

July 12, 1938.

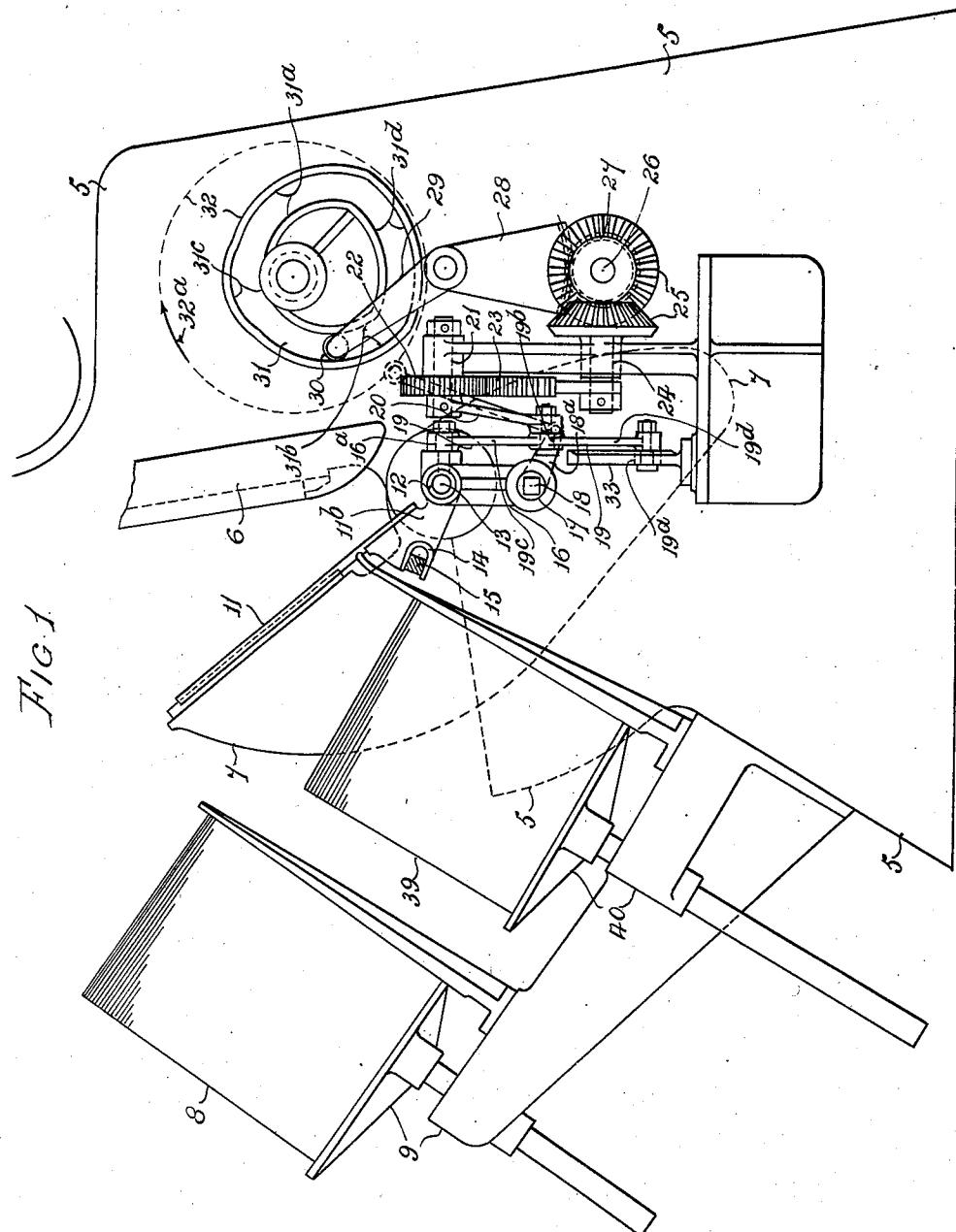
F. S. THOMPSON

2,123,516

## PLATEN PRINTING PRESS

Filed April 30, 1937

5 Sheets-Sheet 1



✓ Inventor:  
Frank Sydney Thompson

by Victor D. Bassett  
Attorney

July 12, 1938.

