

No. 668,807.

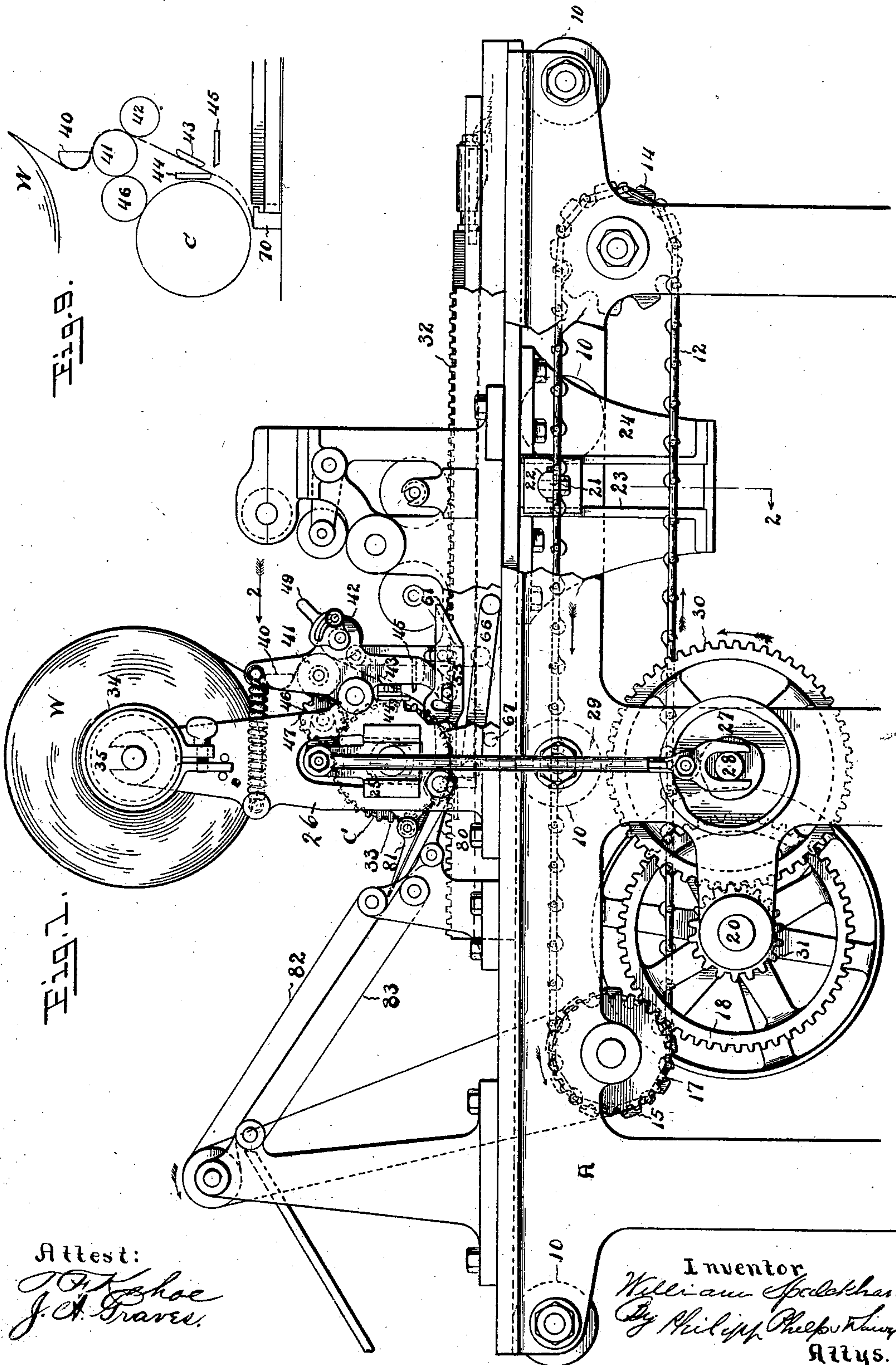
Patented Feb. 26, 1901.

W. SPALCKHAVER.
PRINTING MACHINE.

(No Model.)

(Application filed Dec. 31, 1897.)

3 Sheets—Sheet 1.



Attest:

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3 Sheets—Sheet 2.

Fig. 2.

