No. 626,076. Patented May 30, 1899.

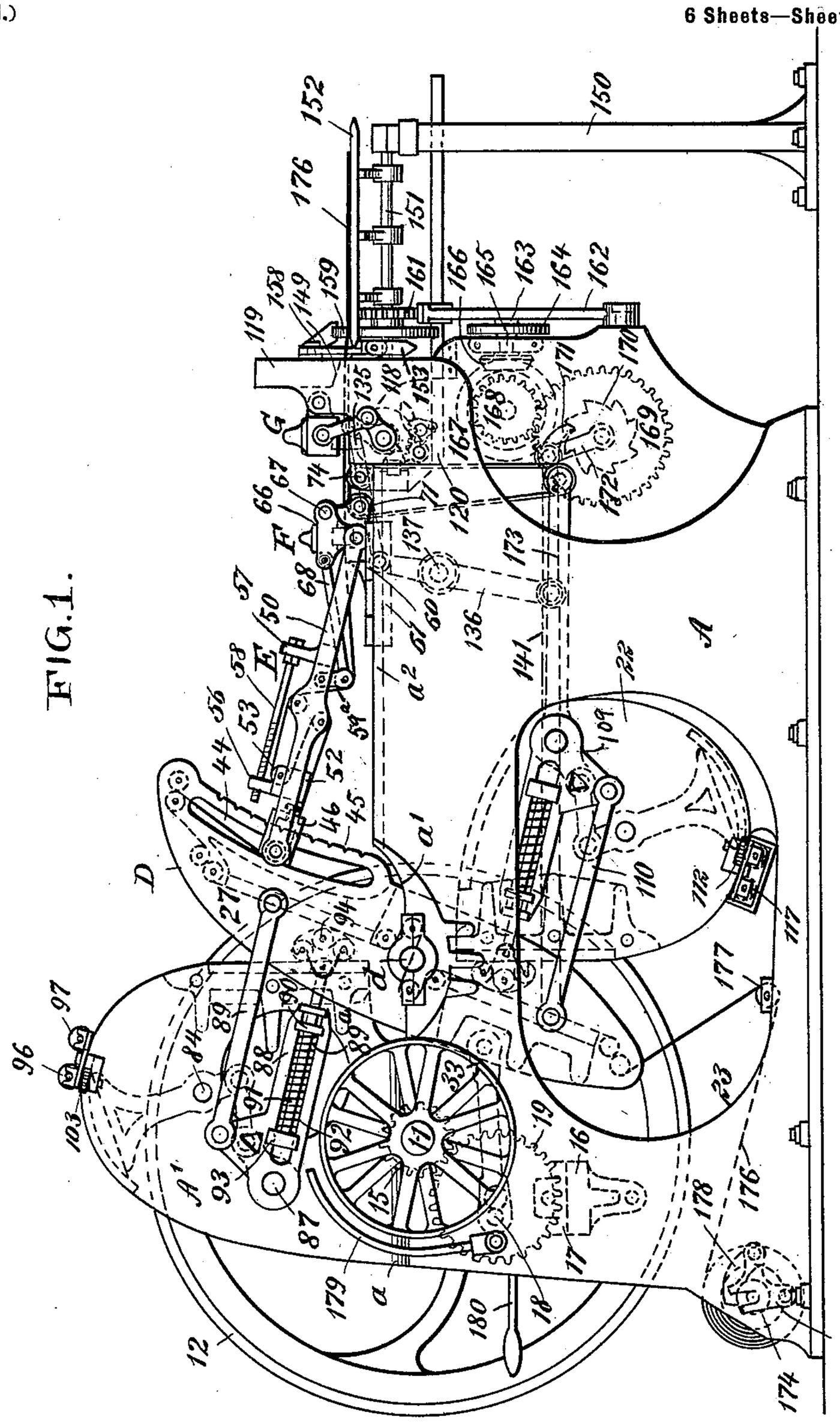
J. C. MOLLOY.

PRINTING PRESS.

(Application filed Sept. 29, 1898.)

(No Model.) 6 Sheets—Sheet 1.

FIG. 1.



WITNESSES:

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J. Fred Acker.

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John C. Molloy.

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Munn & Co.

ATTORNEYS.

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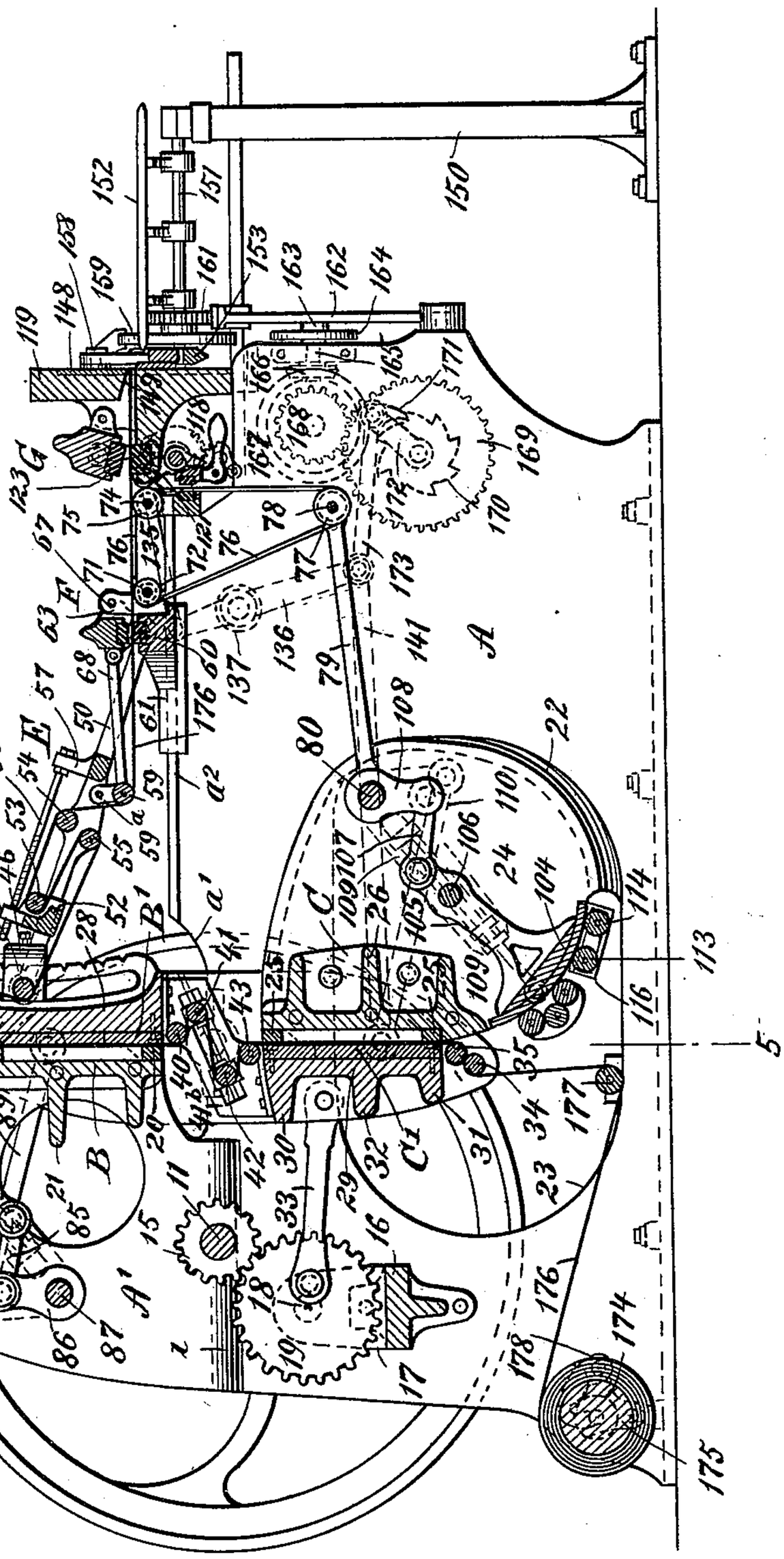
(No Model.) 6 Sheets—Sheet 2.

FIG. 2.



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(No Model.)

