

(No Model.)

6 Sheets—Sheet 1.

A. GODFREY.
PLATEN PRINTING MACHINE.

No. 547,577.

Patented Oct. 8, 1895.

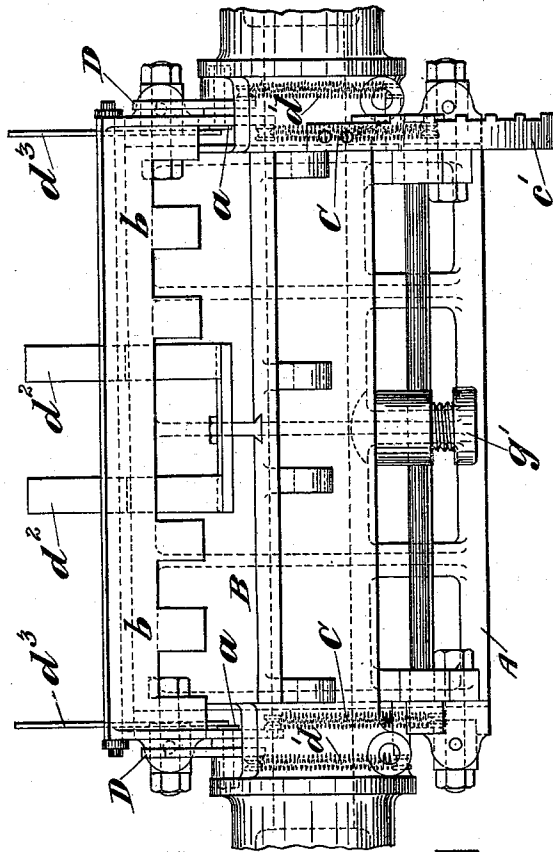


FIG. 2.

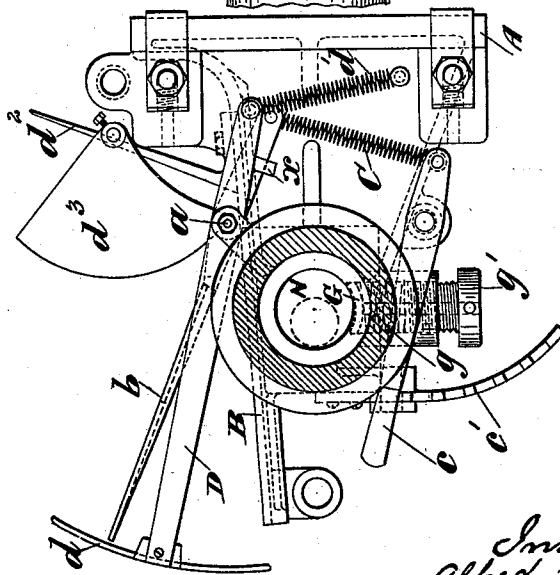


FIG. 1.

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Inventor:
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6 Sheets—Sheet 2.

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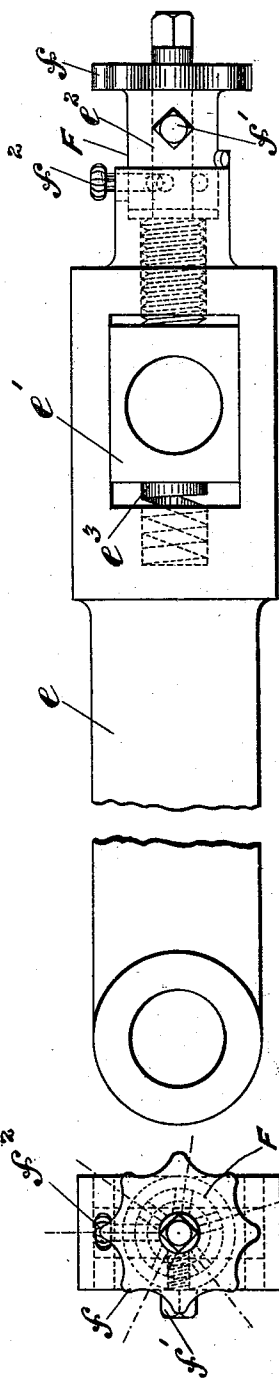


FIG. 4.

FIG. 3.

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6 Sheets—Sheet 3.

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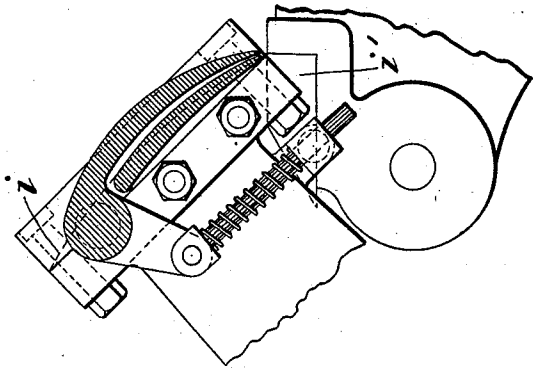


FIG. 7.

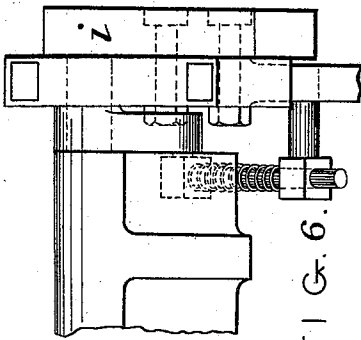


FIG. 6.