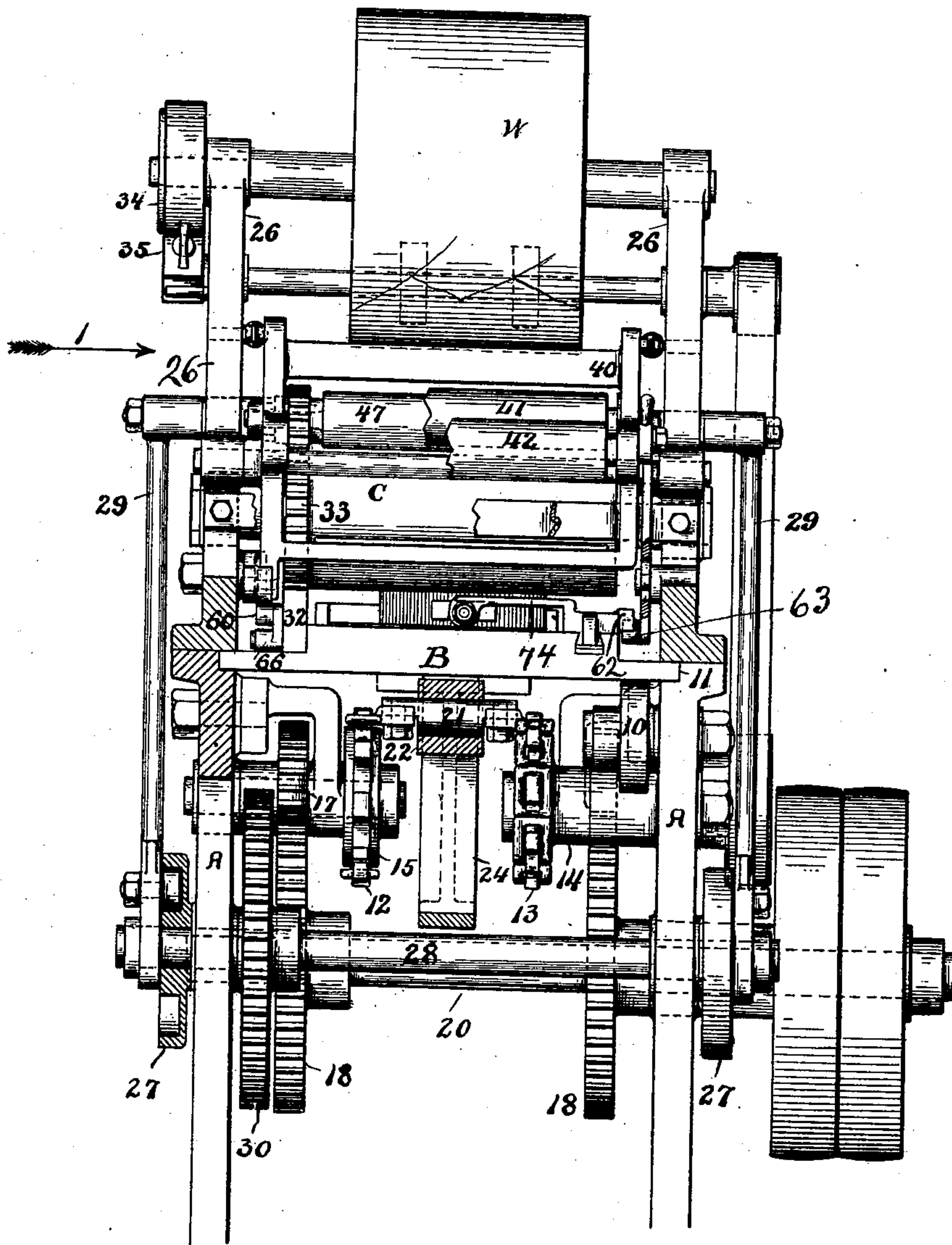
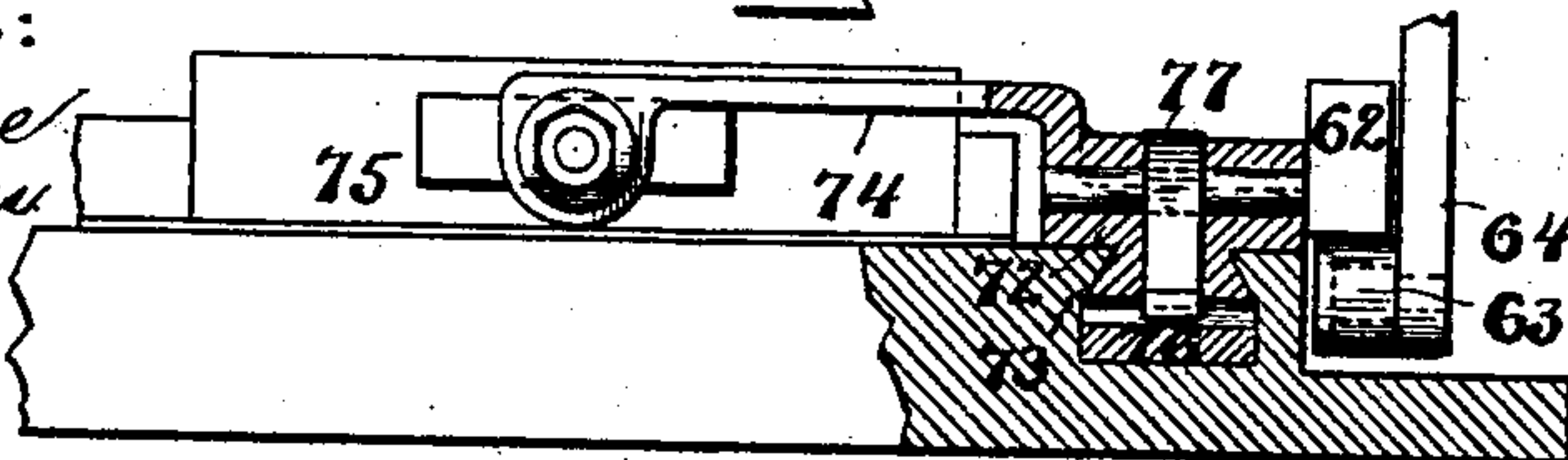


