

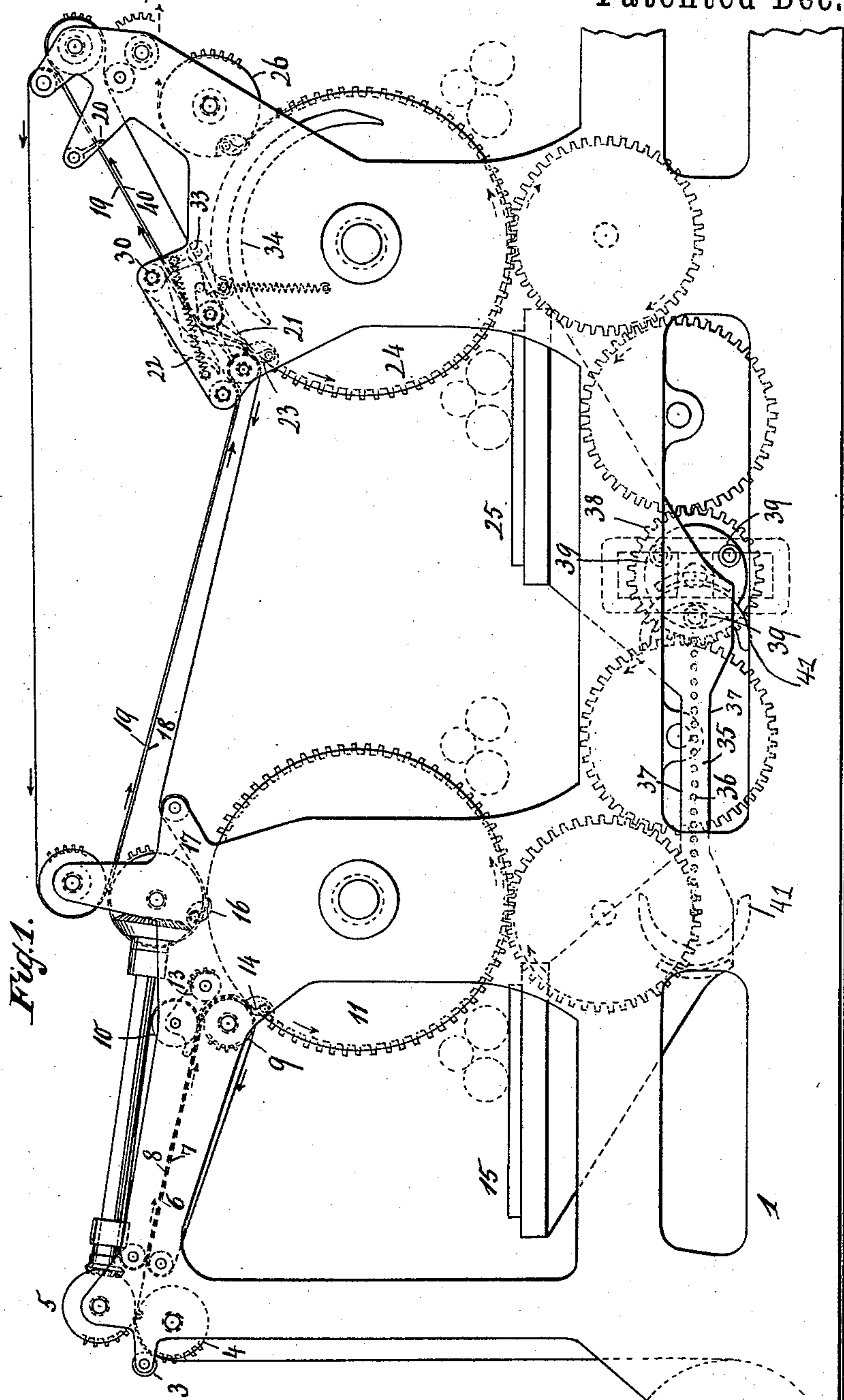
(No Model.)

3 Sheets—Sheet 1.

G. P. FENNER.  
PRINTING PRESS.

No. 572,478.

Patented Dec. 1, 1896.



