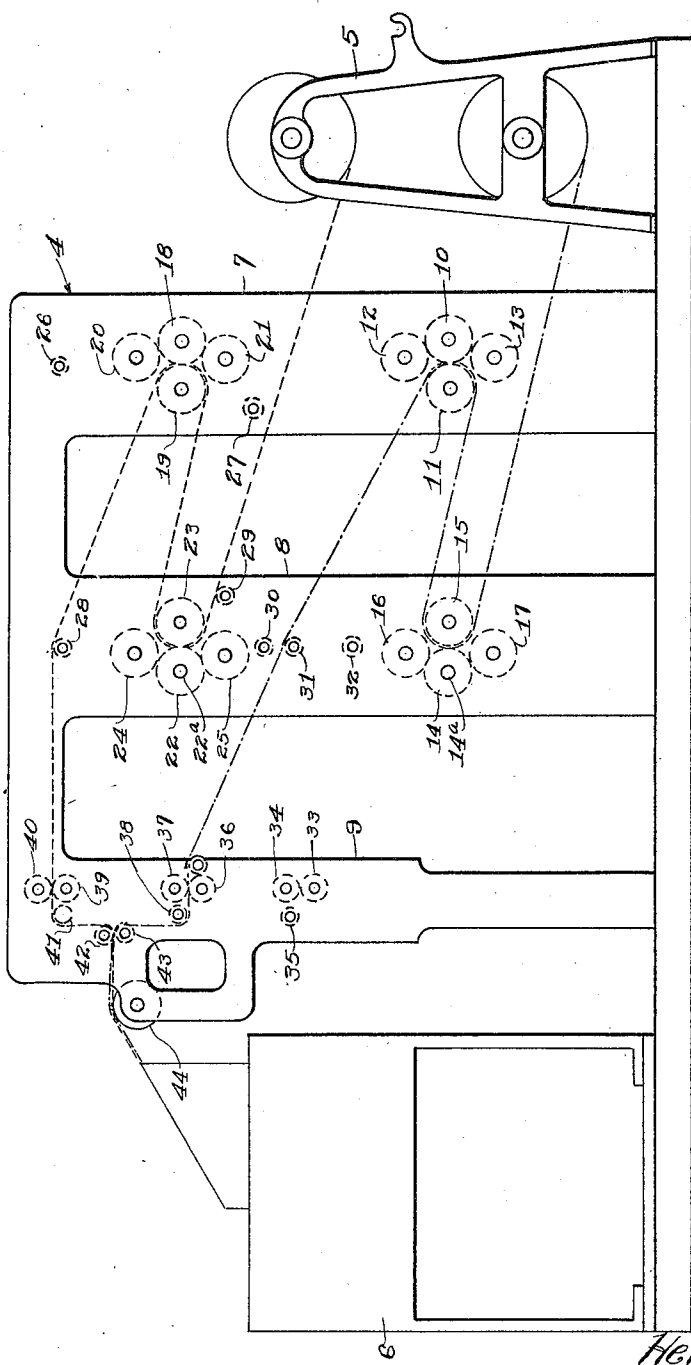


1,305,128.

H. LANGE.
MULTIWEB PRINTING PRESS.
APPLICATION FILED JAN. 8, 1917.

Patented May 27, 1919.
2 SHEETS—SHEET 1.

Fig. 1.

