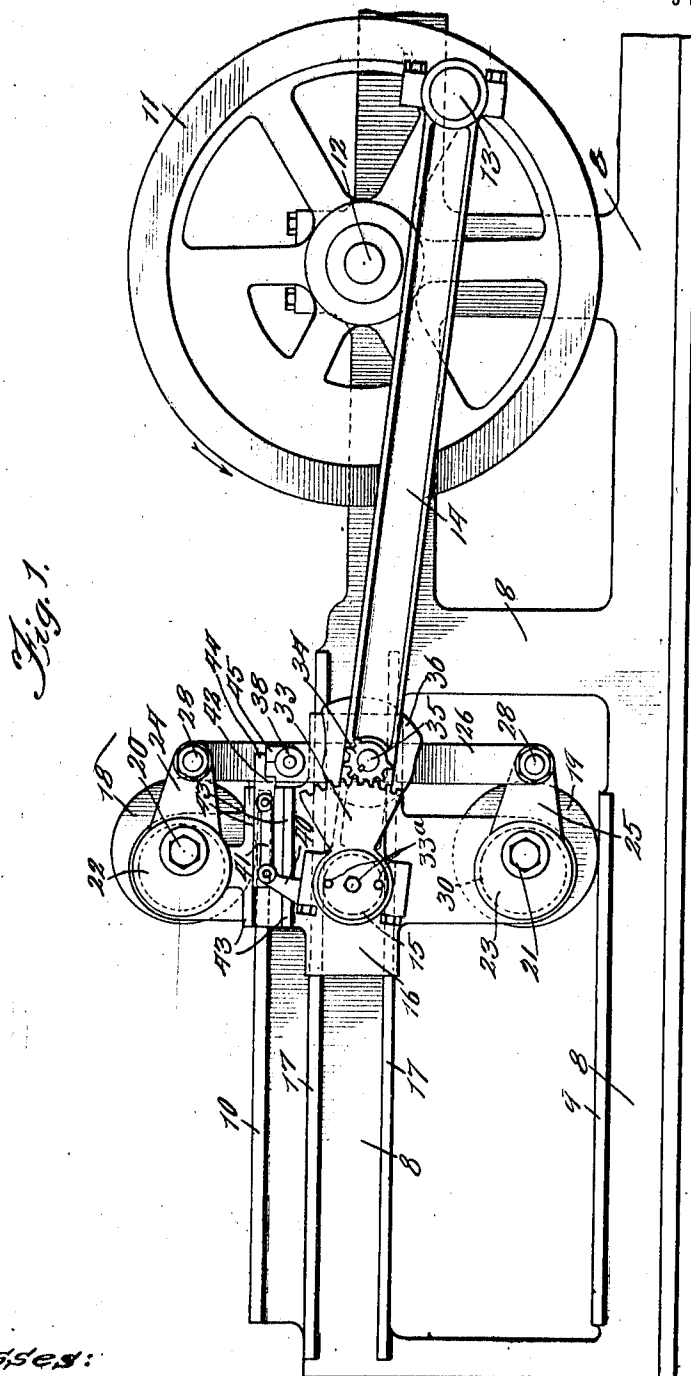


988,548.

P. F. COX.
WEB PERFECTING PRINTING PRESS.
APPLICATION FILED MAY 5, 1910.

Patented Apr. 4, 1911.

