

No. 818,974.

PATENTED APR. 24, 1906.

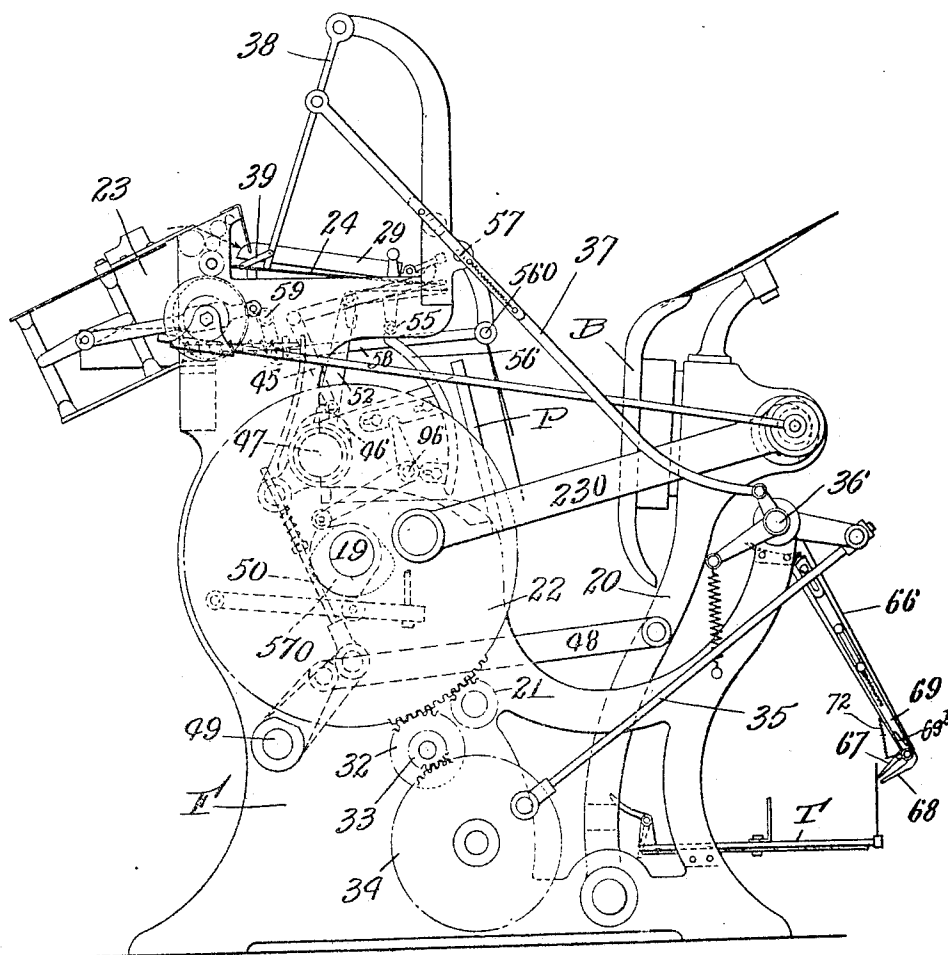
L. E. MORRISON.

