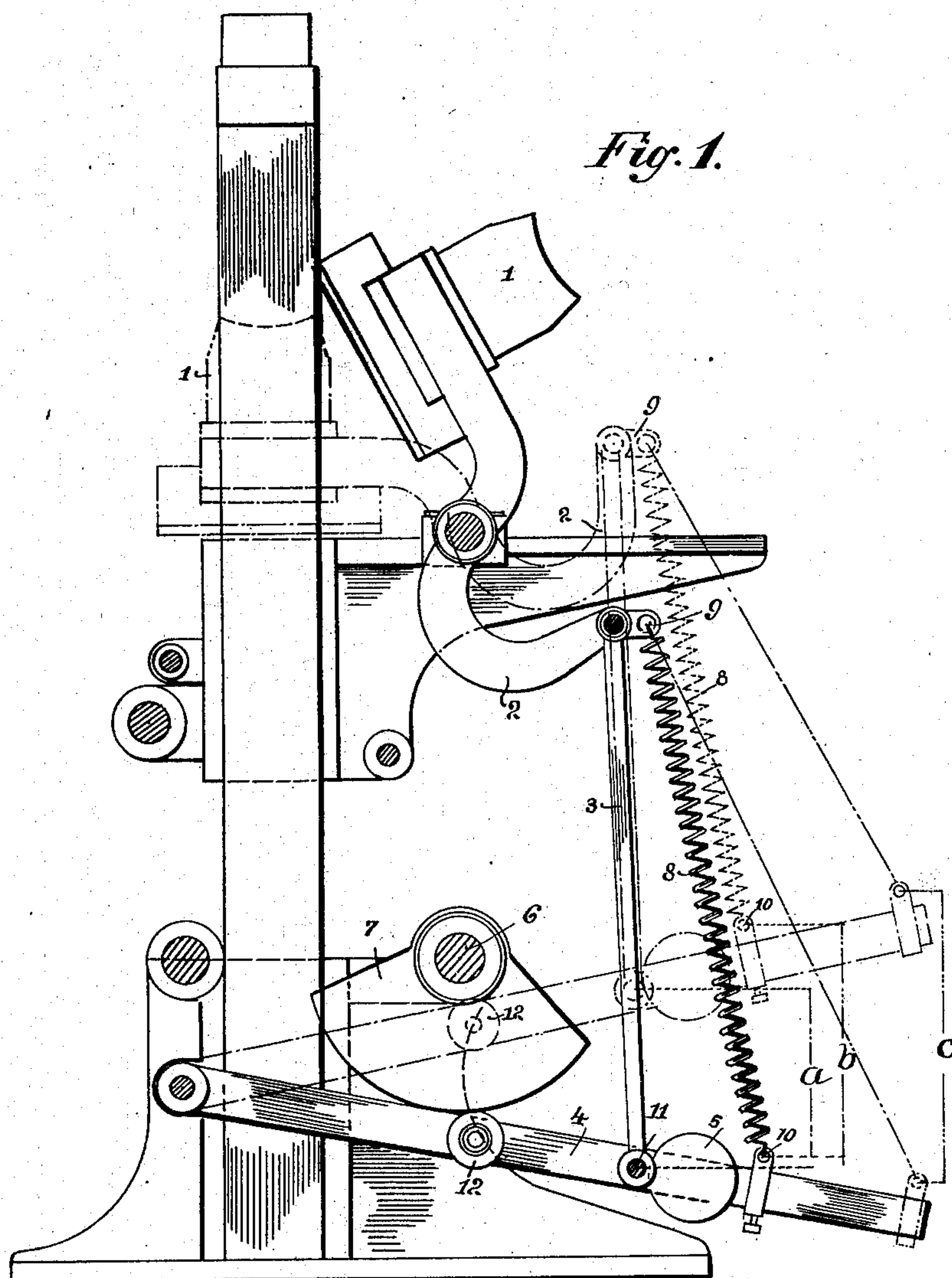
No. 757,458.

PATENTED APR. 19, 1904.

J. HEIM.  
PLATEN PRINTING PRESS.  
APPLICATION FILED NOV. 7, 1903.

NO MODEL.

6 SHEETS—SHEET 1.



*Witnesses*  
J. N. Freeman  
H. M. Gillman, Jr.