WITNESSES:

*E. Wolff.*  
*Chas. E. Poensgen.*

INVENTOR

*George P. Fenner.*

BY

*Hauff & Hauff*  
ATTORNEYS

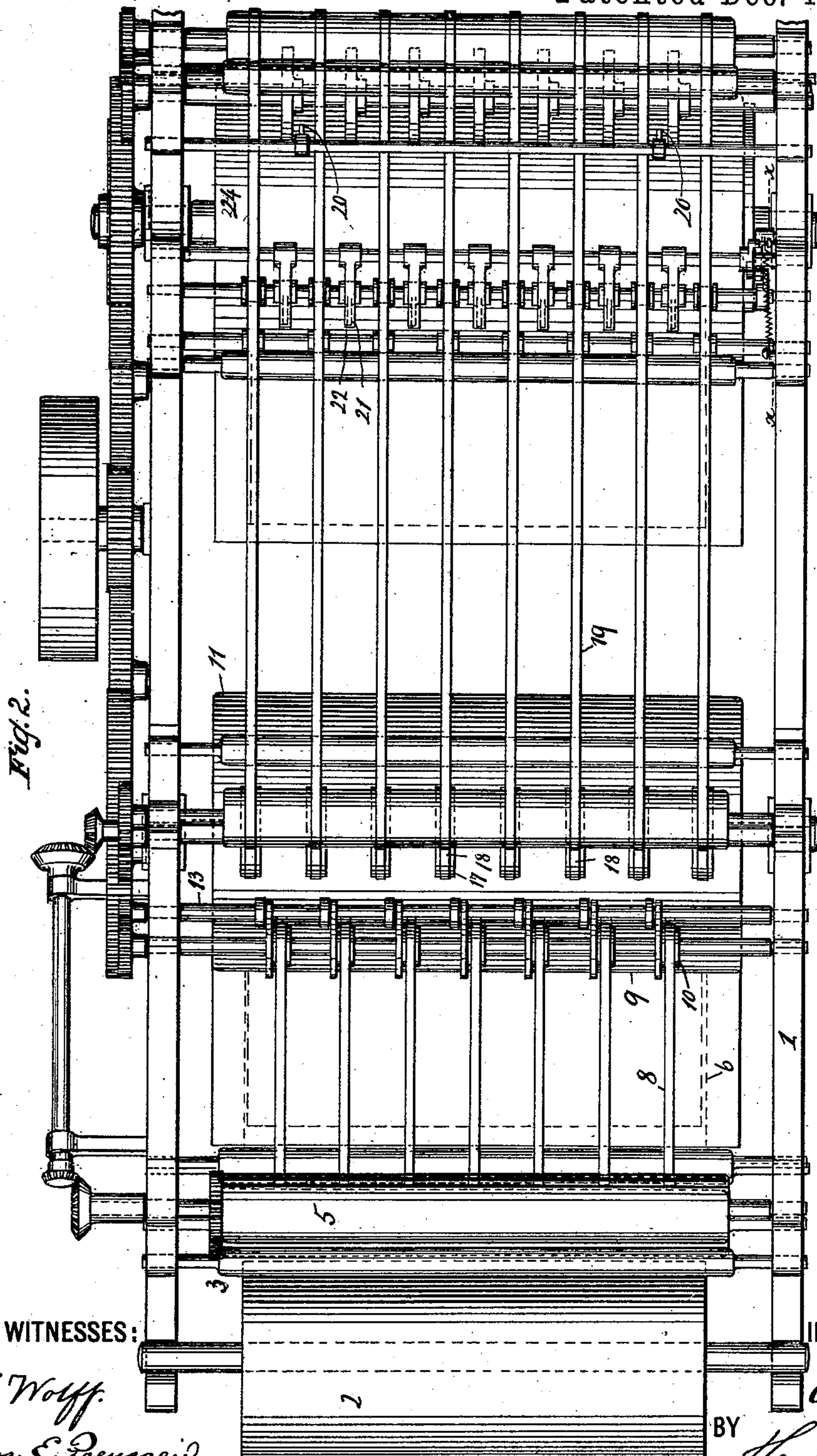
(No Model.)

3 Sheets—Sheet 2.

G. P. FENNER.  
PRINTING PRESS.

No. 572,478.

