E. T. WATERS.

FEED AND DELIVERING MECHANISM FOR PLATEN PRESSES.

APPLICATION FILED DEC. 6, 1920.

1,437,030.

Patented Nov. 28, 1922.

6 SHEETS—SHEET 1.

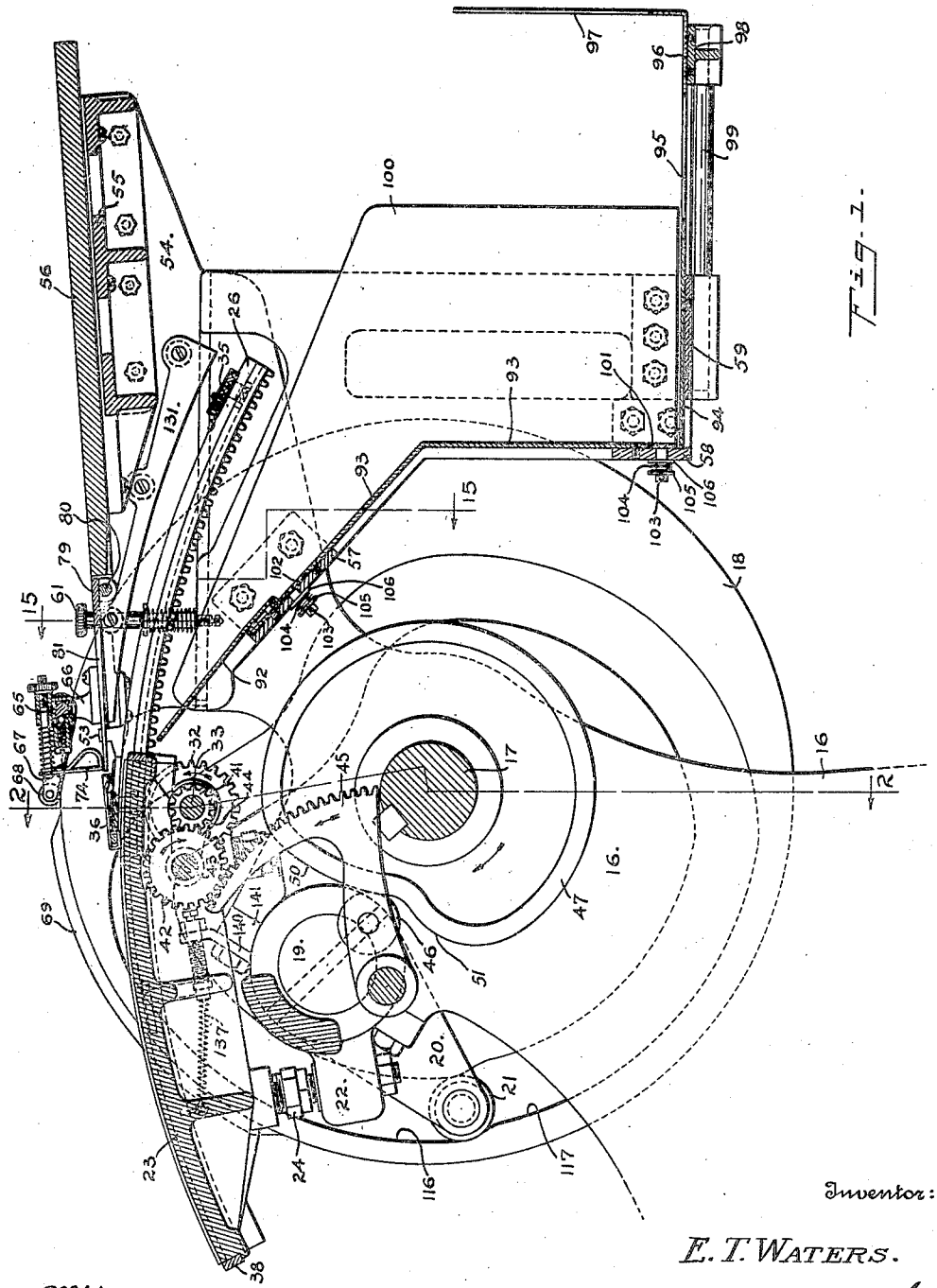


Fig. 1.

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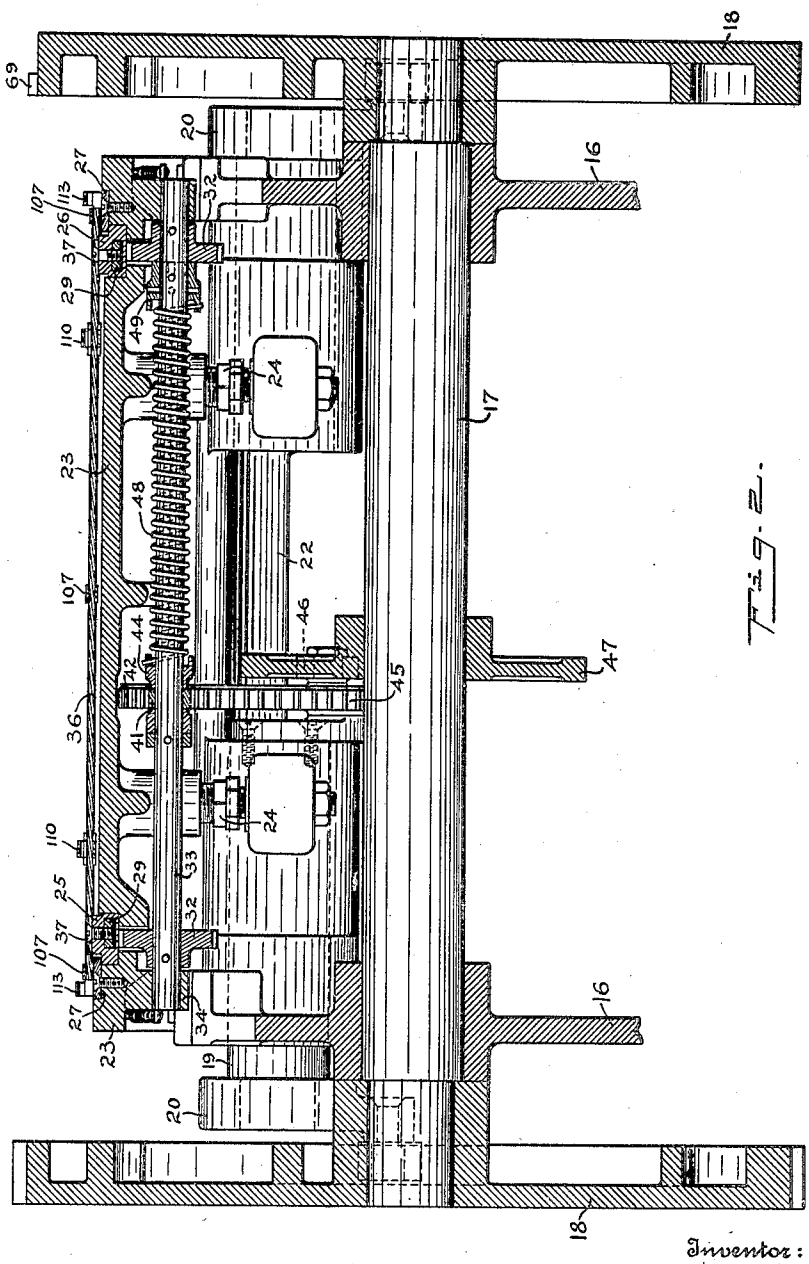


Fig. 2.