Fig. 3.

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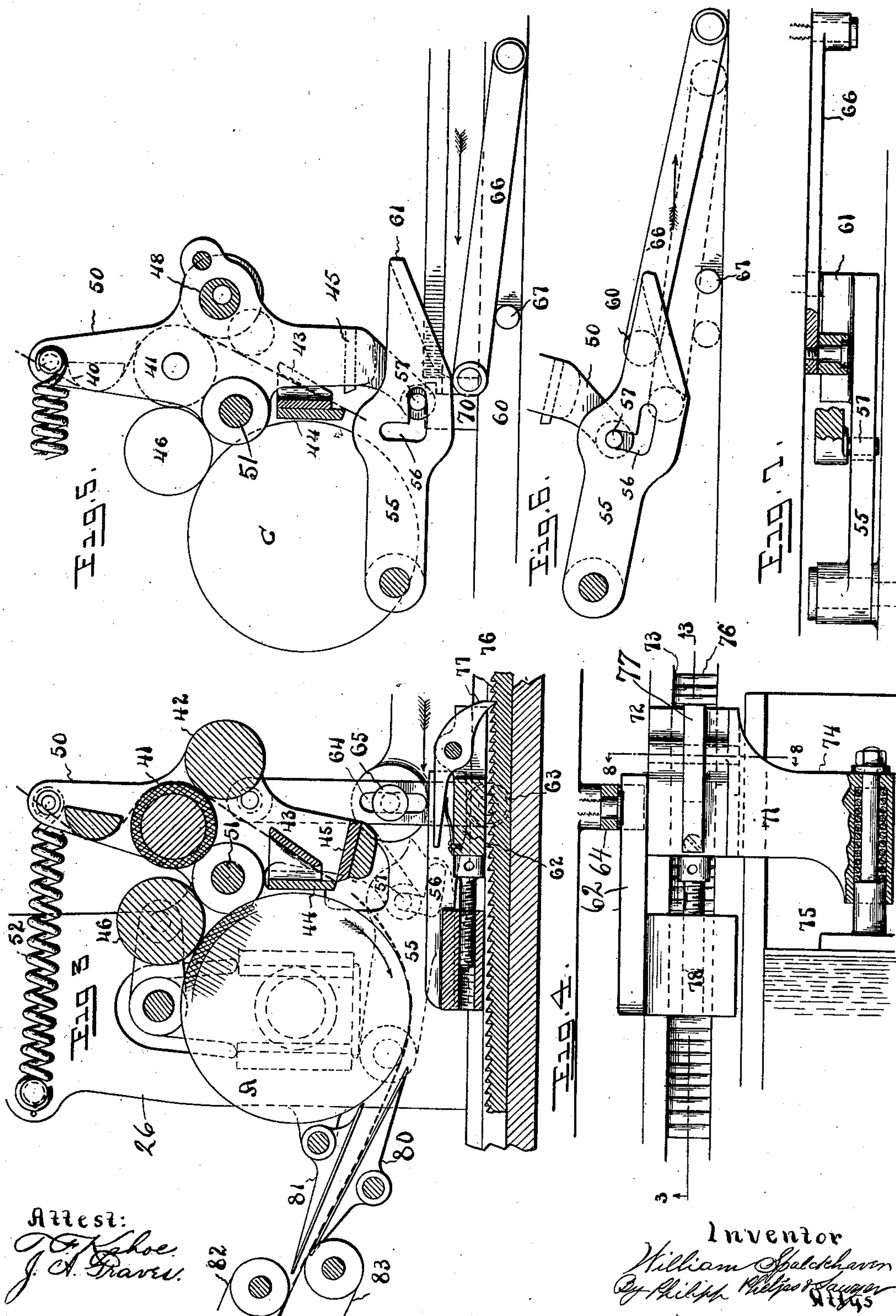
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3 Sheets—Sheet 3.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM SPALCKHAVER, OF BROOKLYN, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO ROBERT HOE AND CHARLES W. CARPENTER, OF NEW YORK, N. Y.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 668,807, dated February 26, 1901.

