

No. 732,528.

PATENTED JUNE 30, 1903.

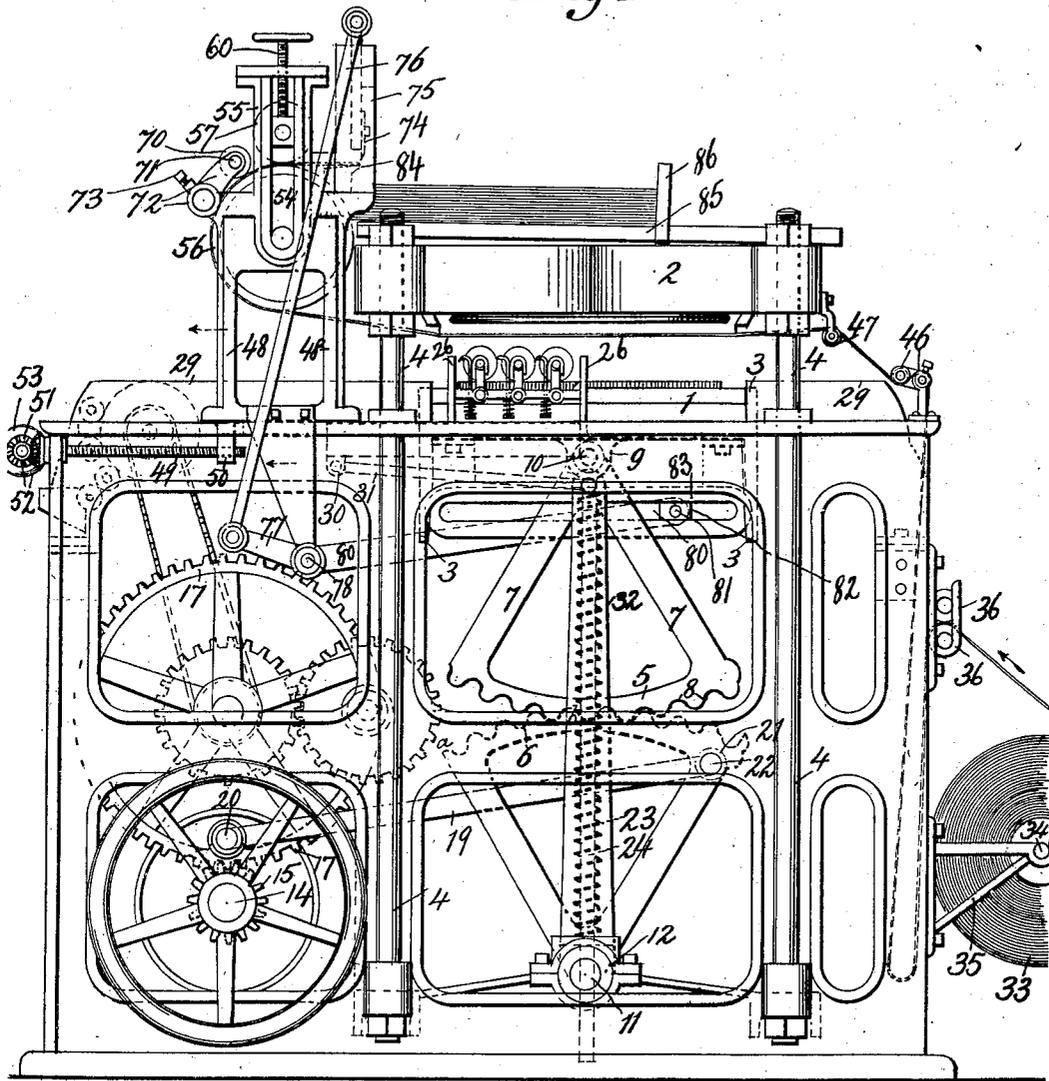
D. I. ECKERSON.
PRINTING PRESS.

APPLICATION FILED MAY 23, 1902.

NO MODEL.

5 SHEETS—SHEET 1.

Fig. 1.



Inventor

Daniel I. Eckerson

Witnesses

J. H. Schott
H. A. Bates

Grant Burroughes
Attorney.

D. I. ECKERSON.
PRINTING PRESS.

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NO MODEL.

6 SHEETS—SHEET 2.

Fig. 2.