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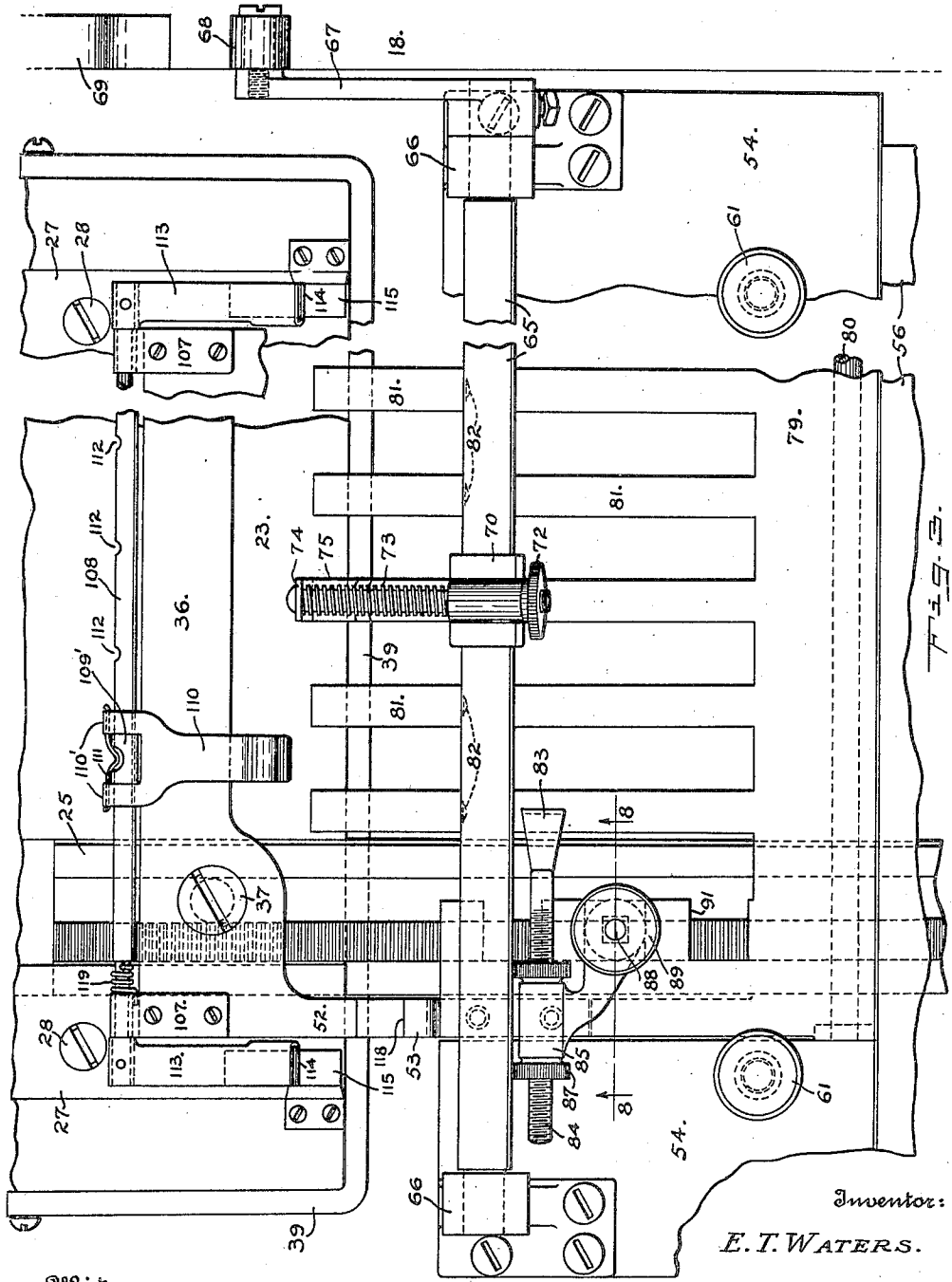
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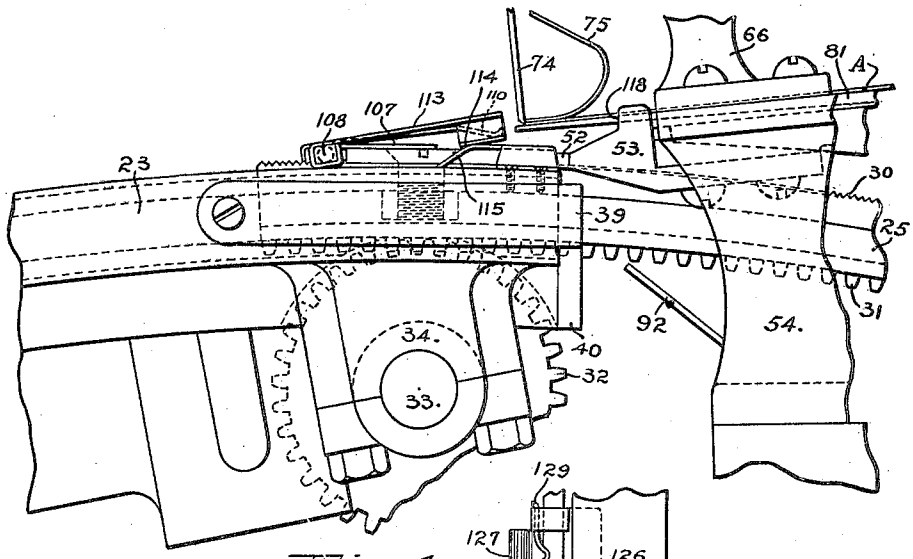


Fig. 4.

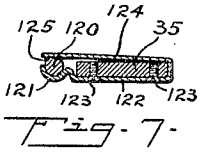


Fig. 7.

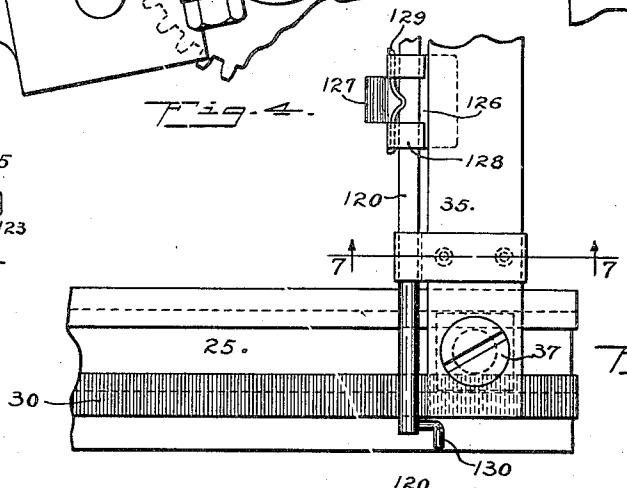


Fig. 5.

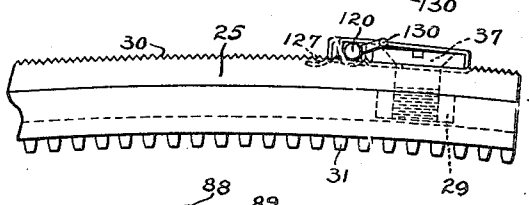


Fig. 6.

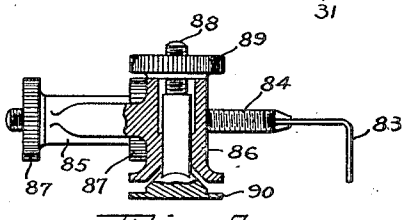


Fig. 8.