Application filed December 31, 1897. Serial No. 665,031. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SPALCKHAVER, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Printing-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to printing-machines, and has been designed especially with a view of providing a machine for taking proof impressions.

15 The invention aims especially to provide an improved construction whereby the length of the web advanced for each impression and the length of the printed sheet are made to correspond with the length of the form.

20 As a full understanding of the invention can best be given by a detailed description of a preferred construction embodying all the features of the invention, all preliminary description will be omitted, and such a detailed description will now be given in connection 25 with the accompanying drawings, showing such a preferred construction, and the features forming the invention will afterward be specifically pointed out in the claims.

30 In said drawings, Figure 1 is a side view of a bed-and-cylinder printing-machine constructed to embody the invention. Fig. 2 is an end view looking in the direction of the arrow 2 in Fig. 1 and parts being shown in section on line 2 of Fig. 1. Fig. 3 is an enlarged longitudinal sectional view of the impression-cylinder and coacting parts and partly taken on line 3 of Fig. 4. Fig. 4 is a detail plan view showing the form-lock and associated parts. Fig. 5 is a view, partly 40 diagrammatic, of the impression-cylinder and coacting parts taken just inside the frame looking in the direction of the arrow in Fig. 2. Fig. 6 is a side view of some of the parts shown in Fig. 5, but in a different position. Fig. 7 is a plan view of the parts shown in Fig. 6. Fig. 8 is a detail section on the line 8 of Fig. 4. Fig. 9 is a diagrammatic view of the impression-cylinder, the web-feeding devices, and the front portion of the bed, with a form

thereon in position just before the beginning 50 of an impression.

Referring to the drawings, the various operating parts of the machine are supported in a suitable frame A. The form-bed B is mounted to reciprocate horizontally on supporting-rolls 10, being guided by grooves 11 in the side frames, as shown in Fig. 2. The bed is reciprocated by means of two endless sprocket-chains 12 13, turning at one end of their run on sprocket-wheels 14, mounted 60 on studs extending inwardly from the side frames, and at the other end on driving sprocket-wheels 15, carried by short shafts 16, each of which shafts 16 carries a pinion 17, meshing with a gear 18 on the driving-shaft 65 20. Connected to a link of each of the sprocket-chains 12 13 is a driving-pin 21, which carries a box 22, mounted to ride in a vertical groove or guideway 23, formed in a hanger 24, carried by the bed. By this construction as the sprocket-chains are driven 70 by the driving sprocket-wheels 15 they will through the pin 21 and box 22 move the bed in one direction or the other, according as the links carrying the pin 21 are traveling in the 75 upper or lower path of the sprocket-chains. As the links carrying the driving-pin arrive at the driving sprocket-wheels after having moved through the upper path of the chains to the left in Fig. 1, as indicated by the arrow, and moved downward around the sprocket-wheels the driving-pin and box 22, moving with said links, slow down, and then stop the movement of the bed to the left in Fig. 1 as the box moves downward in the slot 23 of the 85 hanger 24, and then start and accelerate its movement to the right, and then as the pin-carrying links leave the sprocket-wheels 15 the bed will be moved at a uniform speed to the right until the pin-carrying links reach 90 the sprocket-wheels 14, when the movement of the bed will be gradually decreased, stopped, and then started and increased in the opposite direction as the pin-carrying links turn upward about the sprocket-wheels 95 14, carrying the box 22 upward in the slot 23. Then the bed will be again moved at a uniform speed to the left.