5 SHEETS--SHEET 1.



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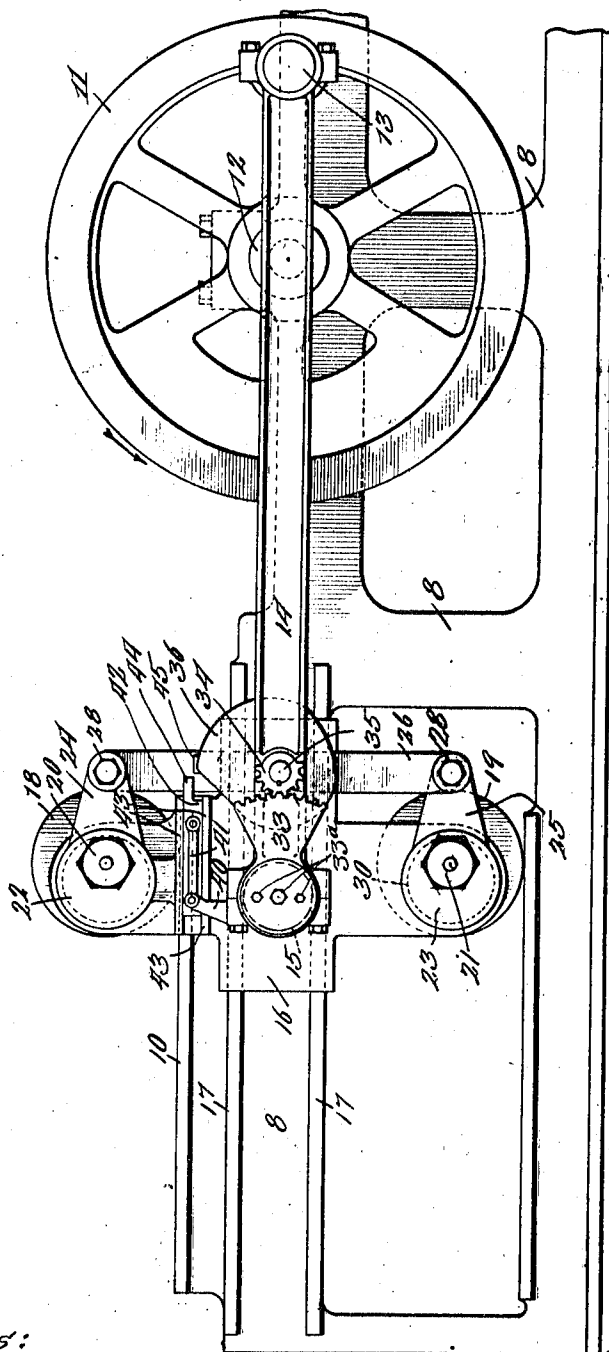
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5 SHEETS-SHEET 2.

Fig. 2.



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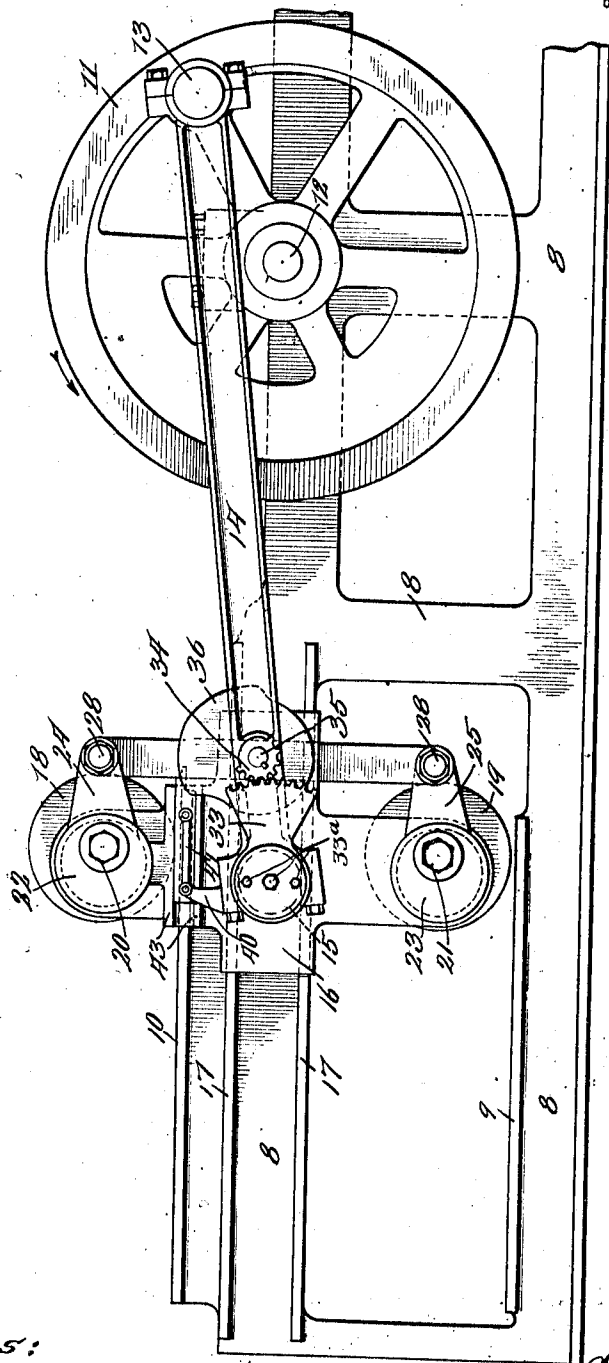
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5 SHEETS—SHEET 3.

