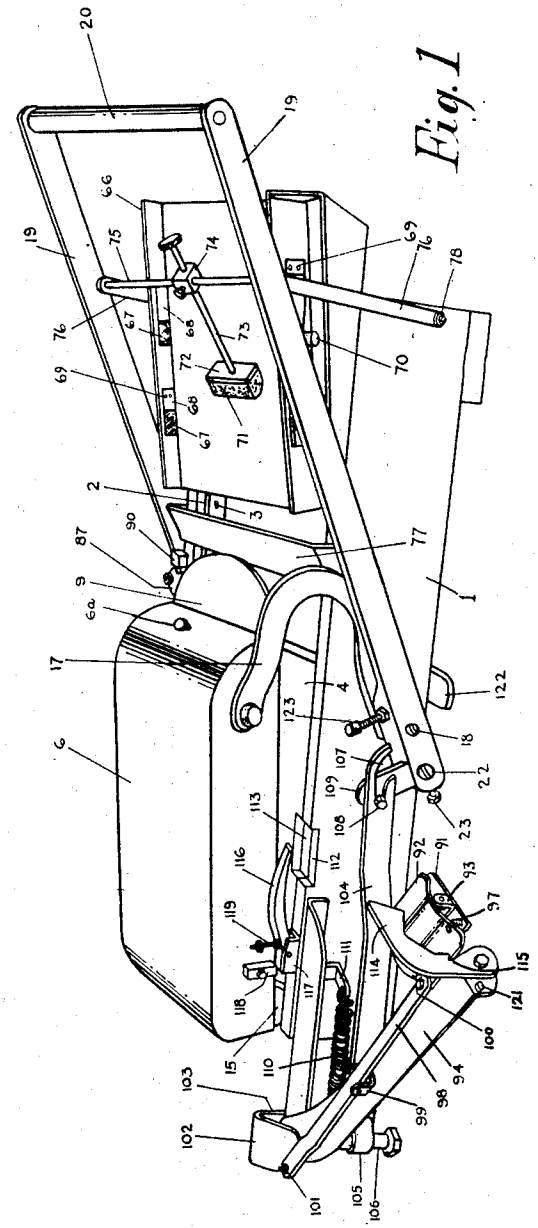
Aug. 26, 1958 H. R. McLAUGHLIN 2,848,944

FLAT BED PLATEN PRINTING PRESSES

Filed Dec. 6, 1955 10 Sheets-Sheet 1

Fig. 1



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FLAT BED PLATEN PRINTING PRESSES

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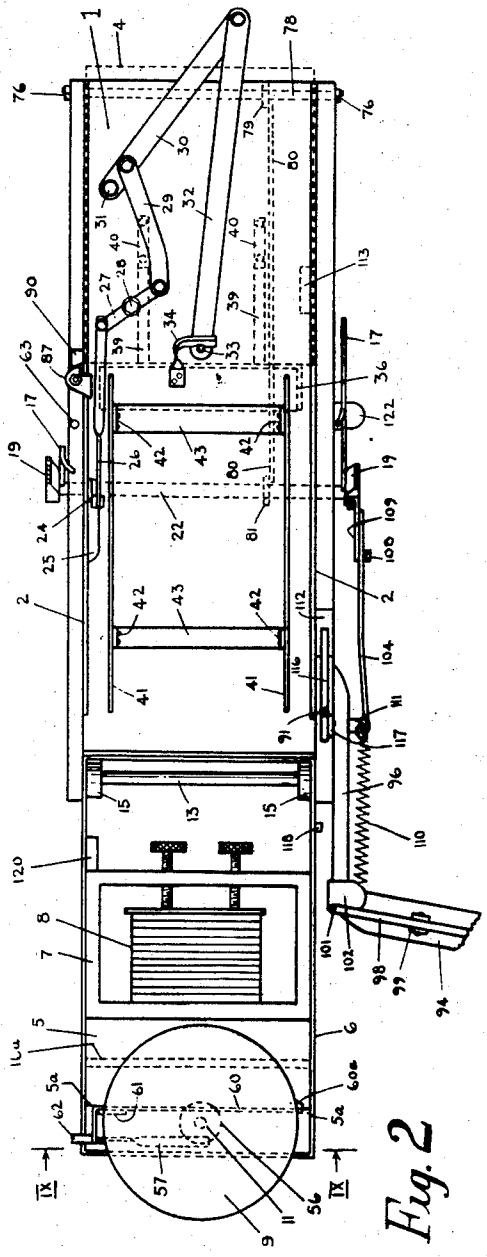


Fig. 2

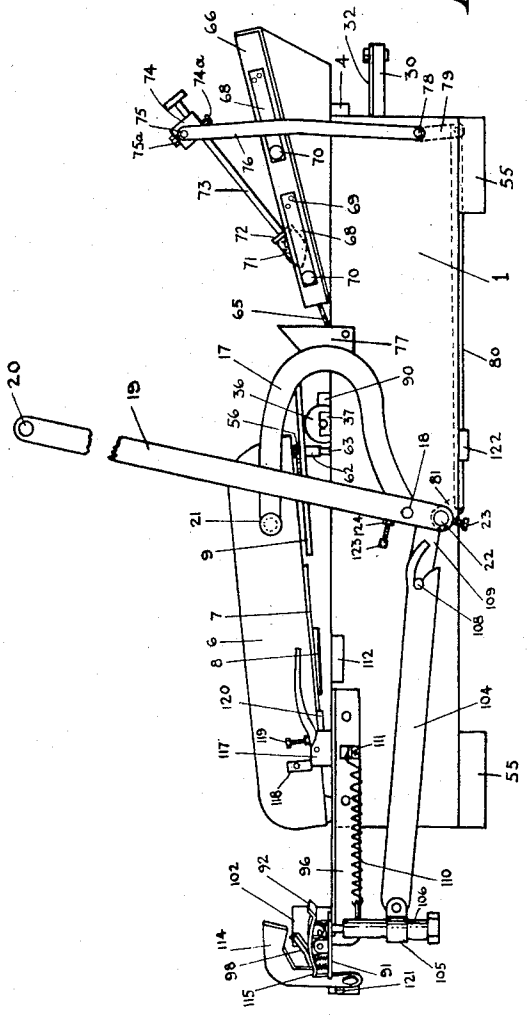
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FLAT BED PLATEN PRINTING PRESSES

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Fig. 4



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FLAT BED PLATEN PRINTING PRESSES

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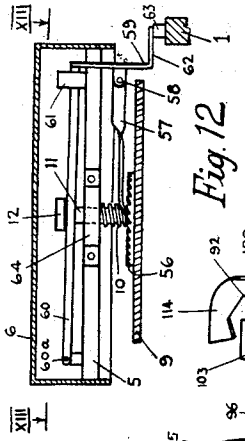