*Inventor*  
J. Heim  
John Heumann & Watson  
*Attorneys*

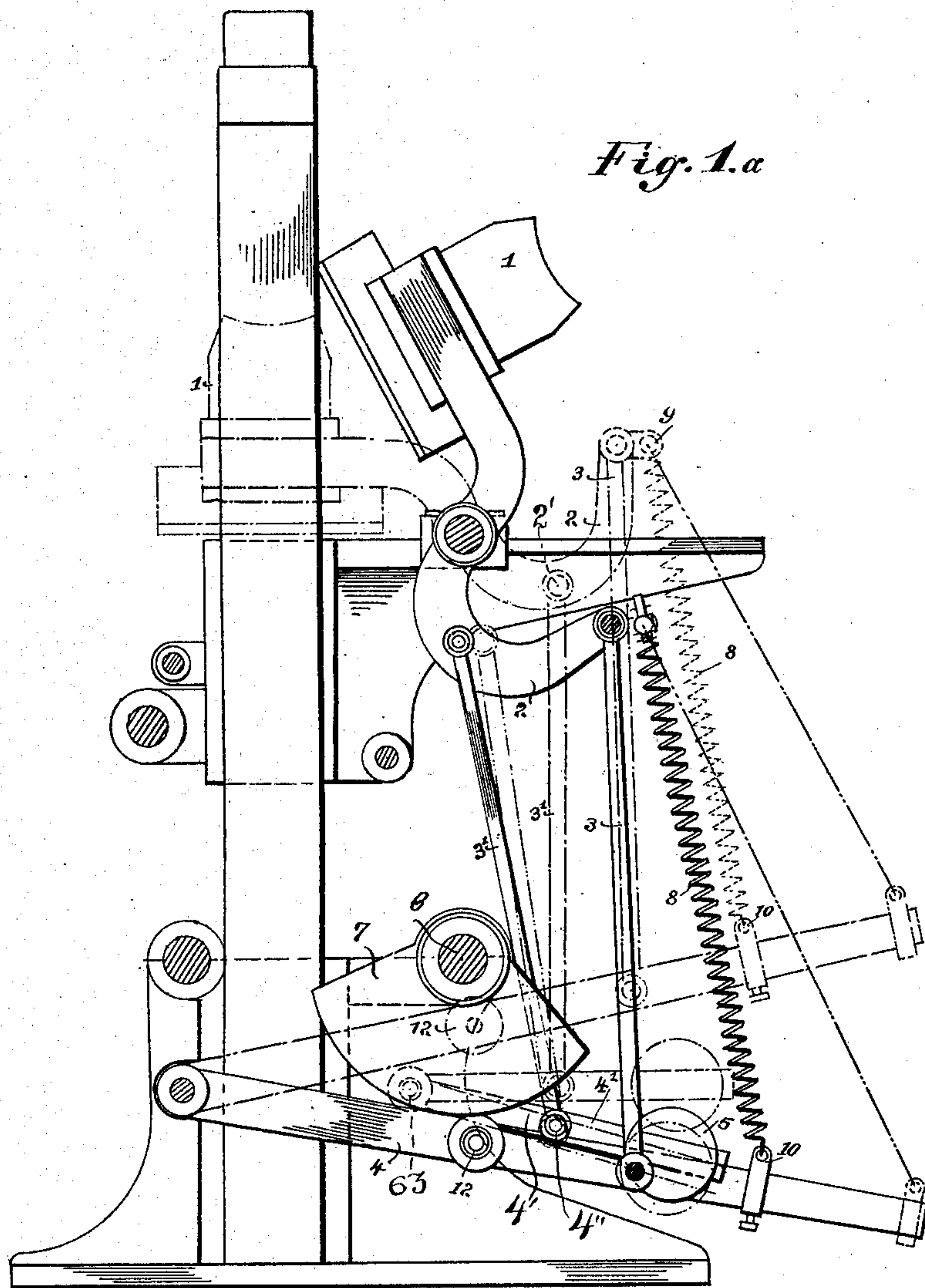
No. 757,458.

PATENTED APR. 19, 1904.

J. HEIM.  
PLATEN PRINTING PRESS.  
APPLICATION FILED NOV. 7, 1903.

NO MODEL.

6 SHEETS—SHEET 2.



Witnesses  
G. N. Freeman  
H. J. Gellman, Jr.

Inventor  
J. Heim  
by  
Freeman & Watson  
Attorneys

No. 757,458.

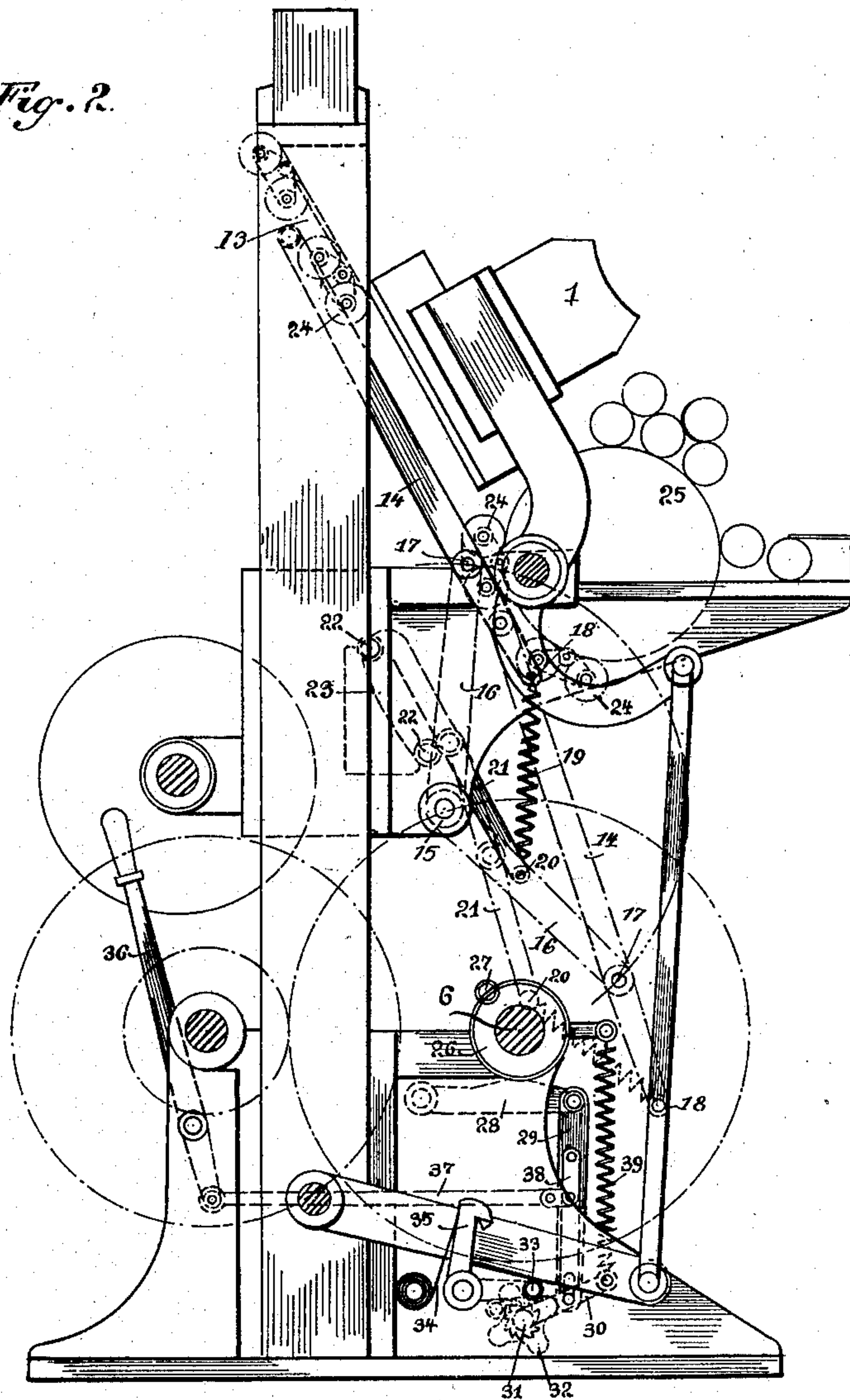
PATENTED APR. 19, 1904.