The impression-cylinder C is journaled in journal-boxes 25, mounted to reciprocate vertically in standards 26, extending upward from the frame A at either side of the machine, which journal-boxes 25 are lowered to hold the cylinder C in printing position when the bed is being moved to the left in Fig. 1 and raised to elevate the impression-cylinder during the return movement of the bed. The journal-boxes 25 are thus raised and lowered by means of cams 27, carried by the cam-shaft 28, one at either side of the machine, through pitmen 29, pivoted one to each journal-box and having forked ends embracing the ends of the shaft 28 and carrying rolls running in the cams 27. The cam-shaft 28 carries a gear 30, meshing with a pinion 31 on the driving-shaft 20, these gears being of proper relative size to cause the cam-shaft 28 to make one revolution to each complete reciprocation of the form-bed B, and the cam 27 being formed to give the desired movements to the journal-boxes 25. The impression cylinder C is driven so as to rotate at a surface speed corresponding to the movement of the bed during its printing movement by means of a rack 32, carried by the bed, and a gear 33, carried by the cylinder.

The roll of paper W is supported by the upper ends of the standards 26, an adjustable tension-band 34 being preferably provided to bear on a tension-disk 35 on one end of the shaft carrying the web-roll. The web is led from the web-roll past a guide-bar 40, between feeding-rolls 41 and 42, over a guide 43, and between cutting-blades 44 and 45 to the under side of the impression-cylinder C to be entered between the cylinder C and the form carried by the bed B for printing. The feeding-roll 41 is driven by frictional contact with a driving-roll 46, mounted in arms carried by the journal-boxes 25, said roll being provided with a gear 47, meshing with the gear 33, carried by the impression-cylinder. The feeding-roll 42 is preferably mounted so as to be adjustable toward and from the feeding-roll 41, as by being carried by eccentrics 48, arranged to be operated through handles 49, and secured by set-screws, as shown clearly in Fig. 1. The feeding-roll 41 is preferably a rubber-covered roll, as indicated in Fig. 3.

The feeding-rolls 41 and 42 and the cutting-blade 45 are carried by a frame 50, pivoted on a shaft 51, so that by rocking the frame 50 the feeding-roll 41 may be moved into and out of position to contact with the driving-roll 46, and the cutting-blade 45 may be moved into and out of position to coact with the stationary blade 44. The pivot-shaft 51 is positioned between the feeding-roll and the blade 45 so that when the frame is rocked so as to bring the feeding-roll 41 in contact with the driving-roll 46 the cutting-blade 45 will be moved away from the blade 44 to allow the paper to pass freely between them and when the frame is rocked to carry the feeding-roll 41 away from the driving-roll. The

blade 45 will be thrown forward to coact with the blade 44 in severing the web. This rocking frame is under tension, as by a coiled spring 52, which tends to rock it, so as to hold the feeding-roll 41 in contact with the driving-roll 46; but it is normally held in its non-feeding position—that is, with the feeding-roll 41 out of contact with the driving-roll 46—by means of a pivoted latch 55, having a right-angular slot 56, which engages a pin 57, carried by a downward extension of one side of the frame 50. As the bed is advanced to carry the form beneath the impression-cylinder for printing, before the front end of the form reaches the cylinder an abutment formed by a stud or roll 60, carried by the bed, engages the under side of an inclined cam-plate 61 on the latch 55 and throws the latch upward from the position shown in Fig. 6 to bring the horizontal portion of the right-angular slot 56 opposite the pin 57 on the rocking frame 50, thus releasing the frame, which is then rocked by the spring 52 to carry the feeding-roll 41 into contact with the driving-roll 46, as shown in Figs. 1 and 5, thus causing the feeding-rolls to advance the web downward over the guide 43. The position of the abutment 60 longitudinally of the bed is such as to cause the feeding of the web to begin in time so that the forward end of the web will be advanced from the cutting-knives in time to enter beneath the impression-cylinder in advance of the front end of the form. As the printing movement of the bed continues, the rocking frame remains in the position shown in Fig. 5 until a cam 62, carried by the bed, engages a stud or roll 63, carried by a link 64, pivoted to the frame 50, and guided by a pin 65, extending from the frame A through a slot in the link. The cam 62 draws the link 64 downward, thereby rocking the frame 50 against the tension of the spring 52 from the position shown in Fig. 5 to that shown in Fig. 3, whereby the cutting-blade 45 is thrown to coact with the blade 45 to sever a sheet length from the web, and the feeding-roll 41 is carried away from the driving-roll 46 to stop the feed of the web, the pin 57 being also brought beneath the vertical portion of the right-angular slot 56 in the latch 55, thus allowing the latch to fall and lock the frame in this position. The frame 50 then remains in its non-feeding position until the web is again to be fed as the bed begins its next printing movement.