Fig. 12

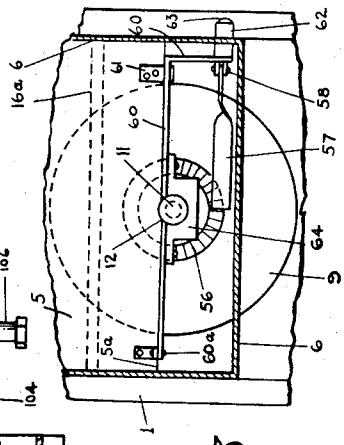


Fig. 13

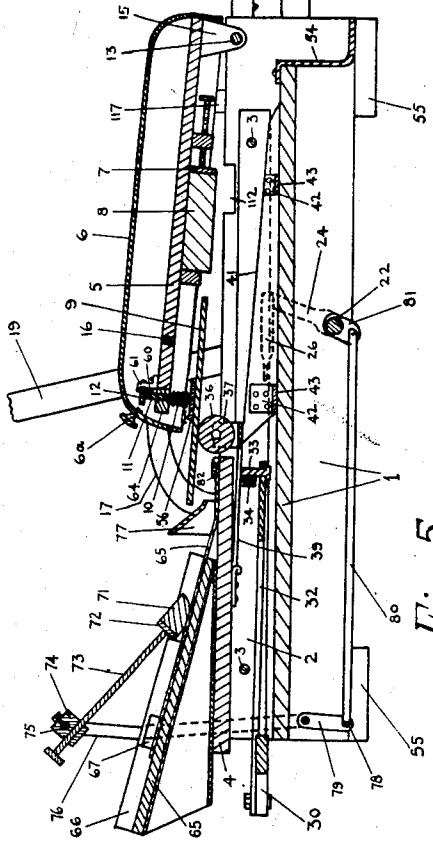


Fig. 5

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FLAT BED PLATEN PRINTING PRESSES

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Fig. 3

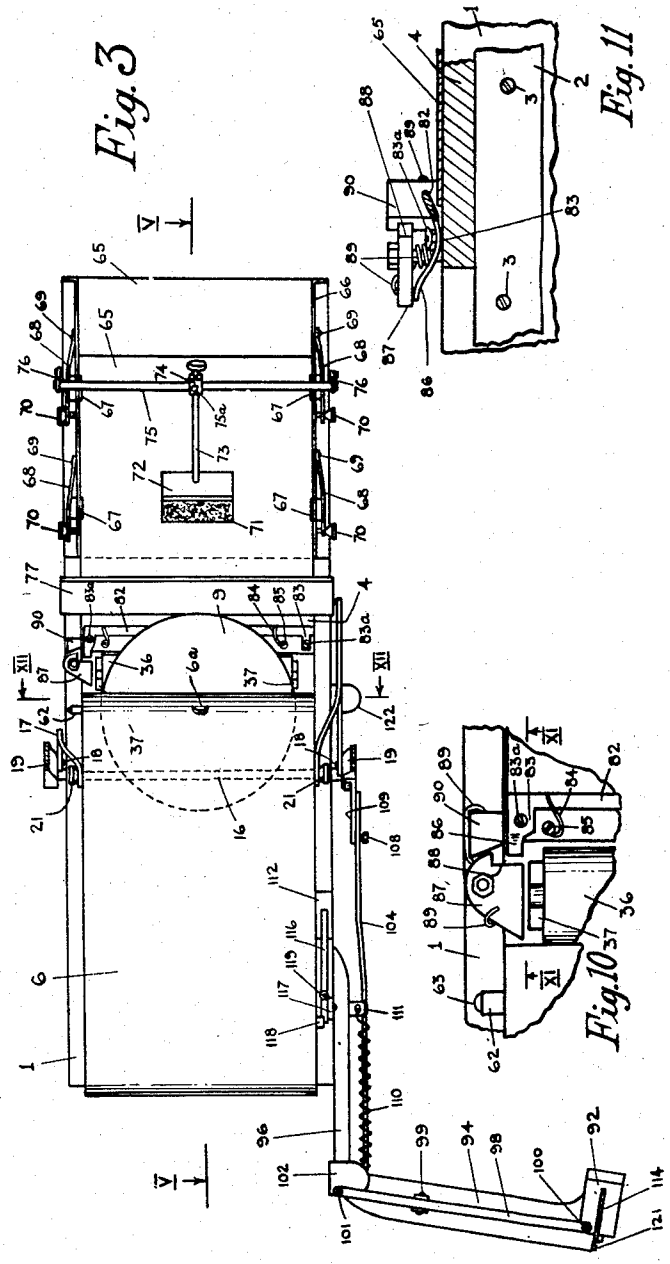


Fig. 11

Fig. 10

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FLAT BED PLATEN PRINTING PRESSES

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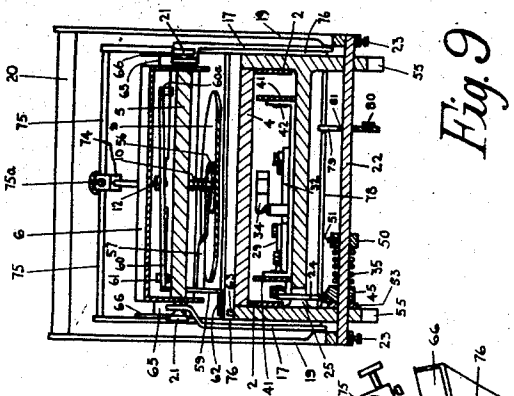


Fig. 9

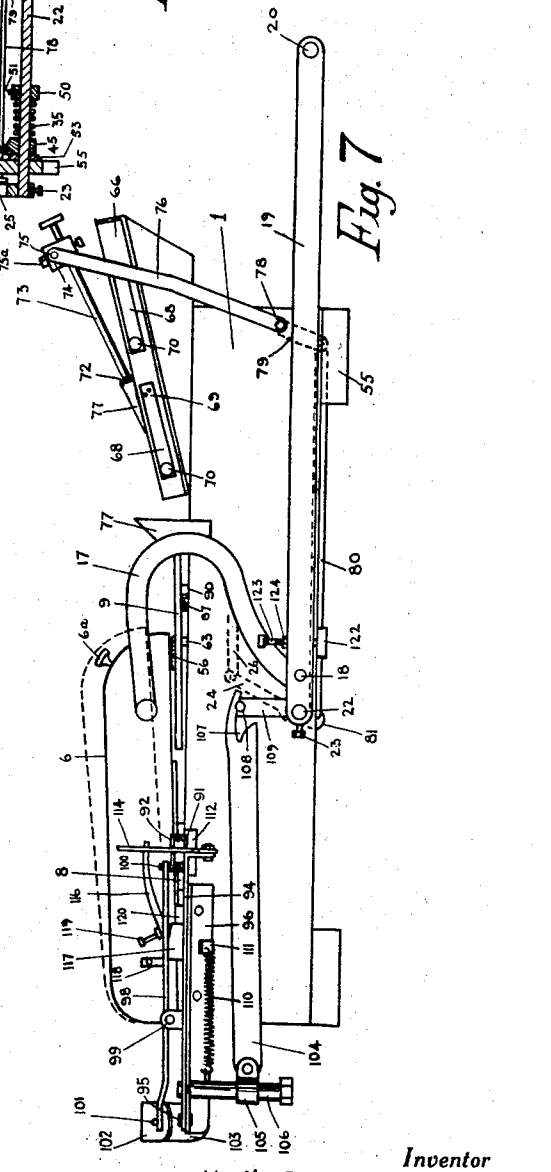


Fig. 7

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FLAT BED PLATEN PRINTING PRESSES

