Mar. 6, 1923. 1,447,435

R. SATTLER

PLATE PRINTING MACHINE

Filed Mar. 12, 1921 3 sheets-sheet 1

Fig. 1.

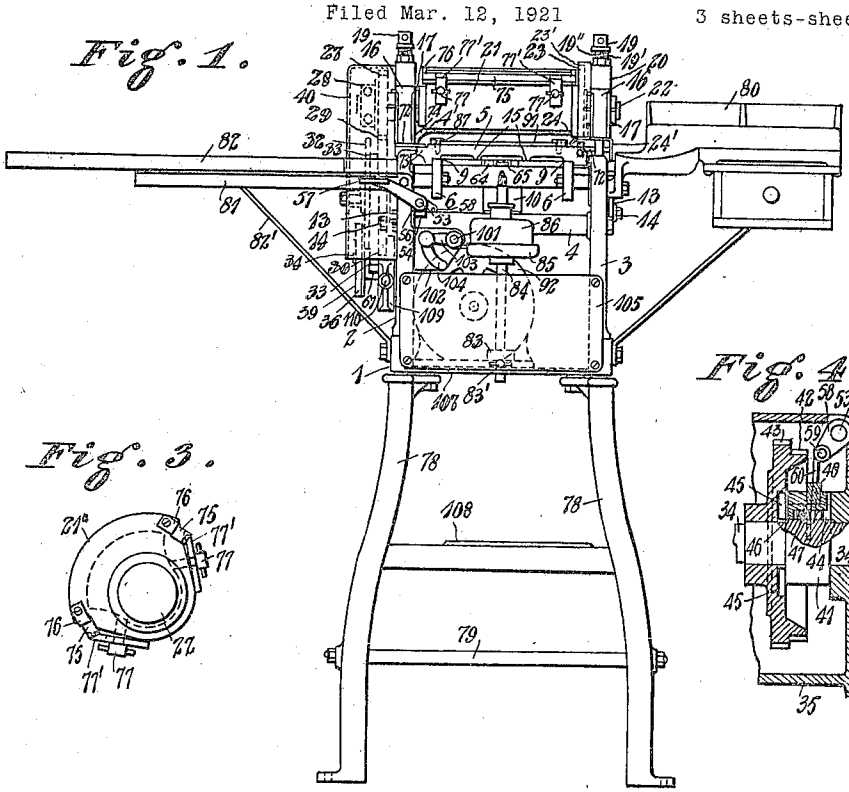
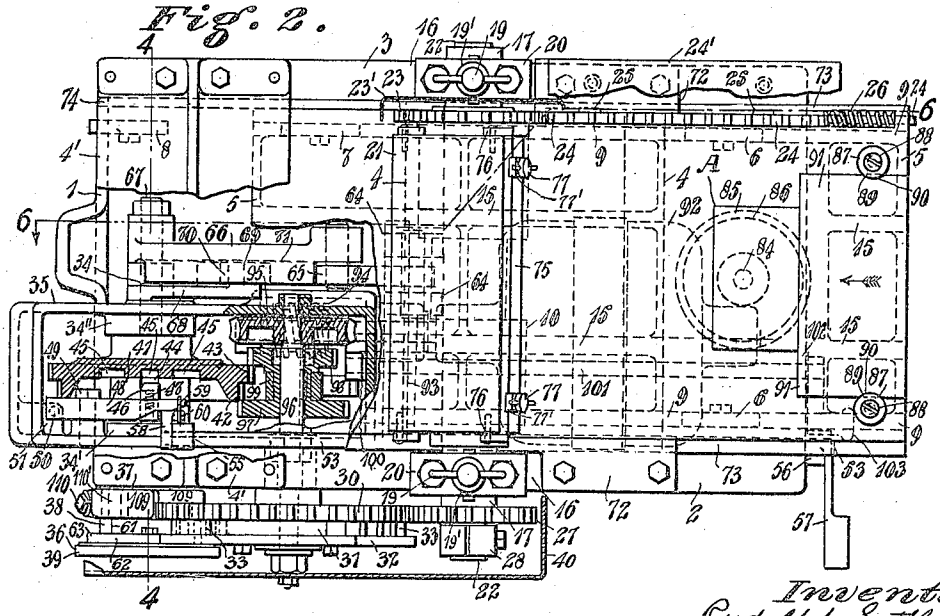


Fig. 3.

Fig. 4.

Fig. 2.



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PLATE PRINTING MACHINE

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Fig. 5.

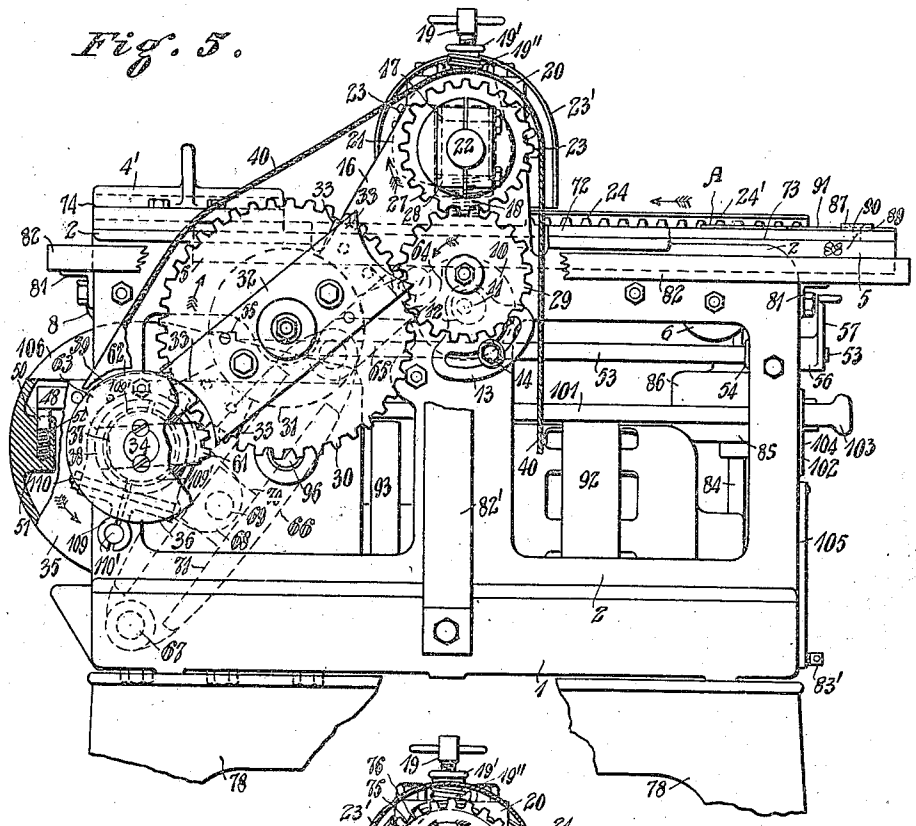
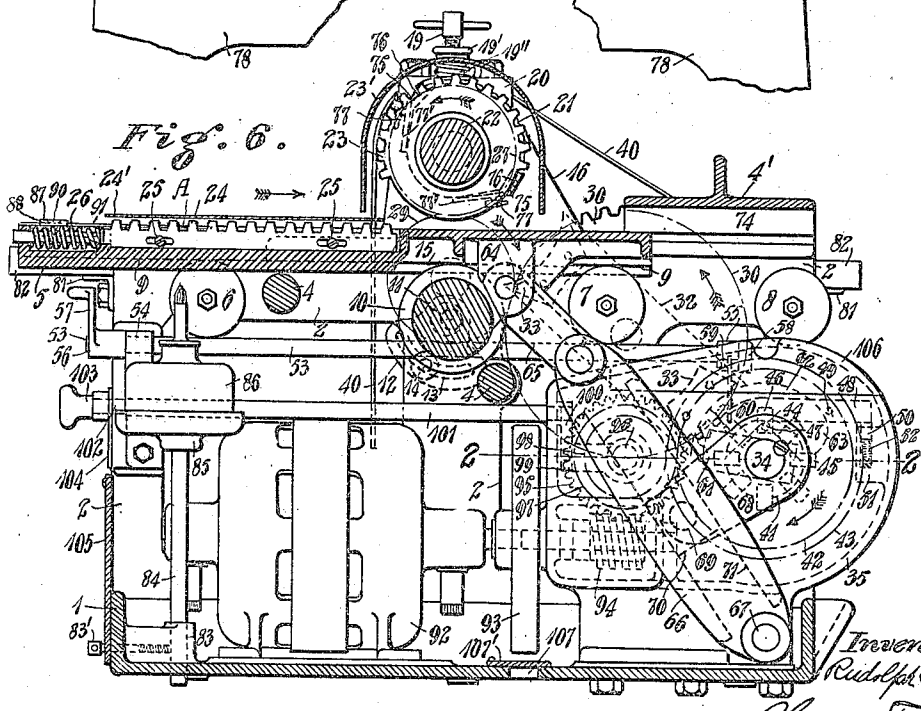


Fig. 6.