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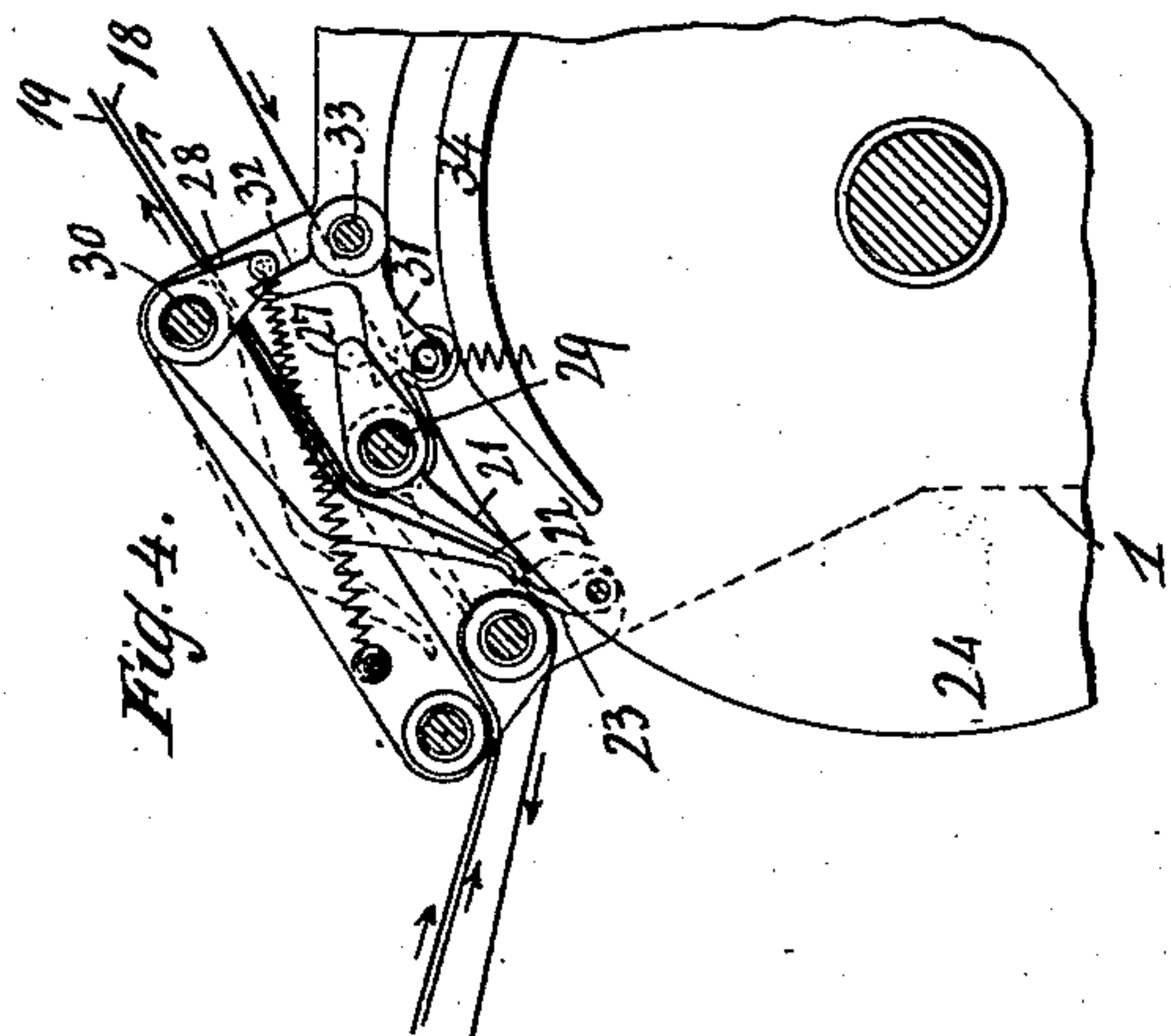
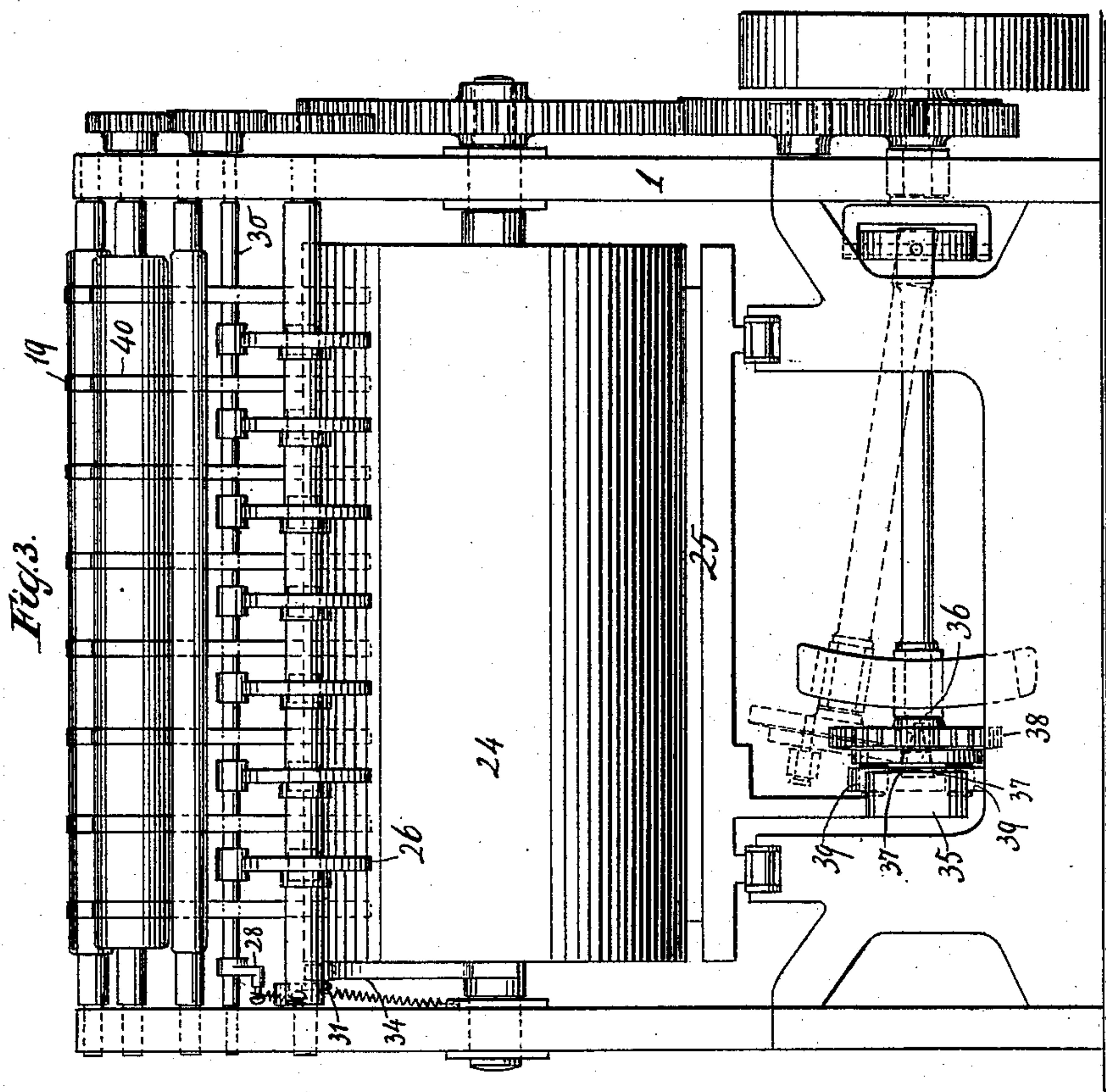
(No Model.)