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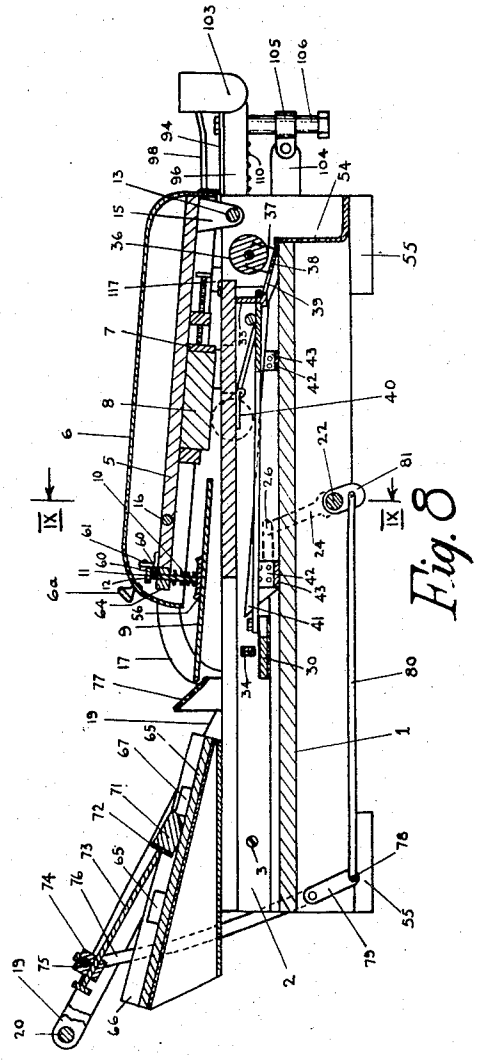


Fig. 8

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FLAT BED PLATEN PRINTING PRESSES

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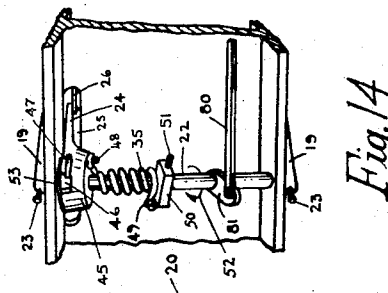


Fig. 14

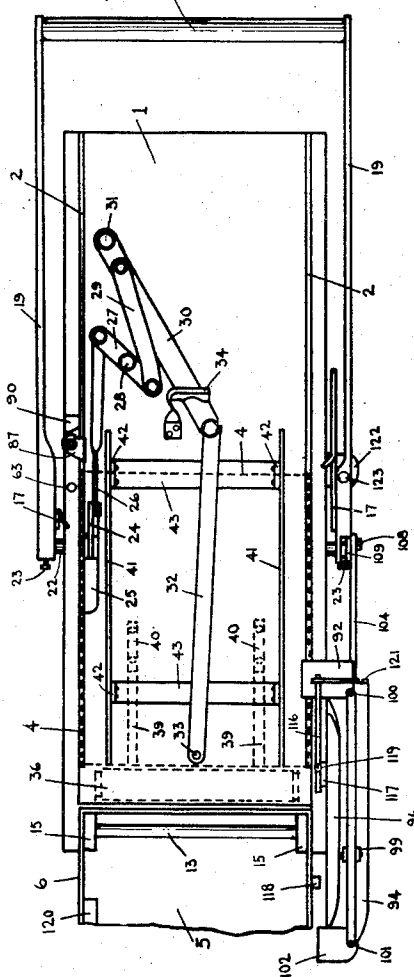


Fig. 6

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FLAT BED PLATEN PRINTING PRESSES

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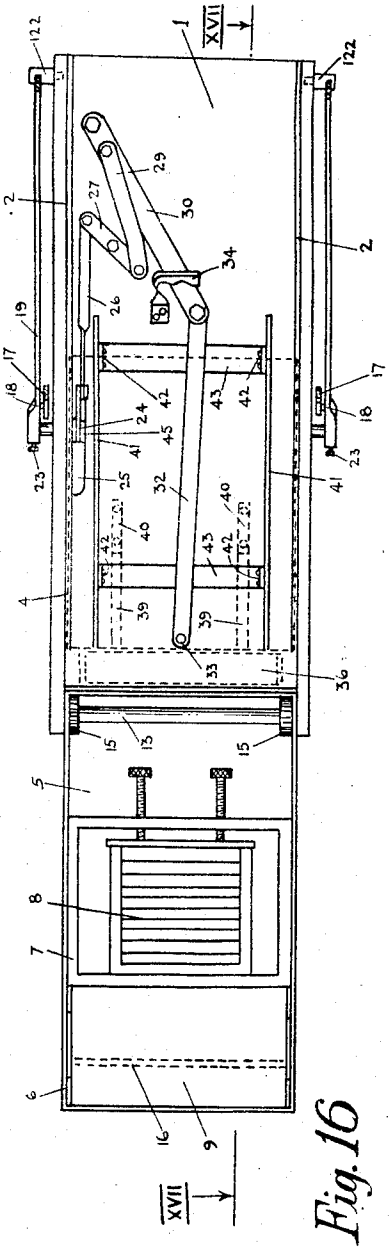


Fig. 16

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FLAT BED PLATEN PRINTING PRESSES

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Fig. 15

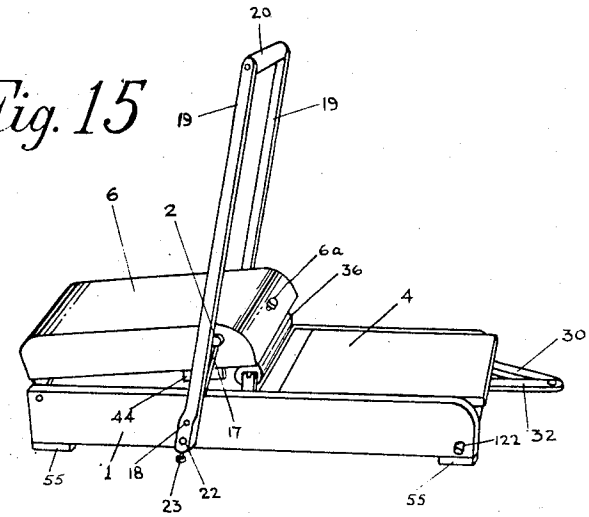


Fig. 17

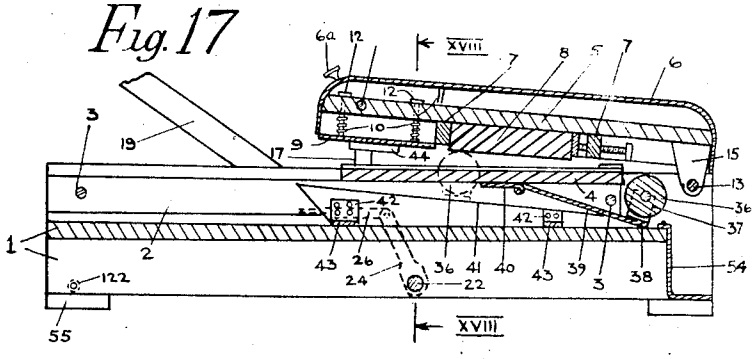
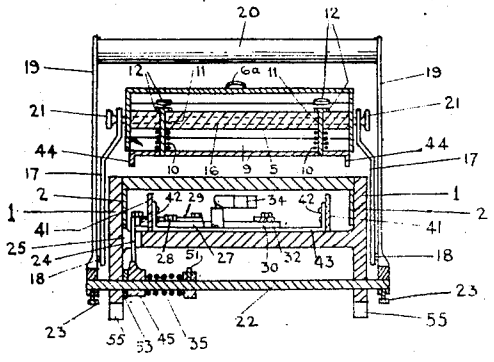


Fig. 18



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2,848,944

FLAT BED PLATEN PRINTING PRESSES

Hugh Rogers McLaughlin, Dublin, Ireland

Application December 6, 1955, Serial No. 551,405

10 Claims. (Cl. 101—302)

This invention relates to flat bed platen printing presses for letterpress printing, the object of the invention being to provide a portable construction of the aforesaid type of printing press which will be simple, compact, durable and very convenient for manual operation for office use.