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PLATE PRINTING MACHINE

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Fig. 7.

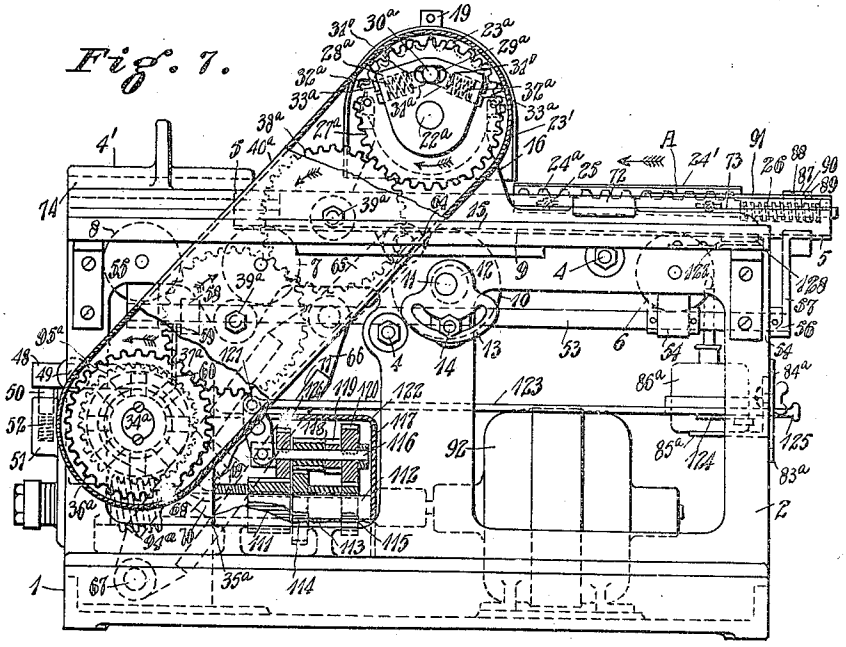


Fig. 8.

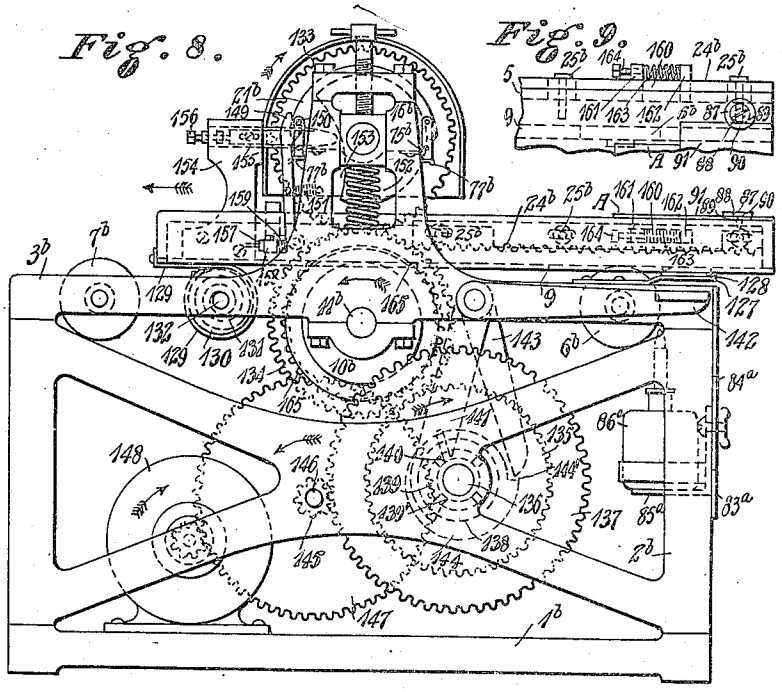


Fig. 9.

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Patented Mar. 6, 1923. 1,447,435

UNITED STATES PATENT OFFICE.

RUDOLPH SATTLER, OF CINCINNATI, OHIO.

PLATE-PRINTING MACHINE.

Application filed March 12, 1921. Serial No. 451,678.

To all whom it may concern:

Be it known that I, RUDOLPH SATTLER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Plate-Printing Machines, of which the following is a specification.

My invention relates to printing, and more especially to printing from engraved plates; and the objects of my improvement are to utilize power rather than hand operation, thereby allowing a more compact design of the machine and increasing the rapidity of the work, without impairing the quality. Other objects will appear in the course of the ensuing description.

I attain these objects by the device illustrated, for example, in the accompanying drawings, in which—

Figure 1 is a front elevation of a machine embodying my invention, together with its support and side tables;

Fig. 2 is a sectional plan view of the machine, the section being on planes corresponding to the broken line 2—2 of Fig. 6, the side tables being omitted in this and in subsequent views;

Fig. 3 is a detail end elevation of the D-roller;

Fig. 4 is a partial vertical section on a plane corresponding to the line 4—4 of Fig. 2;

Fig. 5 is a side elevation of the machine, with parts broken away to reveal certain interior constructions;

Fig. 6 is a vertical lengthwise section on planes corresponding to the broken line 6—6 of Fig. 2;

Fig. 7 is a side elevation similar to Fig. 5, but showing a modification of my invention;

Fig. 8 is a side elevation of a machine embodying another modification of my invention: and

Fig. 9 is a plan view of the part of the bed of Fig. 8 adjacent to the far right-hand corner thereof as shown in Fig. 8.

As shown in Figs. 1 to 6, inclusive, the frame comprises a base 1 and upstanding sides 2 and 3 fixed to opposite longitudinal edge parts of the base 1. Struts 4 extend across between and are fixed to the sides 2 and 3 near the front end and middle: and at the rear a plate 4′ extends across between and is fixed to the tops of the sides 2 and 3.

The traveling bed 5 is mounted between the tops of the sides 2 and 3, resting on rollers 6 near the front end and rollers 7 and 8 near the rear end. These rollers 6, 7 and 8 are in pairs, rotating on studs fixed in and extending inward from the upper parts of the sides 2 and 3; and the bed 5 has straight lower faces 9 to rest on the smooth peripheries of these rollers. Also, there is a middle pressure-roller 10 loosely mounted on studs 11 fixed in and extending inward from eccentric bearings 12 rotatable in respective frame sides 2 and 3 and having slotted segments 13 outside thereof, with a clamping screw 14 through each segment slot into the frame side. These serve to hold the roller 10 at slightly different heights. The roller 10 is reduced in diameter about midway of its length; and the bed 5 has opposite straight lower faces 15 to rest on the smooth peripheries of the respective unreduced parts of the roller 10.

Each frame side 2 or 3 has near the middle of its upper edge a standard 16. These standards have middle openings in which respective bearing blocks 17 are slidable up and down, each supported by a spring 18 between its bottom and the bottom of the standard opening, and held down by an adjusting screw 19 passing down through a cap 20 fixed across the top of the opening. Each screw 19 has a lock-nut 19′ with a supporting spring 19″ to facilitate adjustment when the nut 19 is loosened. These blocks 17 support the D-roller 21, of segmental shape (Fig. 3) to rotate over the bed 5, having the transverse shaft 22 through it and bearing in the blocks 17.

Between the end of the D-roller 21 and the right-hand standard 16 a spur gear 23 is fixed to the roller 21 and its shaft, 22, coaxial therewith, with some of its teeth omitted. The preferred proportion of omitted teeth, and the relation thereof to the D-roller, will be described later. A rack 24 is mounted along the right-hand side of the bed 5, to travel therewith, having its teeth upward to mesh with the toothed part of the gear 23 as the bed and rack travel backwardly and as the gear 23 rotates over forwardly, as will be described.