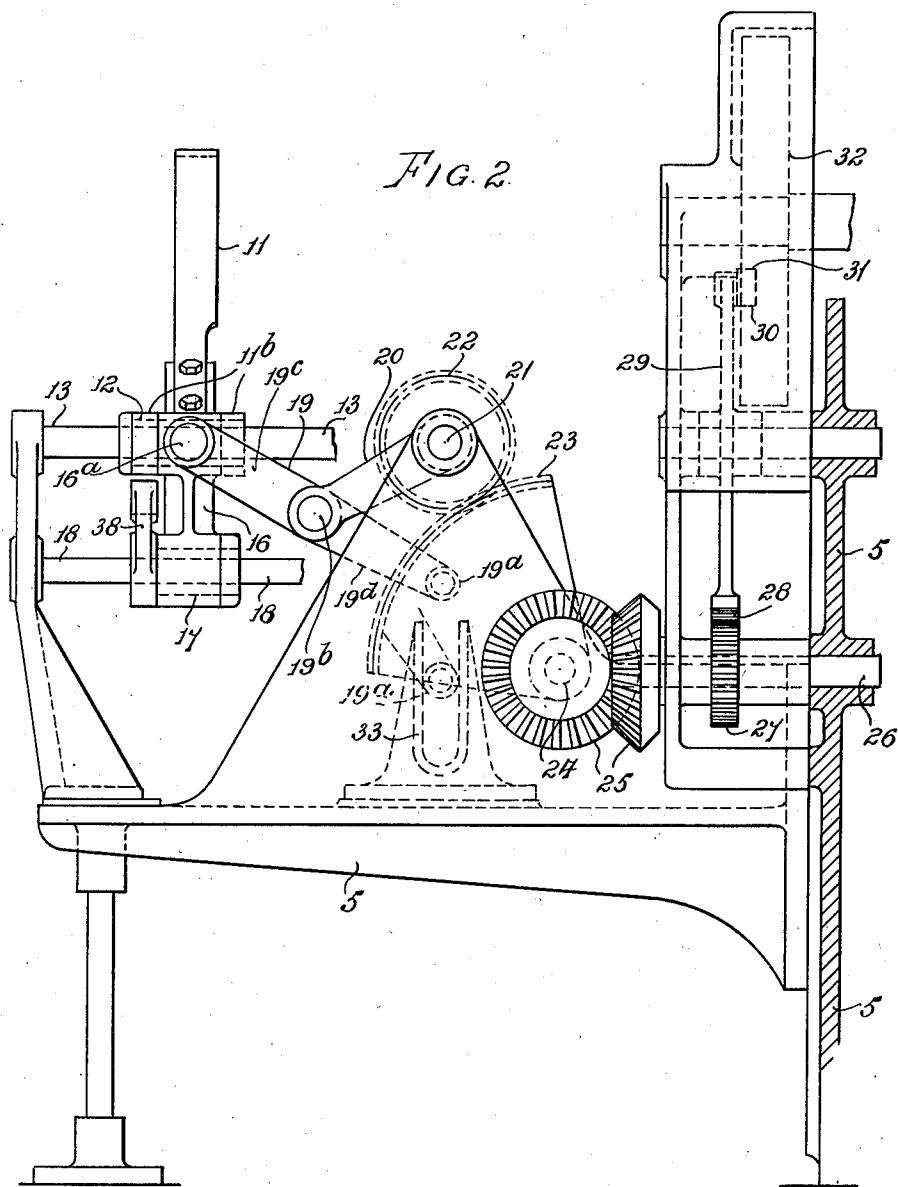
F. S. THOMPSON

2,123,516

## PLATEN PRINTING PRESS

Filed April 30, 1937

5 Sheets-Sheet 2



Debtors:  
Frank Sydney Thompson  
by Victor D. Borst—  
Attorney.

July 12, 1938.