In order that the latch 55 shall not be raised to release the frame on the return movement of the bed, the abutment 60 is carried by a pivoted arm 66, normally resting against a stop 67 to hold the abutment 60 in operative position, as shown in Fig. 5, but free to be raised from that position, so that as the bed returns the abutment, engaging the upper side of the cam-plate 61, rides over the cam without moving the latch 55 from its holding position.

It will be seen that the length of the web

fed between the feeding-rolls 41 and 42 and the length of the sheet cut from the web by the cutting-blades 44 45 depends on the distance between the abutment 60 and the cam 62, carried by the bed, and it is evident that by changing the distance between said abutment and cam, by moving either one or the other, the length of web fed between the rolls 41 and 42 for each impression and the length of the printed sheet may be varied. In the preferred construction shown the distance between the abutment and the cam, and consequently the length of web advanced for each impression, is determined by the length of the form, one of said members being arranged to move with the form-lock or movable member by which the form is secured on the bed.

In the machine shown the forward end of the form always occupies the same position, the form being held against a stationary stop 70, and a movable form-lock 71 being provided to engage the rear end of the form, so as to accommodate forms of different lengths. As shown, the form-lock consists of a body portion 72, which runs in a dovetailed groove 73 in the frame at one side of the bed, and an arm 74, which carries a spring-seated bearing-plate 75. The bottom of the dovetailed groove 73 is provided with a ratchet-rack 76, which is engaged by a spring-pressed pawl 77, carried by the form-lock and by which the form-lock is held securely in place when it has been advanced to bring the spring-pressed bearing-plate 75 against the rear end of the form. The cam 62 is carried by an arm extending from a block 78, which is also held and guided in the dovetailed groove 73 and which is connected with the form-lock 71, so as to be moved therewith. The cam 62 will thus be automatically adjusted with relation to the abutment 60, according to the length of the form on the bed.

In order to provide for varying the margin at the end of the printed sheet, the block 78, carrying the cam 62, is preferably adjustably connected with the form, as by the turn-screw 79.

The printed sheets are advanced from between the impression-roll and the form through guides 80 and 81 to delivery-tapes 82 and 83. Any suitable inking mechanism may be employed.

It will be understood that the invention is not limited to the exact construction shown for the purpose of illustrating the invention and to which the foregoing description has been mainly confined, but that various changes and modifications thereof may be made within the claims.

What is claimed is—

1. The combination of an impression-cylinder, a form-bed, a pair of feeding-rolls by which the web is fed to the impression-cylinder, and means whereby the length of web fed by the feeding-rolls is determined by the length of the form on the bed, substantially as described.

2. The combination of an impression-cylinder, a form-bed, a pair of feeding-rolls by which the web is fed to the impression-cylinder, means for severing the web between the feeding-rolls and the impression-cylinder, and means whereby the length of web fed by the feeding-rolls and the time of operation of said severing means is determined by the length of the form on the bed, substantially as described.

3. The combination of an impression-cylinder, a form-bed, feeding mechanism by which the web is advanced for printing, a reciprocating cutting-blade, a cutting-blade between said reciprocating cutting-blade and the impression-cylinder for coacting with the reciprocating cutting-blade, and means whereby the length of web fed by the feeding mechanism and the time of the cutting movement of the reciprocating cutting-blade is determined by the length of the form on the bed, substantially as described.

4. The combination of an impression-cylinder, a form-bed, a pair of feeding-rolls by which the web is fed to the impression-cylinder, and a member moving with and adjustable longitudinally of the form-bed for controlling the duration of the feeding operation of the feeding-rolls, substantially as described.