This rack 24 is so mounted on the bed 5 that it can slide lengthwise of the bed, being held for this by screws 25 in lengthwise slots of the rack and fixed in the side of the bed. The front end part of the rack is reduced, leaving a shoulder, and the bed has

a slot up and down through it, across which this reduced part extends, with a spring 26 coiled around the reduced part with its rear end against the rack shoulder and its front end against the front end of the bed slot. Thus, with the screws 25 loose, and not clamping the rack 24 to the bed, but only guiding it, the rack 24 can yield forwardly lengthwise of itself and of the bed. Its forward and rearward movements are then limited by engagement of its rear end and its front shoulder, respectively, with shoulders on the bed 5 at opposite ends of the rack guideway (Fig. 6). A guard 23′, fixed to the standard 16, covers the gear 23; and a guard 24′, fixed to the frame side 3, covers the rack 24 when the latter is in its forward position with the bed 5.

The screws 25 can be tightened after the first meshing of the rack 24 and gear 23, with whatever yielding the rack may have had in adjusting itself to the gear 23 due to any inaccuracy in the relation of the D-roller backing to the bed 5. However, in practice, I find that this rack may be left free to yield at each reciprocation of the bed 5, adjusting to compensate for inaccuracy each time, though these inaccuracies may vary from time to time: all of which will be more fully described later.

At the opposite side of the machine the D-roller shaft 22 extends out past the bearing block 17; and on this extension a spur-gear 27 is clamped by its hub 28, to mesh with a similar spur-gear 29 turning on a stud extending out from the frame side 2 directly below the gear 27. To the rear, a spur-gear 30, of twice the diameter of the gear 27, turns on a similarly mounted stud some distance lower down, and this larger gear meshes with the intermediate gear 29. All of these gears 27, 29 and 30 have complete sets of teeth; and, as gears, they simply make up a train to reach from the D-roller down to a lower mechanism of the machine, presently to be described. The gear 30 is made twice as large as the others to reach this distance without use of a greater number of gears; it not being necessarily larger for the purpose of the working of the additional details now to be described; but it is sufficient to say that in any variation, with such a gear, it must be of the same diameter, or else a diameter that is an even multiple of the diameter of the D-roller gear 27.

This large gear 30 has an outwardly extended large hub 31, on the face of which is fixed the locking yoke 32, diametrically thereacross, with concave ends. Also, close to the respective ends of this yoke, against opposite sides of the hub 31, are gear-sectors 33, fixed to the gear 30. Each sector 33 has four teeth, only two of which come into use as will later be described, the excess number being to permit of adjustments. It will be understood that the number of sets of these concave elements and these sectors 33 will equal the value of the ratio of diameter of the gear 30 to that of the gear 27. Were it three times the diameter of the gear 27 there would be three sets, and so on; or if the same diameter, or if the gear 27 itself were provided with these elements, eliminating the gear 30, one set would be used. These are merely matters of degree depending upon the arrangement or the length of gear train used.

The main shaft 34 is journaled transversely in bearings 34′ and 34″ in a casing 35 on the base 1 near the left side at the rear; and has an extension out past the side 2 with a rotor 36 fixed on it, comprising a brake-drum 37, a hub 38, and, outermost, a flange 39. A cover or guard 40 is fixed to the side 2 over the gears 27, 29 and 30 and this rotor 36.

Inside the casing 35 the shaft 34 is enlarged, forming the clutch member 41 next to the outer bearing, and has a gear member comprising the gear steps 42 and 43, rotatably mounted on it next to the inner end of this member 41, with its adjacent side dished to receive this member 41. Across the face of this member 41 is a deep key-way 44; and in the adjacent face of the gear member, to register with the adjacent end of the key-way 44, are a number of radial slots 45, there being, as herein shown (Fig. 6.) eight of these slots. The clutch-bolt 46 is slidable in the key-way 44, with a spring 47 compressed between a lug on the inner side of the bolt 46 and a lug in the key-way bottom, causing the bolt 46 to enter any slot 45 registering with the key-way 44. This bolt 46 projects above the face of the member 41, where it has a depression across it; and the clutch-finger 48 rides tangentially across the face of the member 41 in the path of the depression as the member rotates. The outer forward end of the finger 48 is beveled to enter the bolt depression as the bolt comes around, and the finger can be swung up on a fulcrum 49, against the pressure of a pin 50 in a barrel 51 on the back of the casing 35, actuated by a spring 52 compressed between the bottom of the pin and the bottom of the barrel cavity. The front end of the finger 48 is curved down over the member 41 to be met by the up coming bolt 46 earlier, as the member 41 rotates (Fig. 6).

The starting-shaft 53 extends from front to rear in bearings 54 and 55, close to the top of the side 2, with a hub 56 on its front end having the starting-lever 57 extending to the left, and with an arm 58 having a pin 59 at the rear, over the clutch-finger 48, to which it is connected by a link 60, to lift the finger 48 by depression of the lever 57.

The rotor hub 38 has a slot carrying the segment-bar 61 embracing the shaft 34 and

having on one end gear teeth to mesh with the sectors 33; and the locking-segment 62 is fixed to the flange 39 partly around the hub 38 to swing into the concave ends of the locking-yoke 32. The rotor 36 turning backward, the advanced end 63 of this segment 62 is rounded; but the opposite end is radial to the shaft 34.

The bed 5 has near its rear end, at its middle, a pair of depending ears 64; and a link 65 has its upper forward end part between these ears, with a connecting pin extending transversely across through the ears and link. The main lever 66 has at its lower end the fulcrum 67 in the bottom part of the casing 35 next to the rear end of the base 1, and the upper end of this main lever 66 is pivoted to the rear lower end of the link 65. The main crank 68 is fixed on an extension of the main shaft 34 out of the inner side of the casing 35, and its wrist 69 has a block 70 rotatable on it and slidable in a guide slot 71 in the adjacent face of the main lever 66. Thus, rotation of the main shaft 34 swings this lever 66 forwardly as seen in the drawings, with the link 65 only slightly forward from alinement with the lever 66; or swings this lever 66 backwardly past the rear end of the machine frame, pulling the bed 5 backwardly therewith. With the main shaft 34 rotated over backwardly, as described, the backward actuation of the bed 5 is relatively slow, as caused by the over travel of the crank 68, and the return is much faster, as caused by the under travel of the crank.

The bed 5 is held down at the front by clips 72 fixed to the tops of the frame sides 2 and 3 and projecting over bearing ledges 73 lengthwise of the bed 5. The plate 4′ has surfaces bearing on these ledges 73 at the rear; and this plate 4′ also forms a guard over the bed, as well as firmly fixes the frame sides 2 and 3 together at the rear. Its ends 74 curve down to the sides 2 and 3, so that the middle part of the plate 4′ is at an ample distance above the bed top to avoid striking of the work against it as the bed travels backward and forward.

The D-roller 21 has recesses of V-shaped cross-section along the ends of its working periphery, across the machine, occupied by clamp-bars 75 which are hung on small links 76 pivoted to the ends of the roller 21 so that these bars 75 may swing into and out of the recesses. Clamp-screws 77 are tapped into the roller 21 near opposite ends, a pair for each bar 75, with clamp-plates 77′ entering short recesses in the bars 75, to bind against the bars 75 and hold them in the recesses of the roller. These parts are all so arranged that they are well inward from the circle of the D-roller working face.

As shown in Fig. 1, the machine has legs 78 with their tops fixed to the base 1 and having a strut 79 near their bottom, thus supporting the machine at a convenient height. At the right is a side table 80, suitably fixed to the machine frame, and having a drawer thereunder; and at the left parallel bars 81 are hooked to the upper parts of the front and rear ends of the side 2, carrying a leaf 82 so that this leaf may be swung up for use as another work table, or lowered, or removed, along with a suitable brace 82′. Such tables, closely positioned to both sides of the machine, are possible in the absence of cumbersome operating devices at one side or the other of previous plate printing-machines.

The front end of the base 1 has a hub 83, in which is clamped by a screw 83′ a column 84, carrying at its top a bracket 85 to hold a heater, such as the lamp 86, at a proper height to maintain the right consistency of ink on the engraved plate, as is necessary in machines of this character.