Heretofore in platen printing presses it is usual to mount the type on the flat bed of the machine which is brought into printing contact with the paper platen, the flat bed and the paper platen being angularly arranged with reference to each other and with reference to the horizontal plane, the result being that feeding of the paper to the platen is inconvenient and traverse of the inking roller or rollers over the type face involves a complicated spring actuated mechanism.

The present invention provides a construction of flat bed platen printing press in which the paper is fed to a horizontally disposed paper platen and positive roller inking of the type is effected without complicated spring urging of the roller, the movement of the flat bed to the paper platen is a small and approximately vertical one, and the inking arrangements and type are not exposed as in the hitherto known machines.

The printing press according to the invention is preferably equipped for automatic feeding and withdrawal of the paper, although it will be understood that the feeding and withdrawal of the paper may be done manually in which case, as hereinafter explained, the construction of the printing press may be simplified.

The invention will be more clearly understood from the following description of alternative embodiments of the invention as applied to a manually operated office type printing press, and as illustrated by way of example only with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of the printing press equipped with automatic feeding and withdrawal of the paper, and showing the platen at its innermost position, the actuating handles being in an intermediate position.

Fig. 2 is an opened-out plan view, the links connecting the flat bed to the arms of the actuating handle being uncoupled to allow the flat bed to be swung rearwardly to opened-out position, the platen being shown in its outermost position in dotted outline and the paper tray being omitted for the sake of clearness.

Fig. 3 is a plan view with the parts in the same position as Fig. 2, but with the flat bed in its normal closed over position and a piece of paper being fed to the platen.

Fig. 4 is a side elevational view of Fig. 3.

Fig. 5 is a sectional view on the line V—V of Fig. 3.

Fig. 6 is a partial opened-out plan view showing the platen (in dotted outline for clearness) in its innermost printing position, the paper tray being omitted.

Fig. 7 is a side elevational view showing the parts in printing contact position, and also showing the small arcuate but approximately vertical movement of the flat bed to printing position.

Fig. 8 is a longitudinal sectional view showing the parts just prior to printing contact position, the platen being

in its inner most position and the actuating handle in intermediate position.

Fig. 9 is a cross-sectional view taken on the line IX—IX of Fig. 8.

Fig. 10 is an enlarged partial plan view of the platen paper gripping mechanism.

Fig. 11 is a sectional view on the line XI—XI of Fig. 10.

Fig. 12 is a sectional view on the line XII—XII of Fig. 3 showing the distributing plate revolving mechanism.

Fig. 13 is a sectional plan view on the line XIII—XIII of Fig. 12.

Fig. 14 is a perspective view from underneath showing the main shaft and the spring coupling of the crank lever thereto.

Fig. 15 is a perspective view of a modified printing press without automatic paper feeding and withdrawal, the platen being shown near to its outermost position.

Fig. 16 is a plan view of the press shown in Fig. 15, the flat bed being swung rearwardly to opened-out position and the platen being shown in its innermost position in dotted outline for the sake of clearness.

Fig. 17 is a longitudinal sectional view taken on the line XVII—XVII of Fig. 16.

Fig. 18 is a cross sectional view taken on the line XVIII—XVIII of Fig. 17.

Referring to the drawings the printing press comprises essentially a I-section frame **1** having a pair of horizontal rails **2**, secured by screws **3** to the upper portions of the flanges of the frame, on which the paper-supporting platen **4** slidingly reciprocates from the outward paper feeding position shown in Figs. 2, 3, 4 and 5 to the inward printing contact position shown in Figs. 6 and 7, in which the platen **4** is located immediately beneath and in juxtaposition to a flat bed **5** to which the cover **6** is secured, said flat bed **5** having mounted thereon in inverted position the chase **7** containing the printing type **8** and also a circular ink distributing plate **9** urged outwardly from the flat bed **5** by a coil spring **10** encircling the plate axle **11** which passes freely through a hole in a bracket plate **64** secured to the flat bed **5**, the free end of axle **11** being fitted with a collar **12**. The plate **9** is adapted for automatic intermittent rotation as will be hereinafter explained.

The flat bed **5** with its cover **6** and mountings is rotatably mounted at its inner end on a spindle **13** fixed at each end in holes in the flanges of the I-frame, the flat bed **5** being provided with a pair of bracket lugs **15** encircling the spindle **13**. At the opposite outer end of bed **5** another spindle **16** passes transversely through a corresponding bore **16a** in the flat bed **5** and projects at each end through the cover **6** to receive the bored upper ends of a pair of outwardly cranked links **17** one of which is curved as shown connecting the spindle **16** to pivot pins **18** provided near the bottom ends of the arms **19** of an actuating handle bridged by a handle grip **20**. The links **17** are secured on the spindle **16** by nuts **21**, one of which may consist of a fixed head on the spindle **16**. The bottom ends of the arms **19** are mounted on the projecting ends of a main shaft **22** and secured thereto by grub screws **23**, the main shaft being rotatably supported in the lower portions of the I-frame flanges.

It will be apparent that by uncoupling one of the nuts **21** and withdrawing the spindle **16**, thereby uncoupling the flat bed **5** from the handle arms **19**, the flat bed **5** with its cover **6** and mountings may be pivoted inwardly about spindle **13** to occupy the opened-out position shown in Figs. 2 and 6, in which position the attachment of the chase **7** and type **8** is facilitated and access is gained for cleaning or lubrication. Moreover, the chase **7** and type **8** being horizontal when the flat bed **5** is swung back, alteration or setting of the

type 8 is the chase 7 can be readily effected while they are actually mounted in the machine. The cover is provided with a button handle 6a to facilitate its opening-out.

Manual rocking of the handle arms 19 about shaft 22 reciprocates the platen 4 on the rails 2 through the linkage comprising the crank lever 24 (Figs. 2 and 6) spring coupled, as hereinafter explained, to shaft 22, the free end of crank lever 24 passing through a slot 25 in the horizontal web of the I-frame above which it is pivotally connected to link 26 twisted at its centre to present a flat horizontal surface at its other end for pivotal connection to one end of a lever 27 pivoted at its centre to a stud 28 fixed in the horizontal web of the I-frame 1. The other end of lever 27 is connected by a pivotal link 29 to another lever 30 one end of which is pivotally connected to a stud 31 fixed in the horizontal web of the I-frame 1 and its other end is pivotally connected to a longitudinal link 32 the inner end of which is pivotally connected to a stud 33 (Fig. 5) projecting downwards from the underneath surface of the platen 4 at its inner end. The pivotal connection of link 29 to lever 30 is located near the stud 31 and the entire linkage is predetermined to effect reciprocation of the platen between the outermost paper feeding position (Figs. 2 to 5) determined by the engagement of the platen stud 33 with the mechanical resilient faced stop 34 screwed to the web of the I-frame, and the innermost printing contact position (Figs. 6 and 7). This reciprocation is effected by rocking of the handle arms 19 with corresponding rotation of shaft 22 between the approximately vertical position shown in Fig. 4 and the intermediate downward position shown in Figs. 2 and 8. During this rocking movement of the handle arms 19 the links 17 mostly pivot about their connection with spindle 16 and do not cause any appreciable movement of the flat bed 5 which remains almost stationary above the plane of reciprocation of the platen 4. As will be hereinafter explained, further rocking of the arms 19 to the position shown in Fig. 7 rotates shaft 22 against the resilient action of spring 35 (Fig. 14), moves the flat bed 5 down into printing contact with the paper platen 4 as shown in Fig. 7, after which the arms 19 and shaft 22 are rocked back to the intermediate position as shown in Figs. 1 and 8 under the influence of spring 35.

