

No. 749,536.

PATENTED JAN. 12, 1904.

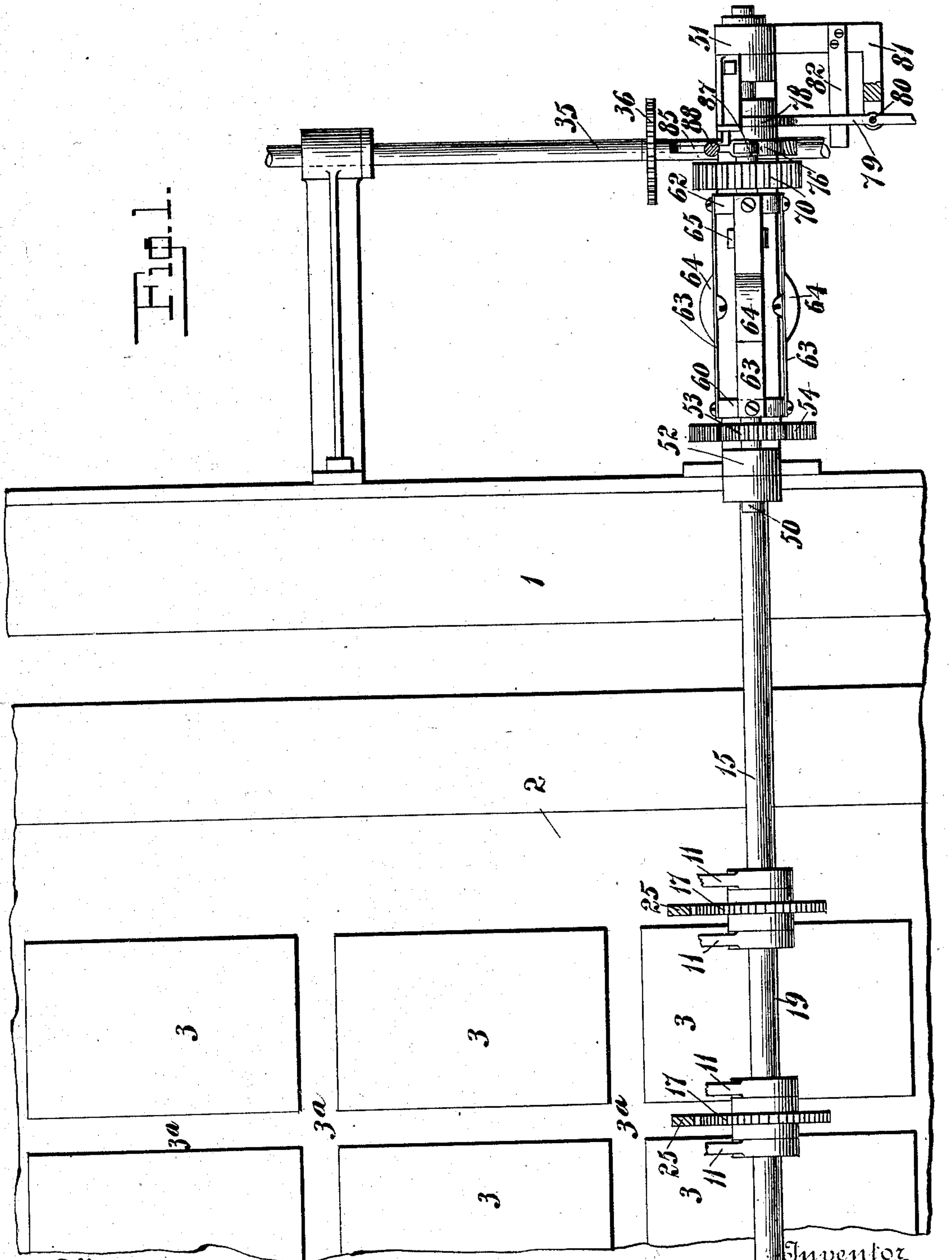
T. C. DEXTER.