Near the front end of the bed 5, close to its opposite sides, clamping disks 87 are fastened down on the flat bed face by screws 88 tapped into the bed. Each disk 87 has a segment cut away in one side of its periphery for a portion of its thickness, leaving a flat side 89 below, overhung by a segmental flange 90. The stop-plate 91 is of a length to fit snugly between the flat sides 89 of the opposite disks 87 when these disks are turned with their sides 89 facing each other (Fig. 2) and to thus bring the end edges of the plate 91 under the flanges 90; being so thick that when the screws 88 are screwed down, these flanges 90 clamp the plate 91 firmly to the bed 5 at whatever position forwardly or rearwardly it may have been adjusted to, but slightly thinner than the thinnest engraved plate A, which is placed with its front edge against the rear edge of the stop-plate 91 and thereby prevented from slipping forwardly on the bed 5.

As herein shown, the machine is designed to be driven at either one of two speeds by an electric motor; the gear member, with its two gear steps 42 and 43 as before described, being provided in accordance with this design. The motor 92 is mounted on the base 1 near the front, with its shaft from front to rear and coupled, through the hub of a fly wheel 93, with the shaft of a worm 94 journaled in the front right-hand part of the casing 35. This worm 94 meshes with the worm-gear 95 fixed on the driving shaft 96, journaled across the front part of the casing 35. Gears 97 and 98 are fixed to opposite ends of a hub splined on the shaft 96, in suitable spaced relation to mesh the gears 97 and 42 or the gears 98 and 43, for faster or slower speed, respectively, or leave both pairs of gears unmeshed, as shown in Fig. 2, so that the main-shaft gear member is not rotated. The shifting of these gears 97 and

98 is effected by means of a yoke 99 around the splined hub, engaged by an arm 100 fixed on the rear end of a shifter-shaft 101 journaled in the casing front and extending forwardly with a front bearing 102 mounted on the inner side of the front part of the frame side 2, in front of which a crank 103 is fixed on the shaft 101 to stop in an upper or lower position on a sector 104 on the face of the bearing 102, within easy access of the operator of the machine, who stands directly in front thereof.

The base 1 is made with raised sides and ends (Fig. 6) so that it confines droppage of lubricant to the inside of the machine; and a front plate 105 prevents splashing upon the operator. The casing 35 may contain sufficient lubricant to immerse the worm 94 and the lower parts of the gears and clutch members therein. It has a removable cover 106 affording ready access to the interior of the casing from the rear of the machine. As herein shown, the base has a slot 107 under the fly wheel 93, covered by a plate 107′, which, when turned aside, will permit passage of a driving belt (not shown) up around the fly-wheel 93 from a motor mounted below the base 1, for which, as here shown in Fig. 1, a shelf 108 is mounted across between the legs 78. Thus the machine may be belt-driven from a motor, permitting use of a larger motor than can be placed inside the machine, and avoiding some difficulty in alinement often met with in assembling the direct motor drive.

The brake-drum 37 is embraced by grips 109 having suitable frictional linings 109′ and being drawn more or less tightly thereagainst by a bolt 110 through their shanks below the drum 37, where these shanks embrace a stud 110′ extending out from the frame side 2.

In Fig. 7 many of the parts are substantially similar to parts in the example of Figs. 1 to 6, inclusive, and these parts are numbered as they are in that example. In this example of Fig. 7, however, the D-roller shaft extension at the left or near side has the spur-gear 27^a rotatable thereon, and has a turning-head 28^a fixed thereon, out past this gear. This turning-head comprises a widened radial extension having a short circumferential slot 29^a transversely through it, and the gear 27^a has a turning-pin 30^a fixed in it and extending out into this slot. At opposite ends of this slot the head has openings out through its opposite edges, reduced in diameter in next to the slot, where these openings receive respective abutment-pins 31^a to slide into and out from the slot, bearing against the adjacent sides of the turning-pin 30^a. Each abutment-pin has a head 31′ inside the larger outer part of the turning-head opening, limiting projection of the pin 31^a toward the turning-pin 30^a; and springs 32^a are compressed between these heads and respective screw-plugs 33^a in the outer ends of the openings, with the springs 32^a coiled around the pins 31^a inside the openings.

The worm-gear 95^a is directly on the main shaft 34^a in this example, and the worm 94^a extends forwardly, with a gear 111 fixed thereon. These gears and the worm are mounted in the pedestal 35^a mounted on the base 1 at the rear left side. The motor 92, on the base 1, has its shaft coupled to the driving shaft 112 having a bearing 113 fixed on the base 1 and having fixed on it at opposite ends of the bearing 113 the gears 114 and 115 of different diameters. Above these, the lay-shaft 116 is journaled in a yoke 117, slidable parallel to the shaft 112, which is alined with the motor shaft and with the worm shaft. A bracket 118 supports the yoke 117 for this movement, and gears 119 and 120 are fixed on the shaft 116 at opposite ends of this yoke, to mesh with the gear 114 or the gear 115, respectively, as the yoke is shifted by a lever 121 fulcrumed on the casing 122 that encloses the gears. The shifter-rod 123 is connected to the lever 121 and extends forward to a suitable stop plate 124 and has a handle 125 outside the front of the machine. The lay-shaft 116 also has fixed on it the gear 126 meshing with the worm-shaft gear 111, which is wide enough to receive the gear 126 in mesh in any of its positions.

It will be understood that the clutch is substantially the same as in the first example.

The extension of the main shaft 34^a, thus driven and controlled, has fixed on it the spur-gear 36^a; and idler gears 37^a and 38^a operatively connect this gear 36^a with the gear 27^a on the D-roller shaft 22^a, these idler gears being loosely mounted on respective studs 39^a fixed in and extending out from the frame side 2. The gears 27^a and 36^a are of the same diameter; and preferably the idler gears are also of this diameter. The gears are covered by a guard 40^a.

Near the front of the machine a resilient plate curved upwardly from and fixed to the frame side 2 forms a brake 127, with leather or other suitable frictional facing 128, to bear against the lower face 9 of the bed 5 at that side when the bed is in a forward position.

In Figs. 8 and 9 the frame comprises the base 1^b, sides 2^b, and the top 3^b; and the bed 5 travels on rollers 6^b and 7^b mounted on the sides 2^b. Backward travel of the bed 5 unwinds the band 129 from a casing 130 having a volute spring 131 fixed to its inner wall and to a shaft 132 on which the casing 130 turns; the shaft being fixed to the sides 2^b. Thus this spring 131, in again unwinding, pulls the bed 5 forward again after an op-

eration. The machine is provided with the stop-plate 91 and associated details, as in the previous examples; and it also has the forward brake 127, as in Fig. 7.

The D-roller 21^b of this machine, like the D-roller 21^a of Fig. 7, is of somewhat greater angular extent than that of Figs. 1 to 6, inclusive; and these D-rollers have spring clips 77^a or 77^b for the clamp bars 75^a or 75^b instead of clamping screws and plates as in the first example. Any of these may be interchanged, and it is understood that the angular extent of the D-roller is subject to variation according to design; and like other dimensions of parts is a matter of degree. The gear 133 fixed concentric with the D-roller 21^b, in Fig. 8, however, is complete, and does not mesh with the bed rack, but with a gear 134 of the same diameter fixed on the shaft 11^b with the pressure-roller 10^b; and this gear 134 meshes with another gear 135 of the same diameter, fixed on the shaft 136. The shafts 11^b and 136 are journaled in the frame sides 2^b, and the gears 133, 134 and 135 are all at the right-hand or far side of the machine. At the near side, a larger gear 137 is rotatably mounted on the shaft 136 and has a clutch member 138. Another clutch member 139 is fixed on the shaft 136, and a suitable clutch-bolt 140 is spring-pressed to enter slots 139′ in the member 138, from the member 139, when released by withdrawal of the clutch-finger 141 by depression of the starting-lever 142. The resetting lever 143 is also fixed to swing with the lever 142 and finger 141, and bears on the face of the cam 144 fixed on the shaft 136 and having an abrupt drop 144′ and increasing in radius from the inner end of this drop around to the outer end thereof.

The gear 137 meshes with a pinion 145 fixed on a transverse shaft 146 along with a large gear 147, this shaft being journaled in the frame sides 2. The motor 148, on the base 1^b, has a pinion meshing with the gear 147.