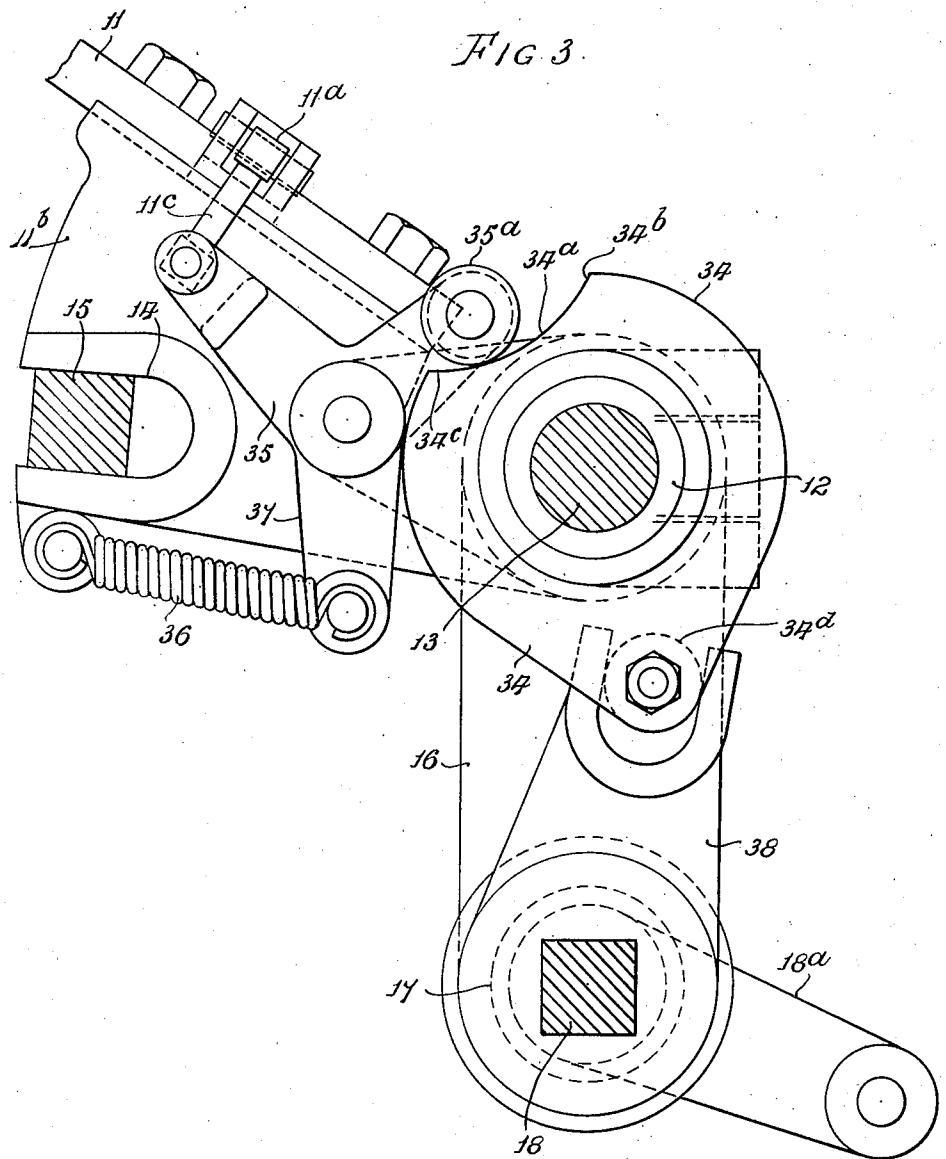
F. S. THOMPSON

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PLATEN PRINTING PRESS

Filed April 30, 1937

5 Sheets-Sheet 3



Inventor:

Frank Sydney Thompson

by Victor D. Bassett  
Attorney

July 12, 1938.