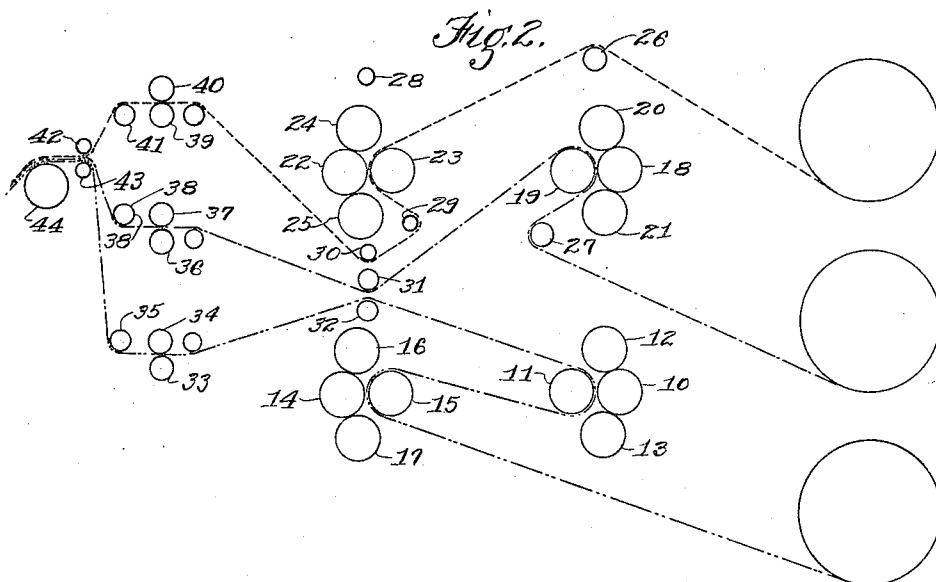
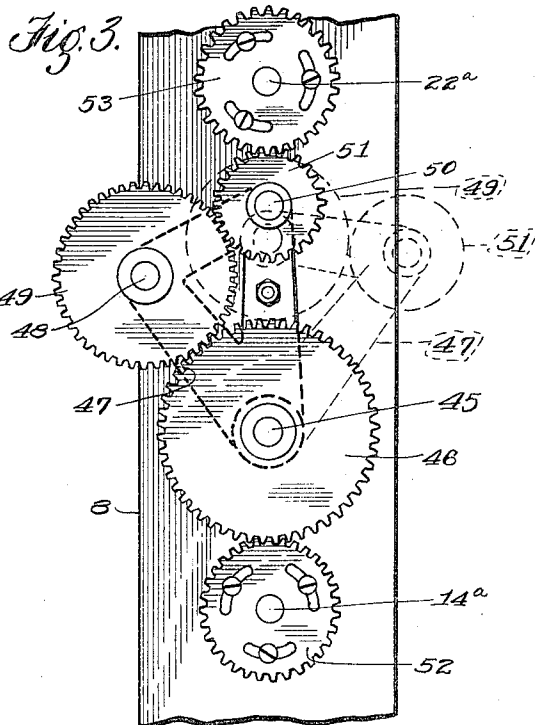


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HENRY LANGE, OF LOS ANGELES, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS,
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MULTIWEB-PRINTING PRESS.

1,305,128.

Specification of Letters Patent.

Patented May 27, 1919.

Application filed January 8, 1917. Serial No. 141,162.

To all whom it may concern:

Be it known that I, HENRY LANGE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Multiweb-Printing Presses, of which the following is a specification.

This invention relates to multi-web printing presses, and pertains especially to multi-deck presses.

Printing presses having sets of plate and impression cylinders arranged to print on two sides of one web and one side of two other webs have usually been constructed with three decks, one for each web. Two of the decks of such presses may be used to print on both sides of two webs. When the latter class of work is performed one of the decks is idle.

It is an object of this invention to provide a press in which only two decks are necessary to print on three webs, one on both sides and the other two on one side, or whereby two webs may be printed on both sides. This decreases the size of the press doing away with the idle deck resulting in obvious advantages. The feature of this invention resides particularly in the construction whereby one set of plate and impression cylinders may be used in coöperation with another set to print on both sides of a single web or for printing on one side of an independent web. The general direction of movement of the web is the same whether one or two webs are printed.

I accomplish the above objects by means of the embodiment of my invention illustrated in the accompanying drawing, in which:

Figure 1 is a side elevation.

Fig. 2 is a longitudinal sectional diagram taken inside of the frame.

Fig. 3 is an enlarged side elevation of the reversing gearing for a set of type and impression cylinders.