6 Sheets—Sheet 3.

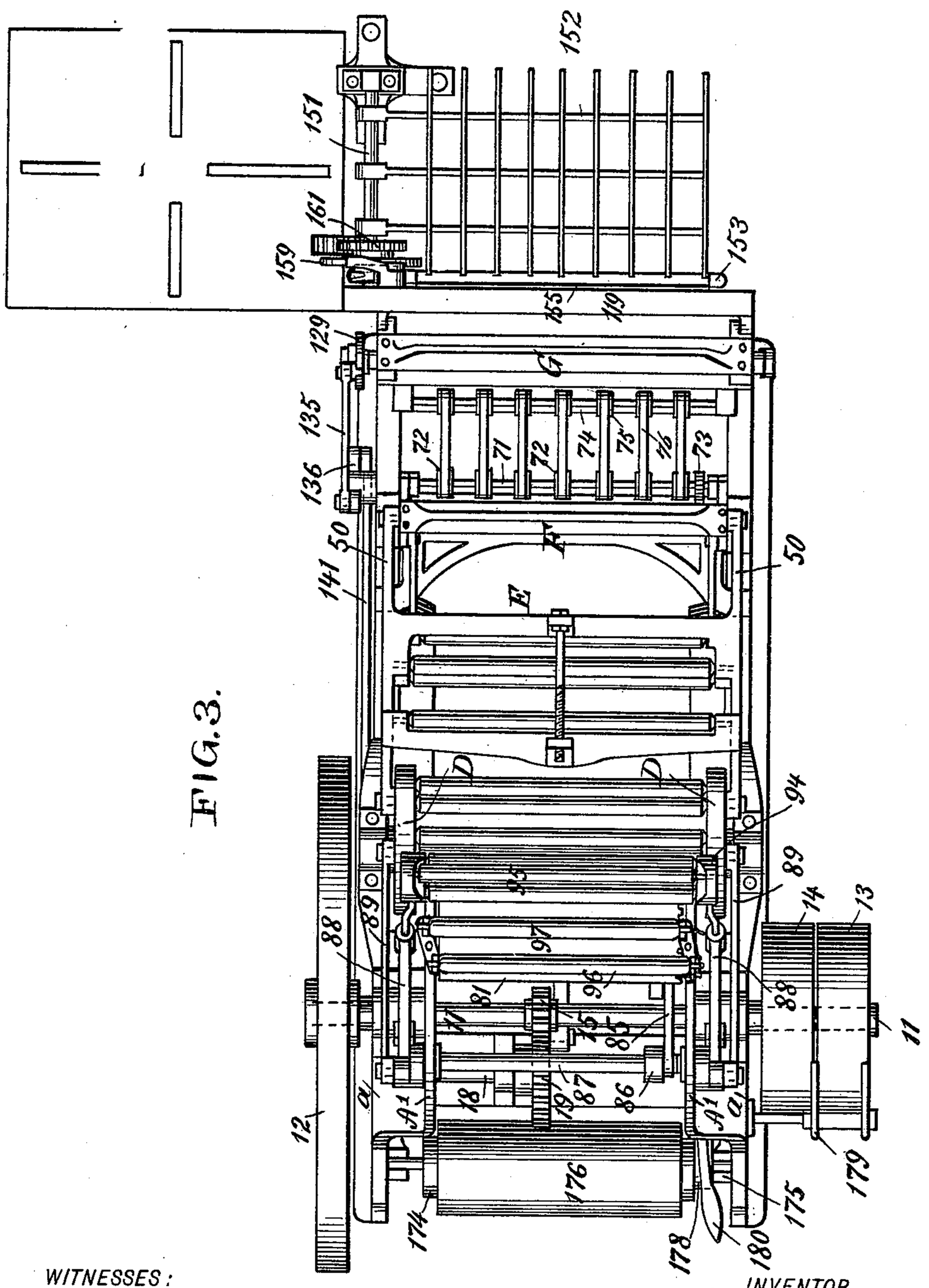

FIG. 3.

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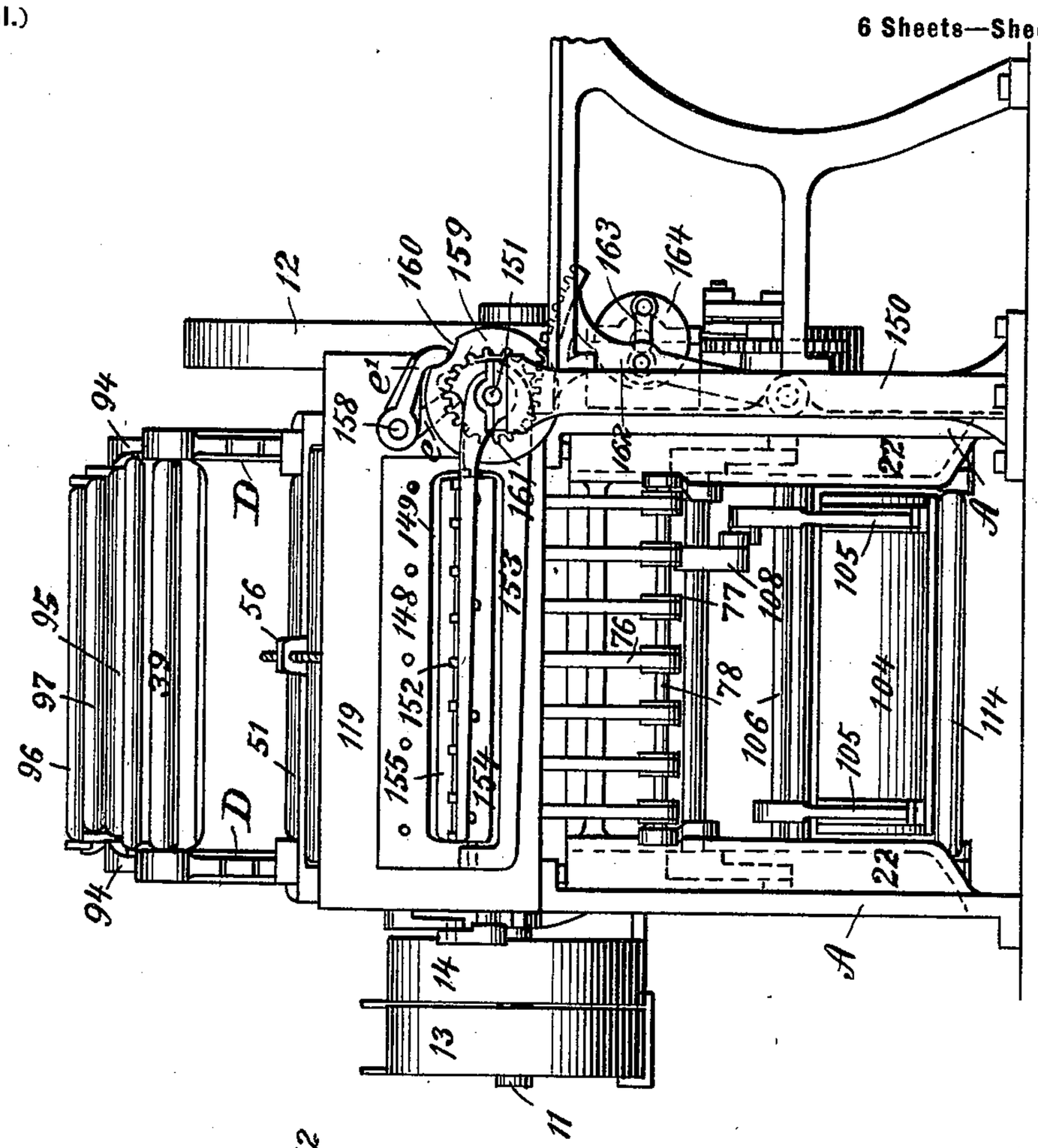
PRINTING PRESS.

(Application filed Sept. 29, 1898.)

(No Model.)

6 Sheets—Sheet 4.

FIG. 4.



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(Application filed Sept. 29, 1898.)

(No Model.) 6 Sheets—Sheet 5.

FIG. 6.

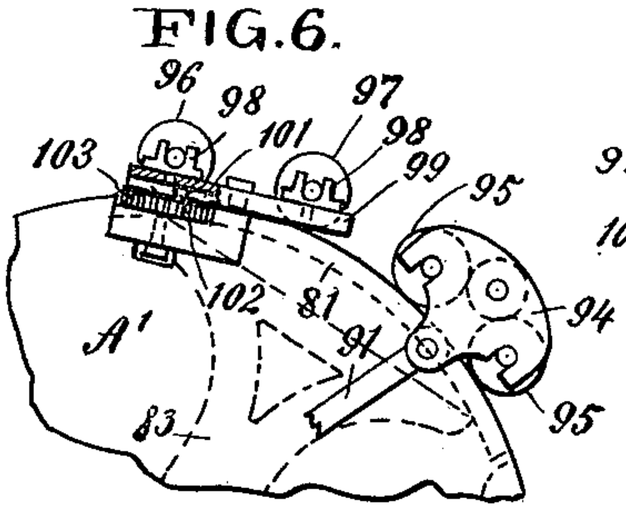


FIG. 7.

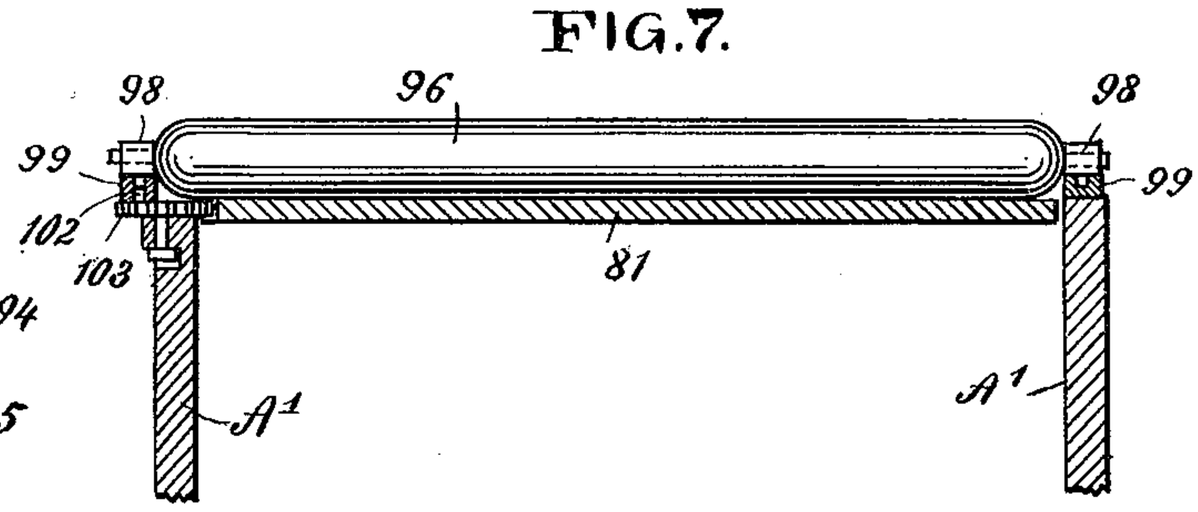


FIG. 8.

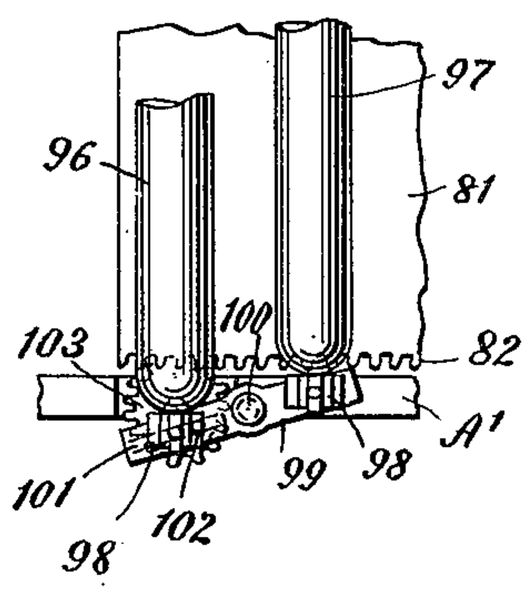


FIG. 9.