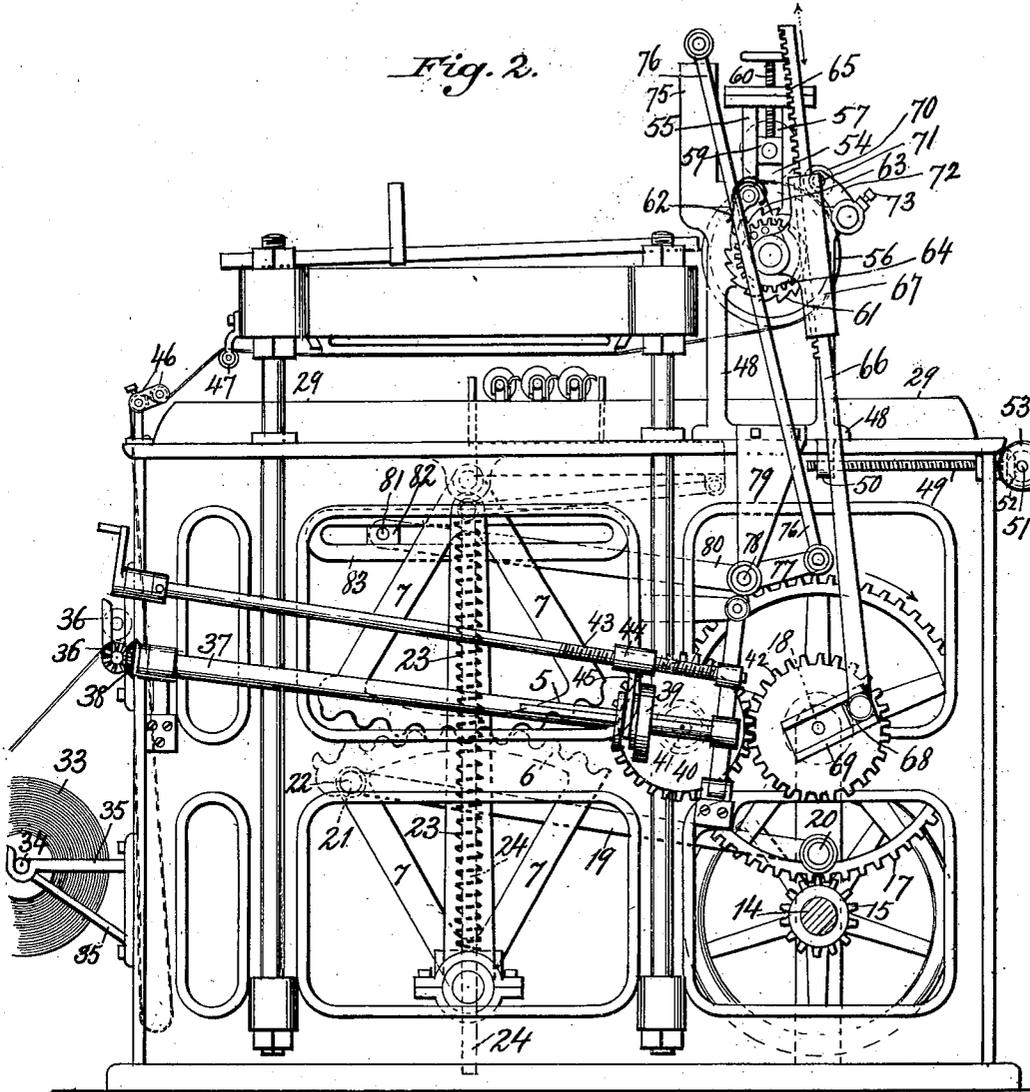
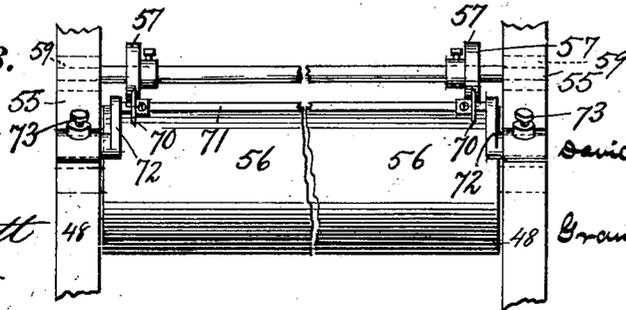


Fig. 3.