SHEET MANIPULATING MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED SEPT. 29, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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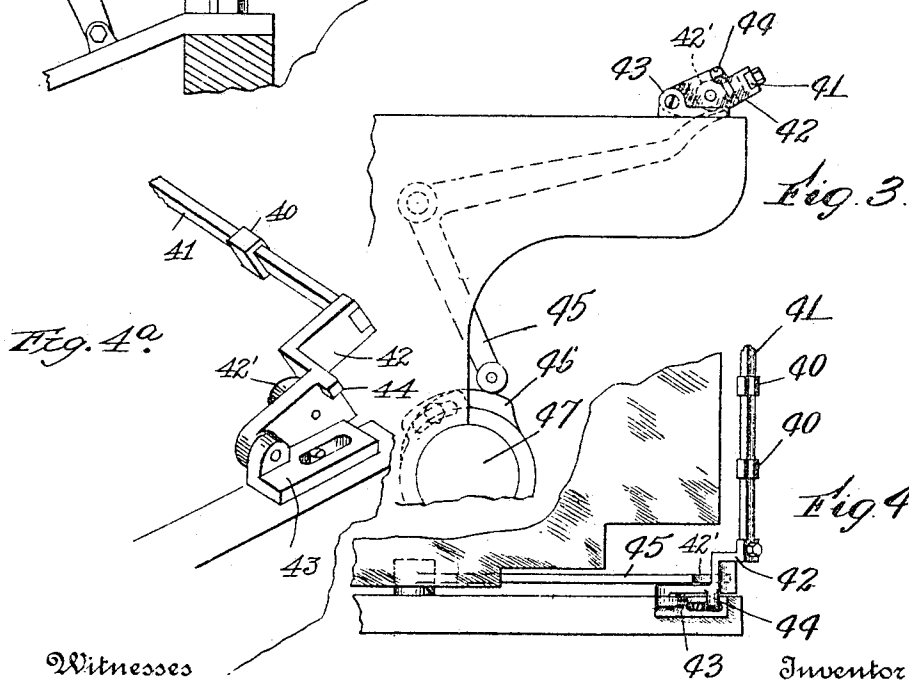
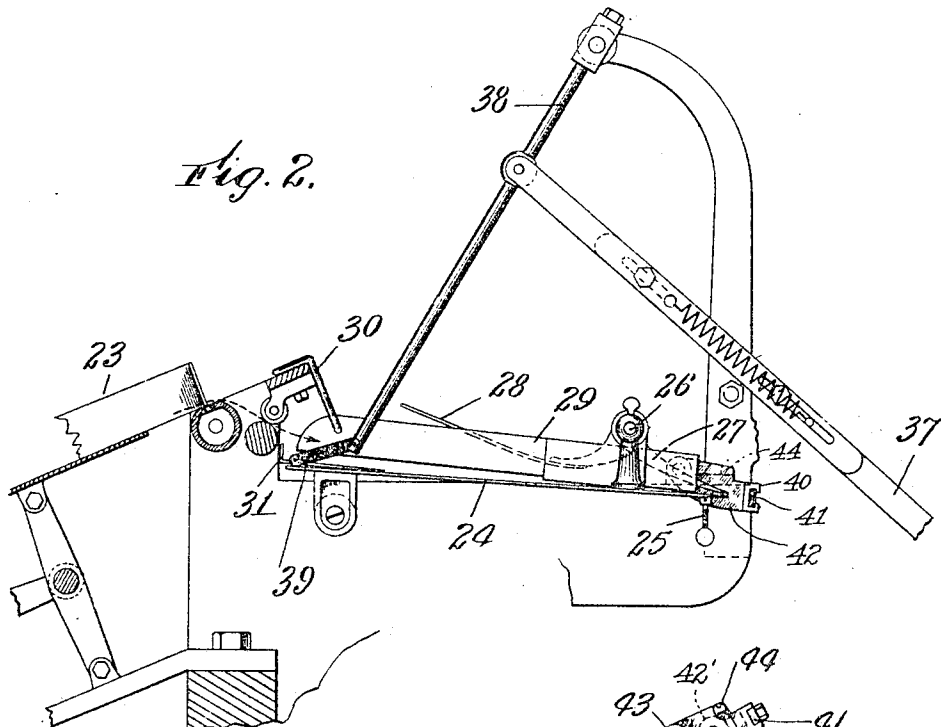
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4 SHEETS—SHEET 2.



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4 SHEETS-SHEET 3.

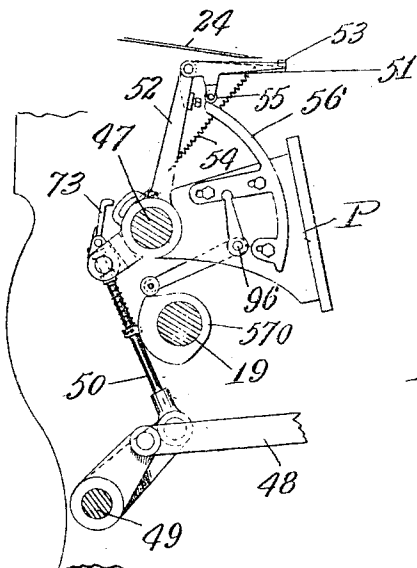


Fig. 5.