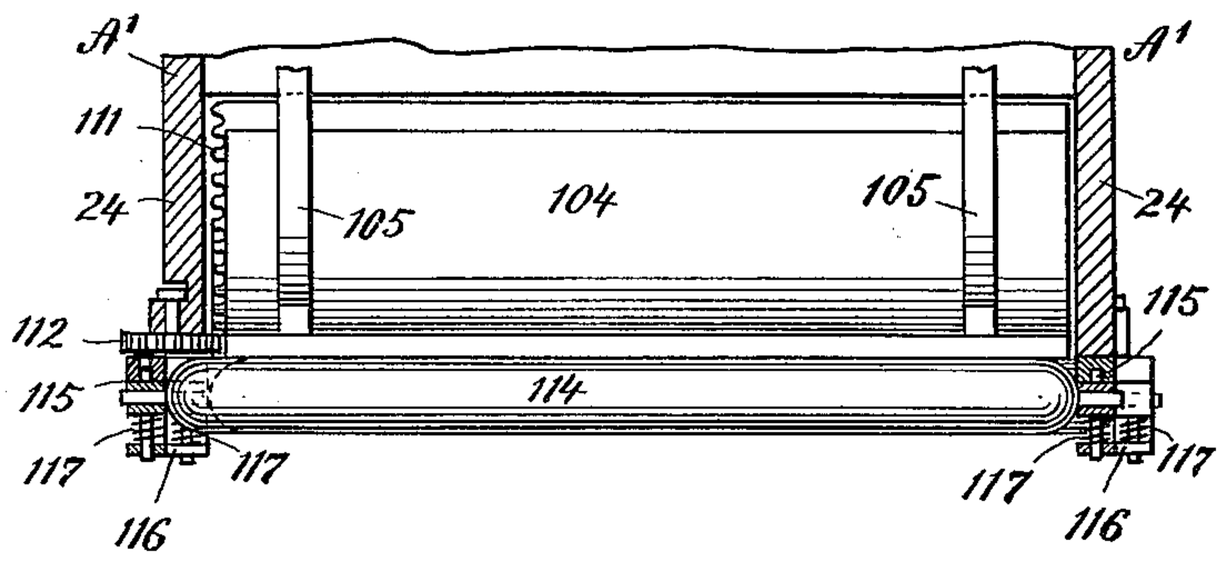


FIG. 10.

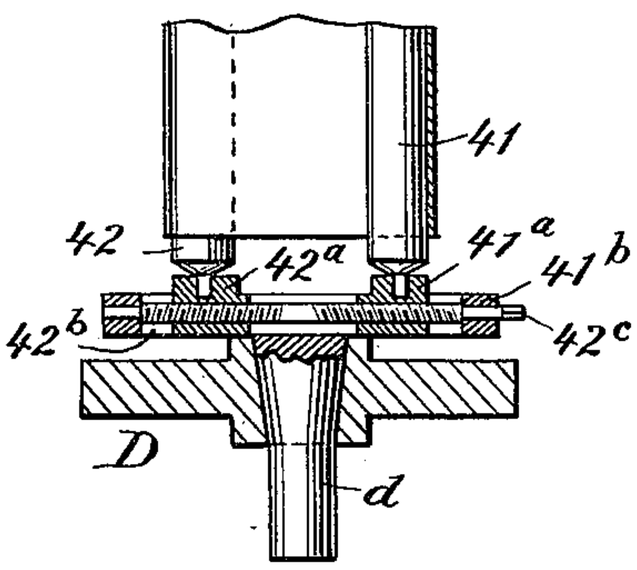


FIG. 11.

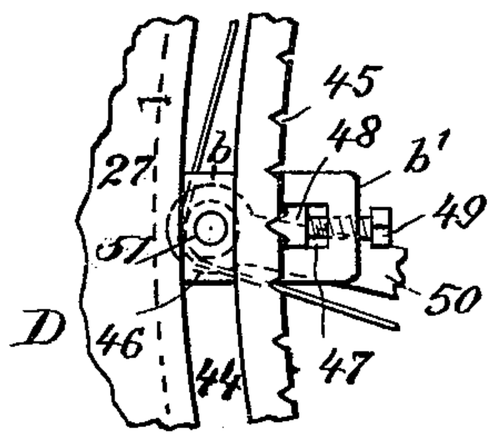
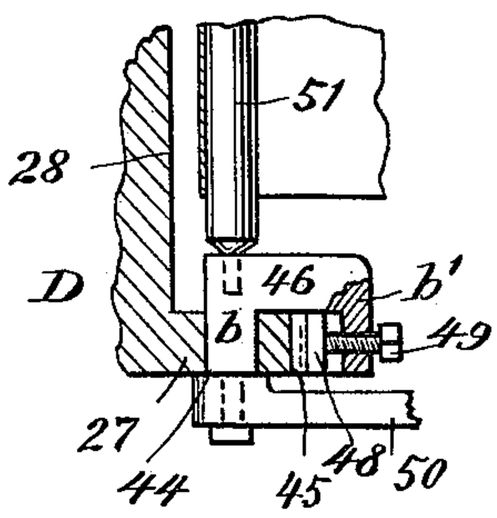


FIG. 12.



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No. 626,076. Patented May 30, 1899.

J. C. MOLLOY.

PRINTING PRESS.

(Application filed Sept. 29, 1898.)

(No Model.) 6 Sheets—Sheet 6.

FIG. 13.

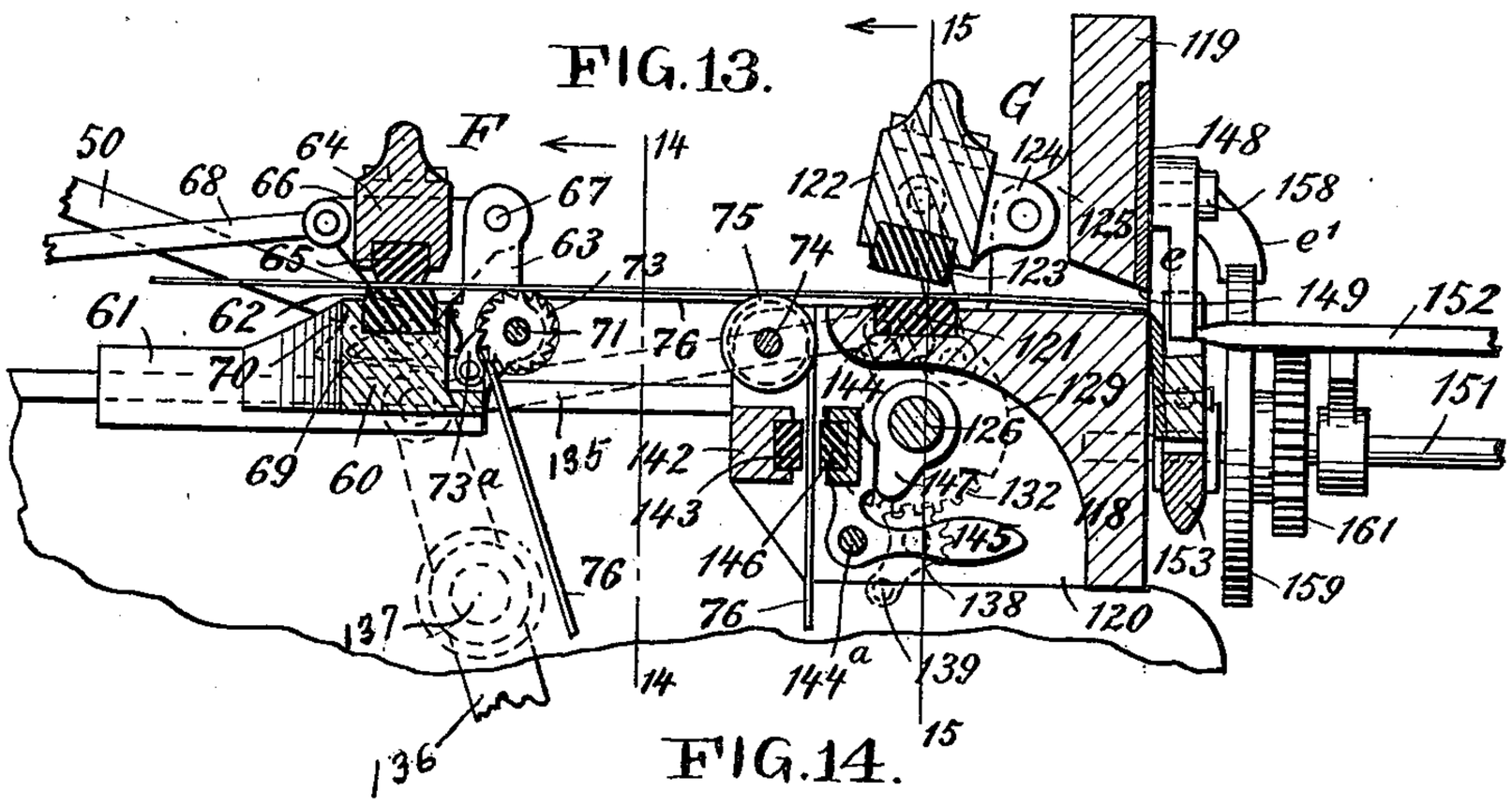


FIG. 14.