Witnesses

H. H. Schott
N. H. Bates

Inventor

David I. Eckerson

Grant Burroughs

Attorney

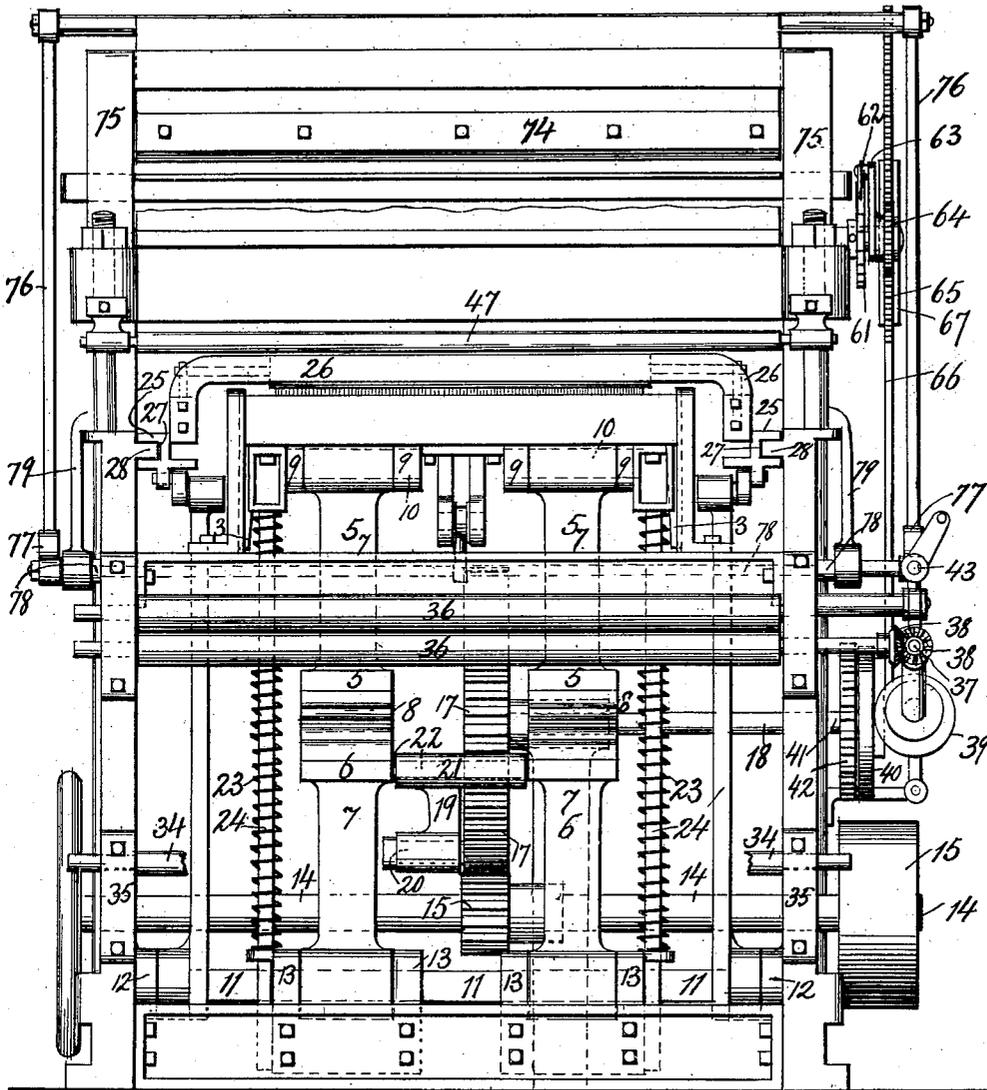
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5 SHEETS—SHEET 3.

Fig. 4.



Inventor

Daniel I. Eckerson

Grant Curran

Attorney

Witnesses

H. H. Schott

N. H. Bates

D. I. ECKERSON.
PRINTING PRESS.

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NO MODEL.