5. The combination of an impression-cylinder, a form-bed, feeding mechanism by which the web is advanced for printing, a reciprocating cutting-blade, a cutting-blade between said reciprocating cutting-blade and the impression-cylinder for coacting with the reciprocating cutting-blade, and a member moving with and adjustable longitudinally of the bed for controlling the operation of the reciprocating cutting-blade, substantially as described.

6. The combination of an impression-cylinder, a form-bed having a longitudinally-movable form-lock, a pair of feeding-rolls by which the web is fed to the impression-cylinder, and a member moving with said form-lock for controlling the duration of the feeding operation of the feeding-rolls, substantially as described.

7. The combination of an impression-cylinder, a form-bed having a longitudinally-movable form-lock for the rear end of the form, feeding mechanism by which the web is advanced for printing, a reciprocating cutting-blade, a cutting-blade between said reciprocating cutting-blade and the impression-cylinder for coacting with the reciprocating cutting-blade, and a member moving with said form-lock for controlling the operation of the reciprocating cutting-blade, substantially as described.

8. The combination of an impression-cylinder, a form-bed, a pair of feeding-rolls by which the web is fed to the impression-cylinder, a movable support for said feeding-rolls, means for driving said feeding-rolls when carried into operative position by the movement of the support, and members moving with the form-bed for controlling the movement of the support to carry the feeding-rolls into and out

of operative position, one of said members being adjustable longitudinally of the bed, substantially as described.

9. The combination of an impression-cylinder, a form-bed, a web-feeding roll, a movable support by which said feeding-roll is carried and by the movement of which it is carried into and out of operative position, a cutting-blade carried by the movable support, a cutting-blade between said cutting-blade carried by the support and the impression-cylinder for coacting with the cutting-blade carried by the support to sever the web when the support is moved to carry the feeding-roll out of operative position, means for moving the support to carry the feeding-roll into operative position, and a member moving with and adjustable longitudinally of the bed for moving said support to carry the feeding-roll out of operative position, substantially as described.

10. The combination of an impression-cylinder, a form-bed, a web-feeding roll, a movable support by which said feeding-roll is carried and by the movement of which it is carried into and out of operative position, a cutting-blade carried by the movable support, a cutting-blade between said cutting-blade carried by the support and the impression-cylinder for coacting with the cutting-blade carried by the support to sever the web when the support is moved to carry the feeding-roll out of operative position, and members moving with the form-bed for controlling the movement of the movable support to carry the feeding-roll into and out of operative position, one of said members being adjustable longitudinally of the bed, substantially as described.

11. The combination of an impression-cylinder, a form-bed, a web-feeding roll, a movable support by which said feeding-roll is carried and by the movement of which it is carried into and out of operative position, said support being under yielding tension to hold said feeding-roll in operative position, a latch whereby said support is held against said yielding tension with the feeding-roll out of operative position, means for moving said latch to release the support as the bed is advanced for printing, and a member moving with and adjustable longitudinally of the bed for moving said support to carry the feeding-roll out of operative position, substantially as described.

12. The combination of an impression-cylinder, a form-bed, a web-feeding roll, a movable support by which said feeding-roll is carried and by the movement of which it is carried into and out of operative position, said support being under yielding tension to hold said feeding-roll in operative position, a latch whereby said support is held against said yielding tension with the feeding-roll out of operative position, a member moving with the form-bed for moving said latch to release the support, and a member moving with the bed

for moving said support to carry the feeding-roll out of operative position, one of said members being adjustable longitudinally of the bed, substantially as described.

13. The combination of an impression-cylinder, a form-bed, a web-feeding roll, a movable support by which said feeding-roll is carried and by the movement of which it is carried into and out of operative position, said support being under yielding tension to hold said feeding-roll in operative position, a cutting-blade carried by said support, a cutting-blade between the impression-cylinder and the cutting-blade carried by the support for coacting with the cutting-blade carried by the support to sever the web when the support is moved to carry the feeding-roll out of operative position, means for holding the support against said yielding tension with the feeding-roll out of operative position, means for releasing the support as the bed is advanced for printing, and a member moving with and adjustable longitudinally of the bed for moving the support to carry the feeding-roll out of operative position, substantially as described.