J. HEIM.  
PLATEN PRINTING PRESS.  
APPLICATION FILED NOV. 7, 1903.

NO MODEL.

6 SHEETS—SHEET 3.

*Fig. 2.*



*In witness  
J. H. Freeman  
H. M. Gillman, Jr.*

*Inventor  
J. Heim  
by J. H. Freeman & H. M. Gillman, Jr.  
Attorneys*



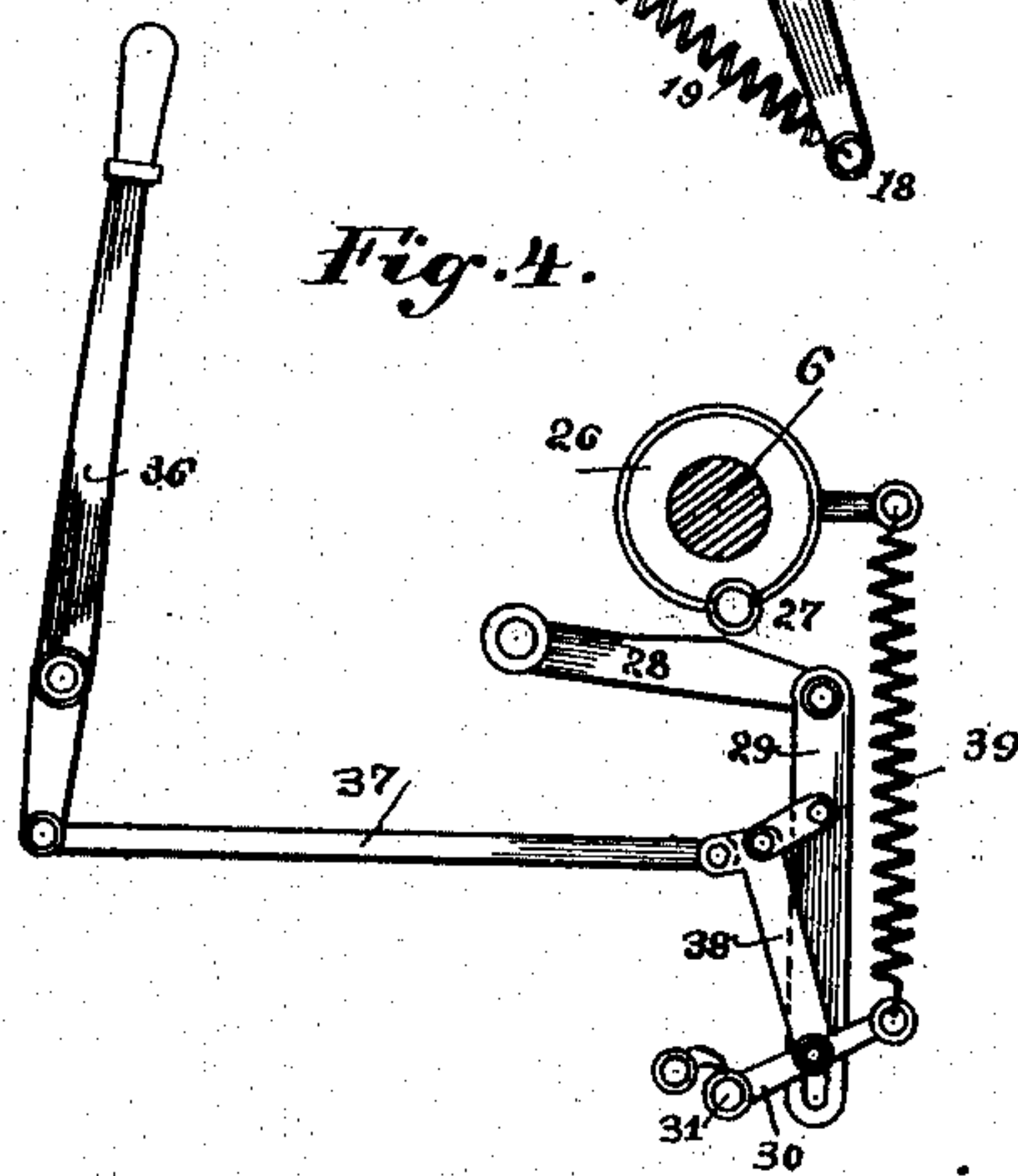
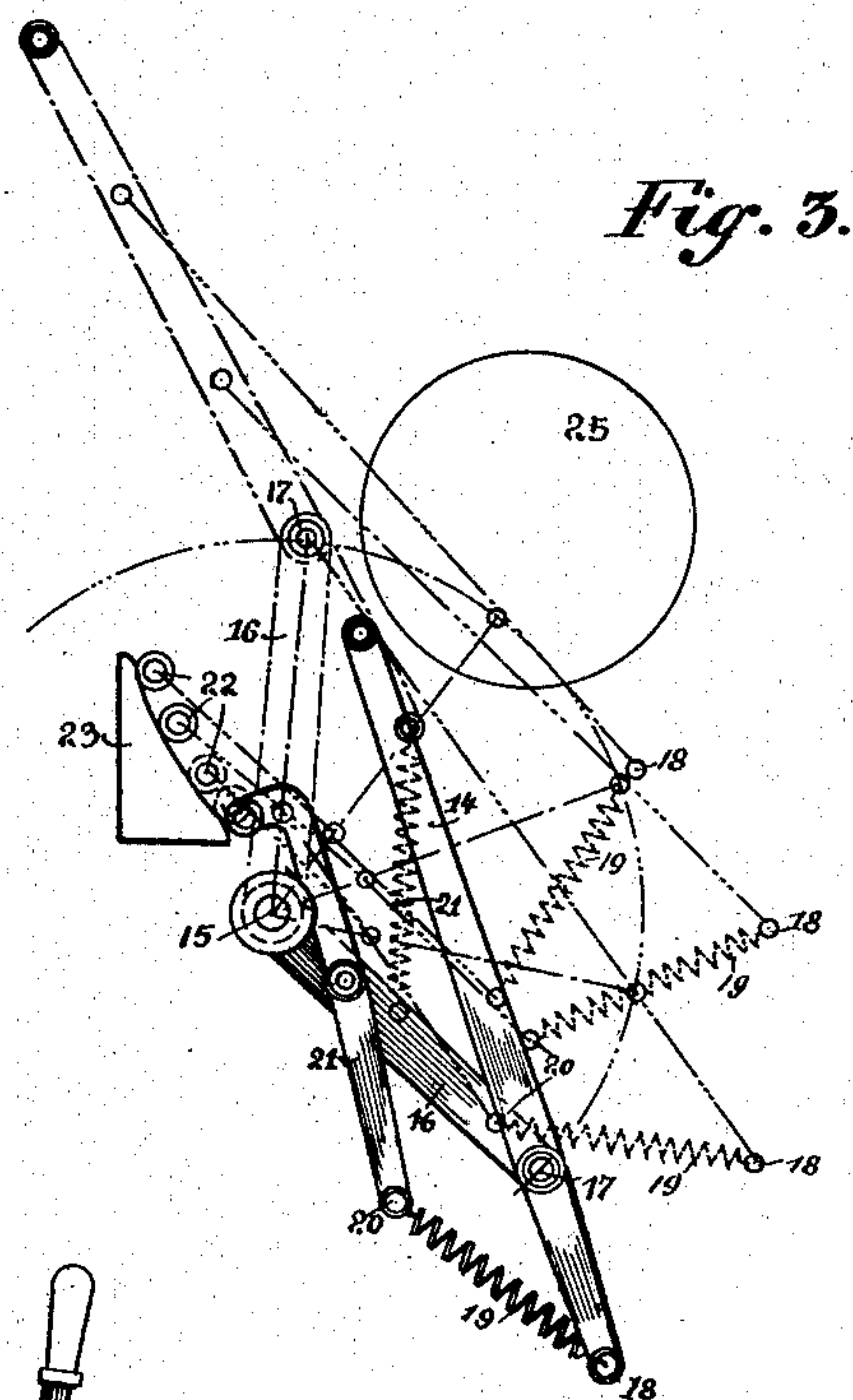
No. 757,458.

PATENTED APR. 19, 1904.

J. HEIM.  
PLATEN PRINTING PRESS.  
APPLICATION FILED NOV. 7, 1903.

NO MODEL

6 SHEETS—SHEET 4.



*Witnesses*  
G. N. Freeman  
J. M. Gillman, Jr.