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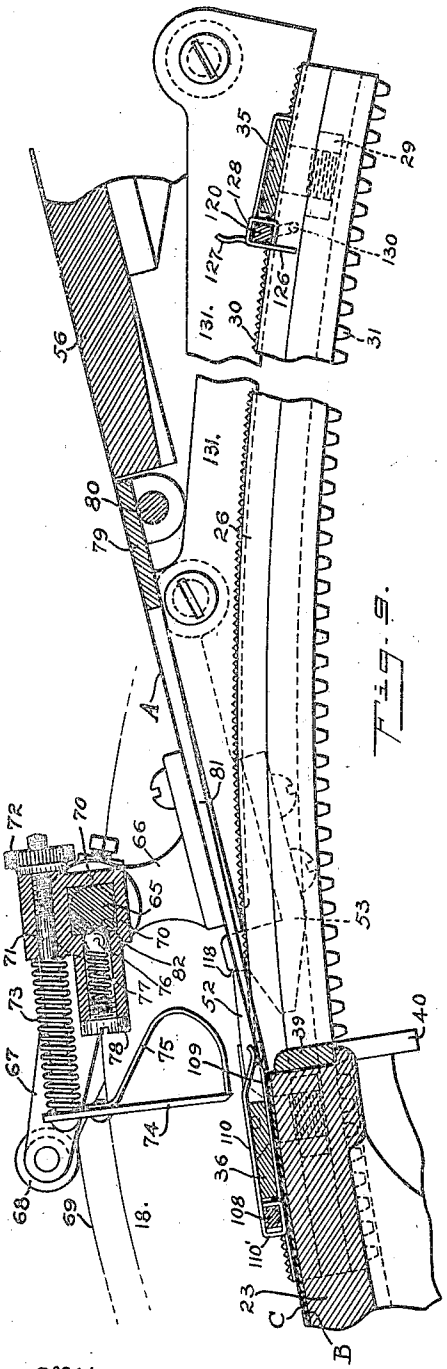


Fig. 9.

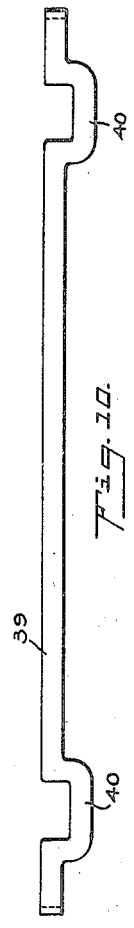


Fig. 10.

Fig. 11.

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6 SHEETS—SHEET 6.

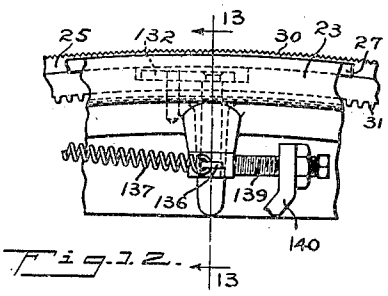


Fig. 12.

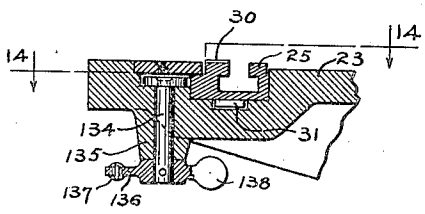


Fig. 13.

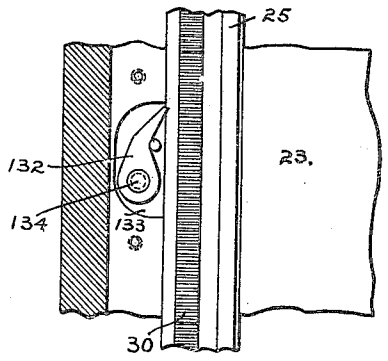


Fig. 14.

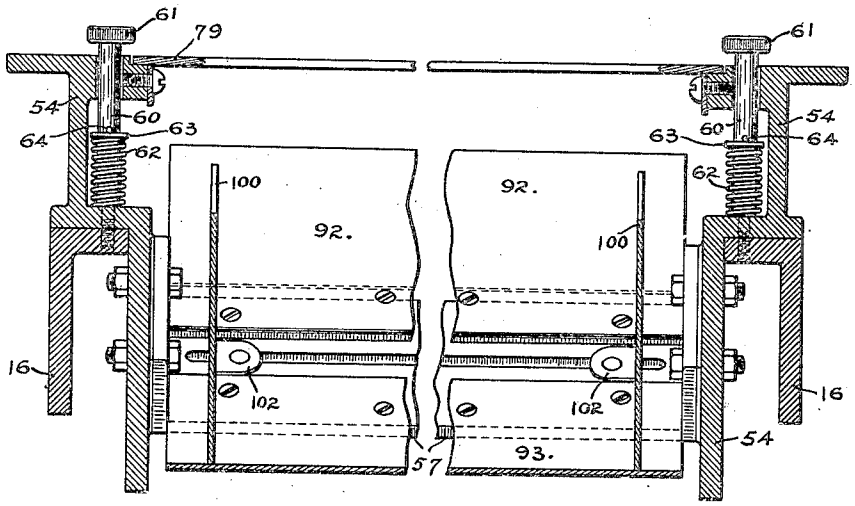


Fig. 15.

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Patented Nov. 28, 1922. 1,437,030

UNITED STATES PATENT OFFICE.

EDWARD T. WATERS, OF OMAHA, NEBRASKA.

FEED AND DELIVERING MECHANISM FOR PLATEN PRESSES.

Application filed December 6, 1920. Serial No. 428,752.

To all whom it may concern:

Be it known that I, EDWARD T. WATERS, a citizen of the United States, and a resident of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Feed and Delivering Mechanism for Platen Presses, of which the following is a specification.

My invention relates to mechanism for feeding paper sheets to printing presses of the class employing an oscillating platen, and for delivering the printed sheets therefrom. It is the object of my invention to provide a mechanism of this kind with which the sheets to be printed, after being fed manually to a definite position upon a feed-table, so as to register with suitable gages thereon, are engaged by gripping devices movably mounted on the oscillating platen and actuated so as to carry the gripped sheet to a definite position upon the platen, holding the same thereon during the printing operation, and finally delivering the printed sheets to a receiving or stacking device. More particular objects of my invention are to provide, in a mechanism of the kind indicated, means for mounting the gripping devices upon the platen, for actuating the same relatively thereto during the dwell of the platen at the feed and delivery positions, for adjusting the gripping devices to handle sheets of varying sizes and to hold sheets of any size at any desired position upon the platen, and means for opening and closing the grippers to release the printed sheets at the proper time and to grip a fresh sheet held in gaged position upon the feed-table. A further object is to provide gripping devices of the character above indicated, capable of being operated over the face of the platen without interference with the type of the printing form, during the impression. A further object of my invention is to provide mechanism of this kind adapted for use with a press employing an oscillating platen having a curved or cylindro-segmental face, such as is employed in the press disclosed in Letters Patent No. 1,360,063, issued to me November 23, 1920. A further object of my invention is to provide a feed-table and a receiver for the printed sheets, so mounted upon the press frame as to be easily removable when desired, to facilitate the preparatory operations in starting a job. Further objects of my invention will appear hereinafter.