Fig. 3.



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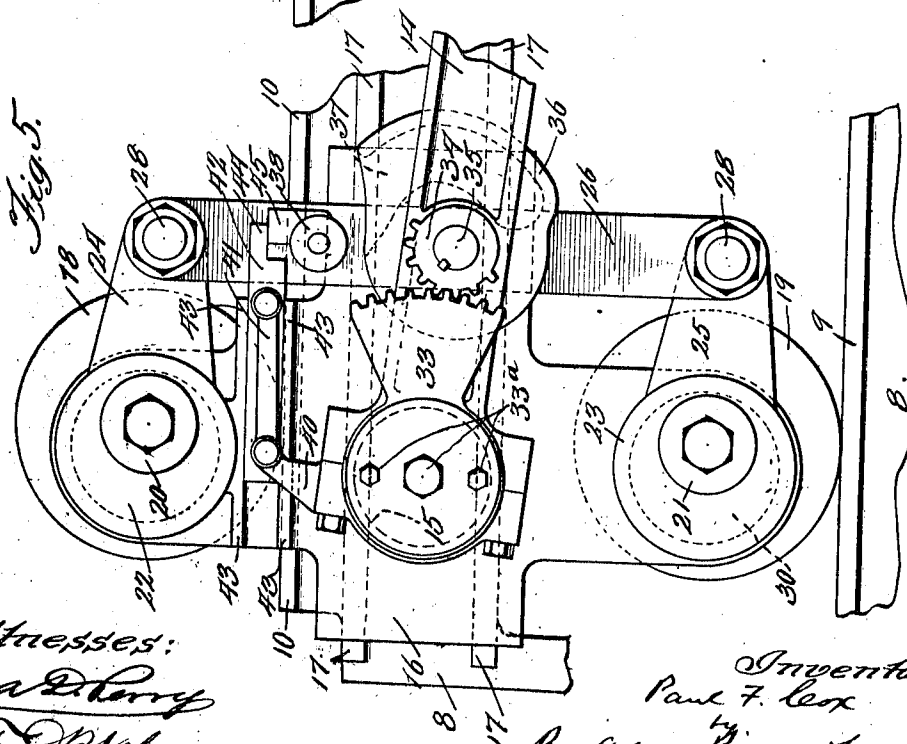
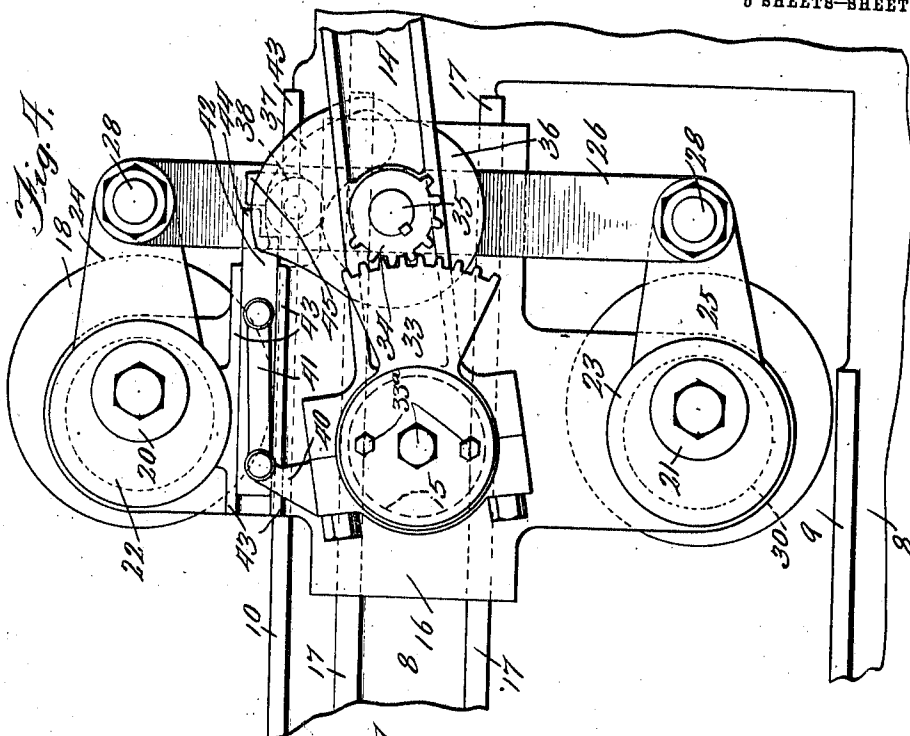
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APPLICATION FILED MAY 6, 1910.