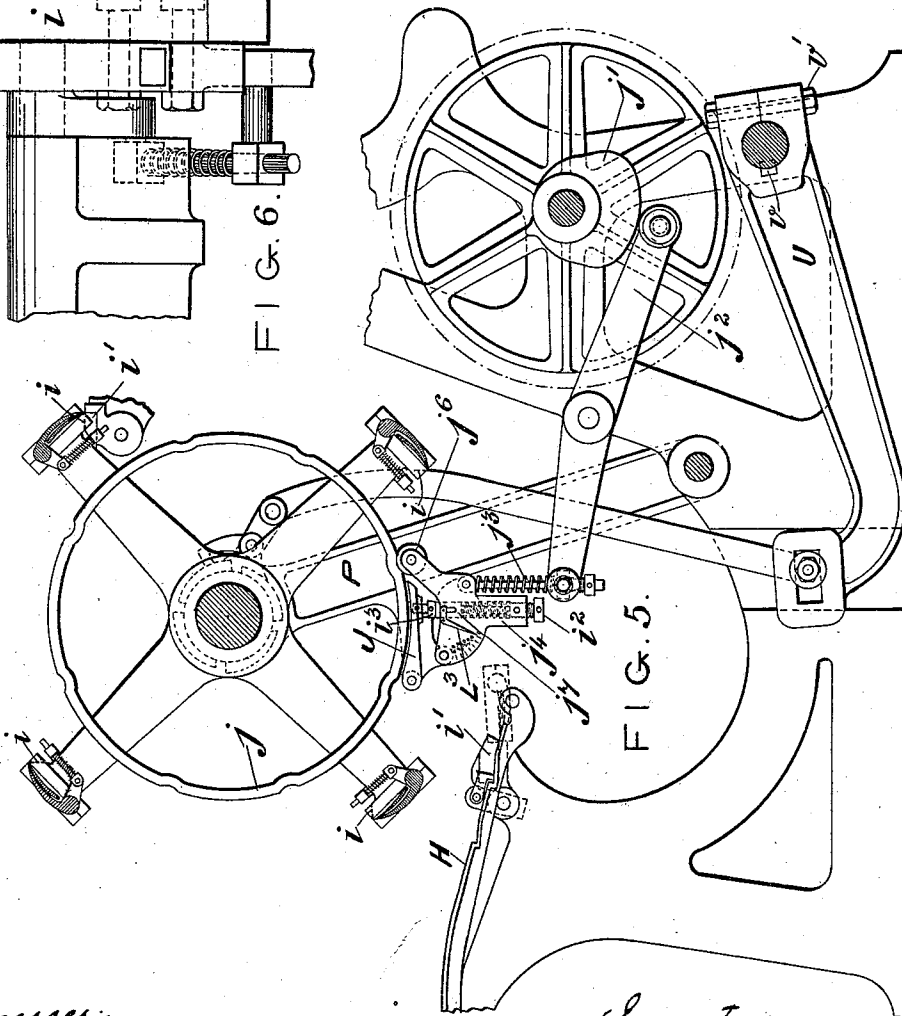


FIG. 5.

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(No Model.)