In the accompanying drawings Fig. 1 is a longitudinal vertical sectional view of mechanism embodying my invention, Fig. 2 is a transverse vertical section of the same, on the line 2—2 of Fig. 1, Fig. 3 is a partial plan view of the mechanism, Fig. 4 is a detail side view showing the grippers at the sheet-delivering position, Fig. 5 is a detail plan view of a part of the front gripper-bar, Fig. 6 is a detail side view of the same, Fig. 7 is a detail vertical section on the line 7—7 of Fig. 5, Fig. 8 is a detail vertical section of the side-gage, the section being on the line 8—8 of Fig. 3, Fig. 9 is a detail vertical longitudinal section showing the feed-position of the platen and positions of certain parts at the moment when the sheet on the feed-table is engaged by the grippers, Fig. 10 is a detail front view of the special tympan-bail, Fig. 11 is a detail vertical section showing the positions of certain parts after the sheet has been carried onto the platen and prior to the movement of the platen to the printing or impression position, Fig. 12 is a detail side view showing one of the rack-bar latch devices, Fig. 13 is a detail vertical transverse section on the line 13—13 of Fig. 12, Fig. 14 is a detail horizontal section on the line 14—14 of Fig. 13, and Fig. 15 is a detail transverse section on the offset vertical planes indicated by the line 15—15 of Fig. 1.

In the illustrated construction, the sheet-feeding and delivering mechanism is considered as applied to a printing press of the kind disclosed in my Patent No. 1,360,063 hereinbefore referred to, and to which reference is had for a more detailed description of the construction and mode of operation of the portions of the press herein

shown, which directly cooperate with the special mechanism forming the subject matter of the present application. Briefly stated, the parts of the press proper which are shown herein are the upper front portions of the side-frames 16, the main shaft 17 which carries at the ends thereof the platen-cams 18, the divided rocker-shaft 19, the rocker-arms 20 which are carried at the ends of the shaft 19 and have rollers 21 running in the grooves of the cams 18, the rocker 22 which connects and bridges the divided rocker-shaft 19, and the curved platen 23 which is mounted upon and secured to the rocker 22 by the impression-screws 24. It will be understood that the curved platen coacts with an oscillating bed carrying the printing-form, making a rolling impression therewith, in the manner disclosed in my patent above referred to, the main shaft 17 being actuated by a drive-pinion meshing with gear-teeth formed on the peripheral portion of one of the cams 18.

Near the ends of the platen the same is channeled to receive slidably the curved rack-bars 25 and 26, which have the same curvature as the face of the platen and which are retained in the channels by means of guide-plates 27 removably secured, by screws 28, in shallow channels extending laterally from the main channels in which the rack-bars are held. The transverse sectional form of the rack-bars is shown in Figs. 2 and 13, from which it will be seen that each of the bars has a longitudinal T-slot therein, adapted to receive slidably in the lower portion thereof the nuts 29. The upper or outer faces of the rack-bars have uniform transverse serrations 30, and the lower or inner faces have rack-teeth 31 which mesh operatively with gears 32 carried on a transverse shaft 33 journaled in bearings 34 beneath the front edge portion of the platen. The front and rear gripper-bars 35 and 36 extend transversely over the face of the platen and are provided on their lower faces near their ends with serrated portions adapted to engage with the serrations 30 on the rack-bars. The gripper-bars are secured in the desired longitudinal relations to the rack-bars by means of screws 37 extending through the vertical portions of the T-slots and engaging the nuts 29 in the lower portions of said slots. The serrated interengaging portions of the gripper-bars and rack-bars effectually prevent accidental slippage of the former along the latter, the mere frictional engagement of the nuts 29 in the T-slots not being depended upon to prevent such slippage. At the rearward edge of the platen the same is provided with a tympan-bail 38 of ordinary form, and at the front edge of the platen there is a special tympan-bail 39 of which the transverse portion has U-shaped bends 40 near the ends thereof, as shown in Fig. 10. The said U-bends 40 of the front tympan-bail are located at the front ends of the grooves in the platen for the rack bars 25 and 26, whereby said bars may be projected out from the front edge of the platen, to positions such as shown in Figs. 1 and 9, without interference with bail.

The rack-bars are actuated by the gears 32 which, in turn, are driven by the shaft 33. On the intermediate portion of said shaft there is secured a pinion 41 which meshes with a gear 42, the latter being revolubly mounted on a short shaft 43 carried at the rearward ends of arms 44 pivoted on the shaft 33 adjoining the sides of the pinion 41. The gear 42 meshes with a gear-segment 45 which is pivotally mounted upon the rocker 22 in the gap between the ends or hub-portions of the rocker which surround the divided rocker-shaft 19. A roller 46 carried upon the side of the segment 45 is adapted to engage a cam 47 secured upon the main-shaft 17, so that the segment may be actuated by said cam during rotation of the main-shaft. The gear-train between the rack-bars and the segment 45 is so arranged that when the rack-bars are in the forwardly projected position shown in Fig. 1, pressure of the cam 47 against the roller 46, swinging the segment rearwardly, actuates the gears in the directions indicated by arrows in said figure and positively returns the rack-bars to rearward positions at which the same are completely retracted within the channels in the platen. The roller 46 is so positioned that when the rack-bars have been returned to the rearward positions the axis of said roller 46 is in alinement with the axis of the rocker-shaft 19, whereby the oscillation of said shaft in moving the platen to and from the impression position will not affect or change the relative position of the roller 46 and cam 47. Thus the portion of said cam which engages said roller during said movements of the platen may be simply circular, and said cam is especially contoured for only that portion thereof which engages the segment-roller 46 during the dwell of the platen at the feed position thereof. Movement of the rack-bars to the forward or projected positions thereof is effected by means of a torsion-spring 48 which is disposed around the shaft 33 as shown in Fig. 2. One end of said spring 48 is connected with a collar 49 which is secured to the shaft adjoining one of the gears 32, the collar being adjustable about the shaft to vary the tension of the spring. The other end of the spring is connected with one of the arms 44 which carry the intermediate gear 42, and the pressure of the spring upon said arm 44 tends to swing the arm toward the segment 45, thus keeping

the gear 42 in mesh with the segment and accommodating slight variations in the relative position of said segment and the shaft 33, due to adjustments of the relation of the platen to the rocker, as effected by the impression-screws 24. It will be seen that while the rack-bars are actuated to the forward or projected positions thereof by the spring 48, the movement is controlled by the cam 47 and cannot occur more rapidly than is permitted by the roller 46 remaining in contact with the cam and traversing the inwardly inclined face 50 thereof. It will be noted also that by reason of the forward movement of the rack-bars being effected by a yieldable actuating member, namely, the spring 48, the forward movement of the rack-bars may be stopped at any point desired, by the interposition of a fixed abutment for limiting said movement, and that when the forward movement of the rack-bars is so limited the roller 46 will merely disengage from the cam 47 and remain stationary until it is re-engaged by the outwardly inclined face 51 thereon, after which the continued movement of the cam will positively return the rack-bars to the rearward or retracted position thereof.