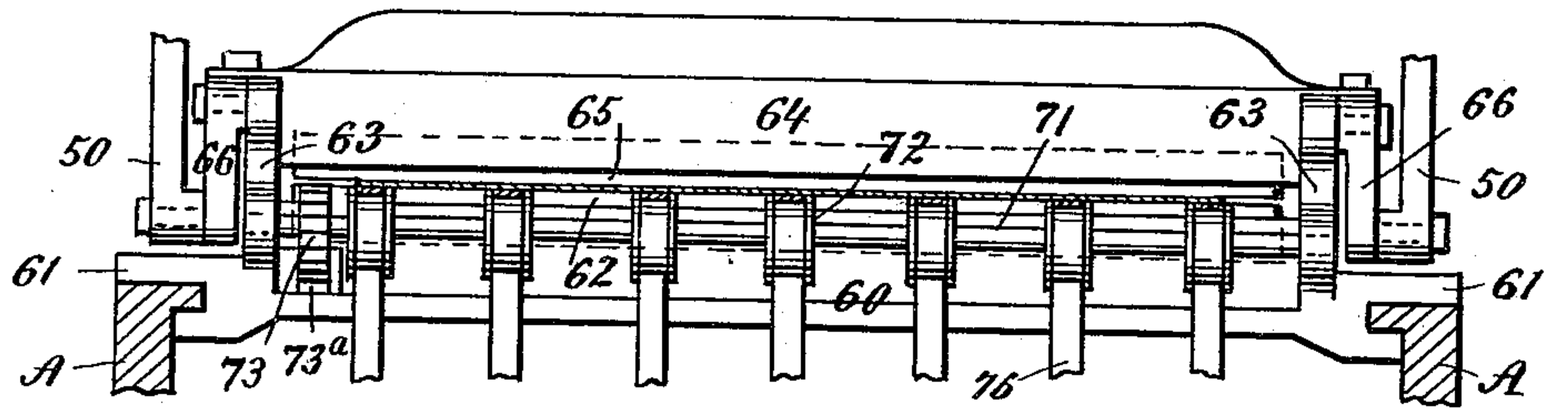
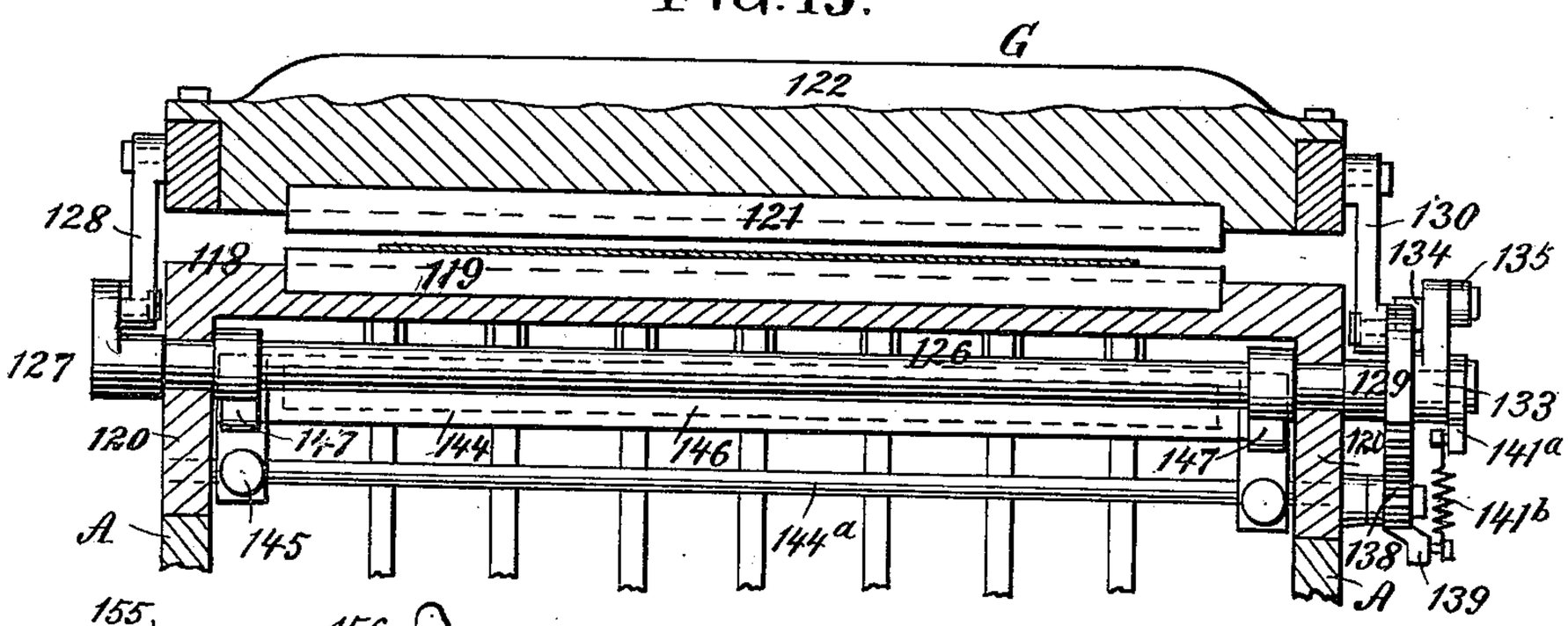


FIG. 15.



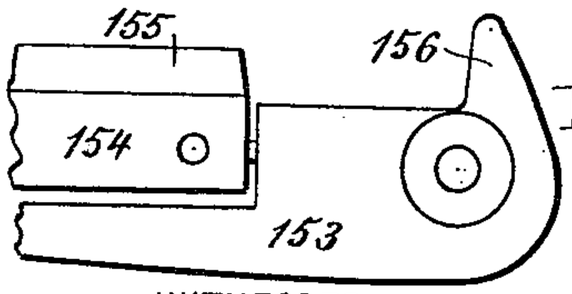


FIG. 17.

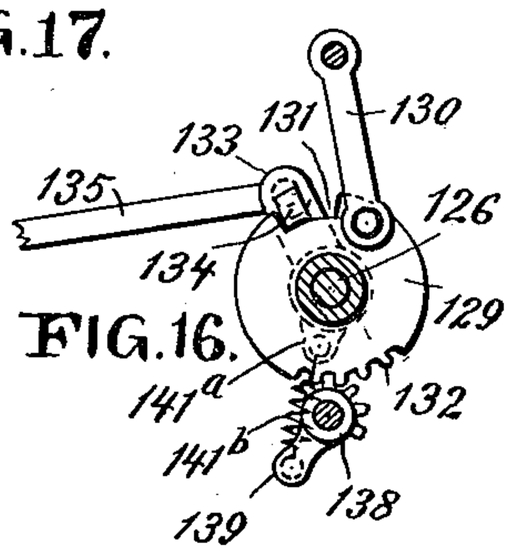


FIG. 16.

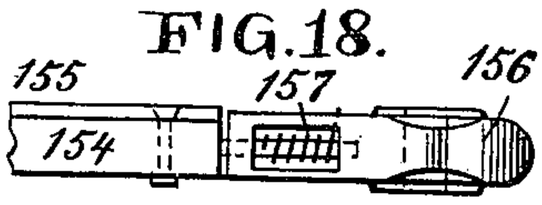


FIG. 18.

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ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN CHRISTOPHER MOLLOY, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-FOURTH TO CORNEAL J. McWILLIAMS, OF SAME PLACE.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 626,076, dated May 30, 1899.

Application filed September 29, 1898. Serial No. 692,166. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHRISTOPHER MOLLOY, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Printing-Presses, of which the following is a full, clear, and exact description.

My invention relates particularly to improvements in job-printing presses; and the object of the invention is to simplify such presses and, furthermore, to so construct a press that a sheet or circular can be simultaneously printed upon opposite sides and whereby the feed of the paper from a continuous roll may be regulated to suit any size of sheet that may require to be printed, the sheet after leaving one form and being printed on one side being automatically delivered to the second form, which will print upon the opposite side of the sheet, and while the second impression on the first sheet is being made the first impression on a second sheet is simultaneously made.

A further object of the invention is to provide a simple, durable, and economic device for feeding the printed sheets at proper stages to the cutting device, means being provided for adjusting said feed, as may be demanded by the length or size of the sheet to be printed.

Another object of the invention is to provide for independent inking devices for each of the chases and, furthermore, to provide a means whereby all of the mechanism will be operated from a single driving-shaft.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the left-hand side of the improved press. Fig. 2 is a longitudinal vertical section through the improved press. Fig. 3 is a plan view of the press. Fig. 4 is a front elevation of the press. Fig. 5 is a transverse vertical section taken substantially on the line 5 5 of Fig. 2. Fig. 6 is an enlarged detail end view of the inking mechanism for the upper chase of the press. Fig. 7 is a longitudinal section through the ink-distributing rollers shown in Fig. 6. Fig. 8 is a plan view of one end of the ink-distributing rollers shown in Fig. 6, illustrating the end movement of said rollers. Fig. 9 is a detail sectional view of the lower inking device adapted for use in connection with the lower chase. Fig. 10 is a detail sectional view of one end of the directing-rollers located on the carriage between the chases, illustrating one manner in which the said directing-rollers may be adjusted. Fig. 11 is an enlarged detail view of a portion of the side of the carriage, illustrating the manner in which the feed mechanism for the printed sheet is connected with the carriage. Fig. 12 is a plan view of that portion of the device shown in Fig. 11. Fig. 13 is an enlarged vertical longitudinal section through the two clamps and cutting device for the press, the forward clamp being shown as closed and in position to feed the paper rearward, while the rear clamp is shown as open. Fig. 14 is a transverse section taken practically on the line 14 14 of Fig. 13 looking in direction of the arrow. Fig. 15 is a transverse section taken practically on the line 15 15 of Fig. 13 looking in the same direction as in the section shown in Fig. 14, and Figs. 16, 17, and 18 are detail views of minor portions of the press.

The frame of the machine consists, primarily, of two side pieces A, which are bolted in any desired manner to a base of any desired construction. Each side piece at its forward end is provided with an upright section or extension A′, the uprights A′ extending inward from the main side pieces, so that the inner faces of the uprights are beyond the plane of the inner faces of the main side pieces, as shown at *a* in Figs. 1, 2, and 3. Boxes 10 are located upon the depressed portions *a* of the frame, and in the said boxes the main drive-shaft 11 is journaled, the said drive-shaft being provided at one end with a balance-wheel 12 and at its opposite end with fast and loose pulleys 13 and 14, as is particularly shown in Figs. 4 and 5. A pinion 15 is secured upon the drive-shaft 11 within the said frame, and below the drive-shaft the frame is connected by a cross-bar 16, upon which a bearing 17 is formed, in which is

journaled a short shaft 18, said shaft extending likewise to one side of the frame, and on this shaft a gear 19 is secured, which meshes with the aforesaid pinion 15, as shown in Fig. 2.