6 Sheets—Sheet 4.

A. GODFREY.
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Patented Oct. 8, 1895.

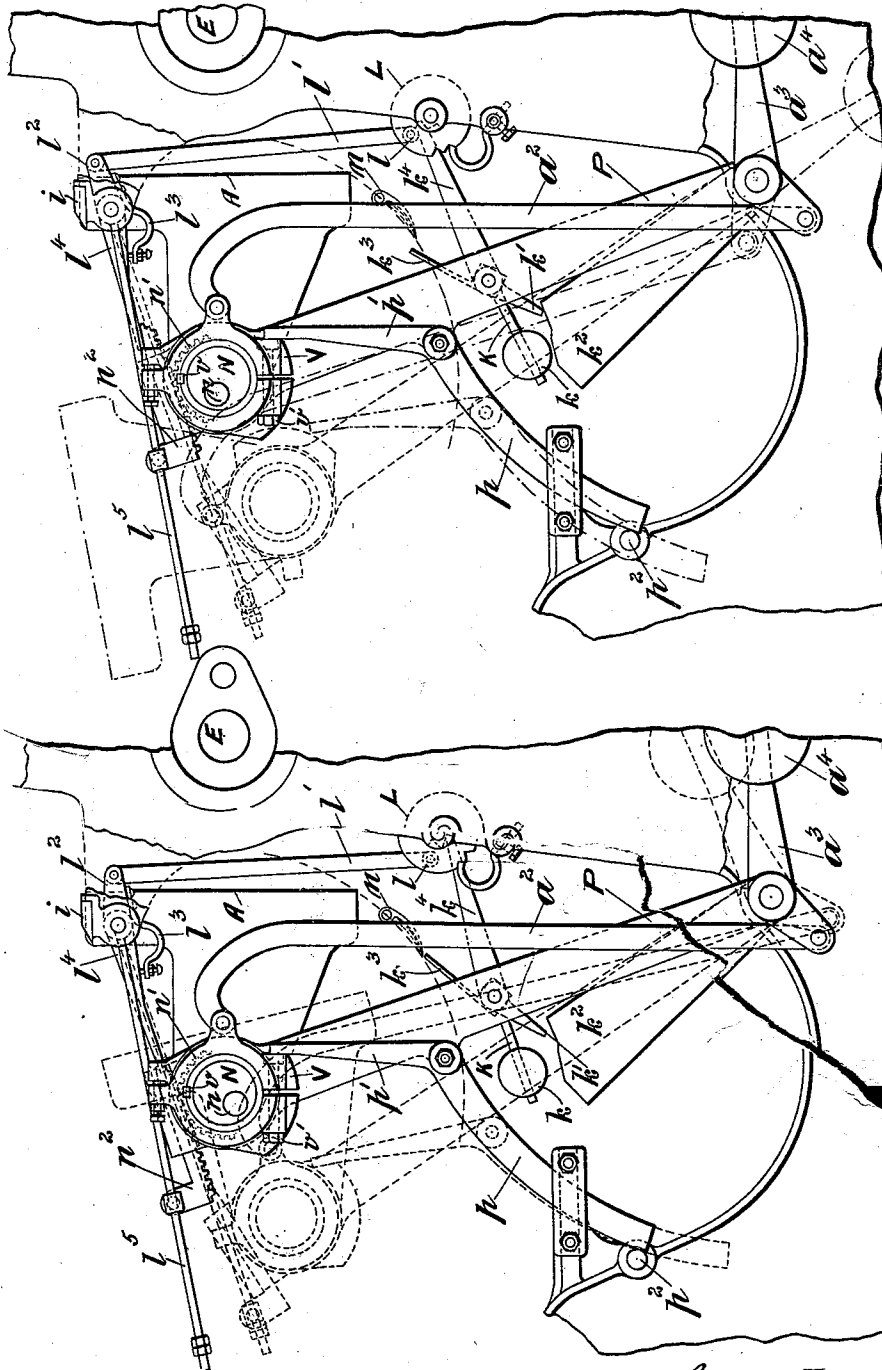


FIG. 9.

FIG. 8.

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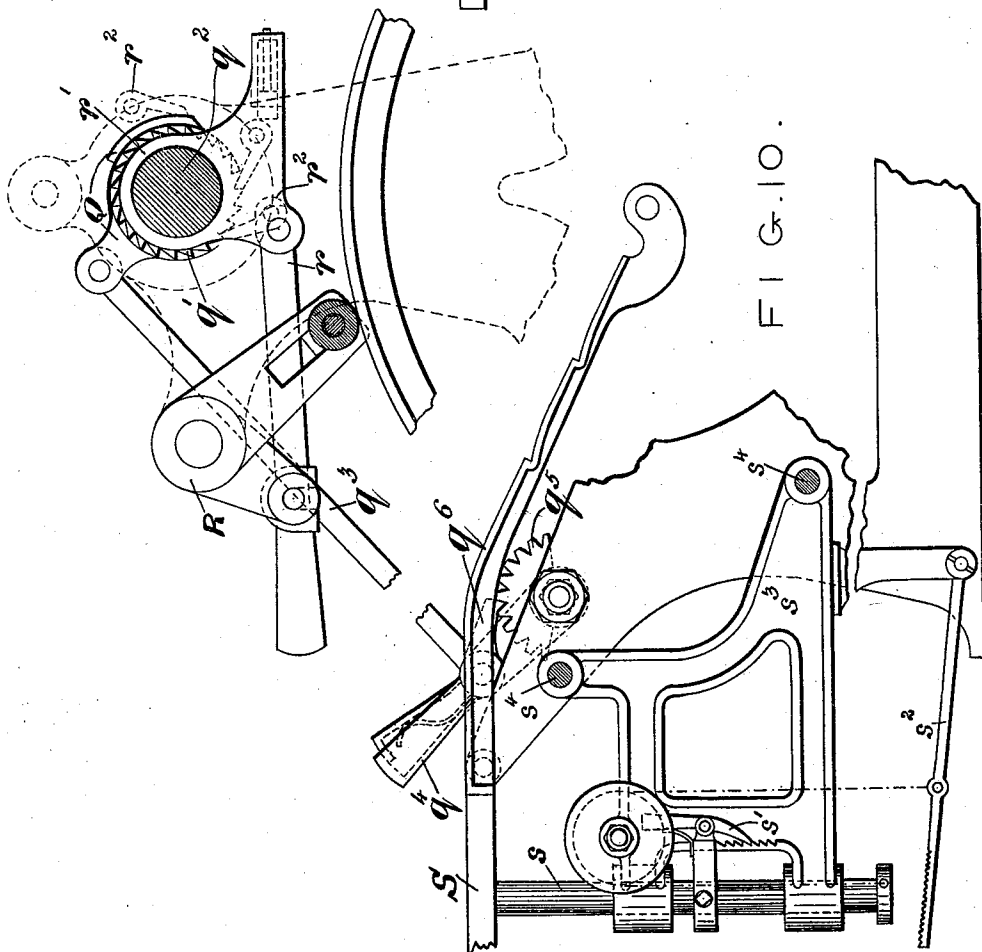
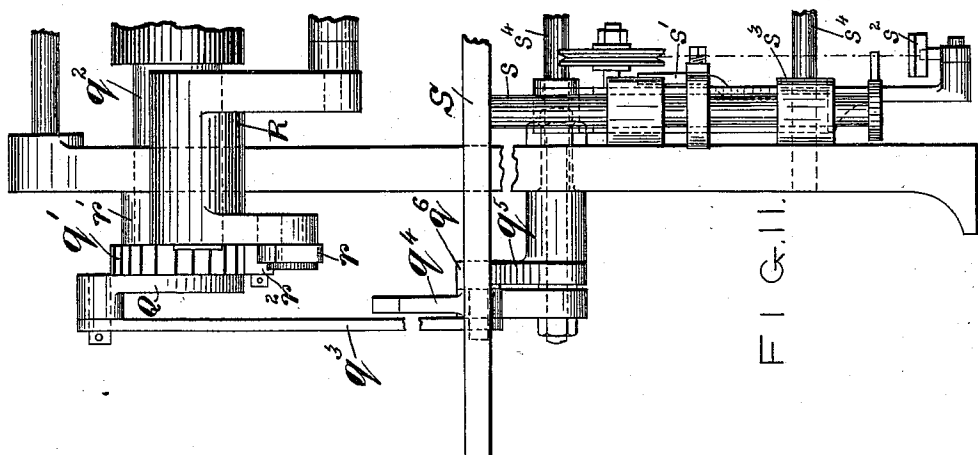
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6 Sheets—Sheet 5.