The ends of the rear gripper-bar 36 are extended laterally beyond the rack-bars, and on said extended ends there are forwardly projecting fingers 52, best shown in Figs. 3, 4 and 9. The forward movement of the rack-bars is limited by the engagement of said fingers 52 with the ends of stop-blocks 53 secured on the rear portion of the feed-table frame side-members 54. Said frame-members 54 rest slidably upon the horizontal upper surfaces of the upper forwardly projecting portions of the press side-frames 16, as best shown in Fig. 15. The forward and upper portions of the side-members 54 are connected to each other by a transverse member 55, over which is disposed the main feed-table 56. The lower portions of the side-members 54 extend down between the press side-frames 16, and said lower portions of the members 54 are connected to each other by transversely extending bars 57, 58 and 59, to which more detailed reference will be made hereinafter. The rigid frame, formed by the members 54 and the transverse connecting members 55, 56, 57, 58 and 59, is held removably upon the press frame by means of screws 60 which extend vertically through suitable openings therefor in the members 54, and which have at their upper ends knurled heads 61. Coiled springs 62 are disposed around the intermediate shank-portions of the screws, as shown in Fig. 15, the upper ends of said springs bearing against washers 63 which engage pins 64 extending transversely through the screw-shanks. The lower ends of the screws enter threaded openings in the press-frame 16, and the shoulders formed at the lower ends of the shanks engage the inwardly offset portions of the members 54, as shown. When the heads 61 are turned to unscrew the lower portions from the frames 16, the springs 62 hold the screws up so that the entire feed-table frame may slide freely off the press-frame.

The feed-table 56 is slightly inclined rearwardly, and at the rearward edge thereof a plate 79 is mounted pivotally on a rod 80 extending transversely between the frame-members 54, the upper surface of the plate forming a rearward extension of the surface of the table 56. The rearward portion of said plate 79 is slotted longitudinally of the table to form a series of transversely spaced fingers 81 which extend in proximity to, and terminate slightly above, the front edge of the platen when the same is in the delivery position shown in Fig. 1. Above the rear portions of the fingers 81 there is a shaft 65 of which the intermediate portion is squared, and the cylindrical end-portions are mounted pivotally in bearing-brackets 66. At one end said shaft 65 carries a rearwardly extending arm 67 which is provided at the end with a roller 68 adapted to engage the peripheral surface of one of the platen-cams 18. On said peripheral portion of the cam 18 there is a raised portion 69 adapted to periodically lift the arm 67 and thus slightly rotate or rock the shaft 65. On the squared intermediate portion of the shaft there are two or more transversely adjustable gage-members of which the detailed structure is best shown in Fig. 9. Each of said gage-members comprises a block or head 70 mounted slidably on the shaft, a rod 71 passing slidably through the upper portion of the head, and extending rearwardly therefrom, the front end of said rod 71 being threaded and carrying a knurled nut 72, a coiled spring 73 disposed around the rearwardly extending portion of the rod, a flat gage-finger 74 secured to the rear end of the rod and extending downwardly therefrom, and a curved guide-strip 75 secured to the front side of the gage-finger, said guide-strip extending first forwardly and then rearwardly so that the end thereof contacts with the gage-finger near the lower end of the latter. On the rearward side of the head 70 there is a tubular neck in which is disposed a ball 76 which is pressed yieldingly into engagement with the side of the shaft by means of a spring 77, said spring being retained by a screw 78 in the rearward end of the neck. In the rear side of the square shaft 65, above each of table-fingers 81 there is formed a shallow conical recess 82, as indicated in Fig. 3, into which the ball 76 is pressed to frictionally retain the gage device in a transversely adjusted position at which the finger 74 is in register with the respective table-finger. The spring 73 holds the nut 72

against the front side of the head 70, and by turning said nut the position of the gage-finger may be varied longitudinally of the table-finger.

Besides the gage devices mounted on the shaft 65, there is provided an adjustable side-gage of which the construction is shown in Figs. 3 and 8. The side-gage is formed by a flat L-shaped finger 83 which is carried at the end of a threaded stem 84, the latter extending horizontally through the head of a bracket 85 formed integrally with a vertical post 86. Nuts 87 on the stem 84 at opposite ends of the bracket-head 85 enable said stem to be adjusted longitudinally therein. A screw 88, having a flanged lower head-portion 90, passes through the vertical post 86, and at the upper end has a knurled nut 89 by means of which the flanged head 90 may be drawn toward the flanged foot of the post. The post is adjustably secured to the table-fingers 81, by passing the head of the screw 88 into the slots between the fingers and tightening the nut 89 to clamp the adjacent edges of the fingers between the foot of the post and the flanged head of the screw. In Fig. 3 the gage-post is shown as mounted at the extreme left side of the feed-table, the clamp-screw being passed through one of a series of special notches 91 formed therefor at the outer side of the last slot between the table-fingers.

To the upper edge of the cross-bar 57 between the side-members 54 of the feed-table frame, there is secured a plate 92 which extends diagonally upward and rearward, terminating adjacent to the front edge of the platen when the latter is in the delivery position shown in Fig. 1, the upper edge of the diagonal plate extending just beneath the rack-bars when the same are in the forwardly projected position. To the lower edge of the cross-bar 57 there is secured a plate 93 which extends first downwardly and forwardly in a plane parallel with the plate 92, and is then turned down vertically and the lower edge thereof secured to the cross-bar 58. To the cross-bar 59 there is secured a series of horizontal fingers 94 which are arranged in alternating relation with fingers 95 formed on the rearward edge of an angle-plate 96, said plate also having a series of vertically extending fingers 97 thereon. The angle-plate 96 is secured to a bar 98, and to the end-portions of said bar are secured the forward ends of horizontal rods 99 which extend slidably through lugs formed at the ends of the cross-bar 59. The vertical portion of the plate 92, and the fingers 97 and vertical portion of the angle-plate 96 form respectively the rear and front sides of a receiver for holding the printed sheets delivered from the press. The bottom of the receiver is formed by the fingers 94 and 95 and the horizontal portion of the angle-plate 96. Adjustable sides for the paper-receiver are formed by plates 100 which extend in vertical planes, and of which the rearward edges are shaped to conform with the plate 93. At said rearward edges of the plates 100 there are inwardly turned lugs 101 which rest against the cross-bar 58 below the lower edge of the plate 93, and lugs 102 which rest against the cross-bar 57 between the lower edge of the plate 92 and the upper edge of the plate 93. To the lugs 101 and 102 are secured pins 103 which extend through slots in the cross-bars 57 and 58, coil springs 104 being disposed around said pins between washers 105 and 106, the washers 105 being secured to the pins and the washers 106 being slidable thereon, so that said washers 106 are held by the springs in frictional engagement with the rear sides of the cross-bars.

Referring now particularly to Figs. 3, 4 and 9, at the ends of the rear gripper-bar 36, adjoining the rear edge thereof, are secured bearing-members 107 for the gripper-rod 108 which extends along the rear edge of the bar 36 and has near its ends cylindrical portions which are held by said bearing-members. The intermediate portion of said gripper-rod, and the end portions which project beyond the bearing-members, are of slightly oblong rectangular sectional form. The main grippers are mounted slidably upon the intermediate portion of the rod 108, and each of said grippers comprises a lower finger 109 and an upper finger 110, said fingers being of resilient sheet metal, such as spring steel. The lower finger 109 has the rear portion thereof formed into a rectangular loop 109′ embracing the rod 108, the main body of the finger extending forwardly from said loop beneath the bar 36 and terminating at some distance beyond the front edge of said bar. The rear portion of the finger 110 is forked, and the forked portion is formed into two rectangular loops 110′ which extend around the rod 108 at each side of the loop 109′. The loops 110′ are slightly longer, however, than the width of the rod 108, whereby to provide a space within the same for receiving the ends of a bowed flat spring 111. The central bowed portion of said spring 111 extends through an opening in the rear side of the loop 109′ and enters one of a series of notches 112 in the adjoining edge of the bar 108, and by this means the gripper is retained upon said bar at definite transverse positions corresponding with the slots between the table-fingers 81, as shown in Fig. 2. The finger 110 extends forward from the forked rear portion thereof, over the top of the bar 36, and in front of said bar curves downwardly so as to press against the lower finger 109 near the end thereof, both the gripper-fingers being so formed that when they are