Referring more particularly to the drawing, 4 indicates the frame of a multiple deck printing press. The web roll rack is disposed at one end of the frame and indicated by 5. At the opposite end of the frame is an associating and delivering frame 6. The webs of paper are indicated by dotted lines and pass in their general movement from the web rolls through the machine to a con-

ducting roll, and then to the associating and delivering mechanism. With my printing press it is possible to print two webs of paper on both sides as indicated in Fig. 1, or three webs of paper, one web on both sides and the others on a single side as indicated in Fig. 2. This is accomplished by merely reversing the direction of rotation of one set of plate and impression cylinders, and passing the webs about the cylinders and over conducting rolls which are suitably arranged.

The frame 4 is shown herein constructed with three columns 7, 8 and 9. Journaled in column 7 near the base thereof is a plate cylinder 10, a coöperating impression cylinder 11, and inking cylinders 12 and 13. Journaled in column 8 adjacent the lower end is a plate cylinder 14, a coöperating impression cylinder 15, and ink cylinders 16 and 17. The sets of type and impression cylinders just described form one pair of cylinders in the lower deck. Journaled in column 7 adjacent the upper end of the frame is a plate cylinder 18 and an impression cylinder 19 coöperating therewith. Ink cylinders 20 and 21 are provided. Journaled in column 8 adjacent the upper end is a type cylinder 22, a coöperating impression cylinder 23, and ink cylinders 24 and 25. The last two sets of plate and impression cylinders described are members of a pair disposed in the upper deck of the press.

On column 7 and above the upper set of cylinders is a conducting roll 26. Disposed adjacent ink roll 21 and at one side thereof is a conducting roll 27. Disposed above the upper set of type and impression cylinders on column 8 is a conducting roll 28.

Disposed to one side and adjacent the inking cylinder 25 is a conducting roll 29. Disposed between the upper and lower sets of type and impression cylinders in column 8 are conducting rolls 30, 31 and 32. Disposed on column 9 at the upper end is a set of conducting rolls 39, 40 and 41. Disposed below this set of conducting rolls 39, 40 and 41, is a set of conducting rolls 36, 37 and 38. Disposed below the last mentioned set of conducting rolls is a set comprising rolls 33, 34 and 35. Disposed between the upper and intermediate set of rolls in column 9 is a pair of conducting rolls 42 and 43. A conducting roll 44 is disposed to lead the webs to the associating and delivering mechanism.

Referring to Fig. 1, two webs are passed through the press itself and printed on both sides thereof. These webs are superimposed in registry as they leave the machine passing
 5 between conducting rolls 42 and 43, and over conducting roll 44 on column 9. The lower web passes forward to the set of type and impression cylinders in the lower deck on column 8. Around the impression cylinder
 10 15, back to the impression cylinder 11 in the lower deck on column 7, around this cylinder forwardly over conducting roll 31 on column 8, between conducting rolls 36 and 37 on column 9, then around conducting roll 38
 15 and between conducting rolls 42 and 43. The upper web is led forward around impression cylinder 23 in column 8, back around impression cylinder 19 in column 7, forward over conducting roll 28 in column 8,
 20 then forward between conducting rolls 39 and 40, over conducting roll 41, and between conducting rolls 42 and 43. It will be noted that the webs are printed on both sides and finally superimposed in registry between the
 25 rolls 42 and 43.

When it is desired to print three webs of paper, one of the webs being printed on both sides, and the other two webs one on each side, the webs are passed through the machine as shown in Fig. 2. The webs are superimposed in registry and pass from the machine. The finished work is suitable for triplicate sales-books, or other work of a like character, and the webs printed on one side
 30 should be superimposed with the printed sides facing in the same direction. The lower web of paper is printed on both sides and is passed through the sets of plate and impression cylinders in the lower deck as in
 40 Fig. 1. The web as it leaves impression cylinder 11 is passed over conducting roll 32, then between conducting rolls 33 and 34, around conducting roll 35 and between conducting rolls 42 and 43. The intermediate
 45 web is passed forwardly around conducting roll 27, then around impression cylinder 19, then around conducting roll 31 forwardly between conducting rolls 36 and 37, around conducting roll 38 and between conducting
 50 rolls 42 and 43. It will be noted that the set of plate and impression cylinders in the upper deck of column 7 rotate in the same direction as in Fig. 1, and that the web is printed on the upper side. For this reason
 55 the upper web must pass through the set of plate and impression cylinders in the upper deck on column 8 in an opposite direction from that in Fig. 1. The upper web is passed over conducting roll 26 around im-
 60 pression cylinder 23, then over conducting rolls 29 and 30, between conducting rolls 39 and 40, around conducting roll 41 and then between conducting rolls 42 and 43. The web in its movement will be printed
 65 upon the upper side, but as will be noted from

the arrows shown in Figs. 1 and 2 on the impression roll 23, the set of plate and impression rolls must rotate in the opposite direction.