A safety pawl 149 is pressed forward against a pin 150 in the end of the D-roller 21^b, by a tension spring 151 connected to the standard 16^b. In this example, the D-roller is driven directly, and it is the bed 5 that is indirectly driven. A cam 152, fixed on the D-roller shaft 22^b between the gear 133 and the D-roller, has a recess or cavity 153 in its periphery, occupying the rear lower quarter of the rotation circle when the parts are in starting position, as shown. The pedestal 154, fixed to the far side of the bed 5 back of the standards 16^b and cam 152, has a bar 155 mounted in it for front to rear adjustment by a screw 156, and has its front end or nose adjacent to the cam periphery. The lower part of the pedestal 154 has a screw 157 abutting the rear end of a plunger 158 in a recess in the rear of the right-hand standard 16^b, against a spring 159, to cushion the return of the bed forwardly under the action of the spring 131 and with the help of the brake 127, stopping the bed with the nose of the bar 155 very close to the concavity of the cam 152 as shown.

The rack 24^b is mounted on the right-hand or far side of the bed 5 by means of screws 25^b extending through lengthwise slots therein into the bed 5, as in the previous examples. Here, however, the spring arrangement is the reverse; allowing the rack to yield backwardly. The rack thus has a slot 160 with a lug 161 of the bed 5 extending out through the rear end, and having a lug 162 on the rack at its front end, with a spring 163 compressed between the rack lug and a screw 164 in the lug 161 of the bed. The screw may be used to adjust the pressure of the spring 163; this being also applicable to the other examples, for adjusting the pressure of their spring 26. The teeth of the rack 24^b face downwardly, and a spur-gear 165 is fixed on the pressure-roller shaft 11^b, between the gear 134 and the pressure-roller 10^b, in the path of the rack 24^b. The teeth of this gear 165 are omitted throughout a considerable segment, which is uppermost at the starting position as shown.

The heater mounting in Figs. 7 and 8 comprises a plate 83^a fixed across the front of the frame, with a vertical guide-slot 84^a, on which the bracket 85^a is clamped at any suitable height, by a clamp-screw through the slot 84^a, thus supporting the lamp 86^a at the required height as in the first example.

In respect of certain specific differences from the example of Figs. 1 to 6, inclusive, the example of Fig. 7 is claimed in my copending application, Serial No. 401,192, filed August 4, 1920, and the example of Fig. 8 is claimed in my copending application, Serial No. 388,889, filed June 14, 1920.

Operation: In any example, suitable backing is clamped around the D-roller by means of its clamping bars. The engraved plate A is laid on the bed 5, with its engraved side up, and the plate 91 is adjusted forward or back so as to hold the plate A in the right printing position on the bed; which will generally be such as will bring the plate about symmetrically under the working face of the D-roller upon impression. The plate A being inked and wiped as usual, the stock is laid on the plate A without any positive stop to gauge the position thereof; this being effected, as is customary in plate printing, merely by drawing a line on the plate A, to mark the position of the edge of the stock. This is done with the bed 5 in its stationary forwardmost position as shown in the drawings. The motor 92 or

48 being in operation, the starting-lever at the left of the bed is depressed by the operator, withdrawing the clutch-finger 48 upward from the depression in the clutch-bolt 46 so that the spring 47 quickly pushes the bolt 46 over against the slotted face of the gear member (Figs. 1 to 6, inclusive,) or against the slotted face of the worm wheel member (Fig. 7;) or, in Fig. 8, this permits a similar action of the bolt 140 as to the gear 137. Thus one of the clutch slots receives the bolt and causes the mechanism to be operated.

In Figs. 1 to 6, inclusive, and in Fig. 7, this starts the main crank 68 upward from its position at right angles to the main lever 66, sliding the block 70 up therealong, starting this lever 66 very slowly to swing upward and backward, with gradually increasing speed as the crank 68 reduces its angle to the lever 66. This pulls the bed 5 backward through the medium of the link 65, swinging the link from a nearly complete alinement with the lever 66 and thus gradually increasing the speed of this link transmission as the link increases its angle to the lever. The two gradually accelerated transmissions are thus compounded, resulting in an extremely slow starting of the bed 5 backward, without appreciable impact, so that the stock on the plate A is not displaced from its correct position, as would be the case upon too sudden starting of the bed, due to inertia of the stock. Gauges or stops to resist this shifting of the stock are not permissible in plate printing, as they would have to travel under the D-roller with the stock, and, to not prevent pressure on the stock, would have to be thinner than the stock, in which case they would not effectively engage the stock edge as a stop or gauge. Hence the special provision for very slow initiation of power driving, to guard against the stock diplacement, as is effected in hand-driven plate printing machines only with great care and slowness by a skillful operator. The brake 109 (Figs. 1 to 6, inclusive) or the brake 127 (Fig. 7) will also tend to prevent too sudden starting; and it will be understood that either kind of brake will be effective, if applied in either of these examples. The brake 109 is more effective; but the brake 127 ceases to act after the bed 5 has passed back therefrom, thus avoiding excessive use of power.

In Figs. 1 to 6, inclusive, the backward rotation of the main shaft 34 that starts the bed 5 also starts the segment-bar 61 up against the gear-sector 33 and withdraws the locking-segment 62 from the end of the locking-yoke 32, thus turning the large gear 30, and, through it and the intermediate gear 29, and the gear 27, turning the D-roller 21 and its mutilated gear 23 over forwardly and bringing the advanced teeth of this gear 23 down into the path of the teeth of the rack 24, which is coming back with the bed 5. These parts are all carefully adjusted so that the segment-bar 61 goes out of mesh with the sector 33 at the same time that the first teeth of the gear 23 and rack 24 engage. From this juncture to nearly the end of the rearward travel of the bed 5, the D-roller is driven by the bed 5, through the medium of the rack 24 and gear 23, with no engagement between the gears and the main shaft 34. Then, when the last teeth of the gear 23 and rack 24 are disengaging, the advanced curved end of the locking-segment 63 will be engaging with the opposite concave end of the locking-yoke 32, the large gear 30 having completed nearly one half revolution while the D-roller has completed nearly one whole revolution. This engagement of the segment 62 and yoke 32 completes the rotation of the D-roller, while the remainder of the main shaft rotation, acting in a short lower sector of the crank rotation, close to the lever fulcrum 67, quickly returns the bed 5 forwardly. The operation stops automatically when the beveled front end of the clutch-finger 48 is received in the beveled rear part of the depression of the upcoming clutch-bolt 46, withdrawing the bolt 46 from the slot 45, and the beveled rear corner of the bolt depression-side has abutted the shoulder of the finger 48. During this final action, the brake 109 acts to stop the moving parts, reducing the impact in the clutch; as would the brake 127 of Fig. 7, if provided in this example, as will be understood without special illustration. The machine is now ready for the next operation, upon depression of the starting-lever 57 again. In the next operation, the large gear 30 and yoke 32 will be rotated through the remaining half revolution, starting, in the manner before described, by engagement of the segment-bar 61 with the opposite gear-sector 33; the parts at the opposite sides of the large gear 30 operating alternately in successive operations. Thus, the D-roller or pressing means is disconnected from the bed except at intermediate stages, when it must conform to the bed speed; and it is connected substantially at this speed without appreciable impact. Also, when the bed is returning forwardly and the D-roller must be up away from the bed, the D-roller is held stationary by the locking action of the yoke 32 and the segment 62.

Theoretically, the surface of the backing on the D-roller must be exactly coincident with the pitch-circle of the intermeshing gear 23 and rack 24, and the beginning of this meshing must be at exactly the same instant that the segment-bar 61 leaves the sector 33. But in practice it is desirable not to be confined to such exact requirements.

It is for this reason that the rack 24 has a resilient lengthwise support in the spring 26. By this means, any slight inaccuracy of relation between the bed 5 and the D-roller 21, either at the beginning of their cooperation or during this period, is compensated by the slight yielding of the rack 24 forwardly; that is, the rack allows the D-roller to adjust the bed 5 backward to itself, under the pressure. But the spring 26 is strong enough to cause the D-roller to be driven by the bed, after such compensation has been established, positively, and not by frictional transmission as in other machines, such as the well-known hand-operated plate printing machine, which, under the rapid action of power driving, would blur or smudge the work by the slippage of the bed relatively to the D-roller. The compensation effected by the spring mounting of the rack that limits slippage of the bed and D-roller relatively to each other is so slight as not to be appreciable during the impression stage. Thus, lack of skill in providing the D-roller backing, or wear or other inaccuracy in the machine parts, will not have any noticeable effect in the work, with the yielding or floating rack as set forth. This also provides for slight variation in thickness of plates A or of the stock; theoretically it being required that the top of the stock be coincident with the pitch line of the rack 24.