A. GODFREY.
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No. 547,577.

Patented Oct. 8, 1895.



Witnesses:
E. H. Sturtevant
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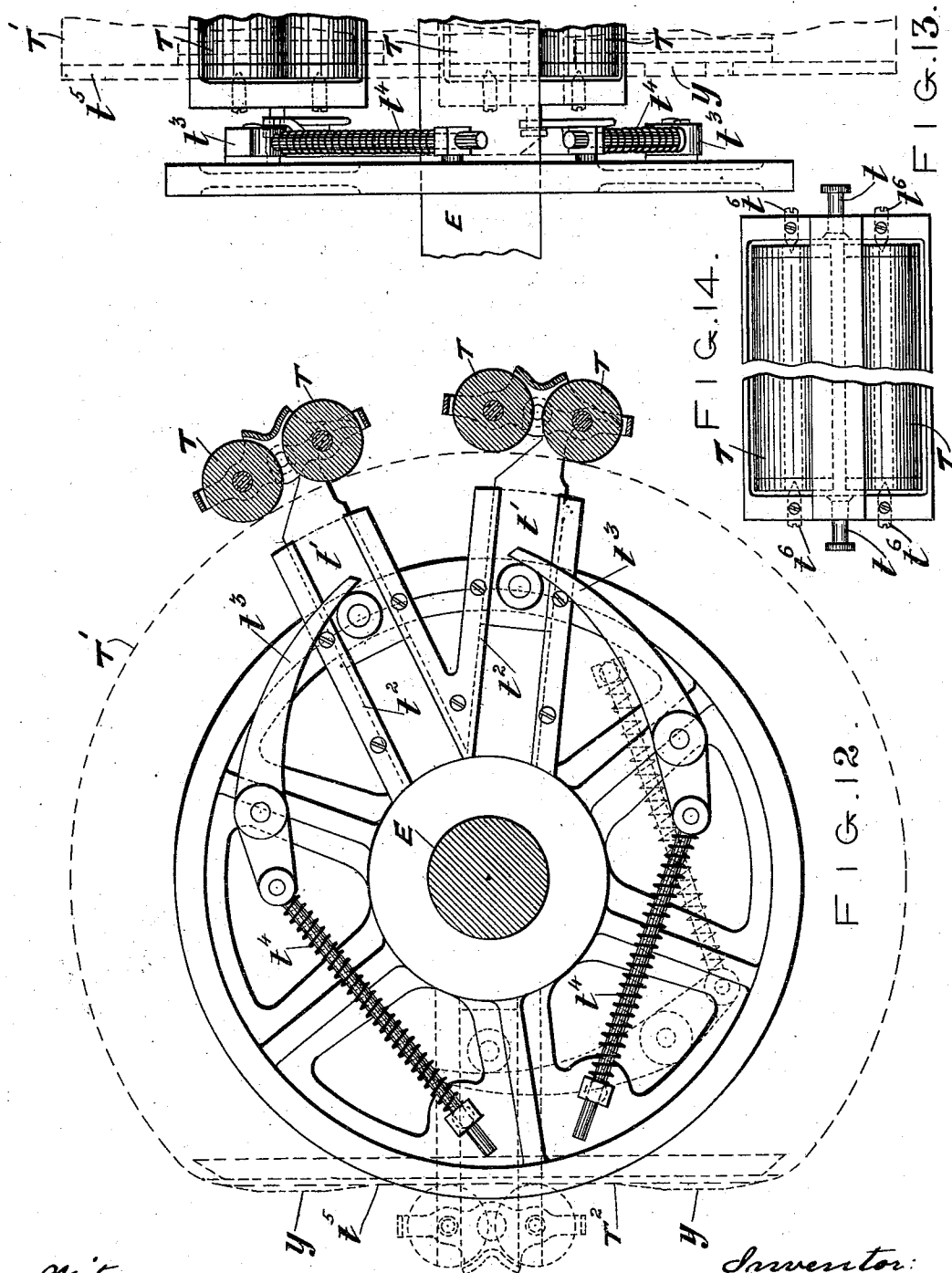
(No Model.)

6 Sheets—Sheet 6.

A. GODFREY.
PLATEN PRINTING MACHINE.

No. 547,577.

Patented Oct. 8, 1895



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Inventor:
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UNITED STATES PATENT OFFICE.