An inking roller 36 is mounted in front of the platen 4, the roller 36 being journalled in the upturned ends 37 of a bracket 38 secured to a pair of hinge links 39 (Fig. 5) the other hinge leaves 40 of which are secured to the underneath surface of the platen 4. The under surface of the bracket 38 rides on a pair of ramps 41 secured to the upturned ends 42 of a pair of brackets 43 secured to the horizontal web of the I-frame. The ramps 41 are downwardly inclined in the inward direction so that the ramps 41 are parallel to the flat bed 5 when the latter is in its normal stationary position shown in Figs. 1, 4 and 5.

The ramps 41 are thus parallel to the face of the type 8 in the chase 7 and also to the surface of the ink distributing plate 9 resiliently mounted on the flat bed 5. The ink distributing plate 9 (Figs. 12 and 13) is provided with a ratchet wheel 56 the teeth of which are engaged by a pawl 57 the free end of which is pivoted at 58 to a right-angled downward extension 59 of a right-angled lever 60 pivoted at 60a to the bed 5. The lever 60 engages underneath the plate axle collar 12 and is maintained in this position by a guide bracket 61 secured to bed 5. The extension 59 has an outward projection 62 situated immediately above and engaging a stop 63 fixed on the flange of the I-frame 1. The end 5a of the bed 5, which does not reach to the front end of cover 6, has a block 64 screwed to its edge and the axle 11 of plate 9 passes freely through a bore in block 64, coil spring 10 urging plate 9 downwardly and maintaining collar 12 in engagement with lever 60. It will be apparent that each time the bed 5 moves downwardly into printing contact with the platen 4 by movement of the handle 20 from the position shown in Fig. 1 to the fully downward position shown in Fig. 7, lever 60 will be pivoted upwardly due to the engagement of the projection 62 with stop 63. This upward movement of lever 60 retracts pawl 57 sufficiently to cause its engagement with the next tooth of ratchet wheel 56, and when the bed 5 rises again after printing contact, pawl 57 rotates ratchet wheel 56 and the distributing plate 9 an angular distance equivalent to the pitch of the teeth in the ratchet wheel 56. In this manner, the distributing plate 9 is automatically rotated intermittently during each printing operation. Moreover, the upward movement of lever 60 performs the additional function that it lifts plate 9 sufficiently to ensure that it does not contact the platen 4 when the latter is situated thereunder for the printing operation.

It will also be apparent that as the platen 4 is reciprocated inwardly, the inking roller 36, to which the printing ink may be initially applied by hand or alternatively by any known ink duct arrangement, first rolls in contact with the resiliently mounted ink distributing plate 9 whereby the ink is distributed uniformly over the roller 36 which then traverses the face of the type 8 in the chase 7 the track of the roller 36 being parallel to hte surfaces of the distributing plate 9 and type 8 mounted in the flat bed 5, and when the roller 36 leaves the inner end of the ramps 41 it is situated below the horizontal level of the platen 4 where it remains during the downward printing contact movement of the flat bed 5 while the handle arms 19 are rocked from the intermediate position of Fig. 1 to the fully downward position of Fig. 7.

On the return reciprocation of the platen 4 to outward position, the roller 36 again traverses the face of the type 8 and the distributing plate 9, and it is to be noted that on leaving the outermost edge of the distributing plate 9 the roller 36 will, due to its inertia, continue to rotate through a small angular movement, whereby on the next inward stroke a different line surface of the roller is presented for entering contact with the plate 9 than in the previous stroke. The same occurs at the inner end of the entering stroke whereby thorough distribution of the ink on the roller 36 is ensured.

Instead of mounting the distributing plate 9 resiliently as shown, it will be obvious that the roller 36 and/or the ramps 41 may be resiliently mounted to press into contact with a fixed distributing plate 9.

Referring to Figs. 9 and 14, the crank lever 24 terminates in a boss 45 loosely mounted on the main shaft 22, and separated from the flange of the I-frame 1 by a washer 53, the boss having a slot 46 through which projects a pin 47 fixed radially in the shaft 22. The coil spring 35 is anchored at one end to a pin 48 fixed in the face of the boss 45 so as to project in the axial direction, and at the other end is anchored to a pin 49 on an anchor block 50 fixed to the shaft 22 by grub screw 51.

It will be apparent that the crank lever 24 is spring coupled to the main shaft 22 so that as the arms 19 are actuated downwardly to reciprocate the platen 4 inwardly, the rotation of the main shaft 22 which is in the direction of the arrow 52 is transmitted to the crank lever 24 by the spring 35 which is strong enough for this purpose. When the platen 4 has reached its inward printing contact position, being the limiting position of the linkage shown in Fig. 6, the further downward actuation of the arms 19 and rotation of shaft 22 takes place against the tightening of coil spring 35 the anchor 48 of which remains stationary and anchor 49 of which rotates with the shaft 22 in the direction of arrow 52 the pin 47 moving through the slot 46. This further rotation of shaft 22 brought about by movement of the handle arms 19 from the position shown in Figs. 1 and 8 and in dotted outline in Fig. 7 to the fully downward position shown

in Figs. 6, 7 and 9, draws downwardly the links **17** thereby effecting the small and arcuate but approximately vertical movement of the flat bed **5** into printing contact with the paper on platen.

Following the printing operation the handles **19** return to the intermediate position as shaft **22** is rotated back under the influence of spring **35**, and the flat bed **5** is raised by the links **17** to its normal intermediate position. Further manual upward rocking of the arms **19** to the vertical position is accompanied by return rotation of shaft **22** which is transmitted to the crank lever **24** by the engagement of pin **47** with the contacting end of the slot **46** in the boss **45**, and the platen **4** is reciprocated to its outward position.

It should be noted that the spring coupling of the platen reciprocating linkage to the handle actuated main shaft **22** could readily be effected in other ways as, for instance, by transferring the spring coupling to another joint in the mechanical linkage, for example, the joint of link **26** with lever **27**, or the joint of the inner end of the longitudinal link **32** with the underneath surface of the platen **4**.

The feeding of the paper **65** to the platen **4** and its withdrawal therefrom after the printing operation is automatically effected in synchronism with the reciprocation of the platen **4** by the up and down movement of the handle arms **19**. The individual sheets of paper **65** are stacked in a tray **66** fixed to the I-frame **1** so that the surface on which the stack of paper **65** rests is inclined inwardly towards the plane of the platen **4** which passes underneath the tray **66** during its outward reciprocation. The side edges of the stack of paper **65** are frictionally held by strips **67** of rubber or other similar material each mounted near one end of a spring steel carrier **68**, the strips **67** projecting into the tray through slots cut in the sides of the tray, and the carriers being secured to the exterior of the sides of the tray. At their other ends, the carriers are fitted with adjustment screws **70** which bear on the sides of the tray **66**, whereby the frictional pressure exerted by the strips **67** on the sides of the stacked paper **65** may be regulated so that it is sufficient to maintain the stack on the inclined surface of the tray while the top sheet of paper **65** is positively pushed forward on to the platen **4** (as hereinafter explained) as the latter reciprocates outwardly.