AUTOMATIC CONTROLLING MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED SEPT. 24, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses
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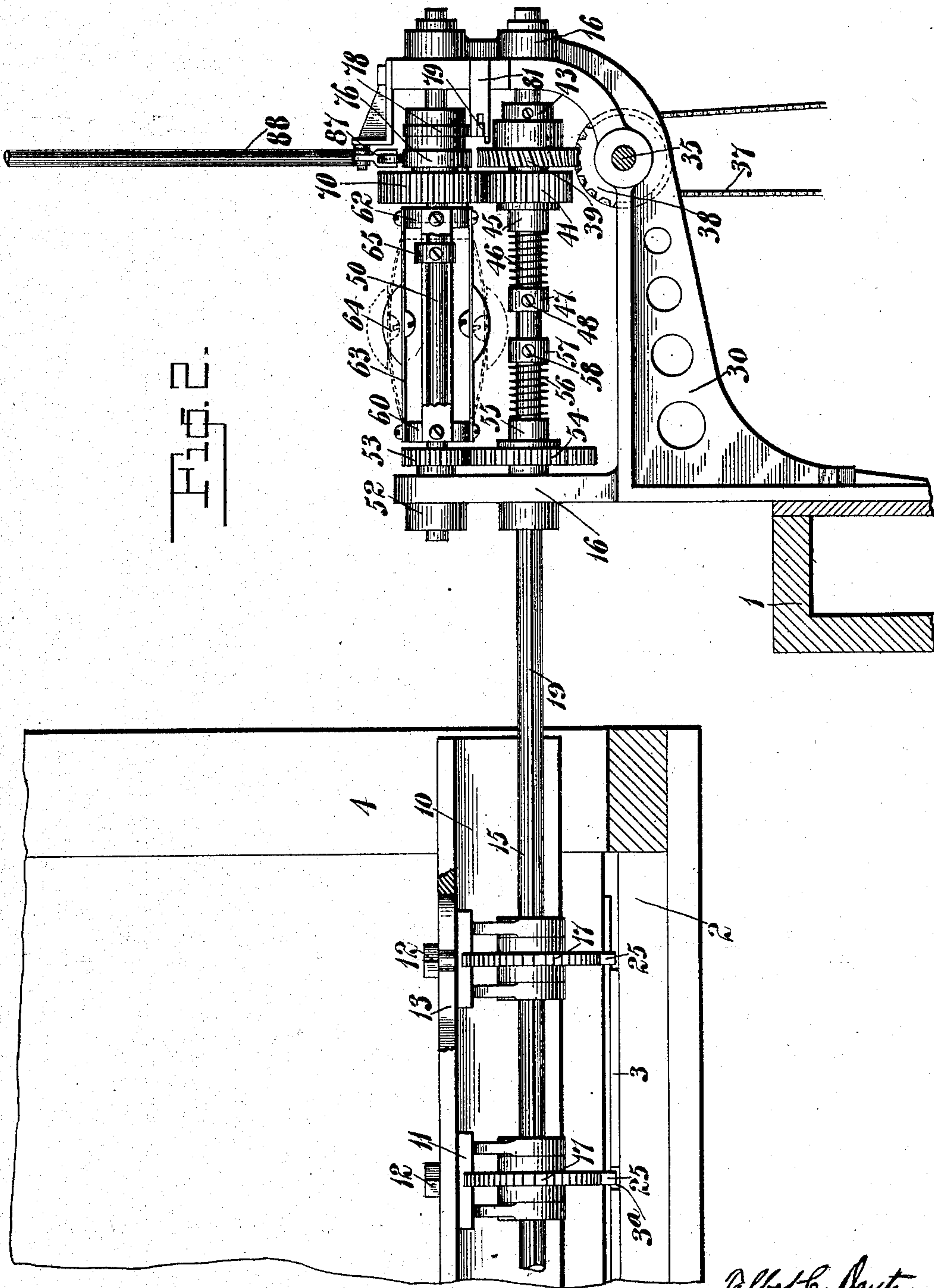
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NO MODEL.

4 SHEETS—SHEET 2.



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No. 749,536.

PATENTED JAN. 12, 1904.