5 SHEETS—SHEET 4.

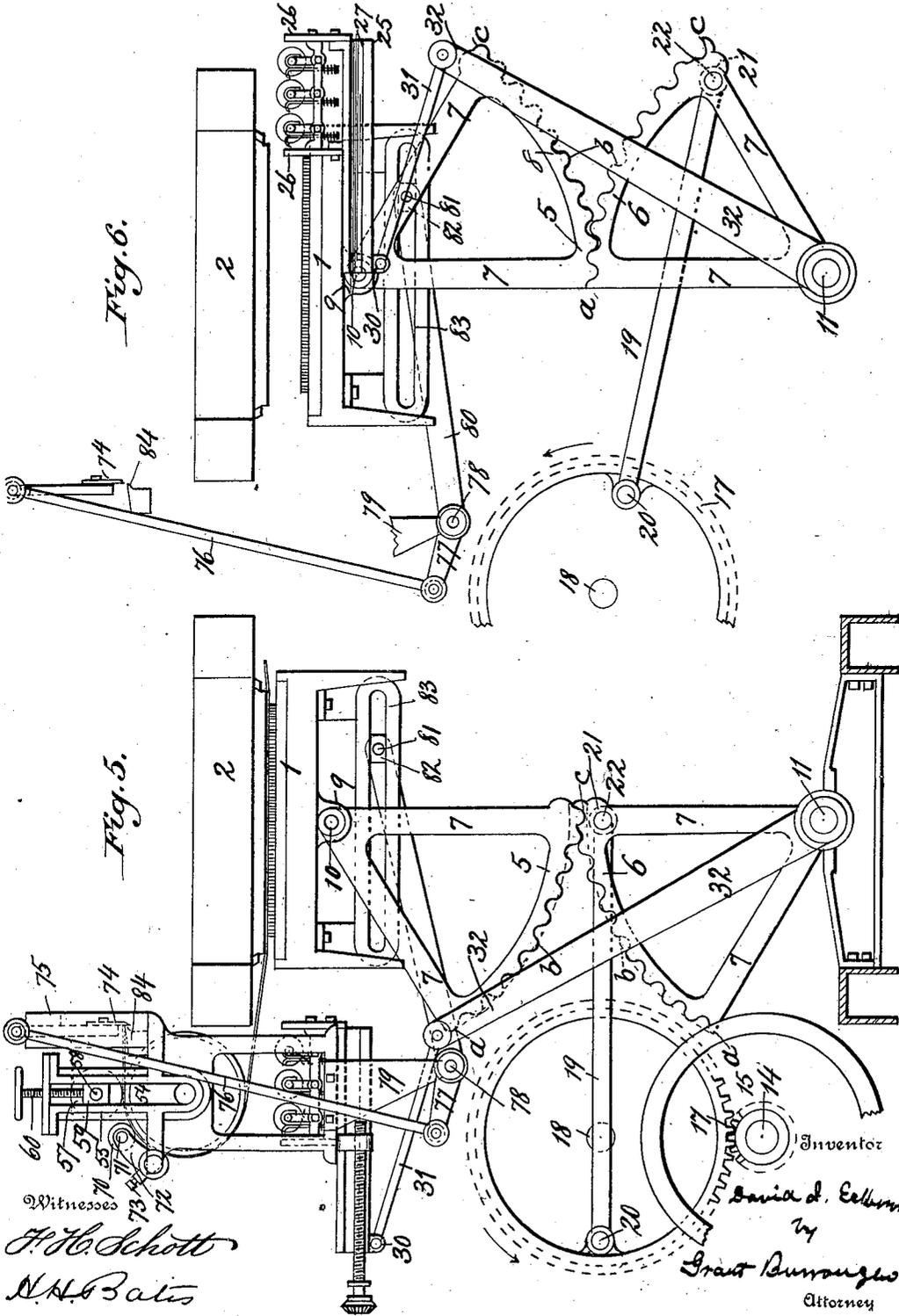


Fig. 6.

Fig. 5.

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Witnesses
H. H. Schott
N. N. Bates

Inventor
David I. Eckerson
by
Grant Burroughes
Attorney

No. 732,528.

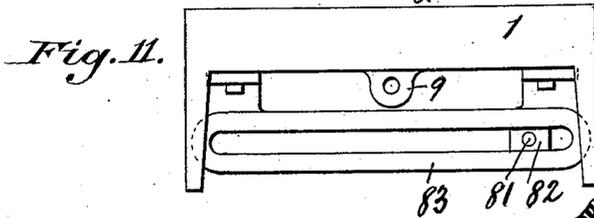
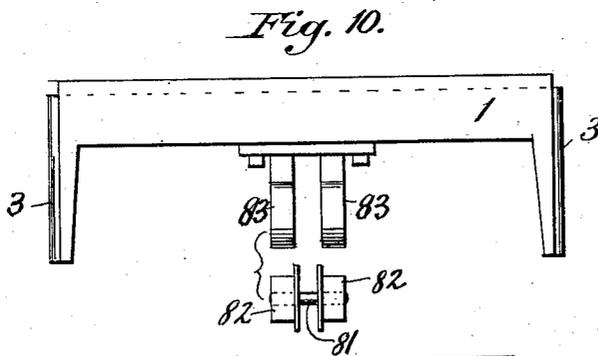
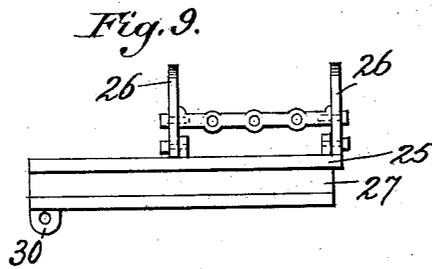
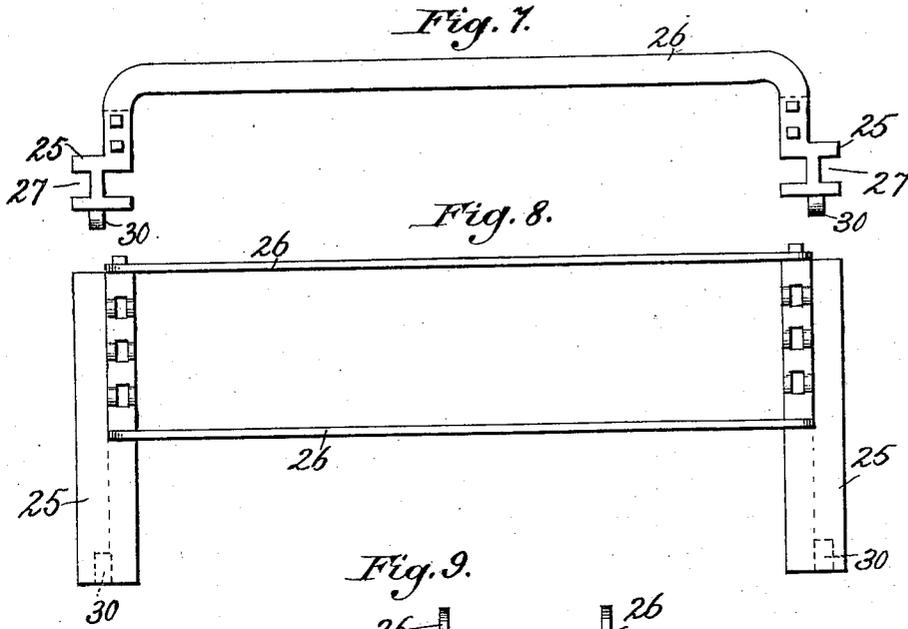
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PRINTING PRESS.