Each side piece of the frame is provided with a concaved surface a' near its extension A', and a plain track a^2 is formed at the upper edge of each side piece extending from the concavity a' to a point near the rear end of each side piece, as shown also in Figs. 1 and 2. The upper portions of the extensions A' are more or less rounded or cylindrical, and at the rear of the extensions the said extensions are connected by a bed B, adapted to receive a chase 20, and the said chase is held in position by blocks or lugs 20^a, as shown in Fig. 5, and a suitable latch 20^b. (Shown in the same figure.) The back portion of the bed 20 is preferably strengthened by any suitable number of ribs 21.

In each side piece a depression 22 is formed, and the forward portion 23 of the said depression is open, as shown in Figs. 1 and 2, while the rear portion 24 of the depression is cylindrical or rounded at its lower surface or that portion which faces the opening 23, and a part of the depressed portion 24 usually extends upward adjacent to the inner faces of the sides A. The front edge of the depressed section 24 in each side piece is straight, and the two depressed sections are connected at their straight edges by a bed C, adapted to hold a chase 25, which chase may be secured to its bed in like manner as the chase 20. The surface of the upper bed B that receives the chase faces the rear of the machine, while the corresponding surface of the lower bed C faces the forward end of the machine, and the lower bed is likewise strengthened at its back by suitable ribs 26. While both of the beds B and C are vertical, they are not in vertical alinement, as is particularly shown in Fig. 2.

A carriage D is pivoted by means of suitable pivot-pins d in boxes located at the upper recessed portions a' of the side pieces, as illustrated in Fig. 1. The carriage consists, preferably, of two side pieces 27, which at the top are curved upwardly and rearwardly, while at the bottom the said side pieces are curved downwardly and forwardly. The upper portions of the side pieces are connected by a vertical partition 28, which partition is preferably provided with a concaved rear face, and upon the forward face of the partition 28 a platen B' is removably attached through the medium of screws or otherwise, as shown in Figs. 2 and 5. The platen B' when the carriage is in printing position is adapted to be brought closely against the chase 20 in the upper bed B. At the lower portion of the carriage D the side pieces are connected by by a second partition 29, preferably provided with ribs 30, 31, and 32 upon its back, and this latter partition is connected by a pitman 33 with the said gear 19, receiving motion from the drive-shaft 11. The rear face of the lower partition 29 is adapted to receive a platen C', which when the carriage is in printing position will be brought closely to the lower chase C, as shown in Fig. 2. Guide or tension rollers are likewise provided in the carriage, two of said rollers 34 and 35 being located one above the other below the lower platen, while two sets of rollers are located above the upper platen, one set of rollers 36 and 37 being located one above the other adjacent to the upper edge of the platen, while the rollers 38 and 39 of the other set are more horizontally located, as shown in Fig. 2. Two sets of directing-rollers are located between the two platens, two of the rollers 40 and 41 being located below the upper platen B', while the other two rollers 42 and 43 are located above the lower platen C'. The roller 41 of one set and the roller 42 of the other set of directing-rollers are made adjustable, so that the paper will pass between the adjusting-rollers in such length as to insure that portion of the sheet receiving an impression at the lower chase being brought in proper registry to receive an impression upon its opposite side at the upper chase. The adjustment of these rollers is shown in detail in Fig. 10, in which it will be observed that the rollers are journaled in boxes 42^a and 41^a, the said boxes being made to slide in a slot 42^b, formed in a plate 41^b, one of which plates is secured to the inner face of each side of the carriage and upon the upper surface of the lower partition 29, and the adjustment of the rollers is accomplished through the medium of a screw 42^c, held to turn in the plate 41^b, the screw being provided with a right and with a left hand threaded surface, one threaded surface passing through the journal-box of one roller and the oppositely-threaded surface being passed through the journal-box of the opposing roller. Under this construction it is evident that a quick adjustment for the feed of the paper from one chase to the other may be expeditiously and readily accomplished.

A curved slot 44 is longitudinally made in the upper edge of each side piece 27 of the carriage, near its rear edge, and the rear edges of the slotted portions of the carriage are provided with notches 45, as shown in Fig. 2. The slots 44 are adapted to receive adjusting-blocks 46, the said adjusting-blocks being adapted to regulate the throw of feed and tension devices, to be hereinafter described and particularly adapted to carry the printed sheets from the carriage to the cutters of the press. These blocks are of peculiar construction and are shown best in Figs. 11 and 12, in which it will be observed that each block is substantially U-shaped, one member, b, extending outwardly through the slot 44, while the other member, b', extends across the notched surface of the carriage adjacent to the slot. The member b' is provided with a recess 47 in its inner or forward edge, and an adjusting-screw 49 is carried through the member b' into the recess 47, where it is swiv-

eled to a head 48, held to slide in the recess 47, the said head being provided with a spur adapted to enter any of the notches 45. The side arms 50 of the feed mechanism are pivotally attached to the outer ends of the members *b* of the blocks. A tension-roller 51 is journaled in the blocks 46, as shown in Figs. 2 and 11.

The tension and feed device for carrying the printed sheets from the impression portion of the press to the cutting device is designated as E and comprises, as heretofore stated, the side arms 50, attached to the adjusting-blocks 46, upon which arms is held to slide adjacent to the carrier a bar 52, and the said bar 52 carries a roller 53, the roller being slightly above the arms 50. The central portion of the arms 50 is enlarged, and two rollers 54 and 55 are journaled one above the other at the enlarged portions, as is also shown in Fig. 2. The sliding bar 52 is provided with an upwardly-extending member 56 at its center, and a corresponding member is formed upon a bar 57, located between the center of the arms 50 and their rear ends. The projection from the bar 57 is adapted to receive the unthreaded end of a screw 58, the threaded portion of the screw being made to pass through a suitable opening in the projection 56 from the sliding bar 52. Through the medium of the said screw 58 the sliding bar may be carried toward or from the center of the arms 50 of the feed mechanism E, so as to increase or decrease the distance between the guide-rollers 53 and 54, in order that the feed of the sheets to the cutting device may be regulated according to the length of the printed sheets. A feed-roller 59 is provided for the feed device E, and this roller is located below the lower edges of the side arms 50, the roller 59 being fulcrumed in links 59^a, which are pivotally attached to the said side arms 50 of the feed device in front of the fixed cross-bar 57, as is also shown in Fig. 2. The object of pivotally suspending the roller 59 from the side arms 50 is to take up the slack of the paper during the movement of the arms.

The feed device E is employed in connection with a clamp F, which clamp is adapted to receive the paper and at the rearward movement of the carrier D carry the said paper or sheets in direction of the cutting device. This clamp F is shown in Figs. 1, 2, 13, and 14, and it consists of a bottom bar 60, which extends from side to side of the frame of the press, and the said bottom bar is provided at each end with a shoe 61, angular in cross-section, the said shoes being adapted to slide upon the tracks a^2 at the upper portion of the sides of the frame, a portion of each shoe extending downwardly at the inner faces of the side pieces and the second portion of the shoes extending over the upper or track surfaces of the said side pieces, as is clearly shown in Fig. 14, in which, however, the track-surfaces of the side pieces are shown to extend beyond the inner faces of the sides of the frame and the members of the shoes are so constructed as to receive between them the aforesaid projecting portions.

The base-bar of the clamp F is made to receive an elastic or yielding substance 62, which may be smooth upon its upper face or corrugated, as desired, and near each end of the bottom bar of the said clamp F an upwardly-extending arm 63 is formed at the rear edge of the said bottom bar, as shown in Figs. 2, 13, and 14. An upper bar 64 is provided for the said clamp F, and in the bottom portion of the upper bar an elastic or yielding substance 65 is located, adapted to face and when the machine is not in use to engage with the bottom yielding surface 62 of the clamp. The upper yielding surface 65 is usually of less width than the lower yielding surface, and the upper cross-bar 64 of the clamp is secured at each of its ends to a triangular head-plate 66, the contracted portions of which plates extend downward, and the said head-plates 66 at their upper rear ends are pivotally connected with the said arms 63 through the medium of suitable pivots 67, whereas the upper forward portions of the said head-plates are pivotally connected with connecting-bars 68, which bars are in their turn pivotally attached to the links 59^a, carrying the pendent roller 59, belonging to the feed device E, as shown particularly in Fig. 2. The lower apex-sections of the triangular heads are pivotally attached to the rear ends of the side arms 50 of the tension and feed device.

In order that the movement of the upper member of the clamp F may be limited, a nose 69 is formed at the lower forward edge of each head-bar 66, as shown in dotted lines in Fig. 13, and each nose 69 is adapted when the upper member of the clamp is carried to its upper position to engage with a limiting-wall of lugs 70, formed upon the shoes 61 for the said clamp. In order that the paper or sheets may be supported between the clamp F and a second and rearwardly-located clamp G, that is placed in front of the cutting device, as shown in Figs. 2 and 13, a shaft 71 is journaled in the lower ends of the arms 63, extending from the base of the forward clamp F, and the said shaft 71 is provided with a series of attached peripherally-grooved pulleys 72, (shown best in Fig. 3,) while adjacent to the rear clamp G, above mentioned, a shaft 74, similar to the shaft 71, is pivoted in suitable bearings attached to a part of the second clamp, the shaft 74 being provided with peripherally-grooved pulleys 75, correspondingly located to the pulleys 72, and at one end of the pulley-shaft 71 a ratchet-wheel 73 is secured, which is adapted to be engaged by a pawl 73^a, pivoted upon one of the slides 61 of the clamp F, as shown in Fig. 13. This pawl prevents the forward movement of the forward pulley-shaft 71 and permits a rearward movement of said shaft.