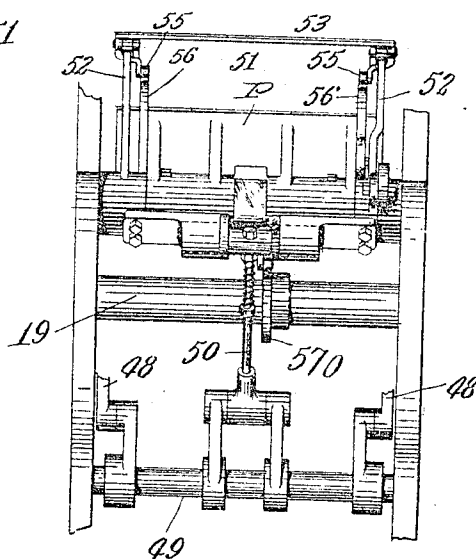


Fig. 6.

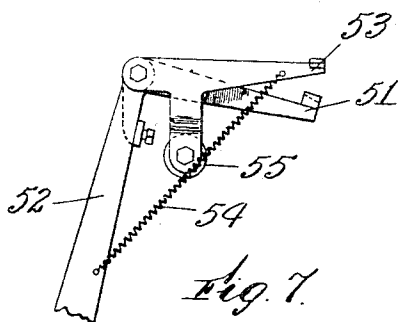


Fig. 7.

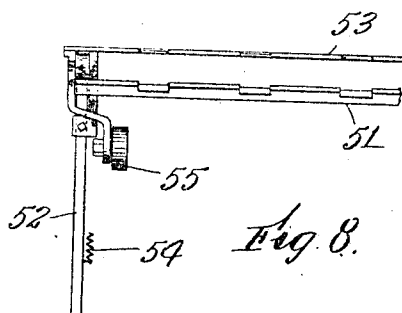


Fig. 8.

Witnesses

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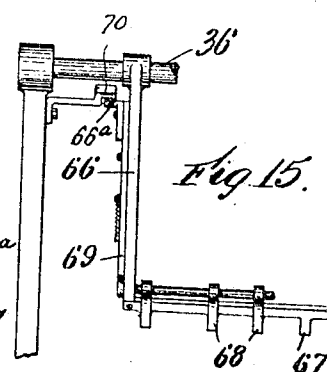
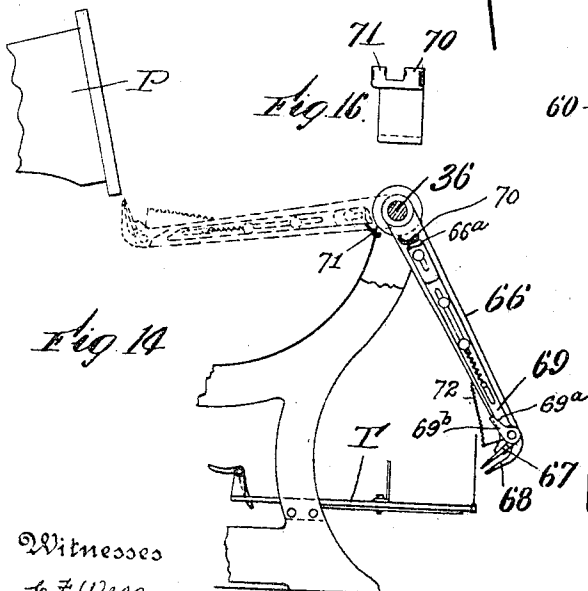
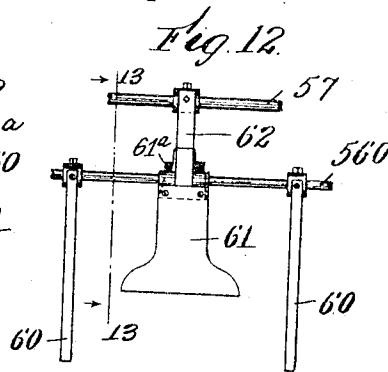
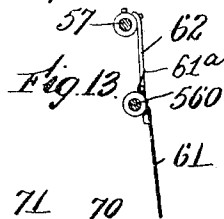
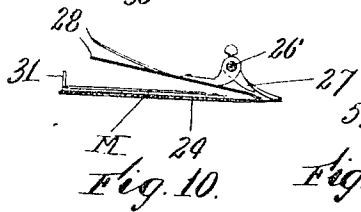
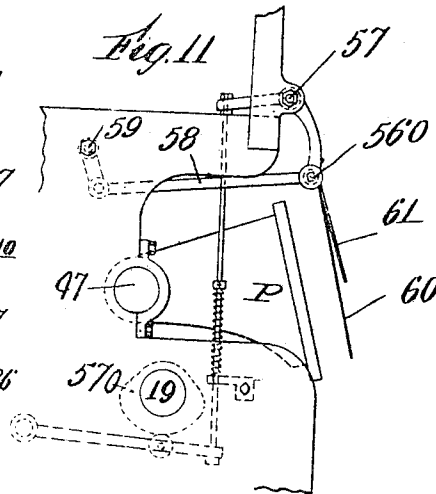
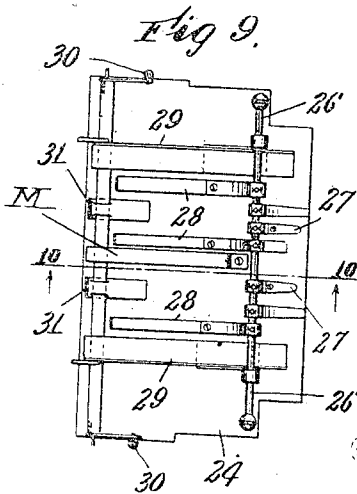
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SHEET MANIPULATING MECHANISM FOR PRINTING PRESSES.