APPLICATION FILED MAY 23, 1902.

NO MODEL.

5 SHEETS—SHEET 5.



Inventor

Daniel I. Eckerson

Grant Burroughs

Attorney

Witnesses

F. H. Schott
A. H. Bates

UNITED STATES PATENT OFFICE.

DAVID I. ECKERSON, OF WORCESTER, NEW YORK.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 732,528, dated June 30, 1903.

Application filed May 23, 1902. Serial No. 108,712. (No model.)

To all whom it may concern:

Be it known that I, DAVID I. ECKERSON, a citizen of the United States, and a resident of Worcester, in the county of Otsego and State of New York, have invented certain new and useful Improvements in Printing-Presses, of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in printing-presses of that class which print upon a web drawn from a roll and in which the impression is made between two flat surfaces, one of which is movable.

It consists in the novel construction, combination, and arrangements of parts such as will be hereinafter fully described, and pointed out in the appended claims.

In the drawings, in which similar reference characters designate corresponding parts, Figure 1 is a side elevation of a press embodying the invention. Fig. 2 is a similar view showing the side opposite to that shown in Fig. 1. Fig. 3 is a detail view, broken away in parts, showing the intermittent-feed rolls and the rotary cutters for slitting the web. Fig. 4 is an end view of the press, broken away in parts. Fig. 5 is a detail view showing the operative mechanism with the type-bed at the upper limit of its movement. Fig. 6 is a similar view with the type-bed at the lower limit of its movement. Fig. 7 is a detail view showing one of the yokes for connecting the side frames of the inking-carriage. Fig. 8 is a detail view showing a plan of the frame of the inking-carriage. Fig. 9 is a side elevation of the same. Fig. 10 is an end view of the type-bed. Fig. 11 is a side elevation of the same.

The framework supporting the several operative parts of the machine may be of any construction suitable in the premises. In the present instance it is generally rectangular in form and consists of a base and side frames suitably secured together and provided with cross-pieces and tie-rods for holding them in their proper relative positions.

The impression mechanism consists of two members, one of which is the movable type-

bed 1 and the other is the stationary platen 2. Both members are arranged horizontally, one above the other, with the platen uppermost. The type-bed is reciprocated vertically and is guided by the flanges 3, engaging with suitable recesses in the frame of the machine. The platen is supported above the type-bed by the rods 4, passing through its corners and secured to the frame of the machine. These rods are of sufficient strength to withstand the thrust of the type-bed against the platen.

The mechanism for reciprocating the type-bed consists of the upper and lower cam-racks 5 and 6, respectively, arranged in pairs, with a lower cam-rack meshing with an upper one. Each cam-rack is in the form of a mutilated segmental gear, consisting of the diverging arms 7, connected at their outer ends by the curved rack 8. The upper cam-racks 5 are pivoted at the converging point of their arms to the under side of the type-bed between the lugs 9 by the bolts 10, and the lower cam-racks 6 are secured on the shaft 11, passing through the lower part of the machine and journaled at its ends in the bearings 12. To hold them in their proper positions on the shaft, the lower cam-racks are placed between the lugs 13, which also form additional bearings for the shaft 11. The rack part of each cam-rack is mutilated. For about one-half of its length, as from *a* to *b*, its curvature is concentric with the pivotal point of the cam-rack, and for the other part, as from *b* to *c*, its curvature is eccentric as it is gradually projected beyond the concentric line. The relative arrangement of two engaging cam-racks is such that when they are rocked the concentric part of one meshes with the concentric part of the other and the eccentric part of one engages with the eccentric part of the other. By this means the cam feature is secured. By oscillating the cam-racks the type-bed is reciprocated vertically. During half an oscillation in one direction—say from the position shown in Fig. 6 to the position shown in Fig. 1—there is no movement of the type-bed as the concentric parts of the cam-racks are engaged; but during the remainder of the oscillation—say from the position shown in Fig. 1 to that shown in Fig. 5—the type-bed is moved toward the platen as the eccentric parts of the cam-

racks are engaged. By means of the cam-racks the type-bed is reciprocated with comparatively little jar or shock, and the machine, even when operated at a high rate of speed, has but little vibration. Mechanism for simultaneously oscillating the cam-racks is provided. On the main driving-shaft 14, driven by the pulley 15, is the pinion 16, meshing with the gear 17, secured on the shaft 18, journaled in suitable bearings in the frame of the machine. A connecting-rod 19 is journaled at one end on the wrist-pin 20, projecting from the side of the gear 17, and at the other end is connected with the sleeve 21 on the shaft 22, connecting the two lower cam-racks 6. When the gear 17 is rotated through the connecting-rod or pitman 19, the cam-racks are simultaneously rocked back and forth, and the type-bed is thereby reciprocated. On the downward movement of the type-bed it is cushioned by the springs 23 on the rods 24. These springs also serve to sustain to some extent the weight of the type-bed, and thereby render an easier movement of the same.