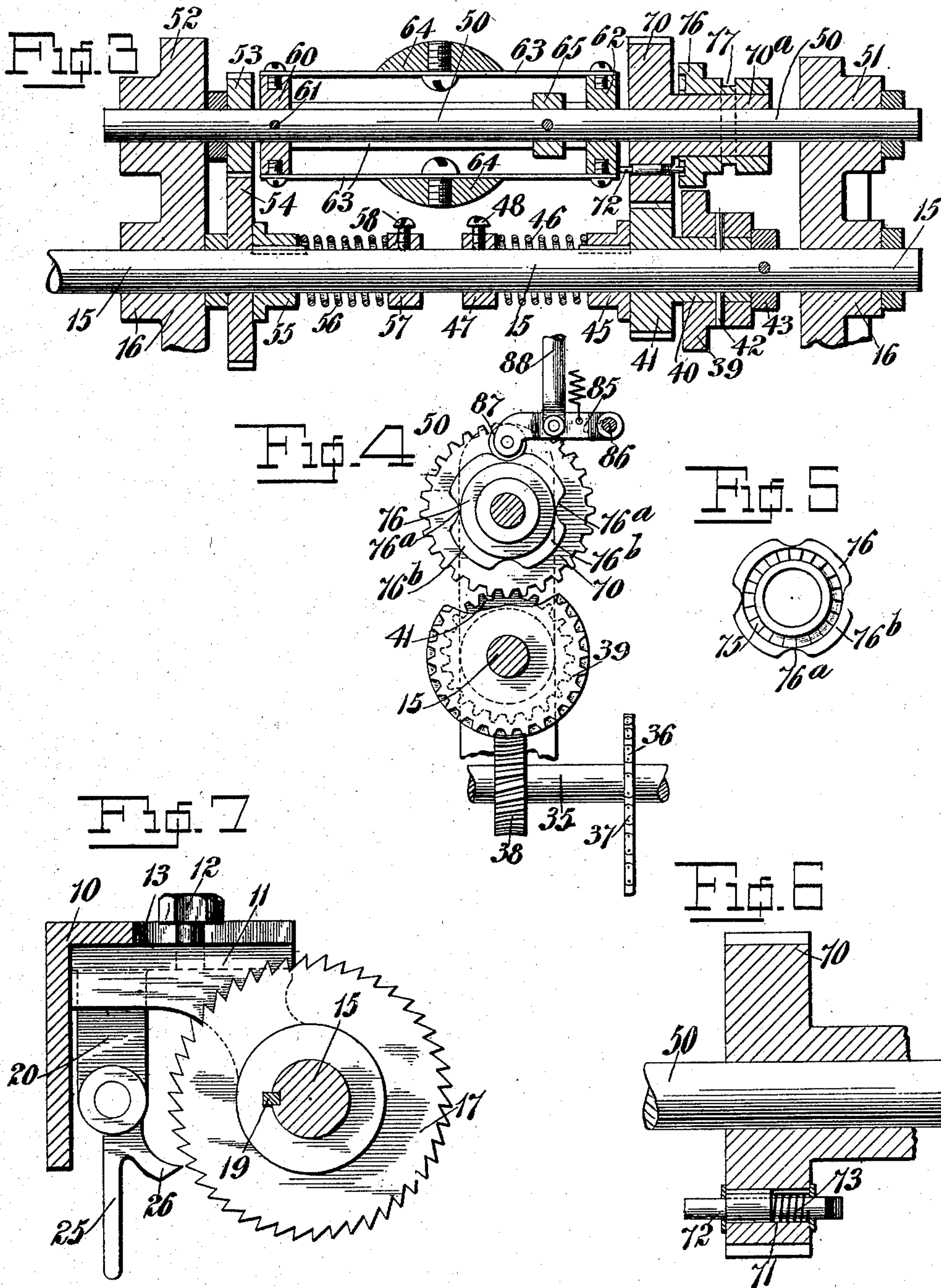
T. C. DEXTER.

AUTOMATIC CONTROLLING MECHANISM FOR PRINTING PRESSES.

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NO MODEL.

4 SHEETS—SHEET 3.



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No. 749,536.

PATENTED JAN. 12, 1904.