Ordinarily, in a plate printing-machine, the plate A is merely laid on the bed, or is secured with some light adhesive, for hand operation. Under power operation, however, the forces tend to shift the plate thus insecurely mounted. The stop-plate 91 affords a positive positioning means for the plate A, resisting forward slipping as the bed drives back against the D-roller, especially in the compensating action of the floating-rack construction as just described. This plate 91 may be adjusted throughout its front to rear width; or a wider or narrower plate may be substituted for extreme adjustments. The disks 90 are past the D-roller backing edges.

The pressure-roller 10 reinforces the bed 5 as the work passes under the D-roller; and the bed is preferably thickened to present a bearing surface throughout its width throughout the printing length, with the parts 9 and 15 merging into this thickened part (Fig. 2.) The adjustment of the roller 10 by its bearing segment 13 allows for wear of these parts, so that complete reinforcement of the bed can always be insured. The provision of the intermediate gear 29, directly below the gear 27, in the D-roller initially-driving gear train, permits free up and down adjustment of the D-roller in the standards 16, without interference with the meshing of the gears; it being understood that these up and down adjustments are slight, proportionate to the gear-tooth depth. The change-speed transmission from the motor to the main shaft permits the machine to be operated at more correct speeds for various kinds of work, under different pressures as the D-roller is adjusted up or down, or with plates A of greater or less engraved area, or due to a combination of these conditions. The fly-wheel 93 affords the momentum desirable to overcome slight shocks in starting and during operation due to lack of balance of the operating parts, as the crank 68 and the clutch parts and the parts on the rotor 36. Due to the nature of the work, with the stock held in correct printing position merely by its friction on the plate A, all shocks and jars in any part of the machine must be minimized, as these are transmitted to the bed 5 and the plate and stock thereon, and may disturb the stock position. These provisions all cooperate to this end.

In Fig. 7, with the beginning of main shaft rotation and bed travel as in Figs. 1 to 6, inclusive, the gear 27^a is rotated on the D-roller shaft by the gear train 37^a, 38^a, over forwardly. The turning-pin 30^a rotates the D-roller 21^a and its mutilated gear 23^a forwardly and downwardly to meet the bed 5 and rack 24^a at a time when the D-roller and bed surface speeds are approximately equal, as are also the gear and rack tooth speeds. The springs 32^a now yield to compensate for the differences between the variable crank-effected motion of the bed 5 and rack 24^a and the uniform motion of the gear 27^a as derived through the train from the main shaft 34^a; either the forward or the rearward spring 32^a yielding, accordingly as the former motion is slower or faster than the latter motion. The floating rack 24^a will compensate for discrepancies in this example, as described for the first example; and the brake 127 and stop-plate 91 will contribute to the operation as in the other case. The modified change-speed transmission will have the same advantages herein as in the case just described, as will also the pressure-roller adjustment.

In this case, there is no disconnection of the D-roller from the main shaft 34^a; but merely the yielding thereof. Thus the upward rearward rotation of the D-roller begins as the bed 5 reaches its rearmost position, and is completed as the bed rapidly returns forwardly; the clutch mechanism automatically stopping all of these parts, with the aid of the brake 127, after one complete revolution of the main shaft 34^a, leaving the parts ready for the next operation.

In Figs. 8 and 9, depression of the starting-lever 142 actuates the clutch with the same effect, substantially, as in the clutch of the other examples. Then the concave

part of the cam 152 engages the nose of the bar 155, starting the bed 5 backwardly very slowly, and gradually increasing the speed of the bed, until, when the first tooth of the gear 165, at the front of its vacant space, engages the oncoming rack tooth, these parts are traveling at substantially the same speed. Then the travel of the bed 5 is constant, as driven by the gear 165 meshing with the rack 24^b, until the vacant part of the gear 165 comes around to the rack, after an almost complete revolution of the gear 165 and the clutch. The latter then automatically acts, by its cam 144 and the bar 143, to disconnect and stop the mechanism, after the D-roller has made exactly one revolution, so that when the spring 131 now returns the bed 5 forwardly, all parts will again be in initial or stock-receiving position, for the next operation. In this, as in the preceding examples, the floating rack 24^b, yielding backwardly, will have the same advantages as to compensation for inaccuracies in the mechanism or the D-roller backing or height of stock surface; and the brake 127 and stop-plate 91 will function substantially as in the other examples.

The absence of hand labor of turning the D-roller very steadily and carefully, and as carefully advancing the bed thereunder with the work, as in the ordinary hand press, adapts my invention especially for more rapid work with less manual labor. The compactness permitted by the power operation permits a more convenient installation of the machine, as with the closely accessible work tables at both sides, as in Fig. 1, which will be understood to be equally applicable to the examples of Fig. 7 and Fig. 8, either as in Fig. 1 or in a modified form, as for instance those shown in the corresponding co-pending applications before referred to. The result of my invention therefore is to increase the quantity and quality of the output.

Other modifications may occur in adapting the invention to various uses, or under different conditions, or as matters of preference, and therefore, while certain constructional details are deemed preferable in connection with my invention, and I have shown and described these rather specifically in elucidating the construction and use of my invention, as is required, I do not wish to be understood as being limited to such precise showing and description, but having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine of the character described, a traveling bed element adapted to carry a printing plate with the stock held in correct printing position on said plate merely by the friction between the stock and the plate, a pressing element having a movement to press said stock against said plate during part of the travel of said bed element, mechanism to cause said travel of said bed element, comprising means whereby said travel is initiated from a stationary stock-receiving position at a gradually increasing speed, avoiding displacement of said stock prior to the pressure of said pressing element thereon, initially engaging means whereby said pressing element and said bed element are driven at non-conforming speeds initially, and another engaging means to which said initially engaging means relinquishes driving control of one of said elements, whereby said elements are driven at conforming speeds, prior to said pressure of said pressing means on said stock.

2. In a machine of the character described, a rectilinearly reciprocating bed to carry a printing plate with stock thereon, pressing means to press said stock thereon during reciprocation of said bed in one direction from a stationary stock-receiving position, mechanism having an operation to cause said reciprocation of said bed positively in both directions, and a clutch manually actuated to cause said operation and automatically actuated to end said operation after a single complete reciprocation of said bed from and to said stock-receiving position.

3. In a machine of the character described, a rectilinearly reciprocating bed to carry a printing plate with stock thereon, segmental rotary pressing means to press said stock thereon during reciprocation of said bed in one direction from a stationary stock-receiving position and to withdraw from said bed during reciprocation thereof in return direction, mechanism having an operation to cause said reciprocation of said bed positively in both directions, and to cause rotation of said rotary pressing means, and a clutch manually actuated to cause said operation and automatically actuated to end said operation after a single complete reciprocation of said bed from and to said stock-receiving position.

4. In a machine of the character described, a rectilinearly reciprocating bed adapted to carry a printing plate with stock held in correct printing position on said plate merely by the friction between the stock and the plate, pressing means to press said stock thereon during reciprocation of said bed from a stock-receiving position, a crank, a lever fulcrumed beyond said crank from said bed, operatively connected to said crank between its fulcrum and said bed, and a link connected to said lever between said fulcrum and said bed, and connected to said bed, with said crank at a high angle to said lever and said link at a low angle to said lever while said bed is in said position, whereby said lever initiates travel

of said bed from said position while said crank is at said high angle to said lever and said link is at said low angle to said lever and gradually increases the speed of said travel as the angle of said crank to said lever decreases and as the angle of said link to said lever increases, to avoid displacement of said stock on said plate prior to the pressure of said pressing means on said stock.

5. In a machine of the character described, a rectilinearly reciprocating bed adapted to carry a printing plate with stock held in correct printing position on said plate merely by the friction between the stock and the plate, pressing means to press said stock thereon during reciprocation of said bed from a stock-receiving position, a crank, a lever fulcrumed beyond said crank from said bed, operatively connected to said crank between its fulcrum and said bed, and a link connected to said lever between said fulcrum and said bed, and connected to said bed, with said crank at a high angle to said lever and said link in substantial alinement with said lever while said bed is in said position, whereby said lever initiates travel of said bed from said position while said crank is at said high angle to said lever and said link is in said substantial alinement with said lever and gradually increases the speed of said travel as the angle of said crank to said lever decreases and as said link recedes from said substantial alinement, to avoid displacement of said stock on said plate prior to the pressure of said pressing means on said stock.

