

No. 648,938.

Patented May 8, 1900.

J. L. FIRM.
PRINTING PRESS.

(Application filed Nov. 23, 1899.)

(No Model.)

6 Sheets—Sheet 1

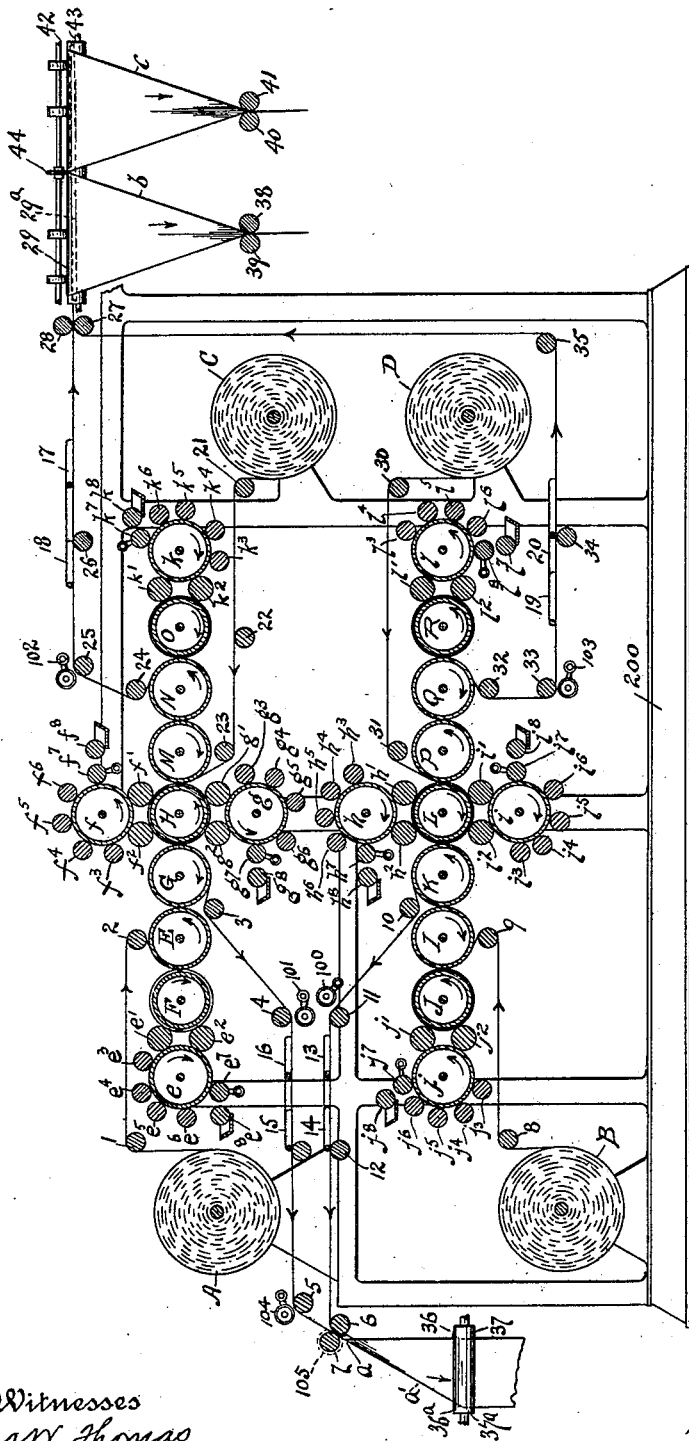


Fig. 1.

Witnesses
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H. L. Reynolds.

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6 Sheets—Sheet 2.