F. S. THOMPSON

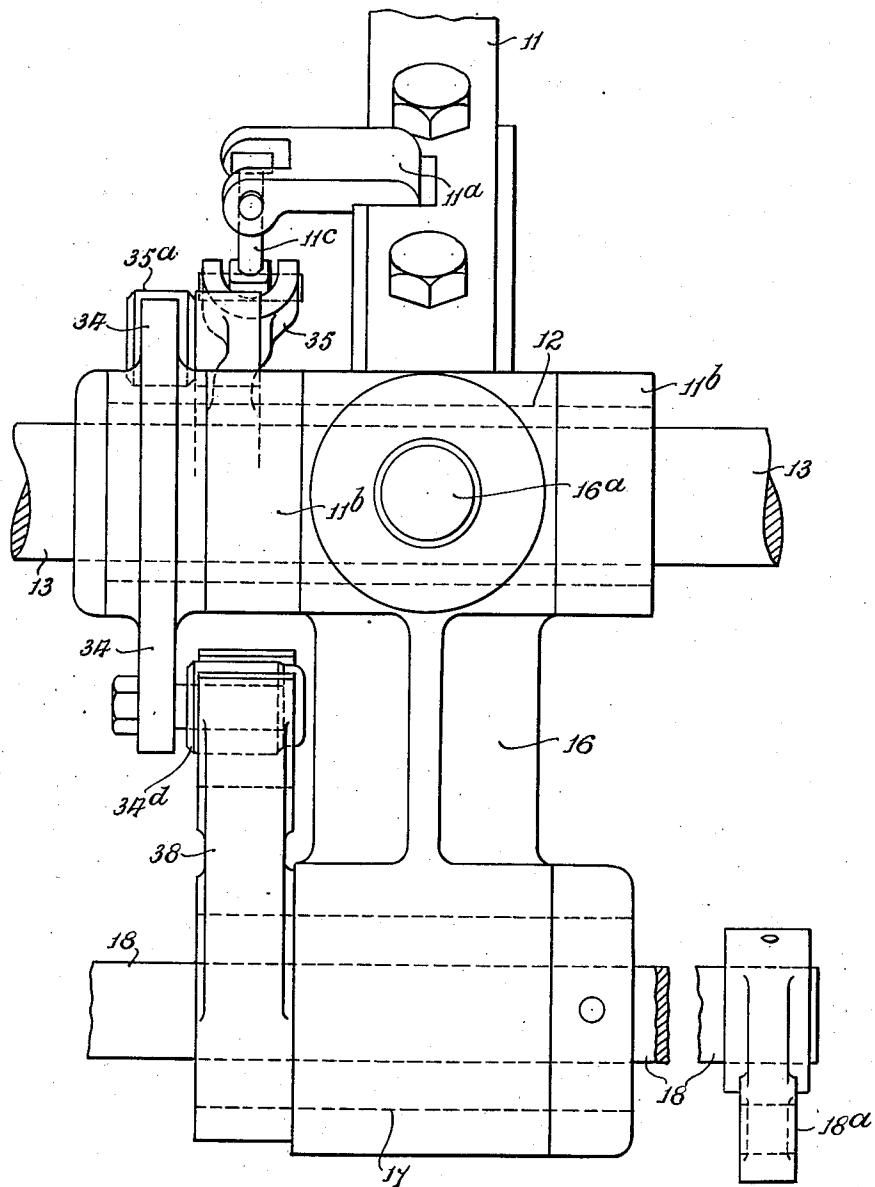
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## PLATEN PRINTING PRESS

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5 Sheets-Sheet 4

FIG. 4.



Inventor:  
Frank Sydney Thompson  
by Victor D. Donat  
Attorney.

July 12, 1938.