The carriage on which the inking-rolls are mounted consists of the side frames 25, connected by the yokes 26. In the outer faces of the side frames are the grooves 27, which register with the flanges 28, projecting from the frame of the machine and extending through the length of the path of travel of the carriage. On opposite sides of the type-bed and in the path of travel of the inking-carriage are the inking-tables 29, one of which, as shown by dotted lines in Fig. 1, is provided with the usual inking mechanism. The inking-rolls mounted on the carriage are of the usual construction. The carriage is reciprocated back and forth over the type-bed for each impression, thereby insuring a thorough inking of the type. From the under side of the carriage project the lugs 30. Rods 31 connect these lugs with the free ends of the levers 32, carried by the shaft 11, on which the lower cam-racks 6 are mounted. As the cam-racks are rocked back and forth the levers 32 are oscillated with them and move the carriage back and forth over the type-bed.

A continuous feed for drawing the web from the roll is provided. The roll of paper 33 is mounted on the shaft 34, journaled in the brackets 35, secured to one end of the machine. The web is continuously drawn off the roll by the continuously-rotated rolls 36. The lower one of these rolls is driven by the shaft 37, through the bevel-gear 38, and the shaft is rotated by the friction-wheel 39, splined thereon and engaging with the friction-disk 40 on the shaft 41, journaled in suitable bearing in the frame of the machine. The periphery of the friction-disk is provided with teeth which engage with the gear 42 on the shaft 18, driven from the main driving-shaft 14 by the pinion 16 and the gear 17.

By moving the friction-wheel relatively to the friction-disk the rotation of the rolls 36 can be regulated to draw more or less of the

web from the paper-roll. A shaft 43, journaled in suitable bearings, is screw-threaded at one end and engages with the sleeve 44, provided with a yoke 45, registering with the circumferential groove in the hub of the friction-wheel. By turning the shaft 37 through the intervening mechanism the relative positions of the friction-wheel and the friction-disk can be adjusted. The web on leaving the paper-roll passes between the feed-rolls 36, through the tension-bars 46, of the usual construction, over the roll 47, mounted on the frame of the platen, to the impression mechanism. As the feed of the web between the impression members is intermittent and very quick, the web is looped between the continuously-operated rolls 36 and the tension-bars 46, so that it can be easily drawn between the impression members by the intermittent feed. By adjusting the tension-bars 46 the resistance of the web to the action of the intermittent-feed rolls can be regulated, so that the paper will be held with sufficient force to avoid any slack between the impression members.

The carriage 48 is adjustably mounted on the frame of the machine. It is moved in its adjustments by the screws 49 engaging with the lugs 50, projecting from the under side of the same. The screws 49 are turned by the shaft 51, with which they are connected by the bevel-gears 52. A hand-wheel 53 is provided for rotating the shaft 51. In the slots 54 in the standards 55, mounted on the carriage 48, are journaled the ends of the shaft of the roll 56. This roll, together with the marginal rolls 57, engages the web and intermittently feeds it between the impression members. The marginal rolls are adjustable on the shaft 58, journaled at its ends in the boxes 59, movable in the slots 54 in the standards 55. By the set-screws 60 impinging on the boxes 59 the force with which the rolls will engage the paper can be regulated.

The roll 56 is provided with mechanism for intermittently rotating the same. On the end of the shaft of the roll is secured the ratchet-wheel 61, with which engages the spring-pressed pawl 62, carried by the arm 63, secured to the gear 64, loosely journaled on the shaft. With the gear 64 engages the rack 65 on the rod 66. The rack is held in engagement with the gear by the yoke 67, pivoted on the shaft of the roll. The lower end of the rod is journaled on the wrist-pin projecting from the block 68, adjustable in the guide-strip 69, secured to the gear 42 on the shaft 18. As the gear is rotated the rod is reciprocated and through the intervening mechanism intermittently rotates the feed-rolls 56 and 57. As the rod is reciprocated it is also oscillated. As the yoke 67 is pivoted on the shaft of the roll 56, the oscillation of the rod will not be interfered with. By adjusting the block 68 in the guide-strip 69 the length of the stroke of the rod can be regulated so as to give more or less rotation of the feed-rolls and a corre-

sponding regulation of the feed of the web between the impression members.

Rotary cutters 70 are provided for slitting the web. These cutters are movably mounted on the shaft 71, journaled in the hangers 72, pivoted to the frame of the machine, and can be adjusted transversely of the path of travel of the web, so that strips of different widths can be cut. By means of the hinged hangers the shaft can be moved either to bring the cutters into engagement with the roll 56, so that the paper passing between the cutters and the roll can be slit, or to move the cutters clear of the paper. By means of the set-screws 73 passing through the hubs in which the hangers are pivoted and impinging on the bearings of the hangers the rotary cutters can be secured in the positions to which they may be moved.