*Inventor*  
J. Heim  
by John Freeman & Watson  
Attorneys

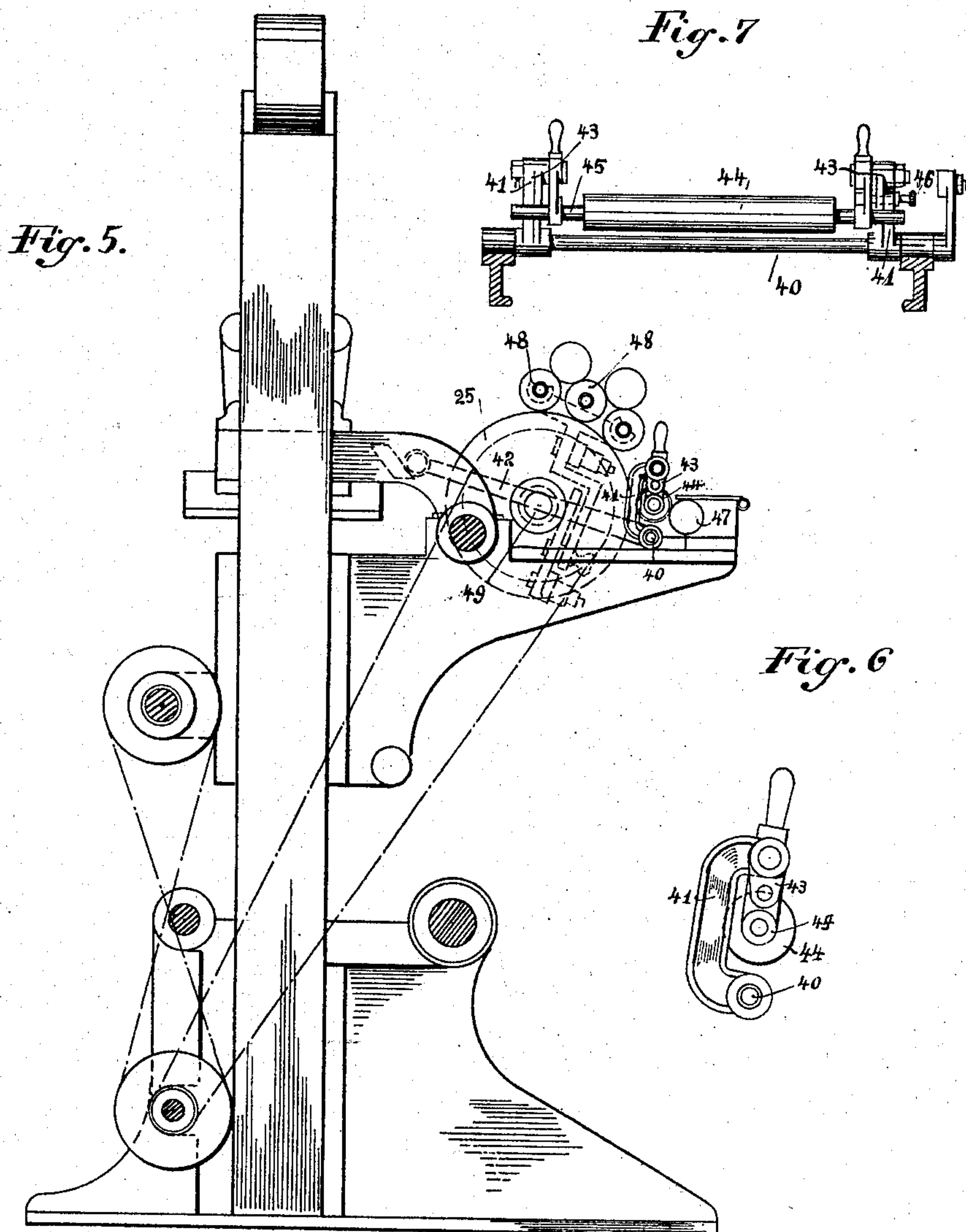
No. 757,458.

PATENTED APR. 19, 1904.

J. HEIM.  
PLATEN PRINTING PRESS.  
APPLICATION FILED NOV. 7, 1903.

NO MODEL.

6 SHEETS—SHEET 5.



Witnesses  
J. H. Freeman.  
Am. Gillman, Jr.

Inventor  
J. Heim  
by J. H. Freeman & Am. Gillman, Jr.  
Attorneys





## UNITED STATES PATENT OFFICE.

JOSEF HEIM, OF OFFENBACH, GERMANY.

## PLATEN PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 757,458, dated April 19, 1904.

Application filed November 7, 1903. Serial No. 180,237. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEF HEIM, a subject of the German Emperor, residing at Frankfurterstrasse 111, Offenbach-on-the-Main, Germany, have invented certain new and useful Improvements in Platen Printing-Presses, of which the following is a specification.

This invention relates to improvements in platen printing-presses. Two classes of presses of this kind have hitherto been known. One class, intended less for fine printing-work than for exerting very powerful pressure, comprised presses with fixed type-beds and toggle-lever action. In cases where fine printing-work was required rather than powerful pressure a machine with a rocking type-bed and crank action was used. Both these classes of machine were unsatisfactory, for the reason that with the one no fine work could be performed and with the other no work requiring a high degree of pressure.

The object of the present invention is to provide a printing-press possessing the advantages of both classes of press referred to above, the invention essentially consisting in the use of a rocking bed in combination with toggle-lever action. In designing a machine of this kind the following difficulties arise. The known laterally-rocking type-bed possessed very considerable unbalanced weight, which was injurious to the working of the machine and to the life of the driving parts and necessitated the use of high power. The arrangement of the bed in this manner was also injurious to the efficiency of the machine, since the bed could only be moved upward and downward very slowly. To remove these disadvantages, the bed of the improved machine is balanced by means of a special balance-weight and system of levers. By this means all injurious strain on the driving parts is removed; but the disadvantage arises that the inertia of the balanced bed would produce during the upward movement of the latter a momentum by which the platen and the usual movable tray coupled thereto would be torn from their bearings when the bed reached its end position. There would also be a lack of momentum to produce or initiate the downward movement, so that the bed would remain in its

upper position. The too violent upward movement of the bed and the stopping of the latter in its highest position could be obviated by using positive gear for controlling the upward and downward movement of the bed. If, however, the downward movement of the rocking parts were positive, the machine would break if an article were on the tray, for instance, and the printer's hand would be crushed if not withdrawn in time.