APPLICATION FILED SEPT 29, 1904.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

LEWIS E. MORRISON, OF PHILADELPHIA, PENNSYLVANIA.

SHEET-MANIPULATING MECHANISM FOR PRINTING-PRESSES.

No. 818,974.

Specification of Letters Patent.

Patented April 24, 1906.

Application filed September 29, 1904. Serial No. 226,507.

To all whom it may concern:

Be it known that I, LEWIS E. MORRISON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Sheet-Manipulating Mechanism for Printing-Presses, of which the following is a specification.

This invention relates to a sheet-manipulating mechanism which has been especially designed for use in connection with bed-and-platen job-printing presses.

The object of this invention is to provide a simple and efficient sheet-manipulating mechanism for registering successive sheets of paper for holding the sheets in proper position to be printed and for delivering the sheets printed side up, the invention being particularly adapted for application to a bed-and-platen printing-press, so as to render the same automatic in action.

To these ends this invention consists of the sheet-manipulating mechanisms and of the combinations of parts therewith, as hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying four sheets of drawings, Figure 1 is a side view of sufficient parts of a job-printing press to illustrate the application of this invention thereto. Fig. 2 is a detail view, partly in section, of the registering-table and parts cooperating therewith. Fig. 3 is a detail view of the front registering-guide and connections for operating the same. Fig. 4 is a fragmentary plan view of the parts shown in Fig. 3. Fig. 4^a is an enlarged perspective view of a portion of the front registering-guide and one of its supports. Fig. 5 is a detail view, partly in section, of the grippers and connections for operating the same to take sheets from the registering-table and present them in front of the platen. Fig. 6 is a rear view of the parts shown in Fig. 5. Fig. 7 is an enlarged view of the grippers. Fig. 8 is a front view of the parts shown in Fig. 7. Fig. 9 is a plan view of the registering-table. Fig. 10 is a sectional view taken on the line 10 10 of Fig. 9. Fig. 11 is a detail view of the clamping-fingers and connections for operating the same to hold a sheet upon the platen during the printing operation. Fig. 12 is a detail view of the clamping-fingers. Fig. 13 is a sectional view taken on the line 13 13 of Fig. 12. Fig. 14 is a side view, partly in section, of the means for deliv-

ering the sheets printed side up. Fig. 15 is a fragmentary front view of the parts shown in Fig. 14, and Fig. 16 is a detail plan view of the cams for opening the delivery-grippers. 60

For many classes of printing, the best and most economical results are now obtained from bed-and-platen job-printing presses. In operating printing-presses of this type it is the usual practice to feed the presses by hand. 65 A sheet-manipulating mechanism constructed according to this invention is designed to be used in connection with a bed-and-platen job-printing press and to render the press automatic in operation. 70

Referring to the accompanying drawings for a detail description of an apparatus embodying this invention, F designates one of the side frames of a bed-and-platen printing-press. Mounted between the side frames F 75 is the platen P. Coöperating with the platen P is the type-bed B, carried by the swinging frame 20.