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5 SHEETS—SHEET 4.



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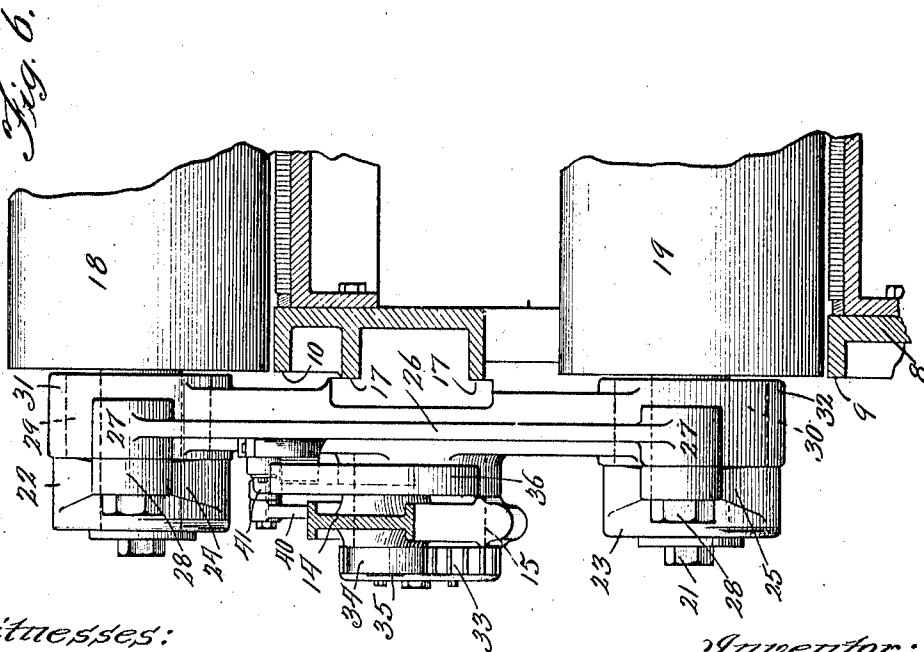
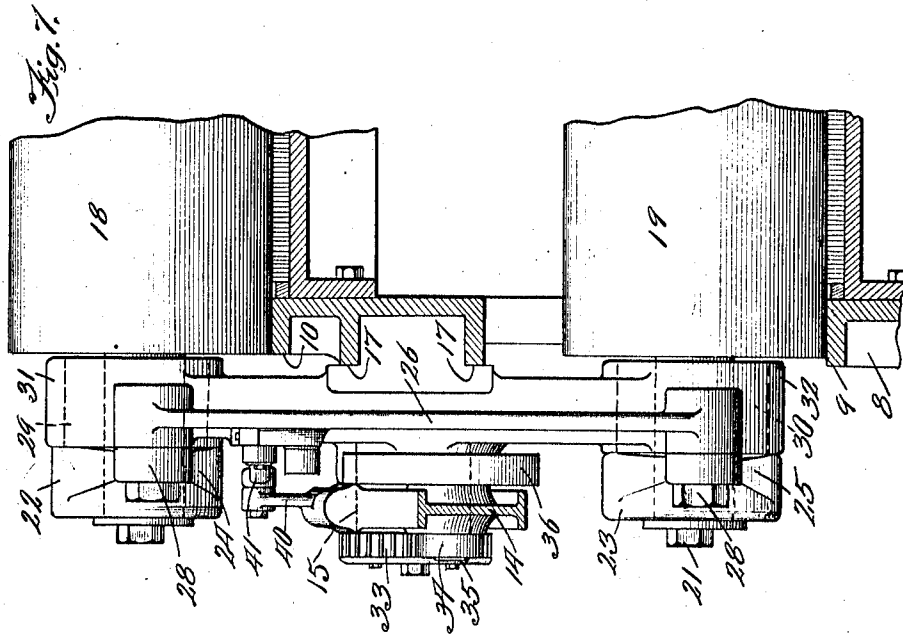
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P. F. COX.
WEB PERFECTING PRINTING PRESS.
APPLICATION FILED MAY 5, 1910.