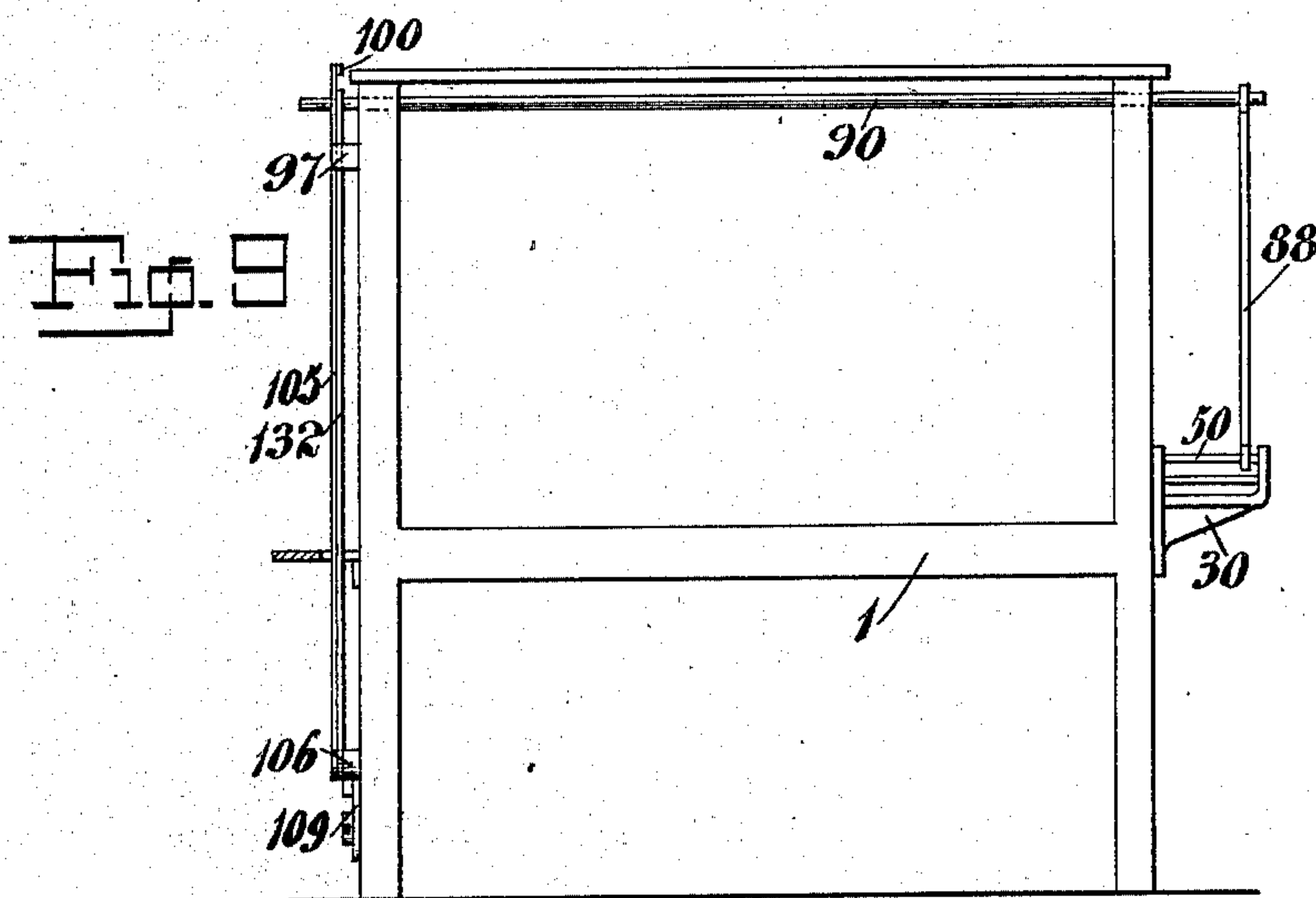
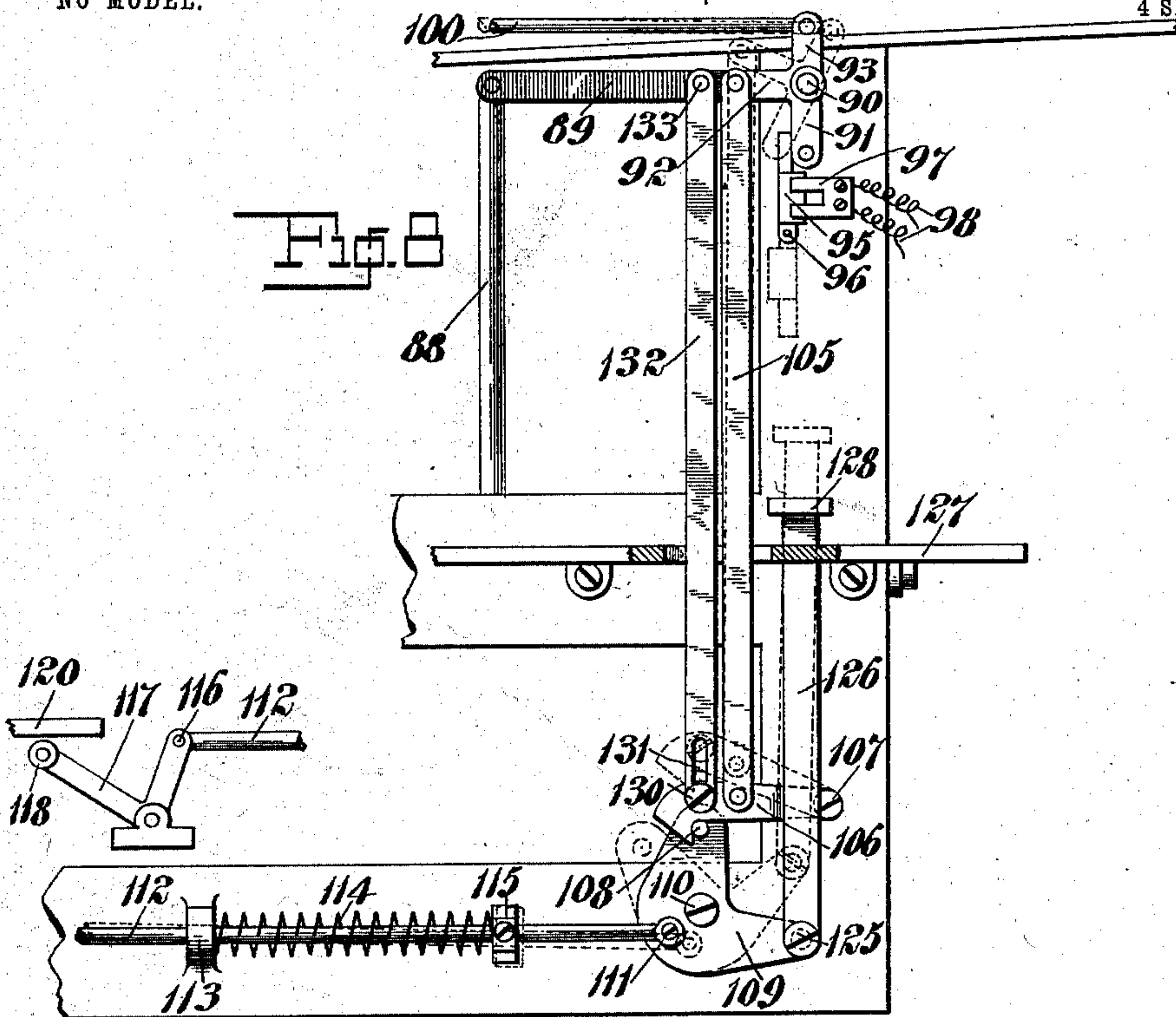
T. C. DEXTER.