Power for operating the press is applied to a shaft carrying a small pinion 21, which 80 meshes with and drives the large gear 22 upon the main shaft 19. The gear 22 is provided with a crank-pin connected by a link 230 to operate the swinging frame 20, which carries the type-bed B. These parts may be 85 of the ordinary or usual constructions, except that in practice the platen is pivotally mounted so that it can be turned up and held, by means to be hereinafter described, in position so that free access may be had to the 90 face of the platen while the press is being made ready for printing any particular form.

Mounted in the upper part of the framework of the press is an automatic sheet-feeding attachment 23 for supplying the sheets to 95 be printed. This sheet-feeding attachment may be of ordinary or approved construction and need not be herein described at length.

From the sheet-feeding attachment 23 the successive sheets are delivered onto a registering-table 24. As shown most clearly in 100 Fig. 2, the registering-table 24 is removably supported at its front edge on suitable lugs or bosses, and the rear edge of the delivery-table rests upon supporting-screws 25, which are 105 threaded into a cross-rod, which screws may be adjusted to set the registering-table to coöperate with the grippers which carry a sheet down in front of the platen. Extending up from the delivery-table 24 are posts carrying a cross-rod 26. Adjustably mounted on 110 the cross-rod 26 are forwardly-extending

sheet-guides 27, the rearwardly-extending sheet-guides 28, and the side guides 29. At their rear ends the side guides 29 are provided with hooks 30, which engage a cross-bar of the framework. By means of this construction it will be seen that the registering-table may be removed and taken out of the way when the press is being adjusted or prepared for operation.

Movably mounted upon the registering-table 24 is a cross-rod having fingers 31 for engaging the rear edges of the sheets. As shown most clearly in Fig. 9, the fingers 31 are carried by pieces which are adjustable upon the cross-rod. Connections for moving the fingers 31 to carry a sheet of paper into registering position on the registering-table are most clearly illustrated in Fig. 1. As shown in this figure, 32 designates a gear which meshes with and is driven from the main gear 22. Turning with the gear 32 is a pinion 33, which meshes with and drives a gear 34. The gear 34 is provided with a crank-pin which is connected by a pitman 35 to an arm extending from the rock-shaft 36. The rock-shaft 36 supports and operates the delivery-grippers, as hereinafter described, and also operate the sheet-registering mechanism by means of an arm which is connected by a link 37 to the swinging arms 38, which extend down from a rock-shaft journaled in brackets on the framework. At their lower ends the swinging arms 38 are connected by links 39 to operate the cross-rod which carries the fingers 31. The link 37, as shown in Figs. 1 and 2, is made in two parts, having a pin-and-slot connection which normally shortens the link 37 by means of a spring, but which will permit the required lost motion for handling sheets of different lengths.

As the sheets are moved forward over the registering-table they are brought into engagement with registering-blocks 40, adjustably mounted on a cross-bar 41. The cross-bar 41 is connected at its ends to the swinging links 42. Each of the swinging links 42 is pivoted in a supporting-piece 43, which is adjustable upon the framework of the press. The swinging links 42 are provided with stops 44 for supporting the registering-blocks in operative position, and one of the swinging pieces 42 is provided with a roller 42', which is engaged by one arm of a bell-crank lever 45. The other arm of the bell-crank lever 45 is provided with a roller engaging an adjustable cam-piece 46. The connections for operating the adjustable cam-piece 46 are most clearly illustrated in Figs. 1, 5, and 6. As shown in these figures, the swinging frame 20, which carries the type-bed B, is connected by links 48 to arms extending from a rock-shaft 49. Also extending from the rock-shaft 49 are arms which are connected by a spring upon a rod 50 to operate the gripper-

levers 52, which are pivoted on the trunnions 65 of the platen. The adjustable cam-piece 46 is fastened to one of the gripper-levers 52. By means of these connections when the type-bed moves up toward the platen on its printing stroke the registering-blocks will be lowered into operative position for registering the succeeding sheet which is to be there-after printed.