A knife 74 is provided for cutting the web into sheets. It is mounted at its ends in the guideways 75 on the standards 55 and is vertically reciprocated by the rods 76, connecting its ends with the arms 77 on the shaft 78, journaled in the hangers 79, projecting from the under side of the carriage 48. The shaft is rotated by the lever 80, extending from it intermediate of its ends. The free end of the lever is pivoted on the shaft 81, carrying the blocks 82. The latter are movable in the slotted brackets 83, secured to the under side of the type-bed 1. As the type-bed is reciprocated the lever 80 is oscillated and through the intervening mechanism the knife is moved up and down to cut the web over the bar or anvil 84. Owing to the elongated slots in the brackets 83, the operation of the knife will not be affected by the adjustment of the carriage 48.

On the top of the platen 2 is the table 85 for receiving the severed sheets. A stop 86 is provided for holding the sheets on the table. This stop may be adjustable to accommodate the table to sheets of different sizes. By mounting the receiving-table on the platen the space occupied by the machine is considerably economized.

By means of the adjustable carriage 48 the intermittent-feed and the cutting mechanisms can be moved to accommodate the press to size of the sheets to be printed.

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

1. In a printing-press, the impression mechanism consisting of movable and fixed members, a pair of cam-racks pivoted to the movable member, a pair of cam-racks pivoted to a fixed part of the machine and engaging with the cam-racks pivoted to the movable member of the impression mechanism, coupling mechanism connecting the cam-racks pivoted to a fixed part of the machine, and operative mechanism connected with said coupling mechanism for simultaneously oscillating the cam-racks pivoted to a fixed part of the machine.

2. In a printing-press, the impression mechanism consisting of movable and fixed members, a pair of cam-racks pivoted to the movable member, a pair of cam-racks pivoted to a fixed part of the machine and engaging with said cam-racks pivoted to the movable member, a shaft coupling together the cam-racks pivoted to a fixed part of the machine, a sleeve journaled on said shaft, a rod connected with said sleeve, and means for reciprocating said rod.

3. In a printing-press, the impression mechanism consisting of movable and fixed members, opposite engaging cam-racks respectively pivoted to the movable member and a fixed part of the machine, each cam-rack having its rack concentric with the pivotal point of the cam-rack for part of the length of the rack and the remainder eccentric, and means for oscillating said cam-racks.

4. In a printing-press, the impression mechanism consisting of movable and fixed members, opposite engaging cam-racks respectively pivoted to the movable member and to a fixed part of the machine, each cam-rack having its rack concentric with the pivotal point of the cam-rack for part of the length of the rack and the remainder eccentric, means for oscillating said cam-racks, an inking-carriage adapted to travel between said movable and fixed members and operated by said cam-racks, and means for intermittently feeding a web of paper between said movable and fixed members.

5. In a printing-press, the movable member of the impression mechanism, opposite engaging cam-racks for reciprocating said member each being in the form of a segmental gear with the line of its teeth mutilated so that when the cam-racks are moved the distance between their pivotal points will vary, and means for oscillating said cam-racks.

6. In a printing-press, the impression mechanism consisting of fixed and movable members, cam-racks for reciprocating the movable member, means for rocking said cam-racks, and an inking-carriage adapted to travel between said members and operated by said cam-racks.

7. In a printing-press, the impression mechanism consisting of fixed and movable members, a cam-rack pivoted to the movable member, a rotatable shaft, a second cam-rack mounted on said shaft and engaging with the cam-rack pivoted to the movable member, means for rocking said cam-racks, a lever carried by said shaft, and an inking-carriage adapted to travel between said impression members and connected with said lever.

8. In a printing-press, the impression mechanism consisting of a type-bed and a platen with one of said members movable relatively to the other, cam-racks for reciprocating the movable member, means for oscillating said cam-racks, an inking-carriage adapted to travel between said type-bed and said platen

and operated by said cam-racks, and mechanism for intermittently feeding a web of paper between said type-bed and said platen.

9. In a printing-press, the impression mechanism consisting of a type-bed and a platen with one of said members movable relatively to the other, cam-racks for reciprocating the movable member, means for oscillating said cam-racks, an inking-carriage adapted to travel between said type-bed and said platen and operated by said cam-racks, a carriage adjustable along the path of travel of the web of paper through the machine, a roll journaled in said adjustable carriage for engaging with the web, and means for intermittently rotating said roll to intermittently feed the web between said type-bed and said platen.

10. In a printing-press, an adjustable carriage, a reciprocal knife mounted on said carriage, the impression mechanism consisting of fixed and movable members, means for reciprocating the movable member, a slotted bracket attached to the movable member, a block movable back and forth in the slot in said bracket, a shaft, a lever secured on said shaft and connected with said block, an arm carried by said shaft, and a rod connecting said arm with said knife.

11. In a printing-press, the impression mechanism consisting of fixed and movable members, means for reciprocating the movable member of the impression mechanism, mechanism for intermittently feeding a web of paper between the members of the impression mechanism, a reciprocal knife mounted adjacent to the path of travel of the web for severing the latter, a lever pivoted intermediate of its ends and having a sliding connection at one end with the movable member of the impression mechanism, and a rod connecting the other end of said lever with said knife.