ALFRED GODFREY, OF LONDON, ENGLAND.

PLATEN PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 547,577, dated October 8, 1895.

Application filed May 11, 1894. Serial No. 510,867. (No model.)

To all whom it may concern:

Be it known that I, ALFRED GODFREY, residing at London, England, have invented Improvements in Platen Printing-Machines, of which the following is a specification.

My invention consists of an improved form of construction of my platen printing-machine as patented to me under No. 374,869, and dated December 13, 1887, in which the rotation of grippers about the axis of the platen-back is an essential feature.

The present improvement relates to a modified construction of the platen, platen-back, and delivery-board thereon, the side impression-rods, the brake and detent gear upon the gripper-frame, and automatic registering devices, the impression throw-off and throw-on, which is rendered automatic by the absence or presence of a sheet in the grippers, the tilting mechanism of the platen, and apparatus interlocking with the starting-gear, the means for the regulation of the flow of ink from the ink-duct, adjustable side-feed supply-boards, means for attachment of gripper-motion lever to its shaft, and of the platen-beam-tilting strap to platen-beam, and the spring-pressing device upon the inking-rollers.

The effect of this improvement is to allow of a larger quantity of printed matter being received upon the delivery-board and its uniform delivery thereon, to permit easy and definite adjustment of the impression, a more certain and unalterable register of the paper upon the type, which shall not be impaired by wear, an automatic throw-off and throw-on of the impression by the absence or presence of a sheet from or in the grippers, and thus allowing a double or multiple inking of the form by the withholding of a sheet for any number of impressions, as may be desired, and preventing the soiling of the tympan where a sheet is not present, the regulation of the flow of ink by the feeder without moving from his position as feeder and without stoppage of the machine, the prevention of accident by causing the tilting of the platen to prevent the starting of the machine while tilted, the power to adjust the side-feed supply-boards as to height and lateral position as to the feeder, so that the feeder may work from the supply of paper in any de-

sired position, and the better inking-effect of the inking-rollers as they pass over the type.

In order that my invention may be the better understood, I now proceed to describe the same, reference being had to the drawings hereto annexed, and to the letters marked thereon.

Figure 1 is a detail side elevation of the combined platen-back and platen and spring-balance delivery-table thereon. Fig. 2 is an end elevation of the same. Figs. 3 and 4 are detail end and side elevations of the adjustable side connecting-rods. Fig. 5 is a part side elevation of the gripper-frame drum, brake, and detent and registering-steel at feed-board. Figs. 6 and 7 are enlarged end and side elevations of the spring-pressed grippers. Figs. 8 and 9 are part similar elevations showing-feeding mechanism to throw off impression, interlocking striking-gear, and the platen in position for printing and tilted, respectively. Figs. 10 and 11 are part side and end elevations showing doctor-roller regulator and adjustable supply-boards. Figs. 12 and 13 are side and part end elevations of the spring-pressing device for inking-rollers. Fig. 14 is a detached plan of inking-rollers and supporting-carriage.

In Figs. 1 and 2, A is a combined platen and platen-back made in one casting, instead of as formerly in separate pieces connected by bolts and screws, to allow of the delivery-table B being considerably lowered within the travel of rotation of the grippers around the axis of the platen-back. This modification admits, by the omission of the usual screws and nuts connecting the platen and platen-back together, of a much deeper delivery-table, which will accommodate a larger quantity of printed sheets before it is filled. As the sheets have, however, in this arrangement a considerable distance to fall, I mount a supplementary table *b* on the delivery-board B. This supplementary table is pivoted on two swivel-pins *a*, one on each side of the table, the outer part of the table receiving the printed sheets being balanced by springs C, controlled by hand-lever *c* and adjusting-quadrant *c'*, according to the size and weight of paper. On the same swivel-pins *a* is mounted a pair of levers D, carrying the back

gage d , and kept up in position, as shown, by the spring d' against the stop x . By this arrangement the back gage d (removed in Fig. 2) will yield and prevent injury to the hand of the operator should he attempt to remove the printed sheets from the delivery-board or from the grippers while the machine is in motion. The front gage d^2 is adjustable in a slot on the delivery-board, so that it can be set, as regards the back gage, to any length of paper. I provide, also, wing-guides d^3 , mounted on a shaft passing through the said front gage, to control the fall of the printed sheets sidewise. I apply, also, a pad-brake G to the platen eccentric-shaft, which partly rotates to throw off the impression in a manner hereinafter described, the pad-brake being set up by a spring g and set-screw g' to prevent the impression coming off with a shock and to keep the eccentric in its proper position while the impression is on.

I connect the usual operating crank-shaft E of the machine with the platen-shaft N by two connecting-rods e , one on each side of machine, (shown in detail in Figs. 3 and 4,) which are of such modified construction as will enable the operator to easily adjust the length of the connecting-rod, and thus the required pressure of the platen upon the form. This adjustment may be readily made by a marked gage-wheel for each job to suit the class of work. One end of each connecting-rod e is a plain hole-bearing which works on the crank-pin; but in the other end a sliding block e' , fitting the end of platen eccentric-shaft, is fitted in the slotted end of the rod. The said block e' is adjusted in position by a screw e^2 , pressing the block against a spring e^3 . The screw-spindle e^2 is provided with a sleeve F , with notched flange f , and fixed to the screw-spindle e^2 by a set-screw f' . When the main screw e^2 is screwed up for maximum impression, the sleeve F being then loose, the sleeve is fixed by the set-screw f' so that the screw e^2 may be turned around easily by hand to reduce the impression in any required degree within a complete turn, the various fractional positions of the turn being determined by a pin f^2 and corresponding holes in the sleeve. This adjustment can be effected while the machine is at work, the hand-wheel or flanged sleeve being at the ends of the connecting-rods nearest to the feeder.