After a sheet has been properly positioned upon the registering-table it is carried down in front of the platen by means of swinging grippers. These grippers and the connections for operating the same are most clearly illustrated in Figs. 5 to 8, inclusive. As shown in these figures, this gripper mechanism comprises the gripper-bar 51, carried by arms which are adjustably connected to gripper-levers 52, before referred to. A cooperating gripper-bar 53 is carried by pivoted arms which can be swung or turned when the grippers are to be opened. The grippers are normally closed by a spring 54. Pivoted on each of the supporting-arms of the movable gripper-bar is a roller 55, which run upon sectors or curved tracks 56. When the curved tracks 56 are moved forward, the grippers will be opened, as shown in Fig. 7, and when the curved tracks 56 are moved back, as illustrated in Fig. 6, the grippers will be allowed to close. The connections for operating the tracks 56 comprise arms extending up from the rock-shaft 96 and an arm extending from the rock-shaft 96 and carrying a roller engaging a cam 570 upon the main shaft 19. By means of this construction the grippers will be swung up and down in front of the platen P and will be opened and closed at proper times to take a sheet from the registering-table and present the same in position to be printed.

To hold the sheet in place upon the platen, I employ presser-fingers, which are most clearly illustrated in Figs. 11 to 13, inclusive. As shown in these figures, 560 designates a cross-rod, and extending up from the cross-rod are arms connected to a rock-shaft 57. Extending rearwardly from the cross-rod 560 are links 58, which are connected to arms extending down from a rock-shaft 59. Fastened rigidly on the cross-rod 560 are spring presser-fingers 60. Pivotally mounted upon the cross-rod 560 between the spring presser-fingers 60 is a central presser-finger 61, having a yielding spring connection 61' with a finger 62, which is pivoted upon the rock-shaft 57. By means of this construction when the presser-fingers are moved toward the platen the central presser-finger 61 will be the first to be brought into engagement with the sheet, while the presser-fingers 60 moving about a different center will hold the sheet rigidly to the platen after it has been smoothed into position, insuring the smooth

positioning of the sheet upon the platen—that is to say, the fingers 60 are moved toward and away from the platen, so as to be kept substantially parallel with the face thereof at all times, while the middle finger 61 has, in effect, a tipping or oscillating motion.

The means for delivering printed sheets are most clearly illustrated in Fig. 1 and in Figs. 14 to 16, inclusive. As shown in these figures, the rock-shaft 36 is provided with downwardly-extending arms 66, carrying the stationary gripper-jaws 67. Pivoted in the arms 66 is a rock-shaft carrying movable gripper-jaws 68. Movable mounted on one of the arms 66 is a longitudinally-movable operating-rod 69. At its lower end the operating-rod 69 is provided with an inclined or beveled end 69^a for engaging an arm 69^b, extending from the rock-shaft which carries the movable gripper-jaws 68. At its upper end the operating-rod 66 has a pin or projection 66^a engaging the cam-pieces 70 and 71, carried by a bracket secured to the framework. The delivery-grippers are normally held closed by a spring 72, as shown, and the cam-pieces 70 and 71 serve to open the grippers. After the sheet has been printed and is about to be released by the gripping-fingers 60, holding it to the platen, the delivery-grippers approach the bottom of the sheet. They are normally held closed during the approach until just before reaching the sheet, when the top of operating-rod 69 engages the cam 71, opening the jaws by depressing the operating-rod 69, causing its beveled end 69^a to engage the arm 69^b, operating the rock-shaft upon which is mounted the fingers 68. At this time the gripping-fingers 60 release their pressure upon the sheet, allowing it to fall into the open jaws of the delivery-grippers. Then the delivery-grippers commence their delivery to the delivery-table. After starting toward the delivery-table the top of the operating-rod 69 is released from the cam 71, thereby closing the delivery-grippers upon the bottom of the sheet. This condition exists until the sheet has reached a position to be dropped upon the table, when the top of the operating-rod 69 engages the cam 70, opening the fingers, allowing the sheet to drop upon the table.

In order that free access may be had to the face of the platen P without interfering with the sheet-manipulating mechanisms, I prefer to pivot the platen upon the trunnions 47, as shown in Fig. 5. By means of this construction the platen can be swung or turned up, and, if desired, it may be supported in its turned-up position by means of a hook 73, which engages a lug or catch on the platen-frame.

When the platen is in its thrown-up position and the registering-table 24 removed, free access may be had to the face of the

platen, so that the press may be made ready for printing from any desired form.

In some cases, where very wide sheets are to be printed, it is desirable that the registering-table should be provided with a center guide, and in Fig. 9 I have shown the registering-table provided with a center guide M, although it is to be understood that this guide is not necessarily required.