6. In a machine of the character described, a front-to-rear traveling bed to carry a printing plate with stock thereon, pressing means to press said stock thereon at each rearward travel thereof, mechanism to cause said travel of said bed, a motor, an operative connection between said motor and said mechanism comprising a clutch near the rear end of said machine, and clutch-controlling means operatively connected to said clutch and extending to the front part of said machine.

7. In a machine of the character described, a front-to-rear traveling bed to carry a printing plate with stock thereon, pressing means to press said stock thereon at each rearward travel thereof, mechanism to cause said travel of said bed, motive means, an operative connection between said motive means and said mechanism comprising a change-speed device near the rear end of said machine, and change-speed controlling means operatively connected to said change-speed device and extending to the front part of said machine.

8. In a machine of the character described, a front-to-rear traveling bed to carry a printing plate with stock thereon, pressing means to press said stock thereon at each rearward travel thereof, mechanism to cause said travel of said bed, motive means, an operative connection between said motive means and said mechanism comprising a clutch and a change-speed device near the rear end of said machine, clutch-controlling means operatively connected to said clutch, and change-speed controlling means operatively connected to said change-speed device, said clutch-controlling means and said change-speed controlling means extending to the front part of said machine.

9. In a machine of the character described, a traveling bed adapted to carry a printing plate with stock thereon, pressing means to press said stock against said plate during part of the travel of said bed, mechanism to cause said travel, means to adjust said pressing means toward or away from said bed, motive means, and a change-speed operative connection between said motive means and said mechanism.

10. In a machine of the character described, a traveling bed adapted to carry a printing plate with stock thereon, pressing means to press said stock against said plate during part of the travel of said bed, mechanism to cause said travel, means to limit slippage of said bed and said pressing means relatively to each other during said part of said travel, and means to limit slippage of the printing plate on said bed during said part of said travel.

11. In a machine of the character described, a rectilinearly reciprocating bed adapted to carry a printing plate with stock held in correct printing position on said plate merely by the friction between the stock and the plate, pressing means to press said stock thereon during reciprocation of said bed from a stock-receiving position, a crank, a lever fulcrumed beyond said crank from said bed, operatively connected to said crank between its fulcrum and said bed and operatively connected to said bed, and a brake acting on said bed during the beginning of the bed reciprocation from said position and during the ending of the return reciprocation of said bed to said position.

12. In a machine of the character described, a rectilinearly reciprocating bed adapted to carry a printing plate with stock held in correct printing position on said plate merely by the friction between the stock and the plate, pressing means to press said stock thereon during reciprocation of said bed from a stock receiving position, a crank, a lever fulcrumed beyond said crank from said bed, operatively connected to said crank between its fulcrum and said bed, a link connected to said lever between said fulcrum and said bed, and connected to said bed, with said crank at a high angle to said lever and said link in substantial alinement

with said lever while said bed is in said position, and a brake acting on said bed during the beginning of the bed reciprocation from said position and during the ending of the return reciprocation of said bed to said position.

13. In a machine of the character described, a traveling bed adapted to carry a printing plate with the stock held in correct printing position on said plate merely by the friction between the stock and the plate, pressing means having a movement to press said stock against said plate during a part of the travel of said bed, mechanism to cause said travel of said bed, comprising means whereby said travel is initiated at a gradually increasing speed, avoiding displacement of said stock prior to the pressure of said pressing means thereon, means whereby said pressing means is moved at a speed uncontrolled by the speed of said bed, initially, and yielding means thereafter operatively connecting said pressing means and said bed and then moving said pressing means at a speed conforming to the speed of said bed, prior to and during the pressure of said pressing means on said stock.

14. In a machine of the character described, a bed adapted to carry a printing plate with the stock held in correct printing position on said plate merely by the friction between the stock and the plate and having a printing movement, pressing means having a movement to press said stock against said plate during a part of said bed movement, said machine comprising means whereby said bed movement is initiated at a gradually increasing speed, avoiding displacement of said stock, and means whereby one of said movements is uncontrolled by the other initially, and is then controlled by the other movement, prior to and at the inception of the pressure of said pressing means on said stock.

15. In a machine of the character described, a bed adapted to carry a printing plate with the stock held in correct printing position on said plate merely by the friction between the stock and the plate and having a printing movement, pressing means having a movement to press said stock against said plate during a part of said bed movement, said machine comprising means whereby said bed movement is initiated at a gradually increasing speed, avoiding displacement of said stock, and yielding means initially inoperative whereby one of said movements is uncontrolled by the other initially and then operating whereby said one of said movements is then controlled by said other movement, prior to and at the inception of the pressure of said pressing means on said stock.

16. In a machine of the character described, a traveling bed adapted to carry a printing plate with stock held in correct printing position on said plate merely by the friction between the stock and the plate, pressing means to press said stock against said plate during part of the travel of said bed, mechanism to cause said travel, a stop-plate to lie flat on said bed with an edge engaging an edge of said printing plate, a clamping element having a part of one edge omitted, forming a flat side to engage an edge of said stop-plate and a ledge to overlie said stop-plate adjacent to said edge, and means releasably securing said clamping element to said bed.

17. In a machine of the character described, a traveling bed adapted to carry a printing plate with stock thereon, movable pressing means to press said stock against said plate during part of the travel of said bed, mechanism to cause said bed travel, means to have an action causing movement of said pressing means uncontrolled by the speed of said bed and then to cease said action, and operatively connecting means whereby said bed causes movement of said pressing means upon cessation of said action prior to and during the pressure of said pressing means on said stock.

18. In a machine of the character described, a traveling bed adapted to carry a printing plate with stock thereon, movable pressing means to press said stock against said plate during part of the travel of said bed, mechanism to cause said bed travel, means to have an action causing movement of said pressing means uncontrolled by the speed of said bed and then to cease said action, and yielding operatively connecting means whereby said bed causes movement of said pressing means upon cessation of said action prior to and during the pressure of said pressing means on said stock.

19. In a machine of the character described, a traveling bed adapted to carry a printing plate with stock thereon, movable pressing means to press said stock against said plate during part of the travel of said bed, mechanism to cause said bed travel, means to prevent movement of said pressing means during another part of said bed travel and then to have an action causing movement of said pressing means uncontrolled by the speed of said bed and then to cease said action, and operatively connecting means whereby said bed causes movement of said pressing means upon cessation of said action prior to and during the pressure of said pressing means on said stock.

20. In a machine of the character described, a traveling bed adapted to carry a printing plate with stock thereon, movable pressing means to press said stock against said plate during part of the travel of said bed, mechanism to cause said bed travel, said machine comprising means whereby said bed

travel is initiated at a gradually increasing speed, avoiding displacement of said stock, means to have an action causing movement of said pressing means uncontrolled by the speed of said bed at its initial speed, and then to cease said action, and operatively connecting means whereby said bed causes movement of said pressing means upon cessation of said action prior to and during the pressure of said pressing means on said stock.

21. In a machine of the character described, a traveling bed adapted to carry a printing plate with stock thereon, movable pressing means to press said stock against said plate during part of the travel of said bed, mechanism to cause said bed travel, said machine comprising means whereby said bed travel is initiated at a gradually increasing speed, avoiding displacement of said stock, means to have an action causing movement of said pressing means uncontrolled by the speed of said bed at its initial speed, and then to cease said action, and yielding operatively connecting means whereby said bed causes movement of said pressing means upon cessation of said action prior to and during the pressure of said pressing means on said stock.

22. In a machine of the character described, a traveling bed adapted to carry a printing plate with stock thereon, movable pressing means to press said stock against said plate during part of the travel of said bed, mechanism to cause said bed travel, said machine comprising means whereby said bed travel is initiated at a gradually increasing speed, avoiding displacement of said stock, means to prevent movement of said pressing means during another part of said bed travel and then to have an action causing movement of said pressing means uncontrolled by the speed of said bed and then to cease said action, and operatively connecting means whereby said bed causes movement of said pressing means upon cessation of said action prior to and during the pressure of said pressing means on said stock.