The top sheet of paper **65** is engaged by a pusher **71** in the form of a short arcuate sectioned length of sponge rubber held in a bracket **72** fixed to a pusher rod **73** the upper end of which passes through a bore in a block **74** carried on a transverse rod **75** the ends of which are pivotally connected to a pair of links **76** the lower ends of which are fixed to the projecting ends of a transverse spindle **78** rotatably supported in bores in the I-frame **1**. Spindle **78** is connected by a crank arm **79** and connecting rod **80** with a crank arm **81** fixed on the main shaft **22**. A grub screw **74***a* secures the pusher rod **73** in adjusted position to the block **74** which itself is secured in adjusted position on the transverse rod **75** by grub screw **75***a*.

It will be apparent that when the handle arms **19** are moved downwardly from their uppermost position (Figs. 2 to 5) the crank **81**, connecting rod **80** and crank **79** cause spindle **78** to rock in a clockwise direction viewing Fig. 4 whereby links **76** retract the pusher rod **73** and pusher **71** which merely slides over the surface of the paper **65** owing to its shape and the fact that it exerts no pressure on the paper other than that arising from its small mass. When, however, handle arms are moved upwardly from the lowest position (Figs. 6 and 7) the reverse action occurs and as pusher rod **73** and pusher **71** now exert a thrust on the paper stack, the top sheet engaged by pusher **71** is pushed forwardly towards the platen **4** which is being reciprocated outwardly towards the paper. The frictional strips **67** hold the rest of the stack of paper **65** on the tray **66**.

Thus, each time the handle arms **19** are raised from their lowermost position (Figs. 6 and 7) to their uppermost position (Figs. 2 to 5), the uppermost sheet of paper **65** is fed towards the platen **4** which is reciprocating towards its outermost position, the paper **65** passing under and being guided to the plane of the platen by a guide plate **77** secured at its side edges to the outer surfaces of the flanges of the I-frame.

At its innermost end the platen **4** is equipped with a paper gripping bar **82** (Figs. 3, 10 and 11) having at each end thereof, a forwardly extending lug **83**, the bar **82** being attached to the platen by a screw **83***a* passing loosely through a bore in each lug **83**. The bar **82** is normally maintained in close contact with the surface of the platen **4** by a pair of wire springs **84** pressing on the bar **82** at each end thereof and anchored to screws **85** fixed in the platen **4**.

The lug **83** at one end is further extended to form an upwardly curved tongue **86**, and as the platen **4** reciprocates outwardly, tongue **86** passes underneath and engages a trigger **87** pivoted at **88** to the upper edge of the flange of the I-frame **1**. The tongue **86** is therefore pressed downwardly whereby the outer edge of bar **82** is raised (Fig. 11) as the platen **4** approaches the sheet of paper **65** being fed thereto, and the inner edge of the sheet of paper **65** passes underneath the bar **82**. As soon as tongue **86** passes out from underneath the trigger **87**, the bar **82** closes down and grips the paper **65** due to the action of springs **84**.

On the return inward reciprocation of the platen **4**, the tongue **86** engages a flat **88** on trigger **87** and rocks trigger **87** out of its path against the action of a wire spring **89** secured to the trigger **87** and anchored to a stop block **90** mounted on the upper edge of I-frame **1**, the block **90** also functioning as a stop to limit the return rocking motion of trigger **87** and re-position it correctly for the next succeeding paper gripping operation.

Downward movement of the handle arms **19** from their uppermost position (Figs. 2 to 5) to their intermediate position (Figs. 1 and 8), reciprocates the platen **4** now fed with a sheet of paper **65** to its innermost position beneath the flat bed **5** ready for the printing operation which is effected during movement of the handle arms **19** from the intermediate position to the fully downward position (Figs. 6 and 7) against the action of coupling spring **35**.

After printing the paper **65** is extracted from the platen by withdrawal mechanism shown in Figs. 6 and 7 at the moment of gripping the paper **65** for its withdrawal from the platen **4**, and in Figs. 1, 2, 3 and 4 after withdrawal from the platen **4**.

The withdrawal mechanism comprises a spring clip the lower fixed jaw member **91** of which is secured at one end of a pivot arm **94** pivotally connected at **95** (Fig. 7) to the projecting end of a bracket **96** of angle section bolted to the flange of the I-beam **1** on which the outwardly curved handle link **17** is situated. The movable jaw **92** of the spring clip is secured and centrally pivoted at **93** to the lower jaw **91** and is urged to gripping contact therewith by coil springs **97**. Depression of the movable jaw **92** about its pivot **93** for the required opening of the jaws at correct timing is controlled by a lever **98** pivotally mounted intermediate its ends on a bracket **99** secured to pivot arm **94**, one end of the lever **98** bearing on rear end of the movable jaw **92** through the intermediary of an adjusting screw stud, **100** while its other end carries another adjustable screw stud **101** which rides on the inclined surface of a cam plate **102** a downward extension **103** of which is bolted to the rear flange of the bracket **96**.

The pivot arm **94** is actuated by a link **104** (Fig. 7) connected to a sleeve **105** encircling a downwardly extending pin **106** secured to the pivot arm **94** at a short radial distance from the pivot **95** of the pivot arm **94**. The other end of link **104** is formed with a slot **107** engaging

a stud **108** fixed to an upstanding lug **109** on the inner end of handle arm **19**. It will be apparent that as the handle arms **19** are raised from the intermediate position (Figs. 1 and 8) to the uppermost position (Figs. 2, 3, 4 and 5), link **104** will pivot arm **94** outwardly away from the printing press, and on moving the handle arms **19** downwardly the link **104** is pivoted inwardly to paper gripping position by the action of coil spring **110** anchored at one end to a lug **111** fixed to the bracket **96** and anchored at the other end to the pin **106**.

The flange of the I-frame **1** is recessed at **112** and the platen **4** is inwardly recessed at **113** to receive the spring clip the jaws **91** and **92** of which are open (as hereinafter explained) and straddle the paper **65** at the platen recess **113**. This occurs before the handle arms **19** have reached their lowermost position and during the further movement of the arms **19** to their lowermost position at which printing is effected, the stud **108** rides freely in slot **107**. Similarly during the initial portion of the return upward movement of the handle arms **19**, the stud **108** rides freely in slot **107** until it engages the closed end thereof when pivoting of arm **94** outwardly commences.

A curved latch **114** pivoted to the free end of arm **94** so as to overlie the spring clip has a notch **115** formed therein adapted to engage the inner end of the upper jaw **92** of the spring clip to maintain the jaws open, when jaw **92** has been depressed by lever **98** the stud **101** of which rides to the highest portion of cam **102** as pivot arm **94** pivots outwardly. This latch **114** maintains the jaws open until it is tripped by a trigger arm **116** pivoted near its inner end on an angle lug **117** bolted to the upper edge of the flange of the I-frame, the innermost end of trigger arm **116** being located immediately below a stop **118** fixed to the flat bed **5**. The extent of rocking of the free end of trigger arm **116** is adjustable by means of adjusting screw **119** passing freely through trigger arm **116** and engaging its bottom surface.