Endless belts 76 are carried over the pul-

leys 72 and 75, forming a support for the sheets of paper, since the upper portions of said belts are horizontal, and the belts 76 extend downward from the pulleys 72 and 75 over pulleys 77, secured upon a shaft 78, the said shaft 78 being carried by arms 79, which arms are pivoted upon a shaft 80, which extends through the depressed sections 24 of the side members of the frame, as shown particularly in Fig. 2. The arms 79 are adapted to weight the belts 76 and hold them taut. When the carrier D moves rearwardly, the impressions having been made, the printed sheet of paper is moved also rearwardly by reason of the clamp F engaging the said paper between its yielding faces, since the rearward movement of the carrier causes a rearward movement of the feed device E, and the rearward movement of the feed device, through the medium of its side arms 50, will cause the two members or jaws of the clamp to be brought together, due to the connection of said arms with the head-plates 66 of the upper member of the clamp. Consequently at the rear movement of the said carrier the sheet of printed paper is carried toward the rear end of the machine and the dog or pawl 73ª will prevent the shaft 71 moving forward, and as the shaft 71 approaches the shaft 74 the tension or gravity arm 79 will draw the belts 76 downward, shortening their stretches between the two shafts, yet preserving said stretches taut. In this manner the printed sheet is supported and assisted in its movement from the clamp F to the clamp G. When the carrier D, however, moves forward to effect other impressions, the side arms 50 of the feed device, by rocking the head-plates 66 in an opposite direction to that produced when the carrier moved rearward, will cause the members of the clamp or clutch F to separate. Thus at the rearward movement of the clutch or clamp F it will not engage with the paper, and the dog or pawl 73ª will not prevent the shaft 71 from turning. Consequently the belts 76 in the forward movement of the carrier will not have any influence upon the sheets that may be above them, while at the same time the length of the upper stretches of the belts is increased and the tension or gravity arm 79 is drawn upward. At this time the rear downward stretches of the belts 76 are held stationary by clamping or brake devices, to be hereinafter described.

The inking device for the form of the upper chase is shown in Fig. 2 and likewise in Figs. 6, 7, and 8. This inking device consists of an ink-distributing table 81, adapted to receive ink from a fount suitably located. This table is provided with a convex upper surface and at one of its ends has teeth 82 produced therein, as shown in Fig. 8. The table is provided with two supporting-arms 83, one at each end, and these arms, as illustrated in Fig. 2, are mounted to turn upon a shaft 84, carried from side to side of the extensions A′ of the frame of the machine. One arm is carried below the pivoted shaft 84, and the extension of this arm is attached to a link 85, which in its turn is pivotally connected with a crank-arm 86, secured upon a second shaft 87, also journaled in the extensions A′ of the sides of the frame. The shaft 87 extends through and beyond the outer faces of the extensions A′ of the frame, and each end of the shaft, as shown in Fig. 1, is attached to an L-shaped or angle arm 88, the shorter member of each of the said angle-arms 88 being connected by a pitman 89 with the sides of the carrier D between the center of its sides and their upper ends. The longer member of each angle-arm is provided with a longitudinal slot 89ª, and at the rear end of the slotted portion of each angle-arm bearings 90 are provided, through which bearings a rod 91 is loosely passed into the slot, the rod 91 being provided with a head 93 at its forward end, adapted to travel on the side walls of the slot. A spring 92 is coiled around each rod 91, having bearing against the head 93 of the rod and the adjacent bearing 90 for the rod. Each rod is pivotally connected at its rear end to a plate 94, in which plates ink-supplying rollers 95 are journaled, the said rollers being adapted to travel in the downward movement of the angle-arms along the upper edges of the extensions A′ of the frame and over the type in the form of the upper chase, this movement of the ink-supply device taking place at the rearward movement of the carrier D. At the forward movement of said carrier the ink-supply device is carried forward to the dotted position shown in Fig. 1.

The ink is mixed or equally distributed on the ink-table 81 through the medium of two rollers 96 and 97. (Shown in Figs. 6 and 8.) These rollers 96 and 97 are mounted in boxes 98, the said boxes being pivotally attached to the ends of rocking bars 99, one of said bars being located at the top upper edge of each of the extensions A′ of the frame, being attached to the said extensions by a central pivot-pin 100, as shown particularly in Fig. 8. One end of one of the bars 99 is provided with a longitudinal slot 101, which longitudinal slot receives a pin 102, attached to a pinion 103, the said pinion, as shown particularly in Figs. 6 and 7, being mounted in one of the side extensions A′ of the frame, and the teeth of this pinion engage with the teeth 82 of the ink table or carrier 81. Thus it will be observed that when the ink-table passes beneath the distributing-rollers 96 and 97 and the teeth of the table engage with the pinion 103 the rollers have parallel end movement in addition to their rotary movement, thus grinding and distributing the ink on the upper surface of the table, from whence it can be taken by the take-up or supply rollers 95, which in their turn convey the ink to the type.

The inking mechanism for the form of the lower chase is substantially identical with that provided for the form of the upper chase, except that the inking mechanism for the form

of the lower chase is located at and part of it is adapted to travel along the lower circular portion of the depressed section 24 in the side pieces A, as shown in Fig. 2. The ink-supply table 104 corresponds in construction to the table 81, heretofore described in connection with the form of the upper chase, the table being carried by arms 105, pivoted on a shaft 106, mounted in the depressed portions 24 of the side pieces of the frame, and one end of one of the arms 105 is elongated to pivotally receive an end of a link 107, which is pivotally attached to a crank-arm 108, secured to the shaft 80, heretofore mentioned, and as illustrated in Fig. 2. An angle arm or bar 109 is secured at the junction of its members at each side of the shaft 80 outside of the said depressed section 24 of the frame, as shown in dotted lines in Fig. 2, and this angle arm or bar 109 is of similar construction to the arm or bar 88, described in connection with the form of the upper chase, the rollers carried by the said arms or bars 109 being arranged to travel across the table 104 and over the type in the form of the lower chase. The shorter member of each of the arms 109 of the ink-supply device is pivotally connected by a connecting-rod 110 with the lower part of the sides of the carrier D, as shown in Figs. 1 and 2. The table 104 is also provided with teeth 111 at one of its ends, and these teeth engage with a pinion 112, corresponding to the pinion 103 at the upper portion of the frame, the pinion 112 being mounted at the bottom portion of the depressed side section 24, as shown in Figs. 1 and 9. This pinion is provided also with a pin which enters a slot in a bar 116, two of which bars are employed, one at each side of the machine, and the said bars 116 are pivoted at their centers to the aforesaid depressed surface 24 and act in like manner as the bars 99, described in connection with the inking apparatus for the form of the upper chase; but the bars 116 are rectangular, and the bearings 115 for the distributing-rollers 113 and 114 are located between the members of the bars, the said bars being rectangular and of skeleton form, and the bearings are held in place by suitable springs 117, as shown in Fig. 9. The alteration in the shape of the bars 116 and the addition of the springs 117 are made necessary by reason of the distributing-rollers facing downwardly, the springs serving to keep the rollers in their bearings. The movements of the inking devices for the form of the lower chase are identical and in concert with the inking devices for the form of the upper chase, which movements have been particularly set forth.

The rear clamp or clutch G consists of a bed-plate 118, which extends from side to side of the frame, the top of the bed-plate being preferably flush with the upper surface of the frame; but the said bed-plate is provided at its rear edge with a longitudinally-located and upwardly-extending section 119, and the bed-plate is further provided at each of its sides with a downwardly-extending section 120, as shown best in Fig. 13. In the upper forward portion of the bed-plate 118 a longitudinal strip 121 of rubber or a like material is placed, and the upper section or jaw of the said clamp or clutch consists of a bar 122, having a strip 123 of yielding material in its under face, which yielding strip is adapted to register with the strip in the bed-plate, as is also shown in Fig. 13. The bar 122 of the upper member of the clamp or clutch is provided near each end with ears 124, which are pivotally attached to forward projections from the forward face of the rear upper extensions 119 of said bed-plate, as is also best shown in Fig. 13. Preferably the side pieces of the frame are cut away at the top to receive the downwardly-extending portions 120 of the said bed-plate, and below the yielding strip 121 in the bed-plate of the second clamp or clutch G a shaft 126 is journaled in the lower side extensions 120, as shown in Figs. 13 and 15, and at the left-hand end of the shaft 126 a crank-arm 127 is attached, connected by a link 128 with the upper bar or member 122 of the said clamp or clutch G. At the opposite or right-hand end of the shaft 126 a disk 129 is secured. (Shown in detail in Fig. 16 and as attached in Fig. 15.) This disk 129 is connected by a pitman 130 with the right-hand end of the upper member of the clutch G. In the upper edge of the crank-disk 129 a peripheral recess 131 is made, while in the lower peripheral portion of the crank-disk a series of teeth 132 is produced. These teeth are adapted to mesh with the teeth of a segmental gear 138, provided with an attached shank 139, by means of which it is pivoted to the outer side face of one side piece of the frame, as is likewise shown in Figs. 15 and 16. A crank-arm 133 is loosely mounted on the right-hand end of the shaft 126, and this crank-arm is provided with a stud or finger 134, adapted to travel in the recess 131, the crank-arm being connected by a pitman 135 with a lever 136, pivoted by a pin 137, located between its center and upper end, the said pin being secured to the outer face of the rear side of the frame, as shown in dotted lines in Fig. 1, and the lower end of the lever 136 is through the medium of a connecting-rod 141 pivotally attached to the right-hand side of the carrier D, preferably at that point where the pitman 110 of the lower inking device is likewise attached. A collar 141^a is secured upon the right-hand end of the shaft 126, and a spring 141^b is attached to the said collar and to the shank of the mutilated gear 138, the said spring serving to exert tension on the upper member of the clamp or clutch G when said member is open and when it is closed. The clamp or clutch G is opened and closed through the medium of the connecting-rod 141, lever 136, crank-disk 129, and the shaft 126, to which the crank-disk is attached, it being obvious that there is a slight lost motion by reason of the finger 134 having to

travel some distance in the recess 131 of the crank-disk before the said disk is moved, and this lost motion is provided for in order that the cutting and delivery devices may be operated prior to the opening of the aforesaid clamp or clutch G. The clamp or clutch G is closed when the carrier moves to printing position and is opened at the time that the carrier moves from the chases, and the feed mechanism E operates to carry the printed sheets rearward. The rear shaft 74, carrying the guide-pulleys 75, is journaled in the forward upper end portion of the lower extension of the bed-plate of the said rear clamp or clutch G, as shown in Fig. 13, and in the same portion of the said extension 120 of the bed-plate 118 a bar 142 is transversely secured, forming a portion of a brake for the belts 76, the rear face of the said bar being provided with a yielding surface 143. This bar and its yielding surface are at the forward side of the rear downward stretches of the guide-belts 76, and at the rear side of the said belts a second bar 144, provided with downwardly-extending crank-arms 145, is pivoted in the under extension 120 of the bed-plate 118 of the rear clamp or clutch by means of a rod 144^a, passed through the angular portion of the bar 144 at the intersection of the members thereof. The bar 144 is provided with a yielding forward face 146, and the horizontal members 145 of the angular bar 144 are so weighted as to keep the bar 144 normally out of engagement with the said belts 76, as shown in Fig. 13.