14. The combination of an impression-roll, a form-bed, a web-feeding roll, a rocking support by which said roll is carried and by the movement of which it is carried into and out of operative position, said support being under yielding tension to hold the feeding-roll in operative position, a cutting-blade carried by said support, a stationary cutting-blade for coacting with the cutting-blade carried by the support to sever the web when the support is moved to carry the feeding-roll out of operative position, means for holding said support against said yielding tension with the feeding-roll out of operative position, means for releasing the support as the bed is advanced for printing, and a member moving with and adjustable longitudinally of the bed for rocking the support to carry the feeding-roll out of operative position, substantially as described.

15. The combination of an impression-roll, a form-bed, web-feeding mechanism, web-cutting mechanism, a movable member which when moved in one direction causes the web-feeding mechanism to operate and when moved in the opposite direction causes the web-cutting mechanism to operate and the web-feeding mechanism to cease to operate, said member being under yielding tension to move into position to cause the web-feeding mechanism to operate, means for holding the movable member against said yielding tension with the web-feeding mechanism inoperative, means for releasing said member, and a member moving with and adjustable longitudinally of the bed for moving said movable member to cause the operation of the web-feeding mechanism to cease and to cause the web-cutting mechanism to operate, substantially as described.

16. The combination of an impression-cyl-

inder, a form-bed, web-feeding mechanism, web-cutting mechanism, a movable member which when moved in one direction causes the web-feeding mechanism to operate and when moved in the opposite direction causes the web-cutting mechanism to operate and the web-feeding mechanism to cease to operate, said member being under yielding tension to move into position to cause the web-feeding mechanism to operate, means for holding the movable member against said yielding tension with the web-feeding mechanism inoperative, a member moving with the bed to release said movable member, and a second member moving with the bed for moving said movable member to cause the operation of the web-feeding mechanism to cease and to cause the web-cutting mechanism to operate, one of said members moving with the bed being adjustable longitudinally thereof, substantially as described.

17. The combination of an impression-cylinder, a form-bed, web-feeding mechanism, web-cutting mechanism, a movable member which when moved in one direction causes the web-feeding mechanism to operate and when moved in the opposite direction causes the web-cutting mechanism to operate and the web-feeding mechanism to cease to operate, said member being under yielding tension to move into position to cause the web-feeding mechanism to operate, a latch 55 for holding the movable member against said yielding tension with the web-feeding mechanism inoperative, a member moving with the bed to engage said latch to release said movable member, and a second member moving with the bed for moving the movable member to cause the operation of the web-feeding mechanism to cease and to cause the web-cutting mechanism to operate, one of said members moving with the bed being adjustable longitudinally thereof, substantially as described.

18. The combination of an impression-cylinder, a form-bed, web-feeding mechanism, web-cutting mechanism, a movable member which when moved in one direction causes the web-feeding mechanism to operate and when moved in the opposite direction causes the web-cutting mechanism to operate and the

web-feeding mechanism to cease to operate, said member being under yielding tension to move into position to cause the web-feeding mechanism to operate, a latch 55 for holding the movable member against said yielding tension with the web-feeding mechanism inoperative, said latch being provided with a cam 61, a member moving with the bed to engage the cam 61 and raise the latch to release the movable member on the forward movement of the bed, said member being mounted to ride over the cam 61 on the return movement of the bed, and a second member moving with the bed for moving said movable member to cause the operation of the web-feeding mechanism to cease and to cause the web-cutting mechanism to operate, one of said members moving with the bed being adjustable longitudinally thereof, substantially as described.

19. The combination with an impression-roll and a form-bed, of the rocking frame 50, web-feeding roll 41 carried by the frame 50, driving-roll 46, cutting-blade 45 carried by the frame 50, said frame 50 being pivoted between the feeding-roll 41 and the cutting-blade 45, cutting-blade 44 between blade 45 and the impression-roll, means for rocking said frame, and a member moving with and adjustable longitudinally of the bed for controlling the rocking movement of the frame in one direction, substantially as described.

20. The combination with an impression-roll and a form-bed, of the rocking frame 50, web-feeding roll 41 carried by the frame 50, driving-roll 46, cutting-blade 45 carried by the frame 50, said frame being pivoted between the feeding-roll 41 and the cutting-blade 45, cutting-blade 44 between cutting-blade 45 and the impression-roll, and means for controlling the rocking movements of the frame 50 by the movement of the bed and according to the length of the form on the bed, substantially as described.

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

WILLIAM SPALCKHAVER.

Witnesses:

F. W. H. CRANE,
E. L. SPEIR.