3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

GEORGE P. FENNER, OF NEW LONDON, CONNECTICUT.

## PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 572,478, dated December 1, 1896.

Application filed November 21, 1895. Serial No. 569,692. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE P. FENNER, a citizen of the United States, residing at New London, in the county of New London and State of Connecticut, have invented new and useful Improvements in Printing-Presses, of which the following is a specification.

This invention resides in certain novel features of construction and operation; and it consists in the arrangement of type beds and cylinders for printing different sides of a sheet, as also in other details set forth in the following specification and claims and illustrated in the annexed drawings, in which—

Figure 1 is a side elevation of a printing-press. Fig. 2 is a plan view of Fig. 1. Fig. 3 is an end view of Fig. 1. Fig. 4 is a detail view of depressors.

The frame 1 of the machine is shown as supporting a roll 2, from which or from any suitable supply is drawn off the paper or strip for the sheets to be printed. The feed-rollers 3 and 4 draw off from the supply 2, and one of said rollers 4 operates in connection with roller 5 to cut off a sheet 6 from the strip or supply. The rollers 4 and 5 do not entirely cut off the sheet, but make a partial cut, or preferably a line of perforations, along the boundary or edge where the sheet is subsequently severed off from the supply. The sheet thus partly severed or cut off passes along between two sets of tapes or carriers 7 and 8 in the direction of rollers 9 and 10.