assembled upon the rod 108 their forward ends will tend to press firmly together. Upon each end of the rod 108, outside the bearing-members 107, there is secured an arm 113 which extends forwardly alongside the end of the bar 36. At the inner edge of said arm, adjoining the front end thereof, is an integral tongue 114 which extends first downwardly and is then turned outwardly beneath and parallel with the main or upper portion of the arm, thus forming a U-shaped head on the arm, with the open side of the U at the outer side of the arm. In the operation of the gripper mechanism, as the bar 36 approaches the forward limit of its travel said U-shaped heads of the arms 113 engage the rear inclined faces of resilient track-members 115 which are secured upon the platen in the path of said heads, as best shown in Figs. 3 and 4. As the U-heads slide up said inclined rear portions of the track-members the gripper-rod 108 is slightly rotated, whereby the grippers are opened, the upper fingers 110 being raised at the front ends thereof and thus moved away from the lower fingers 109 which, by reason of their extension beneath the bar 36, are held down substantially in contact with the platen. The parts are so arranged and proportioned that the grippers are fully opened at the moment when the fingers 52 on the ends of the bar 36 engage the ends of the stop-blocks 53. Referring now to Fig. 1, it will be seen that the grooves in the platen-cams 18 have portions 116 which are concentric with the main-shaft 17, and in which the rollers 21 run while the platen remains stationary at the delivery position shown in said figure, said position being that in which the platen is at the upper and forward limit of its movement. It will also be seen that the platen-cam grooves have portions 117 which are also concentric with the main-shaft 17, but which are of slightly smaller radius than the portions 116, the cam-groove having a slight inward offset at the adjoining ends of the concentric portions 116 and 117. Now, as the cam-rollers 21 pass through said offset part of the cam-groove, the rocker and platen are tilted slightly rearward above the axis of the rocker-shaft 19, and the front edge of the platen is moved slightly upward and rearward, whereby the face of the platen at said front edge is brought into tangency with the feed-table fingers 81. The relative positions of the platen and the fingers 81 at the beginning and end of said tilting movement, are shown in Figs. 4 and 9, and will be designated as the delivery position and feed position, respectively, of the platen. The described movement of the platen to the feed position lifts the fingers 52 out of engagement with the ends of the stop-blocks 53. The upper faces of said stop-blocks adjoining the ends thereof are upwardly inclined and said inclined faces terminate at shoulders 118 with which the fingers 52 are in register at the conclusion of the tilting movement of the platen. Now, remembering that the forward movement of the rack-bars which carry the gripper mechanism is effected by the spring 48 around the shaft 33, it will be seen that when the fingers 52 are disengaged from the ends of the stop-blocks said spring 48 will cause a slight additional forward movement of the rack-bars and gripper mechanism relative to the platen, and that said movement will be terminated when the fingers 52 engage the shoulders 118 of the stop-blocks. The additional forward movement of the gripper-bar 36 carries the U-heads of the gripper-releasing arms 113 past the front ends of the track-members 115 and permits the closing of the grippers, the slight rocking movement of the rod 108 during said gripper-closing movement being assisted by small torsion springs 119 disposed around said rod 108 adjoining the bearing-members 107, the ends of said springs being connected respectively with the rod and the bearing-members. One of said springs is shown in Fig. 3. After the closing of the grippers, and the beginning of the rearward movement of the rack-bars, the lower parts of the U-heads on the arms 113 move beneath the track-members 115, of which the inclined rear portions are adapted to spring upwardly enough to enable the tongues 114 to pass under them.

The gripping devices carried by the front gripper-bar 35 are shown in detail in Figs. 5, 6, 7, 9 and 11. Referring to said figures, a rod 120 is arranged adjacent to and parallel with the rear edge of the bar 35, being connected therewith by bearing-members of the form shown in Fig. 7. Each of said bearing-members is formed by an integral strip of resilient metal such as spring steel, one end of the strip being formed into a semi-cylindrical seat 121 for the lower side of the rod, the adjacent portion 122 extending forward beneath the bar 35 and being secured thereto by screws 123, the strip then extending up around the front edge of the bar, and a straight portion 124 extending back over the top of the bar and forming a flat spring resting on the upper side of the rod and holding the same in the seat 121. The portion of the rod 120 intermediate the bearings is square in section, the portions resting in the bearings are three-quarter round, and the portions extending beyond the bearings are round in section. The projecting corner 125 formed on each of the three-quarter round portions of the rod forms two flat faces for engagement with the flat spring-portion 124 of the respective bearing-member, whereby the rod is held yieldingly in either of two positions

between which the rod may be turned a quarter-revolution by the application of sufficient force to cause the projecting corners 125 to lift the end of the spring. On the square intermediate portions of the rod 120 are slidably disposed two or more gripping devices each comprising a flat plate 126 having at one end thereof a slightly curved tongue 127 and two tongues 128 which are turned at right angles to the plane of the plate and formed into rectangular loops which pass around the rod. The loops formed by the tongues 128 are slightly longer than the width of the rod, thus providing space within the loops for receiving the ends of a bowed spring 129, similar to the spring 111 of the rear gripping devices. The central bowed portion of the spring 129 is adapted to enter one of a series of notches formed in the side of the rod 120, whereby to retain the gripper at definite transverse positions corresponding with the slots between the table-fingers 81. At the ends of rod 120 are small cranks 130 formed by L-shaped pins inserted in the front side of the rod, so that the same extend forward and slightly upward when the plates 126 and tongues 127 lie horizontally, or with the plates 126 extending forward beneath and in contact with the lower side of the bar 35, as shown in Figs. 5 and 6. This may be regarded as the normal position of the front grippers. On the inner sides of the frame-members 54 are secured track-plates 131 which are alined vertically with the laterally projecting cranks 130, and which are engaged by the cranks during the movement of the platen to the feed position shown in Fig. 9. It will be seen by reference to said figure that by the engagement of the cranks with the track-plates 131 the rod 120 will be caused to make a quarter-revolution, whereby the members 126—127 will assume the approximately vertical position shown. The lower edges of the track-plates are curved to correspond with the curvature of the rack-bars 25—26, whereby the cranks will engage said edges no matter what may be the extent to which the rack-bars are projected in front of the platen, and regardless of the positions to which the gripper-bar 35 may be adjusted longitudinally of the rack-bars. The front grippers being in the vertical positions shown in Fig. 9, the rearward movement of the rack-bars, by which the same are retracted into the channels therefor in the platen, causes the plates 126 to strike the rounded upper edge of the front tympan-bail 39, whereby the grippers are turned down to the normal position thereof and pass back over the platen in said position, as shown in Fig. 11.

Upon completion of the rearward movement of the rack-bars 25—26, the same are retained in the retracted position by means of latches 132 of which the detailed construction is shown in Figs. 12, 13 and 14. Referring to said figures, said latches are disposed in recesses 133 formed in the platen beneath the guide-plates 27, the ends of the latches being adapted to engage in suitable notches formed in the adjoining edges of the rack-bars, as indicated in Fig. 14. Each of the latches is carried upon the upper end of a small shaft 134 which extends downwardly from the recess 133 through a boss 135 on the lower side of the platen. Upon the lower end of the shaft is secured a laterally extending arm 136 to the outer end of which is connected a spring 137, said spring extending rearwardly and being connected to the body of the platen, as indicated by dotted lines in Fig. 1. A short flat arm 138 extends from the shaft oppositely to the spring-arm 136, and is adapted to engage the end of an adjusting-screw 139 when the platen is in the delivery position shown in Fig. 1. The screw 139 is carried by a fixed bracket 140 which is secured to the cap 141 of the bearing for the rocker-shaft in the press-frame 16, and the screw is so adjusted that as the same is engaged by said arm 138 the shaft 134 will be thereby turned so as to disengage the latch from the rack-bar and permit the forward or projecting movement thereof. When the movement of the platen to the feed position occurs, the arm 138 is carried away from the screw 139 sufficiently to permit the latch to again engage the rack-bar and to enter the notch therein when the same is moved to the retracted position thereof.