12. In a printing-press, the impression mechanism consisting of fixed and movable members, means for reciprocating the movable member of said impression mechanism, mechanism for intermittently feeding a web of paper between the members of the impression mechanism, a carriage adjustable along the path of travel of the web, a reciprocal knife mounted on said carriage adjacent to the path of travel of the web for severing the latter, a lever pivoted to said carriage and having a sliding connection at one end with the movable member of the impression mechanism, and a rod connecting the other end of said lever with said knife.

13. In a printing-press, the impression mechanism consisting of a type-bed and a platen with one of said members movable relatively to the other, opposite engaging cam-racks respectively pivoted to the movable member and to a fixed part of the machine for reciprocating the movable member, each cam-rack having its rack concentric with the pivotal point of the cam-rack for part of the length of the rack and eccentric for the re-

mainder, means for oscillating said cam-racks, and mechanism for intermittently feeding a web of paper between said type-bed and said platen.

14. In a printing-press, the impression mechanism consisting of a type-bed and a platen with one of said members movable relatively to the other, opposite engaging cam-racks respectively pivoted to the movable member and to a fixed part of the machine for reciprocating the movable member, each cam-rack having its rack concentric with the pivotal point of the cam-rack for part of the length of the rack and eccentric for the remainder, means for oscillating said cam-racks, a carriage adjustable along the path of travel of the web of paper through the machine, a roll journaled in said carriage for engaging with the web, and means for intermittently rotating said roll to intermittently feed the web between said type-bed and said platen.

15. In a printing-press, the impression mechanism consisting of movable and fixed members, means for reciprocating the movable member of the impression mechanism, a carriage adjustable along the path of travel of the web of paper through the machine, a roll journaled in said carriage for engaging with the web, mechanism for intermittently rotating said roll to feed the web between the members of the impression mechanism, a reciprocal knife mounted on said carriage adjacent to the path of travel of the web for severing the latter, a lever pivoted to said carriage and having a sliding connection at one end with the movable member of the impression mechanism, and a rod connecting the other end of said lever with said knife.

16. In a printing-press, the impression mechanism consisting of a type-bed and a platen with one of said members movable relatively to the other, cam-racks for reciprocating the movable member of the impression mechanism, means for oscillating said cam-racks, an inking-carriage adapted to travel between said type-bed and said platen and operated by said cam-racks, a carriage adjustable along the path of travel of the web of paper through the machine, a roll journaled in said adjustable carriage for engaging with the web, mechanism for intermittently rotating said roll to intermittently feed the web between said type-bed and said platen, a reciprocal knife mounted on said adjustable carriage adjacent to the path of travel of the web, and mechanism adjustably connecting said knife with the movable member of the impression mechanism to operate said knife to sever the web.

17. In a printing-press, the impression mechanism consisting of a movable type-bed and a fixed platen horizontally arranged one above the other with the platen uppermost, a receiving-table placed on said platen, cam-racks for reciprocating said type-bed, means for oscillating said cam-racks, an intermit-

tent feed mechanism for intermittently feeding the web of paper between said type-bed and said platen onto said table, and mechanism for cutting the paper into sheets as it is deposited on said table by said feed mechanism.

18. In a printing-press, the impression mechanism consisting of a movable type-bed and a fixed platen horizontally arranged one above the other with the platen uppermost, a receiving-table placed on said platen, cam-racks for reciprocating said type-bed, means for oscillating said cam-racks, a carriage adjustable along the path of travel of the web of paper through the machine and relative to said table, a roll journaled in said carriage for engaging with the web, mechanism for intermittently rotating said roll to intermittently feed the web between said type-bed and said platen onto said table, a reciprocal knife mounted on said carriage adjacent to the path of travel of the web, and mechanism adjustably connecting said knife with said type-bed to operate said knife to sever the end of the web as the paper is delivered onto said table.

19. In a printing-press, the impression mechanism consisting of a movable type-bed and a fixed platen horizontally arranged one above the other with the platen uppermost, a receiving-table placed on said platen, means for reciprocating said type-bed, a carriage adjustable along the path of travel of the web of paper through the machine and relative to said table, a roll journaled in said carriage for

engaging with the web, mechanism for intermittently rotating said roll to intermittently feed the web between said type-bed and said platen onto said table, a reciprocal knife mounted on said carriage adjacent to the path of travel of the web, a lever pivoted to said carriage and having a sliding connection at one end with said type-bed, and a rod connecting the other end of said lever with said knife to operate the latter to sever the end of the web as the paper is delivered onto said table.

20. In a printing-press, the impression mechanism consisting of movable and fixed members, opposite engaging cam-racks respectively pivoted to the movable member of the impression mechanism and to a fixed part of the machine, each cam-rack having its rack concentric with the pivotal point of the cam-rack for part of the length of the rack and the remainder eccentric, means for oscillating said cam-racks, mechanism for intermittently feeding a web of paper between the members of the impression mechanism; and a reciprocal knife mounted adjacent to the path of travel of the web and connected with the movable member of the impression mechanism and operated by the latter to sever the web.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

DAVID I. ECKERSON.

Witnesses:

BIRNEY GOODENOUGH,
JOHN C. WALKER.