The bars 142 and 144 constitute two jaws for the clamping or brake device for the belts 76, above referred to, and serve to hold the belts 76 stationary during the time that the rear clamp or clutch G is closed, and the jaw 144 is carried to the clamping or gripping position with the belts 76 through the medium of cams 147, which are attached to the shaft 126, operating the movable member of the clamp G, and these cams when the upper member of the said clutch is closed upon its lower member engage with the rear surface of the movable jaw or bar 144 and force said jaw or bar forward, and when the jaw or bar 144 is relieved from engagement with the cams 147 the weighted arms or members 145, attached to said jaw or bar, will carry it automatically out of engagement with the said belts 76.

A metal plate 148 is fitted in the rear face of the upright member or portion of the bed-plate 118, as shown in Fig. 4, and a longitudinal slot 149 is made in the said plate and likewise in the member 119, to which the plate is attached, as shown particularly in Fig. 13, the slot in the member having a flat bottom and an inclined upper surface, and the upper edge of the slot in the plate 148 is made a cutting edge. A standard 150 is secured to the base of the machine and is made to extend upward at the rear right-hand side thereof, and in the upper end of this standard 150 and likewise in the upright member 119 of the bed-plate 118 a shaft 151 is journaled, to which one end of a delivery-table 152 is secured, the normal position of which table is horizontally at the rear of the aforesaid member 119 of the bed-plate 118, as shown in Figs. 1, 2, and 4. An arm 153 is loosely pivoted at its right-hand end upon the shaft 151 quite close to the rear surface of the extension 119 of the bed-plate. The said arm is recessed in its upper edge from a point near its pivot to a point near its outer end, and within the said recess a case or holder 154 is pivoted, and a knife 155 is attached to the forward edge of the said case or holder, the knife being adapted to engage with the outer or rear face of the plate 148 at the rear of the machine, having a cutting edge 149, the knife 155 in operation passing the cutting edge 149 in such manner as to produce a shear cut, the paper being cut through the medium of the two cutting-surfaces. At the rear or pivot end of the knife-carrying arm 153 an upwardly-extending horn 156 is located, and the knife is held against the blade 148 by means of a torsion-spring 157, (shown best in Fig. 18,) located in a recess near the pivot end of the knife-carrying arm, the spring being attached to the said arm and to one of the pivots of the knife-holder 154.

An angle-lever 158 is fulcrumed at the junction of its members upon the rear face of the extension 119 of the bed-plate 118, as shown in Figs. 4 and 13, and the two members e and e' of this lever are out of alinement, the outer member e being adapted to engage with the horn 156 of the knife-carrier, and when the opposite member e' of the lever is raised the member e will so act on the knife-carrying arm as to raise the said arm and bring the knife-blade to the cutting position. The outer member e' is engaged with the peripheral surface of the disk 159, which disk is provided with a cavity 160 in its peripheral surface, and when the member e' of the lever 158 is in the said cavity the knife will be in its lower or normal position; but after the member e' has passed the said recess 160 the knife will be carried upward past the cutting-surface 149 of the plate 148 and held in an upper position until the recess 160 of the disk is again brought around to its normal position. (Shown in Fig. 4.)

A pinion 161 is secured to the outer face of the disk 160, and this pinion is engaged by the toothed surface of a segmental arm 162, fulcrumed upon the rear end of the right-hand side of the frame, as shown in Fig. 2. The segmental arm 162 is pivotally attached to a link 163, the link being in its turn pivotally connected with a crank-disk 164, secured upon a shaft 165, mounted upon the outer face of the rear side of the frame, the shaft 165 at its forward end being provided with a beveled pinion 166. The beveled pinion 166 engages with a beveled gear 167, provided with an attached spur-pinion 168, which pinion is made to mesh with a gear 169, having a ratchet-wheel 170 secured to its outer

face, as shown in Figs. 1 and 2. A crank-arm 172 is pivoted upon the shaft upon which the combined gear and ratchet-wheel 169 and 170 are mounted, the said crank-arm carrying a dog 171, arranged for engagement with the ratchet-wheel 170, and the said crank-arm 172 is connected by a link 173 with the lower end of the lever 136.

While the rear clamp or clutch G holds the paper at the commencement of the forward movement of the carrier, the aforesaid gearing operates the disk 159, and consequently the shaft 151, to such an extent that the knife will be carried to the cutting position and the delivery-table will have been carried to the dumping position and returned to its normal position before the finger 134 shall have traveled the length of the groove 131 in the crank-disk 129, operating the movable jaw of the clutch G to engage with a surface of said crank-disk that will cause the disk to rotate in a direction to release the movable jaw of the said clutch G from the paper, at which time the rearward movement of the carriage will take place, and the forward clutch or clamp F will be closed, as heretofore described, enabling the paper to be passed freely through the rear clutch and through the opening in the upper extension 119 at the upper rear portion of the machine out upon the distributing-table, so that at the commencement of the forward movement of the carrier the paper will be delivered on the table to be cut. At each rearward movement of the carrier, as heretofore stated, the paper, which is in a continuous sheet, is drawn upward from the lower form, by which it was printed upon one side, and delivered to the upper form, so that the same portion of the sheet may be printed upon the opposite side at the next printing movement of the carrier. The roll 174, upon which the paper 176 is wound, is mounted in suitable bearings 175, located at the bottom forward end of the machine, the roll being readily removable from its bearings, and the paper 176 is carried rearward over a guide-roller 177 up between the lower guide-rollers 34 and 35 at the lower portion of the carrier, thence upward in engagement with the printing-face of the lower platen C′, then over and around the intermediate tension-rollers 42, 43, 40, and 41 to an engagement with the printing-surface of the upper platen B′, thence in engagement with the two upper sets of guide-rollers in the carriage designated as 36, 37, 38, and 39,) and from these rollers the paper is carried over the roller 51, carried by the adjustable blocks 46, thence over the roller 55, the adjustable roller 53 forming a portion of the feed mechanism E, and over the rollers 54 and 59 of said feed mechanism, thence between the jaws of the first clamp or clutch F, over the upper stretches of the guide-belts 76, and between and through the jaws of the rear clamp or clutch G. It is evident that at the rear or feeding movement of the feed device E the belts 76 will assist in conducting the sheet to the second clutch G, since as the rollers 71 and 74 are brought somewhat close together, as shown in Fig. 1, the weight of the gravity-arms 79 will keep the belts 76 constantly tight and the shaft 71 will be prevented from turning by means of the pawl 73ª engaging with the ratchet 73; but at the return movement of the feed mechanism E and the carriage D, the clamp or clutch G having closed upon the paper and the clamp or clutch F having opened, the supporting-belts 76 may return to their normal position, since the shaft 71 will be free to turn, the pawl 73ª not acting to hold the ratchet-wheel 73; but at this time the bars 142 and 144 will hold the rear stretches of the belts 76 stationary, thus preventing the lengthening of the upper stretches interfering with the printed sheets beneath which they lie.

A belt-shifter 179 is used in connection with the fast and loose pulleys upon the drive-shaft, said shifter being operated by a suitable lever 180 at the front of the machine. A brake 178 of any approved construction is preferably employed for the trunnions of the roll 174, upon which the paper 176 is wound, as shown in dotted lines in Figs. 1 and 2.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a printing-press, fixed type or impression beds, a rocking carriage mounted between said beds and provided with upper and lower oppositely-facing platens having their contact-surfaces in a plane with a line drawn centrally and longitudinally through the line of bearing of the carriage, the said platens being adapted to engage with opposite sides of the material to be printed, guide-rollers arranged to conduct material to and from the platens and from one platen to the other, and a regulating device for the material to be printed, located between said platens, said regulating and guide devices constituting a portion of the carriage, as specified.

2. In a printing-press, type or impression beds, a carriage pivoted between its ends, means for rocking said carriage, independent platens formed upon the carriage, facing in opposite directions and adapted for movement to and from the impression-beds, guide-rollers for the paper located between and adjacent to the outer edges of the platens, and adjusting devices for the paper located between the sets of guide-rollers, and clutch devices for the printed sheets, operated by the movement of the carriage, as set forth.

3. In a printing-press, a carriage provided with independent platens facing in opposite directions, impression-beds for the platens, guides for the paper located between and adjacent to the outer edges of the platens, tension-rollers journaled in said carriage, a feed mechanism for the printed sheets, connected with the carriage and operated therefrom,

and clutches for the printed sheets, arranged to alternately open and close, substantially as described.

4. In a printing-press, the combination, with stationary type-beds and a carriage provided with platens facing the type-beds, means for rocking said carriage, and adjusting and tension devices for regulating the delivery of a sheet passing from one platen to the other, all the said devices forming a portion of the carriage, of a feed mechanism for the printed sheet adjustably attached to said carriage, a clutch for the printed sheet operated by the movement of the carriage, a second clutch, a mechanism for opening and closing the second clutch alternately with the similar movement of the first-named clutch, and a belt-feed between the two clutches, substantially as described.