988,548.

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6 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

PAUL F. COX, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

WEB-PERFECTING PRINTING-PRESS.

988,548.

Specification of Letters Patent.

Patented Apr. 4, 1911.

Application filed May 5, 1910. Serial No. 559,468.

To all whom it may concern:

Be it known that I, PAUL F. COX, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Web-Perfecting Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in web-perfecting printing-presses, and particularly to that type of web-perfecting printing-presses in which the web is perfected by the cooperation of stationary type-beds and traveling impression cylinders, and the main object of this invention is to provide a new and improved operating mechanism for the impression cylinders, by means of which they are lifted after their impression movement so as to be free of the type-beds for their return movement.

More particularly still this invention relates to mechanism for raising and lowering and locking such cylinders in their impression position by a direct connection with and operation by the driving-rod by which the carriage carrying said cylinders is reciprocated.

This invention has for a further object the improvement in printing mechanisms of this character in sundry details hereinafter set forth.

In the drawings,—Figure 1 is a side elevation of a portion of a press, showing the improvement, and showing the cylinders at almost the end of their impression movement and about to be lifted for the return stroke; Fig. 2 is a side elevation, showing the impression cylinders at the very end of their impression stroke and the cam just coming into engagement with the roller to lift them for their return stroke, and the stop moved so as to permit this upward movement; Fig. 3 is a view of the same parts, showing the cylinders lifted and just beginning the return stroke; Fig. 4 is an enlarged detail showing the impression cylinder operating mechanism in the same position as that in which the parts are in Fig. 3; Fig. 5 is an enlarged detail of the same parts as in Fig. 4, showing the impression cylinders nearly at the end of their printing position and with the locking mechanism moved partly backward before the cylinders are raised for their return stroke; Fig. 6 is an end view of

the parts shown in Fig. 4 and in the position shown therein; and Fig. 7 is an end view of the same parts, showing the mechanism in the position shown in Fig. 5.

Referring to the drawings,—8 indicates the frame of a portion of a printing press having type-beds 9 10.

11 indicates a fly-wheel mounted on shaft 12 which is journaled in the frame of the machine and driven by any suitable source of power (not shown).

13 indicates a crank-pin on the fly-wheel 11, to which a connecting-rod 14 is pivotally connected at one end. The other end of the driving rod 14 is journaled on the stud 15, fixed on the body of a traveling carriage 16 which is slidingly mounted upon suitable guides, as 17, on the frame 8 so as to reciprocate backward and forward thereon a suitable distance to enable the impression cylinders to travel backward and forward the length of the type-bed.

18 19 indicate impression cylinders of the well-known type and description, which are mounted, respectively, upon shafts 20 21. The shafts 20 and 21 are rotatably mounted, respectively, in cams 22 23 eccentrically of the centers of said cams. The drawings show only one side of the press, but it will be understood, of course, that the cams 22 and 23 are mounted one upon each end of the shafts 20 and 21, alike at each end.

24 25 indicate arms which are secured to the cams 22 23 and preferably integral therewith.

26 indicates links which are provided with hubs 27 at each end and are pivotally connected at each end with the outer ends of the arms 24 25 by means of studs 28. The eccentrics 22 23 are provided with journals 29 30, respectively, which are journaled, respectively, in suitable journal-boxes 31 32 on the carriage 16. It will be obvious that by raising or lowering the links 26 the eccentrics 22 23 will be rotated in their journals and the impression cylinders being eccentrically mounted in them the cylinders will be raised or lowered accordingly.

33 indicates a segmental rack, which is secured, as by bolts 33^a, to the outer end of the stud 15.

34 indicates a mutilated gear, which is keyed upon a short shaft 35 loosely journaled in the connecting-rod 14 so as to mesh with the segmental rack 33 as the connecting-rod

moves up and down, whereby as the connecting-rod swings in the rotation of the fly-wheel 11 the mutilated gear will be partially rotated back and forth in one direction and then in the other alternately.

36 indicates a cam secured on the other end of shaft 35 at the inner side of connecting rod 14 and having a cam-groove 37 best shown in Figs. 4 and 5.