23. In a machine of the character described, a rectilinearly reciprocating bed to carry a printing plate with stock thereon, segmental rotary pressing means to press said stock thereon during reciprocation of said bed in one direction and to withdraw from said bed during reciprocation thereof in return direction, mechanism having an operation to cause said reciprocation of said bed, means to prevent rotation of said pressing means when withdrawn and then to have an action rotating said pressing means toward said bed uncontrolled by the speed of said bed, as said bed begins reciprocation in one direction, and then to cease said action, and operatively connecting means whereby said bed causes said movement of said pressing means upon cessation of said action, whereby said movement of said pressing means conforms to said bed travel during the pressure on said stock, and then to again act on said pressing means to withdraw it from said bed, said operatively connecting means then ceasing its action on said pressing means, for return reciprocation of said bed while said pressing means is withdrawn.

24. In a machine of the character described, a rectilinearly reciprocating bed to carry a printing plate with stock thereon, segmental rotary pressing means to press said stock thereon during reciprocation of said bed in one direction and to withdraw from said bed during reciprocation thereof in return direction, mechanism having an operation to cause said reciprocation of said bed, a segment gear on said pressing means, a rack on said bed initially removed therewith from said segment gear, an operative connection from said mechanism to said pressing means comprising a pair of rotary meshing means and a pair of rotary locking means, meshing and unlocking as said bed reciprocates in said one direction toward said pressing means, rotating said pressing means until said rack is carried by said bed into mesh with said segment gear, and then unmeshing and allowing said pressing means to move with said bed during pressure of said pressing means on said stock, and then said locking means engaging and drawing said pressing means away from said bed after said rack unmeshes from said segment gear during said reciprocation in said one direction, said locking means then locking and holding said pressing means away from said bed while said bed reciprocates in the return direction, and being adapted to be unlocked at the next meshing of said meshing means as said bed begins its next reciprocation in said one direction.

25. In a machine of the character described, a rectilinearly reciprocating bed adapted to carry a printing plate with stock thereon, segmental rotary pressing means to press said stock thereon during reciprocation of said bed from a stock-receiving position, a crank, a lever fulcrumed beyond said crank from said bed, operatively connected to said crank between its fulcrum and said bed and operatively connected to said bed to reciprocate said bed from and to said position past said pressing means, a segment gear on said pressing means, a rack on said bed initially removed therewith from said segment gear when said bed is in said position, an operative connection from said crank to said pressing means comprising a pair of rotary meshing means and a pair of rotary locking means, meshing and unlocking as

said bed reciprocates in said one direction toward said pressing means, rotating said pressing means until said rack is carried by said bed into mesh with said segment gear, and then unmeshing and allowing said pressing means to move with said bed during pressure of said pressing means on said stock, and then said locking means engaging and drawing said pressing means away from said bed after said rack unmeshes from said segment gear during said reciprocation in said one direction, said locking means then locking and holding said pressing means away from said bed while said bed reciprocates in the return direction, and being adapted to be unlocked at the next meshing of said meshing means as said bed begins its next reciprocation in said one direction.

26. In a machine of the character described, a rectilinearly reciprocating bed to carry a printing plate with stock thereon, segmental rotary pressing means to press said stock thereon during reciprocation of said bed in one direction and to withdraw from said bed during reciprocation thereof in return direction, mechanism having an operation to cause said reciprocation of said bed, a segment gear on said pressing means, a rack on said bed initially removed therewith from said segment gear and longitudinally slidable thereon, a spring on said bed yieldingly resisting sliding of said rack away from said segment gear, an operative connection from said mechanism to said pressing means comprising a pair of rotary meshing means and a pair of rotary locking means, meshing and unlocking as said bed reciprocates in said one direction toward said pressing means, rotating said pressing means until said rack is carried by said bed into mesh with said segment gear, and then unmeshing and allowing said pressing means to move with said bed during pressure of said pressing means on said stock, and then said locking means engaging and drawing said pressing means away from said bed after said rack unmeshes from said segment gear during said reciprocation in said one direction, said locking means then locking and holding said pressing means away from said bed while said bed reciprocates in the return direction, and being adapted to be unlocked at the next meshing of said meshing means as said bed begins its next reciprocation in said one direction.

27. In a machine of the character described, a rectilinearly reciprocating bed to carry a printing plate with stock thereon, segmental rotary pressing means to press said stock thereon during reciprocation of said bed in one direction and to withdraw from said bed during reciprocation thereof in return direction, a rack on said bed, a segment gear operatively connected to said rotary means for rotation simultaneously therewith, initially out of mesh with said rack, means to bring said rack and said segment gear into mesh for pressure of said pressing means on said stock, and means to automatically stop and hold said gear and said pressing means after said pressure, with said gear and said rack unmeshed, for return of said bed.

28. In a machine of the character described, a rectilinearly reciprocating bed to carry a printing plate with stock thereon, segmental rotary pressing means to press said stock thereon during reciprocation of said bed in one direction and to withdraw from said bed during reciprocation thereof in return direction, a rack longitudinally slidable on said bed, a spring on said bed yieldingly resisting sliding of said rack in one longitudinal direction, a segment gear operatively connected to said rotary pressing means for rotation simultaneously therewith, initially out of mesh with said rack, means to bring said rack and segment gear into mesh for pressure of said pressing means on said stock, and means to automatically stop and hold said gear and said pressing means after said pressure, with said gear and said rack unmeshed, for return of said bed.

29. In a machine of the character described, a rectilinearly reciprocating bed to carry a printing plate with stock thereon, segmental rotary pressing means to press said stock thereon during reciprocation of said bed in one direction and to withdraw from said bed during reciprocation thereof in return direction, a rack longitudinally slidable on said bed, a spring on said bed yieldingly resisting sliding of said rack in one longitudinal direction, a segment gear operatively connected to said rotary pressing means for rotation simultaneously therewith, initially out of mesh with said rack, means to bring said rack and segment gear into mesh for pressure of said pressing means on said stock, means to automatically stop and hold said gear and said pressing means after said pressure, with said gear and said rack unmeshed, for return of said bed, and means on said bed positively resisting sliding of said printing plate in one longitudinal direction.

30. In a machine of the character described, a rectilinearly reciprocating bed to carry a printing plate with stock thereon, segmental rotary pressing means to press said stock thereon during reciprocation of said bed in one direction and to withdraw from said bed during reciprocation thereof in return direction, a rack mounted on said bed to have a limited longitudinal movement thereon, a segment gear operatively connected to said rotary pressing means for rotation simultaneously therewith, initially out of mesh with said rack, means to bring

said rack and segment gear into mesh for pressure of said pressing means on said stock, and means to automatically stop and hold said gear and said pressing means after said pressure, with said gear and said rack unmeshed, for return of said bed.

31. In a machine of the character described, a frame, a bed rectilinearly reciprocatable on said frame, pressing means on said frame above said bed, mechanism for reciprocating said bed, and a plate secured across said frame near one end thereof above the path of reciprocation of said bed, said mechanism so limiting said reciprocation that the adjacent end of said bed is prevented from passing from under said plate toward said pressing means, whereby said plate forms a guard at said end of said bed.

32. In a machine of the character described, a frame comprising a base with a raised rim, sides upstanding from said base and having standards at their tops, rollers journaled between said sides, a bed supported on said rollers, pressing means journaled in said standards over said bed, and operating means for said bed and said pressing means, mounted on said frame.

33. In a machine of the character described, a frame, a bed rectilinearly reciprocatable on said frame, pressing means on said frame above said bed, mechanism for reciprocating said bed, confined within the lateral limits of said frame, an operative connection from said mechanism to said pressing means, confined close to one side of said frame, and a work-table mounted close to said side of said frame near the horizontal plane of the upper surface of said bed.

34. In a machine of the character described, a frame, a bed rectilinearly reciprocatable on said frame, pressing means on said frame above said bed, a motor mounted inside the lower part of said frame with its rotor axis parallel with the line of reciprocation of said bed, a worm connected to and alined with said rotor near one end of said frame, a worm-gear meshing with said worm, a crank operatively connected to said worm gear for rotation simultaneously therewith, an operative connection from said worm gear to said pressing means, close to one side of said frame, supporting means for said worm, worm-gear and crank, and a lever fulcrumed inside said frame and operatively connected to said crank and to said bed.

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