5. In a printing-press, the combination, with stationary type-beds and a carriage provided with platens facing the type-beds, means for rocking said carriage, adjusting and tension devices for regulating the delivery of a sheet passing from one platen to the other, all said devices forming a portion of the carriage, of a feed mechanism for the printed sheet, adjustably attached to said carriage, a clutch for the printed sheet operated by the feed mechanism, a second clutch, a mechanism for opening and closing the second clutch alternately with a similar movement of the first-named clutch, a belt-feed between the two clutches, a tension device for said belt-feed, and a cutting device arranged to operate in conjunction with the clutch independent of the feed mechanism, as set forth.

6. In a printing-press, the combination with type or impression beds, of a rocking carriage provided with platens arranged to engage with opposite sides of material to be printed, tension and guide devices for the said material, carried by the carriage only, a feed device, a tension mechanism for the feed device, and a clamp for a printed sheet, opened and closed by the movement of the feed device, as described.

7. In a printing-press, the combination, with type or impression beds, of a rocking carriage provided with platens arranged to engage with opposite sides of the material to be printed, tension and guide devices for the said material, carried by the carriage only, a feed device, a tension mechanism for the feed device, a clamp for a printed sheet, opened and closed by the movement of the feed device, and a second clamp for the printed sheet, mechanism for alternately opening and closing the two clamps, and a cutting device brought into cutting operation at the closing movement of the second clamp, as set forth.

8. In a printing-press, the combination, with type or impression beds, of a rocking carriage provided with platens arranged to engage with opposite sides of the material to be printed, tension and guide devices for the said material, carried by the carriage only, a feed device, a tension mechanism for the feed device, a clamp for the printed sheet, opened and closed by the movements of the feed device, a second clamp for the printed sheet, mechanism for alternately opening and closing the two clamps, and a cutting device brought into cutting operation at the closing movement of the second clamp, and a device for receiving the printed sheet from the cutter, said device being carried to a delivery position by the mechanism controlling the second clamp and when said clamp is brought to clamping position with a sheet, as specified.

9. In a printing-press, the combination, with type or impression beds, a rocking carriage having oppositely-disposed platens arranged for simultaneous engagement with the impression-beds, guide and tension devices located entirely upon the said carriage, being adapted to direct the material to be printed to the platens and control the feed of said material, of a feed device for the printed sheet adjustably connected with the carriage, a clamp for the printed sheet, opened and closed by the forward-and-rearward movement of said carriage, a second clamp adapted to open when the first-named clamp is closed, and belt-supports for the sheet located between the two clamps, and a means for regulating the upper stretches of the said belt-supports, whereby the said belt-supports at their upper or supporting stretches will automatically decrease in length as the clamps approach each other, and increase in length as the clamps separate, as set forth.

10. In a printing-press, a platen-carriage, a feed mechanism for the printed material adjustably connected with said platen-carriage, being operated by said carriage, tension and guide devices carried by the feed mechanism, a clutch device connected with the feed mechanism, and means for opening the clutch when the carriage moves to printing position and closing the clutch as the carriage moves from printing position, substantially as described.

11. In a printing-press, the combination, with a rocking platen-carriage, a feed mechanism adjustably attached to said platen-carriage, adjustable tension devices constituting a portion of the feed mechanism, said feed mechanism being adapted to operate upon printed material, of a sliding clutch for the printed material and connected with the carriage and opened and closed through the forward-and-rearward movement of said carriage, as and for the purpose specified.

12. In a printing-press, a rocking platen-carriage, a feed mechanism adjustably attached to said carriage, said feed mechanism comprising side arms, a series of guide-rollers and tension-rollers, a clutch comprising a body having sliding movement with the feed mechanism and a jaw opened and closed by the movement of the side arms of said feed mech-

anism, and a cutting device for the paper operated independently of the feed mechanism and the clutch, as specified.

13. In a printing-press, a rocking platen, a feed mechanism adjustably connected with said platen, a clutch for the printed material, acting in concert with the feed mechanism and operated by the movement of the rocking platen, a cutting device, and a belt-feed between the cutting device and said clutch, as set forth.

14. In a printing-press, a rocking platen, a feed mechanism for the printed material operated by said platen, a sliding clutch carried by said feed mechanism, a stationary clutch, means for operating the stationary clutch alternately with and independently of the sliding clutch, a tension-controlled belt-feed located between the two clutches, and means for controlling the belt-feed, substantially as described.

15. In a printing-press, a feed mechanism for printed material, a clutch moving with and operated from the feed mechanism, a stationary clutch, feed-belts located between the movable and stationary clutches, and operated by the former, supporting and tension shafts for the belts, and means, substantially as described, for alternately opening and closing the clutches, as set forth.

16. In a printing-press, the combination, with a feed mechanism for printed material and a clutch moving with and operated from the feed mechanism, of a stationary clutch, an auxiliary feed mechanism between the two clutches, a clutch for the auxiliary feed, adapted to open from and close upon said feed simultaneously with the opening and closing of the fixed clutch, and an actuating mechanism for the stationary and auxiliary feed clutches, substantially as described.

17. In a printing-press, the combination, with a feed mechanism for printed material, a movable clutch carried by and operated from the feed mechanism, a stationary clutch and a cutting device back of the stationary clutch, of an auxiliary feed device between the two clutches and operated by the movement of the movable clutch, a clamping device adapted to act as a brake upon the auxiliary feed, and an actuating mechanism adapted to simultaneously open and close the stationary clutch and clamping devices alternately with the opening and closing of the movable clutch, and for operating the cutter, substantially as described.

18. In a printing-press, the combination, with a feed mechanism for printed material, a movable clutch carried by and operated from the feed mechanism, a stationary clutch, an auxiliary belt-feed between the two clutches, and a clamping device for the feed-belts, the movable clutches being arranged to alternately open and close with the fixed clutch, of a cutter at the rear of the fixed clutch, comprising a fixed and a pivotal blade, and means for bringing the pivoted blade into cutting action while the jaws of the fixed clutch are closed.

19. In a printing-press, the combination, with a feed mechanism for printed material, a movable clutch carried by and operated from the feed mechanism, a stationary clutch, an auxiliary belt-feed between the two clutches, and a clamping device for the feed-belts, the movable clutches being arranged to alternately open and close and the clamping device to open and close with the fixed clutch, of a cutter at the rear of the fixed clutch, comprising a fixed and a pivotal blade, a pivoted delivery-table at the rear of the cutter, and an actuating mechanism, substantially as described, for bringing the pivoted blade of the cutter into cutting action while the jaws of the fixed clutch are closed, carrying the table to dumping position during the inactive period of the cutter, as set forth.

20. In printing-presses, or similar machines, a cutter consisting of a fixed blade, a support for said blade, a pivoted arm, a blade pivoted in the arm and arranged to cross the fixed blade, and a tension device acting upon the pivoted blade, holding the cutting edge of the blade in engagement with the fixed blade or its support.

21. In printing-presses, the combination, with a frame, type or impression beds supported by the frame, and a platen-carriage pivoted between said beds, of a drive-shaft, a connection between the drive-shaft and platen-carriage, a rocking ink-receiving table adjacent to each bed, series of ink-supply rollers, an independent series being provided for each bed, yielding pivoted supports for the ink-supply rollers, and a driving connection between the supports for the ink-receiving table and platen-carriage and said carriage and the supports for the ink-supply rollers, as set forth.

22. In printing-presses, the combination, with a frame, type or impression beds supported by the frame, one above the other, a platen-carriage pivoted between the said beds, and a drive-shaft connected with the carriage, of a set of ink-distributing rollers located upon the frame adjacent to each type-bed, an ink-receiving table for each set of distributing-rollers, said rollers being operated by the movement of the table, and trucks for supplying ink to the type-beds, each truck comprising side supports having a yielding section, heads connected with the said yielding sections, and rollers journaled in said heads, adapted to travel over said table and over the type-beds, and an actuating connection between the platen-carriage and the arms of the ink-supply trucks and the supports for the table, substantially as described.

23. An ink-supply mechanism for printing-presses, consisting of an oscillating or rocking ink-receiving table, distributing-rollers located over the table, pivoted supports for the rollers, means for actuating the roller-supports by the movement of the table, and an ink-sup-

ply truck provided with tension-controlled rollers adapted to engage with the receiving-table and a type-bed or chase, substantially as described.

24. In an ink-supply mechanism for printing-presses, a support, an ink-receiving table pivoted in said support, arms pivoted upon the supports, bearings pivoted upon said arms, rollers mounted in said bearings, and a connection between the table and one of the said arms, whereby the arms are rocked upon their pivots by the movements of the table, as described.

25. In an ink-supply mechanism for printing-presses, a support, an ink-receiving table pivoted in said support, having a curved outer surface and a toothed edge, arms pivoted upon the support, bearings pivoted upon said arms, distributing-rollers journaled in said bearings, adapted to engage with the table, a toothed disk pivoted upon the support, the teeth whereof engage with the teeth of the table, and a post extending from the disk and into a slot in one of the said arms, and means for reciprocating the table, as described.

26. In a printing-press, the combination, with a frame having upper and lower curved surfaces, a type or impression bed adjacent to each of said curved surfaces, a platen-carriage pivoted between the beds, and means for operating the carriage, of ink-distributing rollers mounted to have rotary and lateral movement, an ink-receiving table over which the distributing-rollers pass, the rollers receiving both rotary and reciprocating movement from the movements of the table, an inking-roller truck, the rollers whereof are arranged to travel over the table and over the type-bed, and a driving connection between the carriage and both the inking-roller truck and ink-receiving table, substantially as described.

27. In a printing-press, fixed type or impression beds, a rocking carriage mounted between said beds and provided with upper and lower, oppositely-facing platens having their contact-faces in a plane with a line drawn centrally and longitudinally through the bearing of the carriage, said platens being adapted to engage with opposite sides of the material to be printed, guide-rollers arranged to conduct material to and from the platens and from one platen to the other, boxes mounted to slide in the carriage and located between the two platens, regulating-rollers mounted in said boxes, and adjusting-screws for the boxes, substantially as described.

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Witnesses:
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