I have provided means for changing the
 70 direction of rotation of the upper set of plate and impression rolls. The gearing for operating all of the sets of plate and impression cylinders is mounted on the side of the frame opposite to that shown in Fig. 1, and
 75 may be of any suitable kind consisting of intermeshing gears.

In Fig. 3, the shaft 45 has mounted thereon a main driving gear 46. This meshes with the driven gear or pair pinion 52
 80 mounted on shaft 14^a to which is secured the printing cylinder 14. Pivotaly mounted on shaft 45 and thereby concentrically pivotally adjustable relative to the gear 46 is a
 85 triangular frame 47. A shaft 48 is secured to frame 47 and rotatably mounted thereon is a gear or pinion 49 meshing with gear 46. Mounted on the third corner of frame
 90 47 is a shaft 50 upon which a gear or pinion 51 is rotatably mounted. Gear 51 meshes with gear 49, and in the position shown in full lines in Fig. 3 meshes with a gear or
 95 pair pinion 53. Gear 53 is fixed to shaft 22^a upon which is mounted the printing cylinder 22 whose direction of rotation may be reversed. In the position shown in full
 100 lines gear 46 drives gear 49, and the latter drives gear 51; gear 51 drives gear 53, rotating plate cylinder 22 in one direction. When it is desired to reverse the direction
 105 of rotation, the frame 47 is swung or adjusted to the position shown in dotted lines in Fig. 3, throwing gear 51 out of mesh with gear 53 and placing gear 49 directly in mesh with gear 53. Gear 53 is then driven
 110 by gear 49 which meshes with gear 46, and the direction of rotation of plate cylinder 22 is reversed.

From the above it will be seen that the sets of the pair of plate and impression cylinders in the upper deck are spaced from
 115 each other in the direction of the general movement of the webs through the press, and also that the two pairs are spaced from each other in the direction transversely of the general movement. By the disposition
 120 of the conducting rolls, or guiding elements 30, 31, and 32, between the pairs, the location of similar elements opposite each set of the upper deck on the side remote from the lower pair, and the location of other
 125 guiding elements between the pairs in planes between the sets of the upper pair, and the provision for the rotation of the posterior set of the upper pair in either of opposite
 130 directions, the press may be employed to print two webs on opposite sides and register them for delivery, or three webs may be printed, one on opposite sides by the sets of one deck, and two others on one side by

the individual sets of the other deck. And it is to be noted that notwithstanding the fact that the sets in one deck are arranged to print opposite sides of a single web, when
5 two webs are printed in said deck, the printed faces of these two webs will face in the same direction when delivered from the machine.

What I claim is:

10 In a multi-deck printing press, in combination, a plurality of pairs of plate and impression cylinders, said pairs being arranged in sets of two pairs each, one set in one deck and another set in another deck, each set
15 adapted to print on opposite sides of webs, and means whereby a pair in one deck and a pair in another deck are driven comprising

a pair pinion adapted to operate one pair, a main driving gear, a frame concentrically pivotally adjustable relative to said main
20 driving gear, and intermeshing pinions carried by said frame, one of said intermeshing pinions being arranged to mesh with said pair pinion at one position of said frame, and the other at another position of said
25 frame, said last mentioned pinion meshing with said main driving gear in either position of said frame, and being out of mesh with said pair pinion when the other frame
30 pinion is in mesh therewith.

In witness that I claim the foregoing I have hereunto subscribed my name this 22nd day of December, 1916.

HENRY LANGE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."