In the operation of the mechanism, a pile of the paper sheets to be printed is placed upon the main feed-table 56 and the sheets are combed out in the usual way to facilitate the separation thereof. Each sheet, as separated from the pile by the press-feeder, is pushed rearwardly over the pivoted table-portion formed by the plate 79 and fingers 81, the side edge of the sheet being engaged with the side-gage 83, and the rear edge of the sheet being engaged with the gage-fingers 74, the sheet A extending beneath the guide-strips 75 as shown in Fig. 4. When the movement of the platen to the feed position occurs, as before mentioned, the rear grippers, which have been previously opened by the engagement of the arms 113 with the track-members 115, are brought into a position slightly behind the edge of the sheet A, with the lower gripper-fingers 109 at a level slightly below the sheet and the upper fingers 110 above the same. Then, as the rack-bars move forwardly to engage the ends of the fingers 52 with the shoulders 118 on the stop-block 53, the gripper-fingers pass below and above the sheet, respectively, so that said fingers will close upon and grip the sheet as the heads of the arms 113 pass

off the front ends of the gripper-opening track-members 115. At the moment when the grippers engage the sheet the shaft 65 is moved by the engagement of the roller 68 with the cam-member 69, and the gage-fingers 74 are thus lifted away from the table-fingers 81. The various parts are then in the positions shown in Fig. 9. The rack-bars are then moved rearwardly to the retracted positions thereof, and during said movement the sheet is pulled by the rear grippers off the feed-table and onto the face of the platen. As the front edge of the sheet passes off the ends of the table-fingers 81, the front gripper-fingers 127 are turned down over the sheet, and thus hold said front edge of the sheet down onto the face of the platen, travelling with the sheet until the final position is reached, as shown in Fig. 11. As the front gripper-bar 35 passes beneath the table-fingers 81 the same are slightly raised thereby, as shown by dotted lines in Fig. 11, said fingers dropping down to their normal position when the gripper-bar has passed. When the rack-bars complete their rearward movement, the latches 132 engage and positively retain them in said position. The platen then moves to the impression or printing position thereof, and returns to the fully raised or delivering position shown in Figs. 1 and 4, and during said movements of the platen the sheet is fixedly held thereon by the grippers. As the platen reaches the delivering position the latches 132 are released by the engagement of the arms 138 with the screws 139, and the rack-bars then move forwardly until the fingers 52 engage the stop-blocks 53, the movement being controlled by the contoured face 50 of the cam 47. As the front edge of the printed sheet passes off the platen, said edge of the sheet falls away from the front gripper-fingers 127, and the sheet is fully released when the rear grippers are opened at the conclusion of the forward movement thereof. The sheet then falls onto the delivery-chute formed by the plates 92 and 93 between the upper portions of the plates 100, and is thereby guided so as to descend by gravity into the receiver or receptacle formed between the lower portions of the side-plates 100.

It will be understood, of course, that the plates 100 are adjusted laterally to provide a suitable space between them, according to the size of the sheets which are being printed, and that the front portion of the paper receiver, formed by the fingers 97, is similarly adjusted by sliding the supporting rods 99 through the lugs on the bottom cross-bar 59. In this connection it will be noted that the lower portion of the plate 92, where it is attached to the cross-bar 57, is doubled or turned under whereby to form an offset or shoulder which prevents the edges of the delivered sheets from catching in the transverse slot through which the lugs 102 and pins 103 are moved in adjusting the side-plates 100.

The method of adjusting the gripper devices for sheets of various sizes is very simple. With the rack-bars at the retracted position thereof, the screws 37 are loosened and the gripper-bars 35 and 36 are moved to positions at which they border the space upon the platen at which the paper sheets should rest during the printing operation. The screws 37 are then tightened, and the grippers are moved along the gripper-bars to the required positions for engaging the rear and front edges of the sheets, the grippers being held in the adjusted positions by the springs 129 and 111. The notches in the gripper-rods 120 and 108, into which said springs 129 and 111 extend in the adjusted positions of the grippers, insure the setting of the grippers at positions intermediate the table-fingers 81, so that the gripper-fingers may pass between the table-fingers without interfering therewith. Similarly, the recesses 82 in the shaft 65 insure the setting of the gage-fingers 74 directly above the table-fingers. From Fig. 4 it will be seen that the guide-fingers 75 prevent upward curling of the paper sheet A at the edge thereof adjoining the gage-fingers 74, whereby said edge of the sheet is definitely held in position to be engaged by the rear grippers when the same move forward and close after the shifting of the platen to the feed position.

When it is required that the printed sheets be in accurate register, as for multiple-color work, the positions of the gage-fingers 74 may be very closely adjusted by means of the nuts 72 on the threaded rods 71 which carry said fingers. Similarly, the nuts 87 on the threaded stem 84 enable accurate adjustment of the side-gage 83.

By releasing the screws 60, the entire feed-table, including the delivery-chute and sheet receiver, may be removed from the press frame and set aside, to provide more convenient access to the platen during the preparatory operations, such as changing the overlay sheets B under the tympan C, to secure the desired pressure of the printing form at all points. During the "make-ready" adjustments the gripper-bars 35 and 36 may be entirely removed from the rack-bars, if desired, to facilitate the insertion or removal of the tympan and overlay, it being noted that the latter are disposed entirely in the space between the rack-bars 25 and 26, and the gripper-bars being slightly raised above the surface of the platen proper, as shown in Fig. 2. The entire gripper mechanism, it will be observed, lies very close to the surface of the platen, the greatest thickness of said gripping devices being less than the difference between the

height of the type and of the usual blocking or "furniture" employed in printing-forms.

Now, having described my invention, what I claim and desire to secure by Letters-Patent is:

1. In a mechanism of the class described, the combination with an oscillating platen, of rack-bars slidable longitudinally in channels at the edges of said platen, gripper-bars connected with said rack-bars and extending transversely across the platen, grippers carried by said bars, and means for actuating said rack-bars during a dwell of the platen intermediate the movements thereof to and from its printing position.

2. In a feeding and delivering mechanism for platen presses, the combination with an oscillating platen, of members mounted slidably thereon, grippers carried by said slidable members, a feed-table, a delivery chute positioned beneath said feed-table; means for actuating the platen to printing position from a feed position at which one edge of the platen adjoins the feed-table, from the printing position to a delivery position at which the edge of the platen adjoins the delivery chute, and from the delivery position to the feed position; and means for actuating the slidable members to move a sheet from the platen while the same is at the delivery position, and to engage the grippers with a sheet upon the feed-table and carry said sheet onto the platen while the latter is at the feed position.

3. In a mechanism of the class described, the combination with an oscillating platen, of gripper mechanism mounted thereon and movable reciprocatingly relatively thereto, and means for actuating said gripper mechanism whereby to carry a sheet onto the platen by movement of the grippers in one direction, to eject the sheet by movement thereof in the opposite direction, and to positively hold the sheet in fixed relation to the platen during a period intermediate said movements.