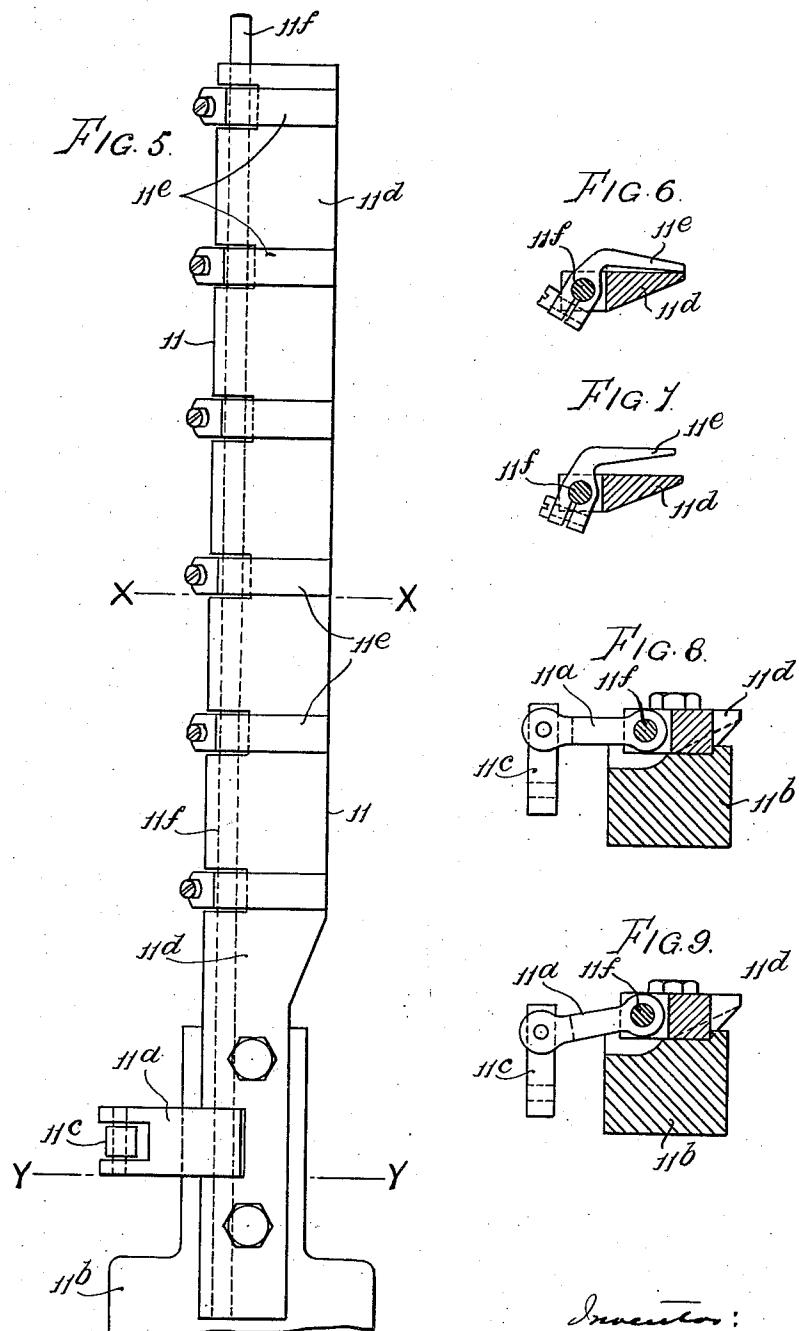
F. S. THOMPSON

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PLATEN PRINTING PRESS

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5 Sheets-Sheet 5



Inventor:  
Frank Sydney Thompson  
by Victor D. Dorset,  
Attorney.

## UNITED STATES PATENT OFFICE

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## PLATEN PRINTING PRESS

Frank Sydney Thompson, Manchester, England,  
assignor to T. C. Thompson & Son, Limited,  
Manchester, England

Application April 30, 1937, Serial No. 139,934  
In Great Britain May 31, 1935

4 Claims. (Cl. 101—287)

This invention has reference to platen printing presses and to such presses wherein the printed sheets are removed from the movable platen by automatic means comprising a gripper device 5 mounted and adapted to be reciprocated laterally of the platen, and which advances and seizes the printed sheet on the platen and then recedes and removes the sheet which it subsequently releases and deposits.

10 In a known platen printing press of the kind referred to the delivery gripper device is mounted independently, and reciprocates laterally, of the movable platen and the seizing of the printed sheet by the device necessarily takes place when 15 the platen has, or has nearly, reached the end of its return movement following the printing operation.

The object of the present invention is to provide in a platen printing press of the said kind, 20 an improved arrangement of reciprocatory delivery gripper device whereby the device may seize the sheet as soon as the printing pressure has been applied to same, and during the return movement of the movable platen strips the 25 printed sheet from the fixed platen and effects its removal from the movable platen.

According to the invention, the reciprocatory delivery gripper device is adapted to also oscillate about an axis, preferably the same axis as 30 the movable platen, parallel to its reciprocatory movements. By this means the gripper device can advance and be opened ready to seize the sheet during the movement of the platen to the printing position, be closed to grip the sheet as 35 soon as the printing pressure has been applied and there is no danger of the register of the sheet being in any way affected, and after stripping the printed sheet from the fixed platen can recede and remove the sheet, during the return 40 movement of the movable platen.

The invention is hereinafter fully described with reference to the accompanying drawings in which Fig. 1 is a part side of a platen printing press comprising one embodiment of the invention, Fig. 2 is a rear view (i. e. looking on the right hand side of Fig. 1) of the mechanism for actuating the delivery gripper device and Figs. 3 and 4 are elevations at right angles to each other to a larger scale than Figs. 1 and 2 showing 45 details of the gripper-actuating mechanism not shown in such views. Fig. 5 is a plan of the gripper device, Figs. 6 and 7 are sections on the line X—X in Fig. 5 showing the hinged jaw of the gripper device closed and opened, respectively, and Figs. 8 and 9, are like sections to Figs. 6 and

7, respectively, on the line Y—Y in Fig. 5. On the drawings and in the following description like numerals of reference indicate like parts.