Commencing with the handle arms **19** in their uppermost position (Figs. 2, 3, 4 and 5), the pivot arm **94** has been swung fully outwardly against the action of spring **110**, the notch **115** of latch **114** is engaging the rear end of the upper jaw **92** maintaining the jaws open and the platen **4** is fully reciprocated outwardly and has been fed with a sheet of paper **65** from the tray **66**. As the handle arms **19** are moved downwardly to the intermediate position spring **110** swings pivot arm **94** inwardly, the paper loaded platen **4** is reciprocated to its innermost position underneath the flat bed **5**, the inking roller **36** traversing the distributing plate **9** and the type **8**, but the flat bed **5** remains practically stationary in its raised position above the platen **4**, and stop **118** is out of engagement with trigger arm **116**. Further downward movement of handle arms **19** against the action of spring **35** allows spring **110** to close in the pivot arm **94** fully, the opened jaws **91**, **92**, of the spring clip straddle the paper overlying the platen recess **113**, and the flat bed **5** begins to descend to printing contact position whereby stop **118** presses on the end of trigger arm **116** thereunder the other end of which rises and lifts latch **114** disengaging its notch **115** with jaw **92**, whereby jaw **92** closes and the paper is gripped firmly between the jaws **91**, **92**.

As the platen **4** reaches its innermost position beneath the flat bed **5**, a stop **120** (Figs. 2, 5 and 6) secured to the flat bed **5** and projecting downwardly therefrom engages the curved tongue **86** of the paper gripping bar **82** on platen **4** and depressing said tongue **86** leaves the paper **65** free for sideways withdrawal from the platen **4**.

Following the printing contact operation, handle arms **19** are moved upwardly from their lowermost position assisted by spring **35** and the flat bed **5** rises allowing the paper still gripped between jaws **91**, **92** to be withdrawn sideways from the platen **4** as pivot arm **94** is moved outwardly by link **104**. During this outward movement of pivot arm **94** stud **101** rides up the inclined surface of cam plate **102** and the other end of lever arm **98** presses on the rear end of upper jaw **92** releasing the grip on the withdrawn and printed paper which falls into a collecting receptacle. When jaw **92** has been depressed on its rear edge sufficiently by lever arm **98**, the notch **115** again engages over the rear edge of jaw **92** maintaining the jaws in open position for the next paper withdrawal operation. As soon as the flat bed **5** rises sufficiently after the printing operation and after withdrawal of the paper from the platen **4**, stop **120** disengages from the curved tongue **86** allowing the paper gripping bar **82** to return to its normal spring closed position on the platen **4**.

A stop **121** is fixed to the end of the pivot arm **94** to prevent latch **114** being lifted by trigger arm **116** beyond the point at which the latch **114** will return again under its own weight to notch engagement with the upper jaw **92** of the spring clip.

It will be noted that the cranked link **17** is curved outwardly on the side of the printing press on which the paper withdrawal mechanism is situated, this being necessary to allow clearance for the sideways withdrawal of the paper from the platen **4**. On the other side of the press, however, the link **17** need not be curved.

A simplified modification of the printing press is shown in Figs. 15 to 18, in which similar references to those employed in Figs. 1 to 14 have been used to denote similar parts, this simplified construction dispensing with automatic feeding and withdrawal of the paper, and the intermittently rotated circular distributing plate **9** is replaced by a non-rotating rectangular distributing plate.

As will be readily apparent from Figs. 17 and 18 the rectangular distributing plate **9** is urged outwardly from the flat bed **5** by coil springs **10** encircling plate studs **11** which pass freely through corresponding holes in the flat bed **5**, the inner ends of the studs **11** having enlarged heads **12**. The plate **9** has side flanges **44** which serve to guide the plate **9** in its inward and outward spring controlled movement within the cover **6** and also serve to engage the platen **4** during the downward printing contact movement of the flat bed **5** and thereby force the plate **9** inwards out of contact with the paper during printing contact.

Each sheet of paper to be printed is placed manually upon the platen **4** when the latter is reciprocated to its fully outward position, and removed after printing when the platen returns to its fully outward position, another sheet being placed on the platen and so on.

Further description of the operation of the simplified printing press of Figs. 15 to 18 is unnecessary as its operation is similar to that of the printing press described with reference to Figs. 1 to 14 with the exception of the distributing plate **9** and the omission of all the components associated with the printing press of Figs. 1 to 14 for the intermittent rotation of the distributing plate **9** and for the automatic feeding and withdrawal of the paper. Neither of the handle links **17** need be curved outwardly since sideways withdrawal of the paper from the platen **4** when beneath the flat bed **5** is not required.

In the flat bed platen printing press according to either embodiment of the invention, the horizontally disposed platen is resiliently coupled with the main driving shaft through the reciprocating mechanism and the entire cycle of the printing operation is effected by only a downward and upward rocking of the main shaft actuating handle, the first portion of the downward rocking and latter portion of the upward rocking effecting respectively the reciprocation of the platen from paper feeding position into and out of printing position beneath an inverted flat bed in which the type is mounted, the latter portion of the downward rocking and first portion of the upward rocking effecting respectively downward movement of the flat bed into printing contact with the platen

against the influence of the spring coupling of the platen with the reciprocating mechanism, and return of the flat bed to its original position assisted by the said spring coupling.

Even if automatic feeding and withdrawal of the paper is not adopted, manual feeding and withdrawal is conveniently carried out since the platen is disposed horizontally. The inking mechanism is considerably simplified as compared with the inking roller arrangements in known printing presses and the inverted disposition of the flat bed on which the type is mounted permits its operation by a single pair of links through a small and approximatly vertical movement to printing contact position, as well as admitting of a very compact construction of press.

If desired the unoccupied space of rectangular cross-section beneath the I-frame web behind the main shaft **22** (and both behind and in front of shaft **22** in the simplified printing press) may be utilised by providing a sliding drawer therein for holding paper or the like material. Alternatively the rear end is closed by a double angle or Z-section length of sheet metal **54**.

Rubber base pieces **55** are preferably provided at each corner of the base of the I-frame.

If desired an adjustable impression stop **122** of steel or other suitable material may be provided on one or both sides of the I-frame **1** to limit the extent of the downward rocking movement of the handle arms **19** so that lighter or heavier printing impression on the paper may be attained. An adjusting screw **123** with locknut **124** has screw threaded engagement with a bore in the handle arm **19**, the projecting end of the screw **123** engaging the stop **122** when the arm **19** is moved fully down.

It will be apparent that feeding and withdrawal of the paper could be effected automatically by means other than that described, such as by pneumatic means.

What I claim is:

1. A flat bed platen printing press for letterpress printing, comprising the combination of a machine frame; a main shaft journaled in the machine frame; a pair of horizontal rails mounted on the machine frame; a paper-supporting platen supported on said rails for horizontal reciprocation on said machine frame from an outward paper feeding position to an inward printing contact position; a flat bed carrying type and supported on the machine frame in juxtaposed position above the horizontal path of reciprocation of the platen and adapted for movement into and out of printing contact with the platen when reciprocated inwardly thereunder; a pivotal connection between the flat bed at its inner end and the machine frame; inking roller means provided at the inward end of the platen for reciprocation therewith and adapted to traverse the face of the type carried on the flat bed during each inward and outward reciprocation; and actuating means adapted to effect both the combined reciprocation of the platen and inking roller means and the sequential printing contact movements of the flat bed, said actuating means including an actuating handle rigidly secured at its innermost end to the main shaft, reciprocating means comprising a crank lever, a mechanical linkage connected between the platen and one end of the crank lever and a spring coupling connecting the other crank lever end to the main shaft, said spring coupling consisting of a coil spring encircling the main shaft, an anchorage on the main shaft to which one end of the spring is connected, a boss on the crank lever by which the crank lever is loosely mounted on the main shaft, an anchorage on said boss to which the other end of the spring is secured and adapted to transmit through the spring to the boss the rotation of the main shaft in one direction, and a pin projecting radially from the main shaft through a slot in the crank lever boss, which is adapted to transmit to the boss the rotation of the main shaft in the other direction, said reciprocating means being adapted to effect the reciprocation of the platen during a rocking movement of the actuating handle from an intermediate to an uppermost position thereof and back again to the intermediate position, and a pivotal linkage between the outer end of the flat bed and the actuating handle, which is adapted to effect the descent to the platen of the flat bed through a small arcuate but substantially vertical movement and the return ascent thereof while the actuating handle is rocked respectively downwardly from the intermediate to a fully downward position against the action of the spring coupling and upwardly again to the intermediate position assisted by the action of the spring coupling.