The roller 3 serves to keep the paper or supply moving in the right direction after the perforation or partial cutting has taken place and prevents the weight of the roll or supply 2 from tearing the strip at the perforations and during the process of perforation. As the sheet passes along between the tapes 7 and 8 on rollers 9 and 10 the leading edge of the sheet, which can also be distinguished as the "head," is caught between said rollers 9 and 10, said rollers 9 and 10 forming what may be called "supplemental feed-rollers" and moving faster than the rollers 3 and 4 or faster than the strip or supply being fed by said rollers 3 and 4. These rollers 9 and 10 have the same superficial velocity as the surface of the impression-cylinder 11. This increased speed of rollers 9 and 10 as compared with the speed of rollers 3 and 4 causes the sheet

to be torn off at the proper moment along the cut or perforations, the head of the sheet being led by curved fingers or guides about roller 9. The sheet is also assisted in passing about roller 9 by the roller 13. The head of the sheet coming between roller 9 and impression-cylinder 11 is grasped by the grippers 14 of said cylinder and carried about to be printed on one side by contact with the type on bed 15. After being printed the sheet continues its travel and is grasped by grippers 16 on delivery-roller 17 and carried along and released, so as to be allowed to pass off between the tapes or carriers 18 and 19. The sheet continues its travel or forward motion, passing from tapes 18 to tapes 40 until its head or leading edge is stopped by contact with the fingers 20, the sheet being thus held or arrested for a moment, or long enough to bring it into perfect position between tapes 19 and 40 in case said sheet should have lost its position or shifted in any manner in its passage or travel.

While the head of the sheet rests against the fingers or stops 20 the tail of the sheet is forced by fingers or depressors 21 and 22 into position for engagement by the grippers 23 on the impression-cylinder 24. The tail of the sheet being grasped or engaged by cylinder 24, said sheet is drawn back out of or away from the tapes 19 and 40 and carried about cylinder 24 to have another side printed by the type on bed 25. The sheet thus printed on different sides is taken off cylinder 24 by grippers or by the delivery 26, whence it passes off to a folder or for such disposition as may be desired. The sheet is thus printed on different sides by the impression-cylinders 11 and 24. These cylinders are shown traveling in the same direction. By using single-revolution cylinders the operation can be rapidly carried on. The type-beds 15 and 25 are also shown traveling in the same direction. A simple construction is obtained by using one common driving mechanism for the parts.

The fingers 21 and 22 are separated while the sheet is passing through between them. These fingers, as seen in Fig. 4, form parts of levers 21 27 and 22 28, respectively fulcrumed at 29 and 30 to suitable arms or parts of the supporting-frame. A lever 31 32 is fulcrumed at 33. As the cylinder 24 rotates the



cam or rim 34 thereon engages lever-arm 31, so that said arm actuates lever 27 21, while lever-arm 32 actuates lever 28 22, so as to cause the arms or fingers 21 and 22 to suitably dip for bringing the sheet-tail to engagement by gripper 23.

The type-beds 15 and 25 are made to travel in unison, being both connected to or actuated by a bar 35, which, as seen in Fig. 3, has teeth 36 projecting from a tooth-base or ridge 37, running along or extending from a side of bar 35, said bar 35, with teeth 36 and tooth-base 37, forming a rack with laterally-projecting teeth. The gear-wheel 38 has projecting from its outer or free side the roller-studs 39. This gear-wheel 38 engages the teeth 36 and has the usual oscillating or up-and-down motion, so as to alternately lie above and below the teeth 36 to cause the rack 35 36 37 to travel back and forth while the gear continues to rotate in the same direction. This gear is provided with a plurality of studs or anti-friction-collars, three studs 39 being shown in the drawing Fig. 1. By having the gear provided with three rollers 39, said gear being of such size as to make two-thirds of a revolution while traveling from one end of the rack to the other, a comparatively large rack-gear can be applied, allowing a proportionately long time for stopping and starting the bed, the gear making half a revolution as the studs 39 pass about the end or part 41 of the rack. In addition the wear is distributed over a plurality of rollers 39.

The carriers or tapes 18 and 40, it may be noted, are suitably spaced or separated so that when the sheet abutting against stops 20 rests on the carriers 40 the tail of said sheet is free to be depressed by fingers 21 and 22 into the space or break between the carriers 18 and 40, such depression or bending of the sheet-tail enabling the grippers 23 to engage such sheet.