Referring to the drawings, 5, Fig. 1, indicates the frame of the machine, 6 indicates the stationary platen and 7 indicates the movable platen which is shown in the lowered or normal position in which the sheets to be printed are fed on to it. 8 indicates the pile of sheets to be printed carried on a support 9 arranged at the front of 10 the machine. 10 indicates a feeding gripper device of the sucker type for feeding the sheets from the pile 8 on to the platen 7. 11 indicates the delivery gripper device which is of the known kind comprising a fixed jaw and a hinged jaw 15 normally closed against the fixed jaw. The fixed jaw of the gripper device consists of a blade 11<sup>a</sup> (Figs. 5-9) secured at its lower end to a support 11<sup>b</sup>. The hinged jaw of the device is constituted by a plurality of fingers 11<sup>c</sup> clamped on a rod 11<sup>d</sup> 20 rotatably mounted in the blade 11<sup>a</sup>. The gripper device is in this particular embodiment of the invention arranged on the right-hand side of the movable platen as viewed from the front and, of course, on the left-hand side as seen from the rear as in Fig. 2. The support 11<sup>b</sup> of the gripper device is bifurcated and is pivotally mounted 25 on a bush 12 slidable on a slide bar 13 constituted by an extension of, or aligned with, the fulcrum shaft of the movable platen 7. The support 11<sup>b</sup> of the gripper device is formed with a guide member 14 which co-acts 30 with a guide bar 15 carried by and extending laterally from the movable platen 7, the co-operation of the guide member 14 and bar 15 causing 35 the gripper device 11 to partake of the oscillations of the platen 7.

The bush 12 is mounted in the upper end of a slide 16 the lower end of which has rotatably mounted in it a sleeve 17 adapted to slide on a 40 slide bar 18 of square cross-section and mounted in the frame of the machine vertically below the slide bar 13.

To the slide 16 is pivotally connected at 16<sup>a</sup> one end of a lever 19 which at the midle 19<sup>b</sup> of 45 its length has pivoted to it the free end of an arm 20, of length equal to half that of the lever, fixed on a shaft 21 on which is also fixed a gear wheel 22 gearing with a toothed quadrant 23 adapted to be oscillated from the main shaft of the machine by suitable means. The arm 19<sup>c</sup> of the lever 19 and the arm 20 constitute a toggle the opening and closing of which cause the slide 16 to reciprocate on the two slide bars 13, 18 and 50 carry with it the gripper device 11. Conveniently, 55

and as shown, the quadrant 23 is fixed on a shaft 24 geared by means of bevels 25 with a shaft 26 carrying a toothed wheel 27 with which gears a quadrant 28 adapted to be oscillated by 5 means of an arm 29 the free end of which carries a bowl 30 which co-operates with a cam groove 31 in a cam disc 32 suitably driven from the main shaft of the machine.

The wheel 22 is adapted to be oscillated by the 10 quadrant 23 through 180° so that the arm 20 oscillates from a position in which it is horizontal on the left-hand side of the shaft 21, as viewed in Fig. 2, to a position in which it is horizontal on the right-hand side of the shaft, and vice 15 versa, and the toggle members 20, 19<sup>c</sup> are fully opened and closed, and vice versa, on each side of the shaft 21, alternately. In order to ensure that when the slide 16 reaches its mid-position in either direction of travel, and the toggle members 20, 19<sup>c</sup> are closed and the pivot 16<sup>a</sup> coincides with the shaft 21, the toggle member 19<sup>c</sup> shall not then move with the member 20 about the centre of the shaft 21, but that the toggle members 19<sup>c</sup>, 20 shall open on the other side of 25 the shaft to continue the travel of the slide 16, the free end of the arm 19<sup>d</sup> of the lever 19 is provided with a bowl 19<sup>a</sup> adapted to enter and co-act with a vertical guide 33 arranged below and in vertical alignment with the shaft 21. 30 The co-operation of the bowl 19<sup>a</sup> with the guide 33 prevents the bowl from moving angularly about the centre of the shaft 21 and so causes the lever 19 to turn on its pivot 19<sup>b</sup> and the toggle members 20, 19<sup>c</sup> to open on the slide of the 35 shaft 21 opposite to that on which they have just previously closed. In this way the toggle members during oscillation of the gear wheel 22 from one extreme position to the other, as aforesaid, first close on one side of the shaft 21 and 40 then open on the other side of the shaft, and reciprocate the slide 16 and gripper device 11 accordingly. The described construction of toggle has the advantage of enabling a maximum reciprocation of the slide 16 and gripper device to be 45 obtained with a minimum length of the toggle members 20, 19<sup>c</sup>. The arrangement is such that while the gripper device 11 partakes of the oscillations of the movable platen 7, as before described, it advances towards the platen during 50 the upward movement of the latter from the normal to the printing position and recedes from the platen during the return movement of the latter.