AUTOMATIC CONTROLLING MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED SEPT. 24, 1902.

NO MODEL.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC CONTROLLING MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 749,536, dated January 12, 1904.

Application filed September 24, 1902. Serial No. 124,605. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, a citizen of the United States, residing at Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Automatic Controlling Mechanism for Printing-Presses, (Case B,) of which the following is a specification.

The present invention relates to improvements upon the form of printing-press-controlling mechanism covered by an application filed by Talbot C. Dexter and Henry Hallstream July 28, 1902, Serial No. 117,331.

In the application of Dexter and Hallstream referred to a plurality of tripping-fingers is arranged above the reciprocating printing-form of a press in position to engage and arrest a series of ratchet-wheels keyed to a constantly-rotating shaft, said shaft being driven through a clutch comprising two relatively movable members. When the ratchet-wheel shaft is stopped by the engagement of a tripping-finger, one of the clutch members throws into operation the throw-out mechanism of the press.

My present invention relates to a novel form of mechanism for actuating the throw-out mechanism of the press through the stopping of the ratchet-wheel shaft by the tripping-fingers. The shaft carrying the ratchet-wheels is driven from any constantly-rotating part of the press which is to be controlled through the medium of suitable clutches, to a part of which is geared a speed-governor. This speed-governor actuates a spring-released pawl, which is adapted to engage with the ratchet-face of a normally stationary cam-wheel which operates a lever suitably connected with the throw-out mechanism of the press. The throw-out mechanism may be a mechanical device, or it may be an electric switch controlling the circuit of a motor.

In order that my invention may be more fully understood, I will first describe the same with reference to the accompanying drawings and afterward point out the novelty with more particularity in the annexed claims.

Figure 1 is a detail plan view of a portion of a printing-press having my invention applied thereto, the impression-cylinder of the

press being omitted. Fig. 2 is a detail vertical transverse sectional view of the same. Fig. 3 is a vertical sectional view of the clutch mechanism and the speed-governor. Fig. 4 is an end view of the same. Fig. 5 is a detail inside view of the ratchet-face of the throw-out-operating cam. Fig. 6 is a sectional view of one of the clutch-gears, showing the spring-retracted pawl, which is operated by the governor. Fig. 7 is a detail sectional elevation of one of the sheet-actuated tripping devices and its controlled ratchet-wheel. Fig. 8 is a detail elevation of part of the press, showing the throw-out-operating devices. Fig. 9 is a diagrammatic end view of the same, illustrating the relative positions of the same parts.

1 is the frame of an ordinary flat-bed printing-press.

2 is the reciprocating bed, and 3 represents an ordinary printing-form mounted upon the bed 2 and having the channels or valleys 3^a separating the printing blocks or parts of the form.

4 represents the impression-cylinder of the printing-press.

Mounted transversely of the press upon the press-frame 1 between the impression-cylinder 4 and the reciprocating bed 2 and beyond the line of impression is an angle-iron bracket 10, upon which are adjustably secured a series of yokes 11. The yokes 11 are secured to the bracket 10 in the desired adjusted position by means of screw-bolts 12, which pass through a slot 13 in bracket 10 and are threaded into openings formed in the yokes 11. A shaft 15, journaled in suitable bearings 16, extends parallel to the bracket 10 and passes freely through suitable openings formed in the arms of yokes 11. Ratchet-wheels 17 are mounted upon the shaft 15 between the arms of yokes 11, each ratchet-wheel being formed with a key-groove that engages the key 19, fixed on the shaft 15.

Freely journaled upon bracket-arms 20, extending from the yokes 11, are the tripping-fingers 25, each one of which is formed with a pawl or dog 26, extending toward the toothed periphery of one of the ratchet-wheels 17. These tripping-fingers 25 hang by gravity from their journals and project slightly be-

low the surface of the printing-form into the valleys or channels 3^a.

The bearings 16, in which the extended end of the ratchet-wheel shaft 15 is journaled, are mounted upon a suitable bracket 30, extending up from one of the side frames of the machine. In this bracket 30 is journaled a short driving-shaft 35, carrying a sprocket-wheel 36, driven by a sprocket-chain 37, which is in turn operated by a driving-sprocket mounted upon any suitable rotating part of the press. This short driving-shaft 35 carries a worm-gear 38, which meshes with a worm-wheel 39, secured to the collar 40 of a gear-wheel 41, which is freely journaled upon the shaft 15. This worm-wheel 39 is keyed to the collar 40 by means of pins 42, so that the worm-wheel 39 and gear 41 will rotate together freely upon the shaft 15. A collar 43, pinned to shaft 15, confines wheel 39 and gear 41 against outward movement upon their supporting-shaft.

The inner face of the gear 41 constitutes one member of the main frictional clutch, the other and movable member 45 being loosely mounted upon and splined to shaft 15 and engaged by an expansion-spring 46, surrounding shaft 15 and held into engagement with the clutch member 45 by means of a collar 47, adjustably secured to shaft 15 by a set-screw 48. By reason of the engagement of frictional clutch members 41 and 45 it will be observed that shaft 15 will be driven so long as it is not subjected to sufficient resistance to overcome the hold of the frictional clutch.