What I claim as new, and desire to secure by Letters Patent, is—

1. A press provided with feeding-rollers, impression-cylinders and type-beds respectively made to print different sides of the sheet, a delivery-roller and carriers for moving the sheet from one cylinder toward another, a stop for arresting the sheet and fingers or pressers made to move an edge of said sheet into engagement with the second impression-cylinder substantially as described.

2. A press provided with feeding-rollers and with a cutting or perforating roller with which one of said feeding-rollers is made to cooperate, combined with supplemental feed-rollers adapted to tear off the sheet at the place of cutting or perforation, impression-cylinders and type-beds respectively made to print different sides of the sheet, a delivery-roller and carriers for moving the sheet from one cylinder toward another, a stop for arresting the sheet, and fingers or pressers made to move an edge of said sheet into engagement with

the second impression-cylinder substantially as described.

3. A printing-press comprising two type-beds, combined with two impression-cylinders, a conveyer or carrier for taking a sheet from one cylinder to another, and fingers or pressers normally separated to allow a sheet to pass therebetween, and mechanism substantially as described to actuate said fingers and move the sheets into engagement with the second impression-cylinder substantially as described.

4. The combination in a printing-press, of type-beds, with two impression-cylinders, the first one of which is made to grasp the leading end or head of the sheet, and devices actuated by the second impression-cylinder for causing the tail end of the sheet to be engaged by said second impression-cylinder to reverse the direction of travel of the sheet, substantially as described.

5. A printing-press, comprising two impression-cylinders, one of which is made to grasp the leading end or head of the sheet while the other, or second impression-cylinder, is made to grasp the tail of the sheet to reverse the direction of travel thereof, combined with type-beds and fingers or pressers actuated by the second impression-cylinder and made to move the tail of the sheet into engagement with said second impression-cylinder, substantially as described.

6. A press provided with feeding-rollers and with a cutting or perforating roller with which one of said feeding-rollers is made to cooperate, combined with supplemental feed-rollers adapted to tear off the sheet at the place of cutting or perforation, tapes or carriers between the feeding-rollers and the supplemental feeding-rollers, impression-cylinders and type-beds respectively made to print different sides of the sheet, a delivery-roller and carriers for moving the sheet from one cylinder toward another, a stop for arresting the sheet, and fingers or pressers made to move an edge of said sheet into engagement with the second impression-cylinder, substantially as described.

7. A press provided with feeding-rollers, impression-cylinders and type-beds respectively made to print different sides of the sheet, carriers for moving the sheet from one cylinder to another, stop-fingers for arresting the sheet, and fingers or pressers made to move an edge of the sheet to engaging position by said second impression-cylinder, said stop-fingers being aligned so as to bring the sheet into adjustment for proper engagement by said second impression-cylinder substantially as described.

8. A printing-press for printing different sides of a sheet comprising a pair of printing-surfaces one of which is made to hold the sheet at its head while passing between said surfaces, and then to release said sheet, combined with a second pair of printing-sur-



faces, carriers made to convey the sheet past said second pair of printing-surfaces until the tail of said sheet is in position to be grasped by one of said last-named surfaces, one of said last-named surfaces being made to grasp the tail of the sheet for moving said sheet between said last-named surfaces in the reverse direction to that in which said sheet arrived at said second pair of surfaces substantially as described.

9. A press provided with feeding-rollers, impression-cylinders and type-beds respectively made to print different sides of the sheet, carriers for moving the sheet from one cylinder to another, stop-fingers for arresting the sheet, and fingers or pressers made to move an edge of the sheet to engaging position by said second impression-cylinder, said fingers being made to form parts of levers and said second impression-cylinder being provided with a cam for actuating said finger-levers substantially as described.

10. A press provided with impression-cylinders and type-beds, respectively made to print different sides of the sheet, carriers for moving the sheet from one cylinder to an-

other, and fingers or pressers actuated by the second impression-cylinder and made to move one edge of the sheet into engagement with said second impression-cylinder, said carriers being spaced or interrupted to leave the edge of the sheet free for actuation by the fingers or pressers, substantially as described.

11. A printing-press comprising two impression-cylinders, one of which is made to grasp the leading end or head of the sheet, the second impression-cylinder being made to grasp the tail of the sheet and reverse the latter, combined with type-beds and with fingers or pressers made to move said sheet-tail into engagement by said second impression-cylinder, and stationary supports or pivots for said fingers or pressers, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE P. FENNER.

Witnesses:

WALTER E. SPICER,  
CARLOS G. CHAMPLIN.