4. The combination with a printing press having a cylindro-segmental oscillating platen, of gripper mechanism mounted upon the platen and movable bodily therewith and adapted to hold sheets thereon while the same are printed, and means for moving said gripper mechanism relatively to the platen concentrically of its curved face to deliver the printed sheets therefrom and to carry fresh sheets onto the same.

5. The combination with a printing press having a cylindro-segmental oscillating platen, of gripper mechanism mounted upon the platen and movable bodily therewith to hold sheets thereon for printing, means for moving said gripper mechanism relatively to the platen concentrically of its curved face to deliver printed sheets therefrom and to carry fresh sheets onto the same, feeding means for holding sheets in position to be engaged by the gripper mechanism, and means for receiving printed sheets therefrom.

6. The combination with a printing press having an oscillating platen, of a feed-table extending adjacent to the path of one edge of the platen, platen actuating means adapted to cause a dwell thereof when said edge adjoins the feed-table, gripper mechanism mounted upon the platen and movable relatively thereto, and actuating means for engaging the gripper mechanism with sheets upon the feed-table and carrying the same onto the platen during the dwell thereof, the gripper mechanism being adapted to retain the sheets upon the platen during printing thereof.

7. The combination with a printing press having an oscillating platen, of gripper mechanism mounted upon the platen and movable over the face thereof between positions adjoining its opposite edges, a feed-table extending adjacent to the path of one edge of the platen, gaging devices on said feed-table; and means for actuating the gripper mechanism to seize a sheet in gaged position upon the feed-table and, without releasing the same, carry the sheet onto the platen and positively hold the same thereon during the printing thereof, whereby the sheet is registered upon the platen according to its gaged position upon the feed-table.

8. The combination with a printing press having an oscillating platen, of rack-bars mounted slidably in said platen near opposite sides thereof, gripper-bars extending transversely across the platen and having the ends thereof secured to said rack-bars, grippers carried by said gripper-bars, and means for actuating said rack-bars reciprocatingly while the platen is stationary and for holding the rack-bars stationary while the platen is moving.

9. The combination with a printing press having a platen mounted to oscillate about a fixed axis, of means for moving said platen about said axis to and from impression position and causing the same to dwell intermediate said movements, said platen-actuating means being also adapted to effect a slight tilting movement of the platen between portions of the dwell thereof.

10. The combination with a printing press having a platen mounted to oscillate about a fixed axis, of a rotary cam for actuating said platen, a roller connected with the platen and engaging said cam, said cam having two concentric portions with which the roller engages to effect a dwell of the platen, and portions connecting said concentric portions and with which the roller engages to effect movement of the platen, one of said connecting portions being of small extent,

and the other being of relatively large extent, whereby to effect major and minor platen-movements between which the same is at rest, gripper mechanism mounted upon the platen, and means for actuating the same to carry sheets onto the platen during one of the dwell periods thereof and to eject the sheets therefrom during the other dwell period.

11. The combination with a printing press having an oscillating platen, of rack-bars mounted slidably in said platen, a gripper-bar extending across the platen between said rack-bars and connected therewith for adjustment longitudinally thereof, grippers carried by said gripper-bar, a feed-table, a fixed stop thereon engageable by the gripper-bar, yieldable actuating means for moving the rack-bars to engage said gripper-bar with said stop, and positive actuating means for returning the rack-bars to normal position from the position at which the gripper-bar engages the stop.

12. The combination with a printing press having a platen movable to separate impression, delivery, and feed positions, and adapted to dwell at each of the latter positions; of gripper mechanism mounted on the platen and movable to convey sheets across the face thereof; means for actuating said gripper mechanism to displace a sheet from the platen at the delivery position, to convey a sheet onto the platen at the feed position, and to positively hold the sheet thereon during the impression; means for receiving sheets displaced from the platen at the delivery position; and means for holding a sheet in position to be seized by the gripper mechanism when the platen is in feed position.

13. The combination with a printing-press having a movable platen, of rack-bars mounted slidably upon the platen at the sides thereof, front and rear gripper-bars secured to said rack-bars and extending across the face of the platen, grippers mounted on the rear gripper-bar and adapted to grasp the edge of a sheet, a feed-table for holding a sheet with its rear edge adjacent to the front edge of the platen, means for moving the rack-bars to carry the rear gripper-bar to the front edge of the platen and to engage the grippers with a sheet on the feed-table, means for moving the rack-bars rearwardly to carry the gripped sheet from the feed-table onto the platen, and fingers movably mounted on the front gripper-bar and adapted to engage the front edge-portion of a sheet on the platen and hold the same against the face of the platen.

14. In a device of the class described, a platen movable oscillatingly between impression and feed positions, rack-bars slidably mounted on the platen and movable bodily therewith, gripper-bars connected with the rack-bars and extending transversely between them, means for moving the rack-bars reciprocatingly to carry one gripper-bar beyond the edge of the platen and to carry the other gripper-bar substantially from edge to edge of the platen, a feed-table beneath which the first gripper-bar is movable, the feed-table having transversely spaced fingers extending adjacent to one edge of the platen, grippers mounted on the gripper-bars and adjustable longitudinally thereof, and means for holding the grippers at adjusted positions alined intermediate the fingers of the feed-table.

15. In a printing press, the combination with a cylindro-segmental platen mounted to oscillate about a fixed axis, of gripper mechanism mounted upon said platen and movable thereon concentrically with the curved surface thereof, means for actuating said gripper mechanism to displace a sheet from the platen while the same is stationary, means for actuating the gripper mechanism to carry a sheet onto the platen while the same is stationary, and means for holding the gripper mechanism in fixed relation to the platen during movement thereof.

16. In a mechanism of the class described, a platen, rack-bars mounted slidably thereon and movable to positions at which portions extend beyond one edge thereof, a transverse bar mounted on said portions of the rack-bar, gripping devices carried on said transverse bar and having fingers pivotally movable from positions substantially parallel with the bar to erect positions substantially perpendicular thereto, a track-plate engageable with said gripping devices to turn said fingers to the erect positions, and means for turning the fingers down from said erect positions to engage and hold a sheet directly upon the face of the platen as the transverse bar is moved to positions over the platen.

17. In a mechanism of the class described, the combination with a platen mounted to oscillate about a fixed axis, of gripper mechanism mounted upon the platen and movable bodily therewith, and actuating means for said gripper mechanism, including a member mounted to move with the platen about the axis of oscillation thereof and pivoted eccentrically to said axis, a roller carried by said member, and a cam engaging said roller and adapted to move the same to a position concentric with the axis of oscillation of the platen, whereby movement of the platen about said axis will not vary the relation of the roller to the cam.

18. In a mechanism of the class described, the combination with a platen, of a gripper-bar mounted thereon and movable reciprocatingly over the face thereof, a gripper-rod extending parallel with said bar and connected pivotally therewith, a track-member mounted on the platen adjoining the path

of the gripper-bar, an arm on the gripper-rod engageable with said track member to tilt the rod as the gripper-bar moves past the track-member in one direction, and a plurality of grippers mounted slidably on the gripper-rod and retained at definite longitudinal positions thereon, each of said grippers comprising a pair of resilient fingers straddling the gripper-bar and engageable with each other at the side of said bar opposite the rod, said resilient fingers tending to close toward each other and being separable to an open position by tilting of the gripper-rod as effected by engagement of the arm and track-member.

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