In order to entirely dispense with the use of positive driving-gear in the improved press, an element is introduced by which the momentum of the rocking mass is checked during the ascent of the bed in proportion with its movement, so that when the bed reaches its highest position it stops very gently and moves the tray operated by it gently against its abutment on the platen. While this is being done, force is stored in the machine in such a manner that notwithstanding the complete balancing of the rocking bed the descent of the latter takes place with gradually-decreasing force, so that at the lowest point the said force is insufficient to crush the printer's hand, since if after the adjustment of the machine any article besides the matrix and the like is on the platen the bed cannot be locked. The said element must not only possess sufficient force to move the bed downward unaided, but must also overcome the weight and friction of the tray operated by it, so as to move it in.

According to my invention springs are used for this purpose, and by this means the desired object is fully attained.

In the annexed drawings, Figure 1 is a side view of the entire press. Fig. 1<sup>a</sup> is a similar view of a modified form of press. Fig. 2 is a side view of the press provided with the inking device, and Fig. 3 a diagrammatic view illustrating various positions of the inking-carriage. Fig. 4 is a detail view of the bed-releasing mechanism. Fig. 5 is a side elevation showing mechanism for insuring uniform inking of the ink-roller. Figs. 6 and 7 are detail views of parts shown in Fig. 5. Fig. 8 is an end view of the machine, showing mechanism for laterally displacing the inking-rollers and mechanism for throwing the inking



device into and out of gear. Fig. 9 is a detail view of the first-mentioned mechanism of Fig. 8, and Figs. 10 and 11 are detail views of the last-mentioned mechanism of Fig. 8.

5 The type-bed 1 is completely balanced by means of an arm 2, extending beyond its fulcrum and connected by a rod 3 to a lever 4, which carries a balance-weight 5. The type-bed is thus adapted to remain stationary in  
10 any position into which it is moved, so that it is incapable of exerting force and of injuring the printer. The balancing of the bed 1 would, however, have the effect that said bed would not return to its original position af-  
15 ter being positively moved upward by means of the cam 7 on the shaft 6, so that printing would be impossible. Means must therefore be provided to move the bed downward from its highest position; but this must be done  
20 in such a manner that no injury is done to the printer's hands if they are not removed from the platen in time. For this purpose there is provided at one or both sides springs 8, connected at 9 to the arm 2 and at 10 to the  
25 weighted lever 4. These springs 8 are adjusted with slight tension when the bed is closed, (see Fig. 1, dotted lines,) so that the attendant can leave his hand on the platen during the descent of the type-bed without suf-  
30 fering injury. During the positive upward movement of the bed by the cam 7 the tension of the springs 8 is increased proportionately to the difference between the stroke of the point 11 and that of the point 10—that is to  
35 say, proportionately to the difference between the lines *a* and *b* and *a* and *c*. The energy thus absorbed by the springs 8 is used for giving the bed a downward impulse and moving it back to its lowest position. This is effected  
40 by the tendency of the springs to pull the connecting-rod back to its original position when the summit of the cam 7 has cleared a roller 12 on the balance-weight lever 4. The said spring also serves as a brake during the up-  
45 ward movement of the bed and stops the latter in its highest position, thus forming, so to say, buffer-springs, which are subjected to tensile instead of a compressive strain.

To regulate the tension of the springs 8,  
50 their point of attachment to the balance-weight levers 4 need only to be altered by placing it nearer to or farther from the pivot thereof. The leverage used for tensioning the spring during the upward movement of the bed is  
55 thus increased or reduced, and it is unnecessary to tension the springs more or less—that is, make them shorter or longer in adjusting them, their points of attachment being simply altered, as indicated in dotted lines in Fig.  
60 1, and the length of the springs being regulated by means of set-screws.

In order to reduce the strain on the springs or prevent their overstraining when the press is running at very high speed, another ar-  
65 rangement (shown in Fig. 1<sup>a</sup>) is used by means

of which the weight 5 does not act on the same lever as the springs 8, but on a separate lever system 3' 4'. The arrangement of the springs is the same as before; but the balance-weight is adjustably connected to a separate lever 4',  
70 pivoted at 63. The said lever 4' is connected at 4'' to a rod 3', pivoted at 2' to the arm 2, extending beyond the fulcrum of the bed 1. Before the bed reaches its highest position this point 2' is rocked beyond the dead-  
75 point of the balanced bed. When the weight reaches its lowest position, it is pulled upward again by the lever 4', so that the weight itself receives a rocking motion opposed to that of the bed, and thus assists the springs 8  
80 to check the upward movement of the bed. The construction of the press in this manner, with a balanced rocking type-bed and well-controlled action, has the further advantage that the press can be directly provided with  
5 an inking device in such a manner that the inking-carriage is pressed freely against the bed without guide-rails and that the bed can be inked in its elevated position beyond reach  
90 of the platen. The material on which the impression is to be made can thus be moved over the platen without being soiled, and the inking operation can be single, double, or continuous.