Considering now the operation of the printing-press as a whole, it will be seen that I have provided an apparatus which is entirely automatic in operation—that is to say, as the successive sheets are fed to the press they will be automatically registered upon the registering-table. They will be taken from the registering-table, carried down in front of the platen, and clamped thereon during printing operation, and after being printed the sheets will be delivered printed side up upon a delivery-table T.

The delivery-table T may be provided with any of the usual joggers for truing up the pile of printed sheets delivered on the delivery-table T, which devices need not be herein shown or described.

I am aware that numerous changes may be made in practicing my invention by those who are skilled in the art and that while my sheet-manipulating mechanism has been particularly designed for use in connection with bed-and-platen job-printing presses certain features thereof can be used in different locations and in different combinations. I do not wish, therefore, to be limited to the construction I have herein shown and described: but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. In a printing-press, the combination of sheet-registering mechanism, means for presenting the registering sheets in position to be printed, and clamping-fingers for holding the sheets in place while being printed upon, and means for smoothing the sheets upon the platen.

2. In a printing-press, the combination of registering devices, means for presenting the registered sheets in position to be printed, means for smoothing the sheets upon the platen, clamping-fingers for holding the sheets while being printed upon, and a sheet-delivering device.

3. In a bed-and-platen printing-press, the combination of means for presenting the sheets in front of the platen in position to be printed, means for smoothing the sheets upon the platen, clamping-fingers for holding the sheets while being printed upon, and means for automatically operating said parts.

4. In a bed-and-platen printing-press, the combination of means for presenting the sheets to be printed upon the platen, means for smoothing the sheets upon the platen, clamping-fingers for holding the sheets in

place while being printed upon, sheet-delivering mechanism, and means for automatically operating said parts.

5. In a bed-and-platen printing-press, the combination of sheet-registering devices, grippers for presenting the sheets in position to be printed upon the platen, means for smoothing the sheets upon the platen, clamping-fingers for holding the sheets in place while being printed, delivery-grippers for delivering the printed sheets printed side up, and means for automatically actuating said parts.

6. An automatic sheet-registering mechanism for printing-presses comprising a removable and adjustable registering-table, means engaging the rear edges of successive sheets to move the sheets forward over the registering-table, registering-stops for the front edge of the sheets, and means for automatically moving the stops out of the way to permit the sheets to be carried forward for printing.

7. An automatic registering mechanism for printing-presses comprising a removable and adjustable registering-table, guides for preventing the sheet from lifting or moving sidewise on the registering-table, means engaging the rear edges of the sheets for moving the sheets on the registering-table, stops for engaging the front edges of the sheets, and means for automatically moving said stops out of the way to permit the sheets to be carried forward for printing.

8. In a printing-press, the combination of a registering-table, means for presenting sheets thereon, and grippers for taking successive sheets from the registering-table, the registering-table being adjustably supported at its rear upon adjusting-screws, and being removable so that it may be taken out of the way to permit access to the press.

9. In a printing-press, the combination of a registering-table, means for removably supporting the registering-table near its front edge, adjustable supporting-screws for the rear edge of the registering-table, whereby the registering-table may be moved out of the way to allow access to the press, means for registering sheets upon the registering-table, and grippers for taking sheets from the registering-table.

10. In a bed-and-platen printing-press, the combination of the platen, the type-bed cooperating therewith, a registering-table supported by brackets at one end and adjusting means at the other and being bodily removable, said platen being movable in the framework of the press so that it may be moved from normal position to permit access thereto.

11. In a bed-and-platen printing-press, the combination of the platen, the type-bed cooperating therewith, a registering-table ad-

justable and bodily removable, registering mechanism mounted upon the table and removable with it, said platen being movable in the framework of the press so that it may be moved from normal position to permit access thereto.

12. In a bed-and-platen printing-press, the combination of a registering-table, a platen, and the type-bed cooperating therewith, the registering-table being bodily removable and the platen being movably mounted in the framework of the press, so that they can be moved from normal position when access is desired to the face of the platen.

13. In a bed-and-platen printing-press, the combination of a platen pivotally mounted in the framework of the press, a type-bed cooperating therewith, a registering-table mounted upon the framework above the platen bodily removable, said parts being arranged so that the registering-table can be removed and the platen turned up when access is desired to the face of the platen.