38 indicates a roller journaled upon the link 26 and adapted as the cam 36 rotates to enter the cam-groove 37. The cam-groove is so shaped that when the cam is moved upward by the upward motion of the connecting-rod 14 and rotated contra-clockwise in the figures, the roller 38 as it enters it will move upward carrying with it the link 26, raising arms 24 and 25, rotating eccentrics 22 and 23 contra-clockwise, and thus lifting both impression cylinders simultaneously. When the impression cylinders are thus lifted about one-twelfth of an inch, the cam-groove is so shaped that, as the rotation of the cam continues and the carriage moves backward, the cylinders are held in this position. When the cam moves in the other direction the cam-groove reaches a position almost at the end of the stroke, at which it ceases to lift the roller 38, after which, as the rotation continues, it moves the roller 38 downward, carrying with it link 26, thus rocking arms 24 25 downward, partially rotating cams 22 and 23 in a clockwise direction in the figures, and lowering the impression cylinders.

40 indicates an arm on the head of the connecting-rod 14, to the upper end of which is pivotally connected a link 41 which, at its other end, is pivotally connected with a slide-bar 42 sliding in suitable guides 43 on the frame of the carriage 16. The forward end of the slide-bar 42 is suitably recessed to provide a projecting end 44, which, as the slide-bar 41 is slid forward, is adapted to engage with block 45 secured upon the side of the link 26. It will be obvious that, as the connecting-rod 14 is swung by the operation of the crank-pin and rotation of the fly-wheel 11 the arm 40 will be rocked backward and forward, and this motion will be communicated by link 41 to slide-bar 42, sliding it backward and forward in its ways. When the parts are in the position shown in Figs. 3 and 5, the end of the slide-bar 42 will rest upon and in contact with the block 45 and prevent any upward movement of the link 26 and hence any lifting of the impression cylinders during their printing impression.

It will be understood, as mentioned above, that all the above-described parts are duplicated upon each side of the machine, but as the drawings show only one side, and as the parts are duplicated, it is believed it is not necessary to show the other side of the machine. It will, of course, be understood also

that as far as the printing press itself is concerned, many parts have been omitted in order not to encumber the drawings with unnecessary illustration of parts which are well-known and understood to anyone skilled in the art and which form no part of my invention. The web, for instance, and the rollers which carry it are omitted; the inking mechanisms are omitted; and many other parts of the press which are well understood and which, if shown, would only unduly complicate the drawings.

The operation of the parts above described is as follows: Referring to Fig. 1, the parts are there shown with the fly-wheel in such position that the crank-pin has almost reached the forward limit of its motion to the right. The impression cylinders are shown, therefore, as almost at the end of their printing or impression stroke, and still in their lowered position, the slide-bar is shown as engaging stop 45, but drawn somewhat back so as to almost be ready to leave the same. As the movement continues, the parts are brought into the position shown in Fig. 2, in which the cylinders have reached the very end of their impression or printing movement and are still in their lowered position but with the roller entering into engagement with the cam-groove of cam 36 and just about to be lifted. The stop on the slide-bar has been moved completely away from engagement with the stop-lock so that the parts may be lifted. It will, of course, be understood that during this swinging of the connecting-rod the mutilated gear 34 will have been traveling upward along the segmental rack 33, rotating the gear contra-clockwise and carrying with it the cam 36. The parts being in the position shown in Fig. 2, the rotation continues, and the cam-groove in the cam 36 now operating lifts link 26, rocking the eccentrics so as to lift the impression cylinders, which, by the action of the connecting-rod 14 on carriage 16, are now being moved in their backward movement. After the parts have made a quarter of a revolution beyond the position shown in Fig. 2, the piston-rod, still driving the carriage backward in the return stroke, begins to lower, causing the rotation of gear 34 in the other or clockwise direction by its action on segmental rack 33 beginning to move the cam back in a clockwise direction. As this movement continues and the parts reach a position which is about a half a revolution from that shown in Fig. 1, the return movement of the carriage will be almost at its end, and the position of the roller in the cam-groove will be such that the roller will be beginning to be lowered. When the parts are in a position of about half a revolution beyond the position shown in Fig. 3, the lowering of the connecting-rod and consequently of the cylinders will