The inking device referred to is shown in  
95 Figs. 2 and 3 of the drawings. The inking-carriage 13 receives its upward-and-downward motion from a connecting-rod 14, operated by a lever 16, mounted on a rock-shaft 15. The  
100 said lever receives its rocking motion through any suitable mechanism by which the shaft 15 is driven. The aforesaid connecting-rod 14 is extended beyond the point at which the lever 16 operating it is connected, and to the  
105 end of this extension a traction-spring 19 is attached at 18. The other end of the said spring 19 is connected at 20 to a lever 21, pivoted on the rocking lever 16. This lever 21 is extended beyond its fulcrum and carries at  
110 its further end a roller 22, which slides on a cam-path 23 on the machine-frame. This cam-path is so shaped that on the movement of the lever system 16 14 21 and spring 19, and therefore of the inking-carriage 13, the  
115 spring 19 possesses and maintains the same length in any position, thus always having the same tension. If said spring, for instance, were directly connected with the rocking lever 16, the pull, and thus the tension of the  
120 spring, would be different in every position of the inking-carriage and the spring subjected to a continuous change of strain, which would soon cause it to become worn and un-  
125 serviceable. By the arrangement of the said spring 19 in connection with the connecting-rod 14 the inking-carriage under spring-pressure is so pressed against its guide-paths that it passes over the form, and therefore the  
130 type-bed 1, without guide-rails under as uniform a pressure as possible and receives less



pressure outside or beyond the bed, especially at the point where the inking-rollers 24 come into contact with the ink-feed roller 25. This is explained by the fact that the spring pull, which is of equal force in all positions, has the least leverage in the highest and the lowest position of the inking-carriage 13 and then exerts the least pressure on the latter, since in these positions the position of the connecting-rod with regard to the rocking-lever gives the least leverage. The inking-rollers will therefore pass the ink-feed roller 25 with only a slight pressure, which is very advantageous for taking up the ink, as well as the always equal pressure of the carriage against the type-bed 1 or form for the printing. By the elastic pressing on of the inking-carriage itself a resilient mounting of the inking-rollers in their carriage 13 becomes superfluous, and the great advantage is attained of being able to give the rollers a firm bearing.

To effect single, double, or continuous inking with the inking device described, mechanism shown in Figs. 2 and 4 is used. This comprises a disk 26, fixed to the main shaft 6 and having mounted on it a roller 27, adapted to operate a lever 28, pivoted to the machine-frame. The lever 28 is adapted to operate a pawl-and-ratchet gear 31 by means of levers 29 and 30. Fixed to the axle of the ratchet-wheel is a cam 32, with four bosses and four recesses. This cam is in contact with a bell-crank lever 35, having a roller 33 on one of its arms and actuated by a spring 34. This lever 35 is adapted to lock the bed 1 in its highest position, Fig. 2. The action of this mechanism is as follows: When the bed 1 is moved from its closed position, Fig. 1, dotted lines, to its most elevated position, Fig. 2, the disk 26 moves the roller 27 into its lowest position, Fig. 4. By this means the ratchet-wheel 31 and cam 32 are operated so that the ratchet-wheel is rotated to the extent of one tooth as for each bed movement, and the roller 33 of the rocking lever 35 alternately engages an elevation and a recess on the cam-disk 32. By this means it is possible for the lever 35 to hold the bed fast in its highest position during one movement of the press. To render possible continuous inking of the bed 1, hand-operated disengaging mechanism is provided. This mechanism, which is shown in Fig. 4, comprises an adjusting-lever 36, a rod 37, and two links 38. By this means it is rendered possible to so reduce the effective length of the rod 29, connected to the levers 28 and 30, that said lever 28 is moved out of the path of the roller 27. While the press is running and the ratchet-wheel 31 is being continuously operated the disengaging mechanism is operated when the bed 1 is in its locked position—i. e., highest position—so that the lever 28 is moved out of engagement with the disk 26 or roller 27. The ratchet-wheel 31 is consequently no longer operated,

and the cam 32 remains stationary in the position in which the roller 33 of the lever 35 engages a recess in the cam. With the mechanism in this position the inking of the bed is continuous. The descent of the bed does not take place till the ratchet-wheel is put into operation again.

To keep the lever 28 in engagement with the roller 27, a spring 39 is provided, fixed to the machine-frame and to the lever 30, Fig. 4, carrying the pawl-operating and ratchet wheel. This mechanism has the great advantage that according to the adjustment of the cam 32 single, double, or continuous inking of the bed can be effected.

Another very important advantage of the improved press consists in the arrangement of a device by means of which absolutely uniform distribution of ink on the ink-cylinder is obtained. This device is shown in Figs. 5, 6, and 7.

Hitherto the ink has been applied to the ink-roller by hand by means of a lick-roller, the ink being applied by means of a spatula. The even distribution of the ink was only effected after the ink-roller had been running some time, since the application of the ink by means of the spatula cannot be made with the regularity required for perfect printing. To remove this disadvantage and provide means for the absolutely uniform distribution of the ink on the inking-roller by hand, the device referred to above is used with the improved press. The said device essentially comprises two levers 41, pivoted on the shaft 40 at the sides of the machine and adapted to be rocked by means of the bed 1 and a lever 42. To the upper ends of the lever 41 are pivoted levers 43, provided with handles and connected to each other by an axle which carries the lick-roller 44. The latter or the levers 43, carrying it, may be fixedly connected to the levers 41 by means of pins 46, adapted to be removably inserted in suitable apertures or loops in said levers 41 and 43, and when said levers are so connected the roller will rock with the said levers 41 and come into contact with the box-roller 47 on one hand and the ink-cylinder 25 on the other hand, so as to apply ink to the latter. To render possible the perfectly uniform extra application of ink by hand at intervals during the running of the press, the roller 44 can be uncoupled from the levers 41 by removing the pins 46 from the levers 41 and 43. The levers 43 and the roller 44 can then be rotated on their pivots by means of the handle. It is thus possible to move the roller 44 to the roller 47 and to the cylinder 25, as desired, and thus to apply ink to the latter. To uniformly and thoroughly distribute the ink on the cylinder 25, there are arranged on the latter three distributing-rollers 48, Figs. 5, 8, and 9, two of which move in one direction and the third in the opposite direction. As is known, the distribution of ink must depend on the na-