On the bush 12 on the upper slide bar 13 is mounted a cam disc 34 having a cam cavity 34<sup>a</sup> with which is adapted to co-operate a bowl 35<sup>a</sup> on one arm of a bell-crank lever 35 the other arm of which is connected with and adapted to open the hinged jaw of the gripper device 11 against the action of a spring 36 by means of which said 55 jaw is normally kept closed. One end of the spring 36 is connected to an arm 37 fixed on the fulcrum boss of the bell-crank lever 35 and its other end is anchored on the guide member 14. The cam disc 34 carries a bowl 34<sup>d</sup> which co-operates in the bifurcated free end of an arm 38 60 fixed on the sleeve 17 mounted on the lower square slide bar 18 which latter has fixed on it an arm 19<sup>a</sup> adapted to be operated through suitable means from the main cam of the machine, to rock the slide bar 18 to alter the angular position of the cam disc 34 and of the cam cavity 34<sup>a</sup> therein relatively to the bowl 35<sup>a</sup> which co-operates with same.

When, during the upward movement of the

platen 7 with a sheet to be printed upon it, the platen nears the printing position, the bowl 35<sup>a</sup> engages the upper part 34<sup>b</sup> of the cavity 34<sup>a</sup> in the cam 34 and operates the bell-crank lever 35 which through a link 11<sup>c</sup> and an arm 11<sup>a</sup> on the 5 rod 11<sup>f</sup> operates the latter to open the hinged jaw of the gripper device 11 against the action of the spring 36, the hinged jaw remaining open while the sheet is being registered and until the application of the pressure of printing has actually commenced. The arm 18<sup>a</sup> on the lower square slide bar 18 is then actuated to rock the bar to cause the cam disc 34 to be so adjusted (clockwise as viewed in Fig. 3) relatively to the bowl 35<sup>a</sup> as to allow the hinged part 11<sup>a</sup> of the 10 gripper device 11 to be closed on the sheet by the action of the spring 36. During the subsequent return movement of the movable platen 7 the gripper device 11 first oscillates therewith and strips the printed sheet from the type on the stationary platen 6 and then reciprocates away from the platen 7 and removes the printed sheet and the lower slide bar 18 is rocked in the opposite direction to formerly (i. e. in an anti-clockwise direction as viewed in Fig. 3) to restore the cam 25 disc 34 to its original position. When the movable platen 7 reaches the end of its return movement and the gripper device 11 the end of its outward reciprocation, the bowl 35<sup>a</sup> engages the 30 lower part 34<sup>c</sup> of the cam cavity 34<sup>a</sup> and effects 35 the opening of the hinged jaw of the gripper 11 to release the removed sheet and deposit same on a delivery pile 39 carried by a support 40.

I claim:—

1. In a platen printing press, the combination 35 comprising an oscillatable platen, a gripper device for removing a printed sheet from the platen, means directly connecting the platen and the gripper device for effecting oscillation of the gripper device with the platen and means for reciprocating the gripper device along its axis of oscillation.

2. In a platen printing press, the combination 45 comprising an oscillatable platen, a gripper device for removing a printed sheet from the platen, a member carried by the platen and slidably mounted in the gripper device for effecting oscillation of the gripper device with the platen, and means for reciprocating the gripper device along its axis of 50 oscillation.

3. In a platen printing press the combination 55 comprising a frame, an oscillatable platen mounted on the frame, a gripper device for removing a printed sheet from the platen, a member carried by the platen and slidably mounted in the gripper device for effecting oscillation of the gripper device with the platen, and means for reciprocating the gripper device along its axis of oscillation including a toggle and a guide 60 mounted on the frame and positioned to engage one element of the toggle.

4. In a platen printing press the combination 65 comprising an oscillatable platen, a gripper device for removing a printed sheet from the platen, means directly connecting the platen and the gripper device for effecting oscillation of the gripper device with the platen, means for reciprocating the gripper device along its axis of oscillation, and means for actuating the grippers of the gripper device including a cam mounted for 70 reciprocating movement with the gripper device and means for effecting angular movement of the cam.

FRANK SYDNEY THOMPSON.