50 is a governor-shaft suitably journaled in the bearings 51 and 52 of the bracket 30 and provided at one end with a small gear 53, which is in constant mesh with a large gear 54, loosely mounted upon the ratchet-wheel shaft 15. The inner face of this gear 54 constitutes one member of the auxiliary frictional clutch, of which the other and movable member 55 is loosely mounted upon and splined to the shaft 15 and held into frictional engagement with member 54 by means of an expansion-spring 56, surrounding shaft 15 and engaged by a collar 57, adjustably secured to shaft 15 by a set-screw 58.

The clutch 54 55 rotates the governor-shaft 50.

60 is the fixed collar of the governor, secured to the shaft 50 by means of a pin 61, and 62 is the movable collar of the governor, loosely mounted upon the shaft 50 to move longitudinally thereon. The collars 60 and 62 are connected by a series of thin leaf-springs 63, carrying the centrally-mounted weights 64. A limiting collar or stop 65 is secured to the governor-shaft 50 inside the movable collar 62 for limiting the inward movement of collar 62, and thereby the expansion of the governor-springs.

70 is a gear-wheel loosely journaled upon the governor-shaft 50 and meshing with the gear 41 of shaft 15. This gear 70 has a lon-

gitudinal socket or recess 71 cut through it, in which is mounted a pawl 72, surrounded by a retracting-spring 73. This pawl 72 is supported by the gear-wheel 70 in proper position to be engaged by the movable collar 62 of the governor, so as to be forced thereby forwardly in its socket against the tendency of its retracting-spring to engage the annular series of ratchet-teeth 75, formed on the inner face of cam-wheel 76. This cam-wheel 76 is formed with a series of depressions 76^a and high portions 76^b and is loosely mounted on the collar 70^a of the gear 70, so as to remain stationary while the gear 70 rotates.

An annular groove 77 is formed in the collar of the cam-wheel 76 to receive the forked end 78 of a lever 79, which is journaled at 80 upon a bracket-arm 81 and is engaged by a leaf-spring 82, extending from the bracket-arm 81, for holding it in the desired adjusted position.

A short arm or lever 85 is journaled at 86 and carries an antifriction-roller 87 in its free end, which operates upon the periphery of the cam-wheel 76. This lever 85 is connected, through a rod or link 88, with a rock-arm 89, extending from and loosely journaled upon a rock-shaft 90. The rock-shaft 90 is suitably journaled in the machine-frame and extends from side to side thereof.

Mounted on the end of the rock-shaft 90 upon the opposite side of the press from rod 88 and arm 89 is a double bell-crank or T-shaped lever formed of rock-arms 91, 92, and 93. The rock-arm 91 rests directly behind the switch-lever 95, which is pivoted to the machine-frame at 96 and controls the contacts (indicated at 97) which are included in the circuit 98, which supplies current to the motor which drives the printing-press or other machine to which the mechanism is applied.

The rock-arm 93 is connected with a rod 100, which is intended to be connected with any suitable sheet-detecting throw-out mechanism—such, for instance, as the mechanism covered by my application, Serial No. 76,728, filed September 27, 1901.

The third rock-arm 92 is connected with a downwardly-extending link or bar 105, which is pivoted at its lower end to a hook 106, journaled to the machine-frame at 107. This hook 106 normally engages a pin 108, projecting from the bell-crank throw-out lever 109, which is journaled at 110 upon the machine-frame. This lever 109 has pivotally connected to it at 111 a spring-actuated rod 112, which passes freely through a bearing 113 on the machine-frame and carries an expansion-spring 114, which is confined against the bearing 113 by means of an adjustable nut or collar 115. This spring-actuated rod 112 is preferably connected at 116 with a bell-crank lever 117, carrying in its free end an antifriction-roller 118, which rests normally beneath a reciprocating controlling arm or lever 120 of an automatic

mechanism for raising and lowering the impression-cylinder from the reciprocating arm of the printing-press. This mechanism for raising and lowering the impression-cylinder may be of any suitable construction. The parts 117, 118, and 120 of the mechanism shown in my present case are of the same construction as corresponding parts in the mechanism covered by my Patent No. 665,072, granted January 1, 1901.

Pivoted at 125 to the heel of the bell-crank lever 109 is a vertically-extending bar 126, which passes up through a suitable opening in the platform 127 of the press and is provided at its upper end with a step or foot-piece 128, by which the bar 126 can be depressed for resetting the mechanism, as hereinafter explained. The hook 106 also carries a pin or screw 130, which operates in a slot 131, formed in the lower end of a link or bar 132, which is pivotally connected at its upper end 133 with the lever 89, which is freely journaled upon the rock-shaft 90, as above explained.