14. In a bed-and-platen printing-press, the combination of the platen and an automatic feeding mechanism with a smoothing mechanism to smooth the sheets upon the platen and a gripping mechanism to hold the sheets to the platen while being printed.

15. In a bed-and-platen printing-press, the combination of the platen and an automatic feeding mechanism with a smoothing mechanism to smooth the sheets upon the platen and a gripping mechanism to hold the sheets to the platen and means for operating them.

16. In a bed-and-platen printing-press, the combination of a registering-table, grippers carrying sheets from the registering-table, into position to be printed upon the platen, presser-fingers for holding the sheets in place while being printed, and means for operating the presser-fingers so that some of said presser-fingers are kept parallel with the face of the platen while being moved toward or away therefrom, and one of the other presser-fingers has a pivoted or swinging motion.

17. In a bed-and-platen printing-press, the combination of a pivoted platen, a registering-table, grippers carrying sheets from the registering-table into position to be printed on the platen, a smoothing mechanism for smoothing the sheets upon the platen, a curved track or way, and means for operating the same to open the grippers.

18. In a bed-and-platen printing-press, the combination of a pivoted platen, a registering-table, grippers carrying sheets from the registering-table into position to be printed upon the platen, a curved track or way mounted at the side of the platen and carried thereby, and means for moving the curved track to open the grippers.

19. In a bed-and-platen printing-press, the

combination of means for automatically presenting the sheets in position to be printed upon on the platen, means for smoothing the sheets on the platen, and a sheet-delivery mechanism comprising swinging grippers for taking the sheets from in front of the lower edge of the platen and delivering the sheets printed side up.

20. In a printing-press, the combination of the platen, a swinging frame carrying the type-bed cooperating with the platen, sheet-registering stops, grippers for carrying successive sheets into position to be printed upon the platen, and connections from the swinging frame for moving the registering-stops out of the way and for actuating the grippers.

21. In a printing-press, the combination of sheet-registering mechanism, means for presenting the successive sheets in position to be printed, a swinging delivery for the printed sheets, and connections from the swinging delivery for operating the sheet-registering mechanism.

22. In a bed-and-platen printing-press, the combination of the platen, a swinging frame carrying a type-bed cooperating with the platen, a main crank-shaft connected to operate the swinging frame, registering-blocks for the sheets, grippers for presenting the sheets in position to be printed upon the platen, connections from the swinging frame, for moving the registering-blocks out of the way and for turning the grippers and connections from the main crank-shaft for opening the grippers.

23. In a bed-and-platen printing-press, the combination of a platen, a swinging frame carrying a type-bed cooperating therewith, a main crank-shaft connected to operate the swinging frame, registering-blocks for the sheets, grippers for presenting successive sheets in position to be printed upon the platen, clamping-fingers for holding the sheets in place while being printed upon, connections from the swinging frame for moving the registering-blocks out of the way and for operating the grippers, and connections from the main crank-shaft for opening

the grippers and for operating the clamping-fingers.

24. In a bed-and-platen printing-press, the combination of a platen, a swinging frame carrying a type-bed cooperating with the platen, a main crank-shaft connected to operate the swinging frame, a registering-table, registering-stops, means for moving the sheets over the registering-table to engage the registering-stops, grippers for carrying the sheets from the registering-table into position to be printed upon the platen, a swinging delivery, connections from the swinging frame for moving the registering-stops out of the way and for operating the means to present the sheets in position to be printed on the platen, connections operated from the main crank-shaft for opening the grippers and connections from the rock-shaft of the swinging delivery for operating the means for carrying the sheets to registered position upon the registering-table.

25. In a bed-and-platen printing-press, the combination of a platen, a swinging frame carrying a type-bed cooperating therewith, a crank-shaft connected to operate the swinging frame, a registering-table, registering-stops, means for moving sheets upon the registering-table to engage the registering-stops, grippers for moving the sheets into position to be printed upon the platen, clamping-fingers for holding sheets in place while being printed, a swinging delivery, connections from the swinging frame for moving the registering-stops out of the way and for operating the grippers, connections from the crank-shaft for opening the grippers and for operating the clamping-fingers, and connections from the rock-shaft of the swinging delivery for operating the means for moving the sheets upon the delivery-table.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LEWIS E. MORRISON.

Witnesses:

J. T. KAVENAUGH,
WILLIAM A. F. ALT.