ture of the ink and the impression desired. In order to render possible different lateral displacement of the distributing-rollers 48, according to the different requirements, the adjusting mechanism shown in Figs. 5, 8, and 9 is used. This mechanism comprises two grooved disks 50, one of which is arranged at each end of the axle 49 of the roller 25 for the purpose of operating the adjusting mechanism by means of rocking levers 51 with rollers 52 engaging said grooved disks. Pivotaly connected to each lever 51 is a double-armed lever 52', slotted at its lower end and bifurcated at its upper end, the connection being made by means of an adjustment-screw engaging into the slot of the lever 51, so that the relative lengths of the levers 51 and 52' can be altered. By this means the stroke of the lever 52' can be altered, and consequently the lateral displacement of the rollers 48 increased or reduced, since the bifurcated end of the lever 52' engages the axles 53 of the rollers 48.

To allow of throwing the inking mechanism into or out of gear at any time, the uncoupling device shown in Figs. 8, 10, and 11, is used. This device comprises a treadle-lever 54, connected by a lever 55 to a disk 56, with four pins 57 fixed to one side of it and a cam-path 58 for a disengaging lever 59 on the other side. To hold the said lever 59 in close permanent contact with the path 58, a spring 60, Fig. 8, is attached to said lever and the machine-frame. Said spring tends to draw the friction-clutch into position to disconnect the inking mechanism from its driving-gear. If when the clutch is operative, as shown in Fig. 8, at which time the lever 59 is in contact with the narrow part of the cam-path the lever 54 is operated by the attendant, so as to be moved into its lowest position, Fig. 11, the disk 56 is rotated to the extent of one pin-space, and the position of the cam-path 58 with regard to the lever 59 is so altered that the clutch 61 is thrown out of gear. The lever 54 is thereupon released and returns to its normal position under the action of the spring 62, and the lever 55 engages the next pin, so that when the lever 54 is operated the next time lever 59 will be rocked to move the clutch to operative position and place the spring 60 under tension. The inking mechanism is thus thrown into gear when the narrow part of the path 58 is in engagement with the lever 59 and is thrown out of gear when the broad part of the path is in contact with the lever. This arrangement has the important advantage that the treadle action is the same for throwing into and out of gear.

I claim—

1. In a platen printing-press, the combination with a rocking type-bed of means for balancing the latter consisting of a lever connected thereto, and provided with an adjustable balance-weight, said lever being mounted so that during the ascent of said bed it is rocked

beyond the dead-point of balance substantially as described.

2. In a platen-printing press, the combination with a type-bed and means for rocking the same, of a counterweighted lever for balancing said bed, and springs connected to the latter and to said counterweighted lever, said springs being tensioned in proportion to the upward movement of the bed substantially as described for the purpose set forth.

3. In a platen printing-press, the combination with a type-bed, and means for rocking the latter, of a rearward extension to the latter, a counterweighted lever connected to said extension for balancing the bed, and springs connected to said extension and adjustably connected to the counterweighted lever, said springs being tensioned during the upward movement of the bed in proportion to the difference of the points of attachment of said springs to the counterweighted lever and of the latter to the bed respectively, substantially as described.

4. In a platen printing-press the combination of a type-bed and means for rocking the same, of a pivoted counterweighted lever connected to said bed and adapted to be rocked beyond the dead-point of balance before said bed reaches its highest position, springs connected at one end to said bed, and a pivoted lever also attached to the bed and to which the other ends of said springs are connected substantially as described for the purpose set forth.

5. In a platen printing-press, the combination with a type-bed, and means for rocking, balancing and controlling the movement of same, of an inking device comprising an inking-carriage, means for reciprocating the same over the bed, and means for pressing said inking-carriage on the bed with a uniform pressure at all points of its movement comprising a compensating lever pivoted to said reciprocating means, a spring connected to the latter and to the compensating lever the tension of said spring being constant, and a cam-path against which said compensating lever bears substantially as described.

6. In a platen printing-press, the combination with a type-bed and means for rocking, balancing and controlling the movement of same, of an inking device adapted to be reciprocated over the bed, mechanism for locking the bed in its upper position comprising a pivoted lever connected to said bed, a disk, and means for rotating the same, a lever system operated by said disk, pawl-and-ratchet gear operated by said lever system, a cam connected to said pawl-and-ratchet gear, and a locking-lever acted upon by said cam and adapted to engage the aforesaid pivoted lever, and means for disconnecting the pawl-and-ratchet gear from said disk substantially as described.

7. In a platen printing-press, the combina-



tion with a type-bed and means for rocking, balancing and controlling the movement thereof, of an inking device adapted to be reciprocated over the bed, an inking-cylinder adapted to supply said inking device, and means for uniformly distributing ink on said cylinder, comprising a licking-roller, means for supplying the latter, levers supporting said licking-roller, arms adapted to be coupled and uncoupled to and from said levers, and means for rocking said arms from the bed substantially as described.

8. In a platen printing-press, the combination of a rocking type-bed, means for balancing and controlling the movement thereof, an inking device adapted to be reciprocated over

said bed, means for pressing said inking device on the bed with a uniform pressure at all points of its movement, means for locking the bed in its upper position for inking purposes, an inking-cylinder adapted to supply said inking device, and means for uniformly distributing ink on said cylinder substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEF HEIM.

Witnesses:

ERWIN DIPPEL,  
MICHAEL VOLK.