be complete and the carriage will have started upon its return movement. At the same time this downward swing of the connecting-rod will have swung arm 40 forward, bringing the slide-bar over the stop 45 and preventing any upward movement of the impression cylinders. The impression cylinders, therefore, in their lowest or printing position and locked in that position, travel forward over the type-bed to make the impression. The cam 36 will have been completely swung away from the roller 38, but the cylinders will be prevented from rising by the stop aforesaid. After the link has reached its lowermost position—that is to say, about three-quarters of a revolution from the position shown in Fig. 1—the parts will begin to move in the reverse direction until they have reached the position shown in Figs. 1 and 5, when the operation is repeated. It will thus be obvious that while the forward and backward movement of the connecting-rod reciprocates the carriage, the swing or oscillation of the connecting-rod on its pivotal connection with the carriage, caused by the fact that it is driven by a crank, is utilized directly to effect the rise and fall of the impression-cylinders. This swing or oscillation is also made use of to actuate the locking and unlocking mechanism by means of which the cylinders are locked in their printing position during the whole of the movement that makes the impression, and are unlocked at the end of such movement to permit of their being raised for their return movement. I am enabled, therefore, by my invention to do away with more or less complicated mechanism hitherto employed for this purpose and to directly make use of the oscillation or “swing” of the driving or connecting rod about its pivotal point on the carriage caused by the crank movement.

That which I claim as my invention, and desire to secure by Letters Patent, is,—

1. In a printing-press having a traveling impression-cylinder, in combination a crank, a driving-rod connected at one end to the crank and adapted to reciprocate said cylinder, and mechanism operated by the swing of said driving-rod to raise and lower said impression-cylinder.

2. In a printing-press having a traveling impression-cylinder, in combination a crank, a driving-rod connected at one end to the crank and adapted to reciprocate said cylinder, and mechanism operated by the swing of said driving-rod to lock said cylinder in printing position.

3. In a printing-press having a traveling impression-cylinder, in combination a crank, a driving-rod connected at one end to said crank and adapted to reciprocate said cylinder and to alternately move said cylinder into printing position and move said cylinder

out of printing position for its return movement, and means operated by the swing of said driving-rod to lock said cylinder while in printing position.

4. In a printing-press, in combination, a frame, a driving crank, a carriage slidably mounted on said frame, an impression cylinder mounted on said carriage, a driving rod connected at one end to said crank and at the other end to said carriage, and mechanism operated by the swing of the driving rod to raise and lower said impression cylinder.

5. In a printing-press, the combination with a frame, a driving-crank, a carriage slidably mounted on said frame and impression-cylinders mounted on said carriage, of a driving-rod connecting said crank to said carriage for reciprocating the same, and mechanism operated by the swing of said driving-rod to raise and lower said impression-cylinders.

6. In a printing-press, the combination with a frame, a driving-crank, a carriage slidably mounted on said frame and impression-cylinders mounted on said carriage, of a driving-rod connecting said crank to said carriage for reciprocating the same, and mechanism operated by the swing of said driving-rod to raise and lower said impression-cylinders and lock them in their printing position.

7. In a printing-press, the combination with a frame, a driving-crank, a carriage slidably mounted on said frame and impression-cylinders mounted on said carriage, of a driving-rod connecting said crank to said carriage for reciprocating the same, and mechanism automatically operated by the swing of said driving-rod to lock said cylinders in printing position and automatically unlock them at the end of the printing movement.

8. In a printing-press, the combination with a frame, a driving-crank, a carriage slidably mounted on said frame, eccentrics mounted on said carriage, and impression-cylinders eccentrically journaled in said eccentrics, of a driving-rod connecting said crank to said carriage for reciprocating the same, and means operated by said driving-rod to work said eccentrics and raise and lower said cylinders at suitable intervals.

9. In a printing-press, the combination with a frame, a driving-crank, a carriage slidably mounted on said frame, eccentrics mounted on said carriage, and impression-cylinders eccentrically journaled in said eccentrics, of a driving-rod connecting said crank to said carriage for reciprocating the same, arms on said eccentrics, a link connecting said arms, a roller on said link, a cam adapted to engage said roller and raise and lower said link to operate said eccentrics, and means operated by the movement of the driving-rod to operate said cam.

10. In a printing-press, the combination
with a frame, a driving-crank, a carriage
slidingly mounted on said frame and im-
pression-cylinders mounted on said carriage,
5 of a driving-rod connecting said crank to
said carriage for reciprocating the same,
means for alternately raising and lowering
said cylinders into and out of printing posi-
tion, a stop on said raising and lowering

means, and a slide-bar operated by said driv- 10
ing-rod and adapted to engage said stop
when said cylinders are in printing position
and to lock them during their printing
movement.

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Witnesses:

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