2. A flat bed platen printing press according to claim 1, including an ink distributing plate mounted resiliently on the flat bed with its surface parallel to the plane of the type carried on the flat bed, a hinged connection between the inking roller means and the platen adapted to transmit to said inking roller means the reciprocating movement of the platen, a pair of inking roller means supporting ramps secured to the machine frame so as to incline downwardly in the inward direction parallel to the surfaces of the distributing plate and the type when the flat bed is in raised position and adapted to maintain traversing contact between the inking roller means and the surfaces of both the distributing plate and the type during each reciprocation of the inking roller means.

3. A flat bed platen printing press according to claim 2, including distributing plate retracting means comprising a downward extending member on the distributing plate, an abutment on the machine frame engaged by said downward extending member each time the flat bed is moved into printing contact position and adapted to raise the distributing plate against the action of its resilient mounting to maintain the distributing plate out of contact with the platen during the printing operation.

4. A flat bed platen printing press according to claim 3, including a circular distributing plate, a central axle on the rear of said plate rotatably mounted in an extension block of the flat bed, a coil spring encircling said axle and anchored between the rear surface of the distributing plate and the extension block, and means actuated by the operating handle adapted to rotate the distributing plate intermittently.

5. A flat bed platen printing press as claimed in claim 4, in which the means for rotating the distributing plate intermittently comprise a ratchet wheel secured centrally on the rear surface of the distributing plate, and a pawl pivotally connected to the downward extending member of the distributing plate and adapted to engage successive teeth on the ratchet wheel each time the flat bed is descended by actuation of the operating handle and to rotate said ratchet wheel through a small angular rotation each time the flat bed is raised again by the actuating handle.

6. A portable flat bed platen printing press for letterpress printing comprising the combination of a machine frame; a main shaft rotatably supported on the machine frame; an actuating handle rigidly secured at its innermost end to the main shaft for rocking action thereof; a paper supporting platen; linkage means connecting the platen to the main shaft for horizontal reciprocation thereby on the machine frame between an outward paper feeding position and an inward printing contact position as the actuating handle is moved successively between its uppermost and an intermediate position; a crank lever whose outer end is connected to the platen linkage means; a spring coupling connecting the inner end of the crank lever to the main shaft for effecting a pause of the platen at its inward printing contact position while the actuating handle is moved successively between the intermediate and its lowermost position, the spring coupling consisting of a coil spring encircling the main shaft, an anchorage on the main shaft to which one end of the spring is connected, a boss on the crank lever by which the crank lever is loosely mounted on the main shaft, an anchorage on said boss to which the other end of the spring is secured and adapted to transmit through the spring to the boss the rotation of the main shaft in one

direction, and a pin projecting radially from the main shaft through a slot in the crank lever boss and adapted to transmit to the boss the rotation of the main shaft in the other direction; a flat bed carrying type and pivotally connected at its inner end to the machine frame in juxtaposed position above the horizontal path of reciprocation of the platen; pivotal link means connecting the forward end of the flat bed to the actuating handle for pivotal movement of the flat bed into and out of printing contact with the platen while the actuating handle is moved successively between its intermediate and lowermost positions; and inking roller means provided at the inward end of the platen for traversing the face of the type carried on the flat bed during each inward and outward reciprocation of the platen.

7. A portable flat bed platen printing press for letterpress printing comprising the combination of a machine frame; a main shaft rotatably supported on the machine frame; an actuating handle rigidly secured at its innermost end to the main shaft for rocking action thereof; a paper supporting platen; linkage means connecting the platen to the main shaft for horizontal reciprocation thereby on the machine frame between an outward paper feeding position and an inward printing contact position as the actuating handle is moved successively between its uppermost and an intermediate position; coupling means connected between the platen linkage means and the main shaft for effecting a pause of the platen at its inward printing contact position while the actuating handle is moved successively between the intermediate and its lowermost position; a flat bed carrying type and pivotally connected at its inner end to the machine frame in juxtaposed position above the horizontal path of reciprocation of the platen; pivotal link means connecting the forward end of the flat bed to the actuating handle for pivotal movement of the flat bed into and out of printing contact with the platen while the actuating handle is moved successively between its intermediate and lowermost positions; inking roller means provided at the inward end of the platen for traversing the face of the type carried on the flat bed during each inward and outward reciprocation of the platen; and an ink distributing plate mounted resiliently on the flat bed with its surface parallel to the plane of the type carried on the flat bed, a hinged connection between the inking roller means and the platen adapted to transmit to said inking roller means the reciprocating movement of the platen, a pair of inking roller means supporting ramps secured to the machine frame so as to incline downwardly in the inward direction parallel to the surfaces of the distributing plate and the type when the flat bed is in raised position and adapted to maintain traversing contact between the inking roller means and the surfaces of both the distributing plate and the type during each reciprocation of the inking roller means.

8. The flat bed platen printing press of claim 7, including distributing plate retracting means comprising a downward extending member on the distributing plate, an abutment on the machine frame engaged by said downward extending member each time the flat bed is moved into printing contact position and adapted to raise the distributing plate against the action of its resilient mounting to maintain the distributing plate out of contact with the platen during the printing operation.

9. A portable flat bed platen printing press for letterpress printing comprising the combination of a machine frame; a main shaft rotatably supported on the machine frame; an actuating handle rigidly secured at its innermost end to the main shaft for rocking action thereof; a paper supporting platen; linkage means connecting the platen to the main shaft for horizontal reciprocation thereby on the machine frame between an outward paper feeding position and an inward printing contact position as the actuating handle is moved successively between its uppermost and an intermediate position; coupling means connected between the platen linkage means and the main shaft for effecting a pause of the platen at its inward printing contact position while the actuating handle is moved successively between the intermediate and its lowermost position; a flat bed carrying type and pivotally connected at its inner end to the machine frame in juxtaposed position above the horizontal path of reciprocation of the platen; pivotal link means connecting the forward end of the flat bed to the actuating handle for pivotal movement of the flat bed into and out of printing contact with the platen while the actuating handle is moved successively between its intermediate and lowermost positions; inking roller means provided at the inward end of the platen for traversing the face of the type carried on the flat bed during each inward and outward reciprocation of the platen; a circular distributing plate; a central axle on the rear of said plate rotatably mounted in an extension block of the flat bed; a coil spring encircling said axle and anchored between the rear surface of the distributing plate and the extension block; and means actuated by the actuating handle adapted to rotate the distributing plate intermittently.

10. The flat bed platen printing press of claim 9, in which the means for rotating the distributing plate intermittently comprises a ratchet wheel secured centrally on the rear surface of the distributing plate, and a pawl pivotally connected to the downward extending member of the distributing plate and adapted to engage successive teeth on the ratchet wheel each time the flat bed is descended by actuation of the actuating handle and to rotate said ratchet wheel through a small angular rotation each time the flat bed is raised again by the actuating handle.

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