The operation of my improved controlling mechanism may be briefly described as follows: When the press is operating, the ratchet-wheel shaft 18 is constantly rotated through the mechanisms described, the speed-governor being in the position indicated by dotted lines in Fig. 2, the controlling cam-wheel 76 being at rest with the lever 85 in engagement with one of the depressions in its periphery, and the parts of the mechanism shown in Fig. 8 being in the position indicated in full lines in that figure. If a portion of a sheet of paper adheres to the printing-form, one of the tripping-fingers 25 will be forced inwardly to cause dog 26 to engage one of the ratchet-wheels 17. This will instantly stop the rotation of shaft 15, which will gradually stop the speed governor, the slipping of clutch 54 55 allowing the governor to run until its inertia is overcome by the frictional engagement between the clutch members. The gears 41 and 70 will continue to rotate upon their shafts until the entire press is stopped, the slipping of clutch 41 45 allowing the shaft 15 to stop without interfering with their rotation. When the speed-governor slows down and stops, the movable collar 62 forces the spring-retracted pawl or dog 72 outwardly into engagement with the ratchet-face 75 of the cam-wheel 76, causing cam-wheel 76 to be rotated with the gear 70. The instant the cam-wheel 76 rotates the lever 85 will be lifted, forcing up rod 88 and lever 89 and raising the link or bar 132 for lifting the hook 106 out of engagement with pin 108, carried by the bell-crank throw-out lever 109. The instant the bell-crank lever 109 is released from its controlling-hook the spring-actuated rod 102 will force lever 109 around on its pivot, as indicated in dotted lines in Fig. 8, and at the same time actuate the impression-cylinder throw-out mechanism so as

to insure the impression-cylinder remaining in throw-out position. At the same time that this operation takes place it will be observed that the lifting of the controlling-hook 106 also forces up the rod or bar 105, thereby moving to the left of Fig. 8 the rock-arm 91 for breaking the electric connection at the switch 97. By this means the electric circuit, including the motor of the press, is broken, and the press will accordingly immediately stop. To insure the immediate stopping of the press, a suitable braking mechanism is usually employed, in addition to the devices already referred to. This braking mechanism may be operated by the rod 112, connected to the bell-crank lever 109, or by any other suitable part of the controlling mechanism.

If the throw-out mechanism is actuated by the sheet-detecting devices connected with rod 100, it will be observed that rock-arms 91 and 92 will be moved to throw out the switch and to raise rod 105 and hook 106 for releasing throw-out lever 109 to effect the operations above described. In the operation of the mechanism from rod 100 it will be observed that pin 130 of hook 106 will move in slot 131 of rod 132, and rod 132, arm 89, rod 88, and the automatic mechanism which actuates them will not be shifted.

After the machine has been thrown out and it is desired to start it up again the lever 79 is moved by hand to shift cam 76 away from gear 70, the treadle-rod 126 is depressed for resetting the mechanism, and the switch 95 is closed. As soon as the press is started, lever 79 is again moved to shift cam 76 back into its operative position in readiness to actuate the throw-out mechanism.

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

1. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a stop-shaft, means for automatically arresting said stop-shaft, a speed-governor suitably geared to and driven by said stop-shaft, a frictional clutch interposed between the stop-shaft and speed-governor, and means operated by said speed-governor for actuating the throw-out mechanism, substantially as set forth.

2. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, means for automatically arresting the rotation of said shaft, a speed-governor, a frictional clutch mounted upon the stop-shaft and comprising a member loose upon said shaft and a member splined upon said shaft, suitable gearing between the loose member of said clutch and the speed-governor, and means operated by said speed-governor for actuating the throw-out mechanism, substantially as set forth.

3. In combination with a machine designed

to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, driving mechanism for said shaft, a frictional clutch interposed between the driving mechanism and said shaft, means for automatically arresting the rotation of said shaft, a speed-governor suitably geared to said rotary shaft, and means operated by said speed-governor for actuating the throw-out mechanism, substantially as set forth.

4. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, suitable driving mechanism for said shaft, a frictional clutch interposed between said driving mechanism and the shaft, said clutch comprising a member splined upon said shaft and a member loose upon said shaft, means for automatically arresting the rotation of said shaft, a speed-governor suitably geared to and driven by said shaft, and means operated by said speed-governor for actuating said throw-out mechanism, substantially as set forth.

5. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, suitable driving mechanism for said shaft, a frictional clutch interposed between said driving mechanism and the shaft, one member of said clutch being geared directly to the driving mechanism and loosely mounted upon said shaft and the other member of said clutch being splined to the shaft, a spring holding said clutch members in frictional contact, means for arresting the rotation of said shaft, a speed-governor suitably geared to said shaft, and means operated by the speed-governor for actuating the throw-out mechanism, substantially as set forth.

6. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, suitable driving mechanism for said shaft, a frictional clutch member loosely mounted upon said shaft and geared to the driving mechanism, a second clutch member splined to said shaft, an expansion-spring surrounding the shaft and engaging the splined clutch member, a collar secured to the shaft and confining said expansion-spring, means for arresting the rotation of said shaft, a speed-governor suitably geared to said shaft, and means operated by the speed-governor for actuating the throw-out mechanism, substantially as set forth.

7. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, suitable driving mechanism for said shaft, a frictional clutch interposed between the driving mechanism and said shaft, means for arresting the rotation of said shaft, a speed-governor suitably geared to the shaft, a frictional clutch interposed between said shaft

and the speed-governor, and means operated by said speed-governor for actuating the throw-out mechanism, substantially as set forth.

8. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, means for automatically arresting said stop-shaft, a speed-governor geared to and driven by said shaft, a normally stationary rotatable cam, means operated by said cam for actuating the throw-out mechanism, and means operated by the speed-governor for operating said cam, substantially as set forth.

9. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, means for automatically arresting said stop-shaft, a speed-governor geared to and driven by said shaft, a normally stationary rotatable cam, a rock-arm supported in peripheral contact with said cam, operative connections between said rock-arm and the throw-out mechanism, and means actuated by said governor for operating said cam, substantially as set forth.

10. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, means for automatically arresting said stop-shaft, a speed-governor geared to and driven by said shaft, a normally stationary rotatable cam, means actuated by said cam for operating the throw-out mechanism, a rotating part carrying a normally inactive device adapted to engage said cam, said cam-engaging device being arranged to be actuated by the speed-governor, substantially as set forth.

11. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, means for automatically arresting the rotation of said stop-shaft, a speed-governor suitably geared to said stop-shaft, a rotating gear-wheel, a spring-retracted pawl mounted upon said gear-wheel and adapted to be engaged by the speed-governor, a normally stationary rotatable cam formed with a ratchet-face adapted to be engaged by said pawl, and means actuated by said cam for operating the throw-off mechanism, substantially as set forth.

12. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, means for automatically arresting said stop-shaft, a speed-governor suitably geared to said stop-shaft and having a movable collar, a gear-wheel mounted to rotate on the governor-shaft, a spring-retracted pawl mounted upon said gear-wheel and supported in position to be engaged by the movable collar of the governor, means for driving said gear-wheel, a normally stationary rotatable cam formed with a ratchet-face which is adapted

to be engaged by said pawl, and means operated by said cam for actuating the throw-out mechanism, substantially as set forth.

13. In combination with a machine designed to operate upon sheets of paper, suitable throw-out mechanism for said machine, a rotary stop-shaft, a governor-shaft suitably geared to said stop-shaft, means for driving said stop-shaft, means for automatically arresting said stop-shaft, a gear loosely mounted upon the governor-shaft and driven by the stop-shaft-driving mechanism, a normally stationary rotatable cam formed with a ratchet-face, means operated by said cam for actuating the throw-out mechanism, a spring-retracted pawl mounted upon said gear-wheel in position to engage the ratchet-face of the cam, and a speed-governor mounted upon the governor-shaft and provided with a longitudinally-movable collar which is adapted to engage said pawl and force it into engagement with the ratchet-face of the cam, substantially as set forth.

14. In combination with a machine designed to operate upon sheets of paper, a throw-out lever adapted to arrest the operation of said machine, a rock-arm engaging and adapted to operate said throw-out lever, a speed-governor, means operated by the speed-governor for actuating said rock-arm, a stop-shaft suitably geared to the speed-governor, and means for automatically arresting said stop-shaft, substantially as set forth.

15. In combination with a machine designed to operate upon sheets of paper, a pivotally-mounted spring-actuated trip-lever, means connected with said trip-lever, for throwing out of operation a part of the machine, a hook or latch normally engaging and locking said trip-lever, a rock arm or lever suitably connected with said latch, a stop-shaft, ratchet-wheels upon the same, means for engaging said ratchet-wheels to arrest said stop-shaft,

a speed-governor suitably geared to said stop-shaft, and means operated by said speed-governor for actuating said rock arm or lever, substantially as set forth.

16. In combination with a machine designed to operate upon sheets of paper, a throw-out lever adapted to disconnect the power from and arrest the operation of said machine, a rock-arm engaging and adapted to operate said throw-out lever, a spring-actuated trip-lever, means, connected with said trip-lever, for throwing out of operation a part of the machine, a retaining hook or latch normally engaging and locking said trip-lever, a link connecting said hook or latch with the operating rock-arm of the throw-out lever, an operating-lever connected with said hook or latch, and automatic means for actuating said operating-lever, substantially as set forth.

17. In combination with a machine designed to operate upon sheets of paper, a throw-out lever adapted to disconnect the power from and arrest the operation of said machine, a rock-arm engaging and adapted to operate said throw-out lever, an automatically-controlled operating-rod suitably connected with said operating rock-arm of the throw-out lever, a spring-actuated trip-lever, means, connected with said trip-lever, for throwing out of operation a part of the machine, a retaining hook or latch normally engaging and locking said trip-lever, a link connecting said hook or latch with the operating rock-arm of the throw-out lever, an operating-lever, a link connected with said operating-lever and having pin-and-slot connection with said hook or latch, and automatic means for actuating said operating-lever, substantially as set forth.

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Witnesses:

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