In order to obtain accurate position of the grippers or register of the sheets when taken off the feed-board H , Fig. 5, and when printed upon the "form" of type, I apply a brake J to a drum j of large diameter fitted to the gripper-frames. The brake-pressure is derived from a cam j' , (shown in detail, Fig. 5,) operating a rocking lever j^2 , at the farther end of which is a spring j^3 , pressing upon a carriage j^4 , hinged to the platen-supporting arm P , which also carries the brake-slippers J . The other end of the carriage j^4 carries a roller j^6 , which engages as a detent into recesses in the periphery of the drum j . The operation

of this compound brake and detent is that the first movements of the rocking lever j^2 through the spring j^3 is to apply a pressure upon the hinged brake-slipper J , through the medium of the spring-pressed pin j^7 , which arrests the momentum of the gripper-arms by brake-friction upon the drum j , affixed thereto. As a further consequence of the continued motion of the lever j^2 , the roller j^6 is pressed home into the recesses of the said drum j . An adjustable set-screw i^3 is used on the under side of the brake-slipper J and meets the top of the spring-pressed pin j^7 to take up the wear of the brake-leather, so that the play and compression of the spring about j^7 remains constant. An index-finger L^3 shows the amount of wear of the brake-leather and allows the minder to accurately take up the said wear by means of the set-screw i^3 , and thus to maintain the required brake-pressure. When the gripper comes to the feed-board in the lowest position to take a sheet therefrom, the register-stops i come home upon the fixed steel i' at the feed-table with the same face as they do at the upper register-steel upon the steel i' , fixed in the frame. These register-stops L are bolted to the gripper-frames, Figs. 6 and 7. Any wear, therefore, upon the register-stops has the same effect both at the feed-board and at the type bed or form, so that the register of the sheet remains unaltered. The action of these register-steels i' upon the frame above the form and the steel i' upon the frame at the side of the feed-board are identical and serve by the final reciprocating motion of the platen-supporting arm in its opposite travels, causing the gripper-stops to slide upon the said fixed register-steels, to complete the motion of the gripper-arms about the platen-axis to an accurate register in a more perfect manner than could be effected by the complete movement being caused only by the known pawl-and-lever driving mechanism.

To cause the impression to throw off or throw on, according to whether a sheet is fed into the grippers or not, I apply a balanced trip-lever K , Figs. 3 and 9, provided with an adjustable balance-weight k and pivotally mounted upon the rocking platen-supporting arms P . The said trip-lever has a tailpiece k' , sliding upon a fixed race k^2 , the counter-balance-weight being so adjusted that the tail k' always rests upon the said race, except when prevented by the paper in the gripper. The trip-lever has also a feeling-finger k^3 and a pawl-arm k^4 , operating a ratchet or toothed wheel L on the frame, provided with a crank-pin l , a connecting-rod l' , operating an arm l^2 , pivoted on the frame. When a sheet of paper is held in the gripper M the feeling-finger k^3 rises against the said sheet of paper as the tailpiece k' slides upon the race k^2 . If the paper be present in the grippers the feeling-finger k^3 is arrested in its travels and the pawl-arm k^4 is held depressed in the position shown in Fig. 8, engaging into the ratchet-

wheel L on the lower side of the axis of said wheel. As the rocking platen-supporting arms P continue their travel toward the type-back the said pawl-arm k^4 produces, by partly rotating the crank ratchet-wheel L, a downward pull upon the rod l' . If no paper is present in the grippers the feeling-finger k^3 rises between the fingers of the grippers, as shown in Fig. 9. The pawl-arm k^4 rises with it and engages into the crank ratchet-wheel L on the upper side of its axis and produces a thrust upward of the rod l' . The rod l' is connected to an arm l^2 , pivoted on the frame, to which is attached a spring-arm l^3 . A loose arm l^4 , also pivoted on the same pivot upon the frame, rests normally upon the spring-arm l^3 , and the upward or downward movement of the rod l' is communicated direct only to the spring-arm l^3 , the loose arm l^4 following the movement of the said spring-arm when it is free to do so. This arrangement is necessary because the throwing on or off of the impression by reason of the presence or absence of a sheet in gripper M, as shown, must not take place until the impression next following the immediate impression.

The platen-shaft N has its crank-pins n by which the impression is produced arranged eccentrically to the axis of the said shaft, and the impression is thrown off or on in the usual way by the partial rotation of the platen-shaft altering the position of the eccentric crank-pin. This is effected in this machine as follows: The platen eccentric-shaft has a cog-wheel n' fitted upon it and a rack n^2 sliding in a groove in the platen-supporting arm gears therein. When the eccentrically-placed crank-pin n is in the position, as shown in solid lines, Figs. 8 and 9, the brake apparatus previously described serves to keep the eccentric-shaft home in position, as shown, the rack thus traveling with the rocking platen-supporting arm without a sliding motion thereto. When the loose arm l^4 is in its lowest position, resting upon the spring-arm l^3 , the loose arm l^4 meets the end of the rack n^2 , as in Fig. 8, which, being thus arrested while the platen-beam travels forward, operates the cog-wheel n' on the platen eccentric-shaft, which is thus partially turned and the impression is thrown off. When the loose arm l^4 is in its highest position, as in Fig. 9, it is lifted out of the way of the said rack and the impression remains on. When the rack has been thus pushed back and the impression thrown off, it slides by means of a pivoting-lug upon the spindle l^5 , pivoted to the frame, and when the platen-supporting arms fall back to their farthest position from the form the nuts upon the end of the spindle l^5 bring up the rack again to normal position, as shown in dotted lines in Figs. 8 and 9, and thus throw on the impression once more. The loose arm l^4 , lifted by the spring-arm l^3 into its highest position, then lies upon the rack and does not arrest it, and engages also with the end of the rack when in its lowest position, so that

the loose arm l^4 does not follow the lift and drop of the spring-arm l^3 until the second impression after the movement of the said spring-arm l^4 by the rod l' . By this automatic throw-on and throw-off of the impression double or treble inking, or any desired amount of inking of the form, can be effected by merely missing the feed of one, two, or more sheets alternately with the sheet that is to be printed, and should a sheet be missed by the feeder the automatic throw-off prevents the type from soiling the tympan. In the same Fig. 9 is shown the arrangement by which the belt-shifter shaft or bar of the machine is locked while the platen is being tilted for the purpose of making ready, and when the platen is in position for printing the belt-shifter shaft or bar locks the tilting-gear, as shown in solid lines, Figs. 8 and 9, so that the platen cannot be tilted while the machine is running. The gear has also a counterbalance-weight to balance the weight of the platen on its axis for easy turning, and which also serves to balance the weight of the platen and platen supporting arms in its reciprocating movement about the lower pivot pin or bearing. This is carried out as follows: To one of the platen-supporting arms P, I attach a pivoted quadrant-arm p , which has an upper straight arm p' , resting against a shoulder of the platen-tilting strap V when the platen is down in its correct position for printing. When the straight arm p' is in this position, the quadrant-arm p passes under the shaft p^2 of the belt-shifter, which projects beyond the framing when the strap is on the fixed pulley, and thus locks the arms p and p' in position, and consequently the platen in proper position for printing. When the belt-shifter is moved over to the loose pulley and the machine stopped, the shaft p^2 is drawn back flush with the framing and the pivoted quadrant-arm p is released, so that the platen may be tilted, the shoulder of the platen-tilting strap v pushing the straight arm p' over and thus lifting the quadrant-arm p' until the latter covers the end of the starting-gear shaft p^2 . (Shown in Fig. 9.) When the platen is thus tilted for making ready, the starting gear and shaft p^2 cannot be moved until the platen is back in its position for printing and the quadrant-arm p falls back into its normal position, uncovering the starting-gear shaft p^2 .

To make the tilting of the platen easy I connect the platen-back A by a rod a^2 to a bell-crank a^3 , mounted on the end of platen-supporting arm-shaft provided with a counterbalance-weight a^4 . This counterbalance-weight fulfills a double purpose of both balancing the weight of the platen for tilting and also balances the weight of the platen-supporting arms P and platen A in their reciprocation about the bottom pivoting-shaft. I effect the regulation of the flow of ink from the ink-fountain by the feeder, without movement from his place and without stopping

the machine, by connecting the loose sleeve-guards Q, Figs. 10 and 11, on the ratchet-wheel q' of the first doctor-roller q^2 , by a rod q^3 , to a hand-lever q^4 , pivoted on the frame near the feeder and controlled as to its position by a notched quadrant q^5 , fixed on the framing and pawl q^6 . The doctor-roller q^2 taking the supply of ink from the fountain receives an intermittent rotary motion from the rocking shaft R by the connecting-rod r and pawl-collar r' and pawl r^2 . The said connecting-rod r is provided with a handle and rests by its weight only by a gab-mouth upon the pin of the rocking shaft R. The rod r may thus be lifted from the pin and worked by hand to set the doctor before starting the machine. The sleeve-ratchet guard Q can be adjusted by the hand-lever q^4 to cover any desired number of teeth in the ratchet-wheel q' , so as to prevent the feed-pawl r^2 from engaging therewith until it has slipped off the guard. The actual rotation of the doctor-roller q^2 against the ink-duct may thus be reduced from full travel to any intermediate amount of travel that may be desired by the position of the hand-lever q^4 .

In order that the supply-boards S, supporting the supply of paper, may be adjustable to any position as to the feeder and to any height, I mount the supply-board S on a spindle s , capable of vertical up-and-down movement, the board in any desired position being locked by the rack and finger s' . To easily lift the board as the supply-pile is reduced I attach the said spindle s by a chain or cord passing over a pulley to a treadle s^2 , by which the feeder can lift the supply-board at any time by foot-pressure. The whole frame s^3 and supply-table spindle can be traversed across the front of the machine to any required position to the feeder by sliding them upon the horizontal bars s^4 .

The inking-rollers T, Figs. 12 and 13, passing around and over the inking drum or slab T' , and the form T^2 are caused to press upon the surface of the form to ink the same where they are nearest to the center of rotation, as is important, with as great or a greater pressure than compared with that by which they press upon the inking-drum by means of the following device. The rollers T T are hung by centers t^6 in carriages in pairs, the pin-axes t of the carriages being engaged under hooks of the sliding slabs t' , working in radial guides t^2 . A pin and roller on such sliding slab is pressed inward toward the center by one end of a lever t^3 , the other end of which receives a thrust from a spiral spring t^4 . The whole device rotates with the rollers, being driven by gearing from the main motion shaft in the usual way. The relative position of the spring-pressed lever, spring, sliding slab, and roller-carriage when the rollers are on the form are shown in dotted lines, from which it will be seen that although the springs in this po-

sition have weakened by extension the levers t^3 exert a greater mechanical effect.

Should it be desired that the inking-rollers should not touch certain parts of the form, I apply attached pieces y , Figs. 12 and 13, fastened to the chase and overhanging the rail t^5 , upon which the bearing-rollers of the ink-rolls travel, so that the inking-rollers are lifted from the form at such points.

To insure more rigid attachment of the gripper-motion lever U to its shaft and of the platen-beam-tilting strap V to the platen-beam in addition to using the ordinary key v , I split the boss of the said lever U and also divide the strap V, fitting bolts v' through the said splits to draw the bosses close together to grip their respective shafts frictionally, as shown in Figs. 5 and 8.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a platen printing machine the combination with the platen and platen back, the fixed and supplemental hinged delivery boards thereon, the feed grippers and gripper frame rotating around the axis of the platen, the adjustable impression rods connected with said axis, the brake and detent gear for the gripper frame, the registering studs, the feeling finger for the paper, and the automatic throw off device operated by said finger in the absence of paper, the tilting mechanism for the platen, and means for interlocking with the starting gear, substantially as described.

2. In a platen printing machine, the combination with feed grippers rotating about the axis of a platen, of a platen back and platen, made in one piece, a fixed delivery board thereon, close to platen shaft, a hinged and spring balanced supplementary delivery board thereon, a spring balanced hinged back gage, an adjustable front gage, with side wings, substantially as and for the purposes described.

3. In a platen printing machine in combination with the platen beam and operating crank shaft, the adjustable impression rods connecting said beam and shaft, said rods having each a slotted end, with a spring pressed bearing block sliding therein and means for adjusting said block comprising the screw e^2 , the sleeve thereon having a set screw for connecting it with the screw e^2 , and the set screw f^2 registering with a series of perforations in said screw e^2 , substantially as described.

4. In combination with the rotating feed grippers and gripper frames, the recessed drum upon said frames, the hinged carriage having a roller detent thereon for engaging the recess of the drum, the brake shoe pivoted to the carriage having a set screw to take up wear, and the index finger for indicating such wear, substantially as described.

5. In a platen printing machine the combination with feed grippers rotating about the axis of a platen of an eccentric pin on the

said platen shaft, engaged by impression connecting rod, a cog wheel on said shaft with sliding rack thereon, a detent arm hinged on frame operated to miss or strike the said rack, 5 a spring-armed lever, hinged at same point on frame operating the detent-arm, a cranked ratchet wheel on frame and connecting rod operating said spring-arm, a balanced pawl arm hinged on balanced supporting-platen-arm, 10 operating said ratchet wheel and a feeling finger, part of said pawl arm, and tail piece traveling on fixed race controlling position of said pawl arm by absence or presence of paper in grippers to automatically 15 throw off the impression and means for throwing on the impression substantially as described.

6. In combination with the platen of a platen printing machine and the sliding belt 20 shaft moving longitudinally as the platen is connected or disconnected with the source of power, means for preventing the tilting of the platen while the machine is running, comprising a lever having one arm adapted to retain the platen against tilting and its other 25 end abutting against the extended end of the sliding belt shaft, substantially as described.

7. In a platen printing machine the combination with feed grippers rotating about the 30 axis of a platen of a fixed inclined feed-board, from which the said grippers take the paper and side adjustable supply-feed-boards, a foot treadle lifting the same vertically in guides (to keep the paper at one height to the 35 said fixed feed board), and horizontal rods on which the said supply boards slide across the machine substantially as and for the purposes described.

8. In a platen printing machine, the combination with the inking drum, the frame having radial guides, the sliding slabs carrying 40 rollers, the inking rollers carried by said slabs,

and the curved spring pressed arms bearing against the rollers and drawing the inking rollers inward, substantially as described. 45

9. In a platen printing machine, the combination with the feed grippers rotating about the axis of a platen, a recessed drum upon the gripper frames, a hinged carriage carrying a brake and a roller detent engaging recesses in the drum, a lever having spring connection with the carriage and a cam operating the lever for applying the brake and roller detent, substantially as described. 50

10. In a platen printing machine the combination of the frame rotating about the axis of the platen, the plurality of grippers carried by said frame, the registering steel upon the frame adjacent the feed board, the second 55 registering steel upon the frame adjacent the form bed, and the registering studs upon one side of said grippers having a bearing face contacting with both the steels, substantially as described. 60

11. In combination in a platen printing machine, a nearly balanced feeling finger pivotally mounted on the platen supporting arm, grippers rotating about the axis of the platen carrying sheets of paper therein, having a traversing movement always in the same direction over the said feeling finger, and means adapted to be operated by the said feeling finger, in the absence or presence of the sheet of paper in said grippers, to throw off or allow to remain on, the impression for 65 printing. 70

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

ALFRED GODFREY.

Witnesses:

RICHARD A. HOFFMANN,
CHARLES H. CARTER.