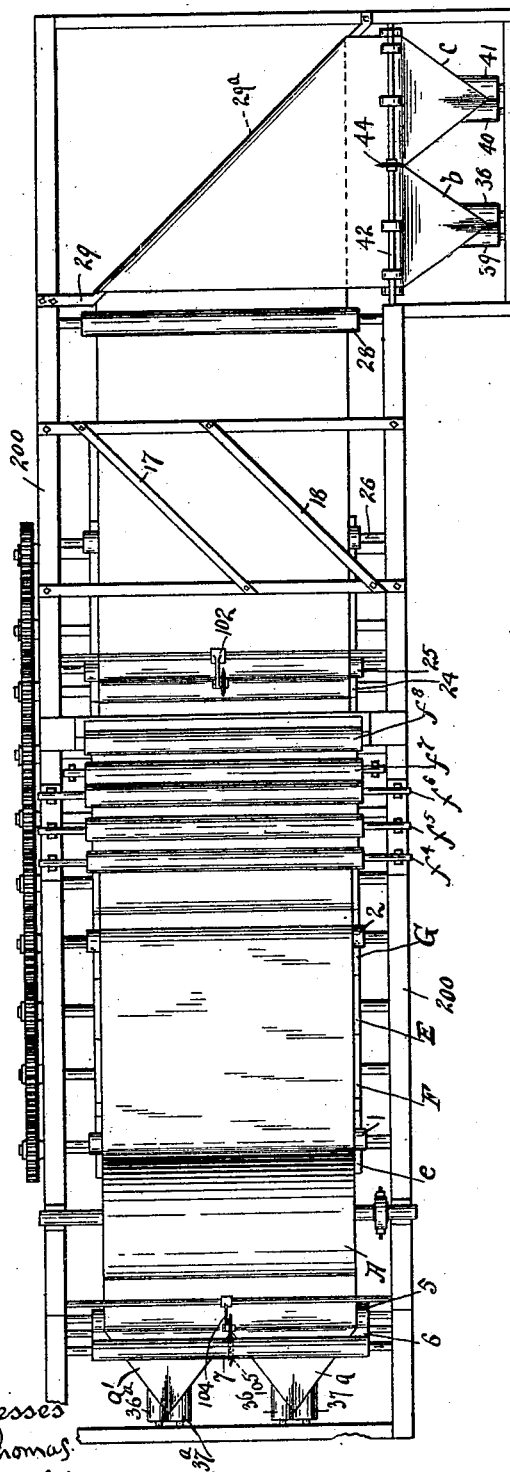


Fig. 2.

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6 Sheets—Sheet 3.

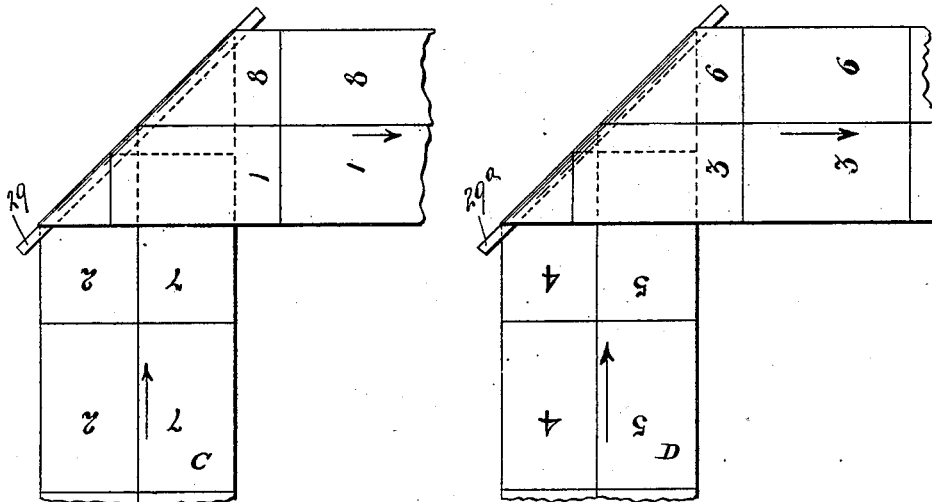


Fig. 3.

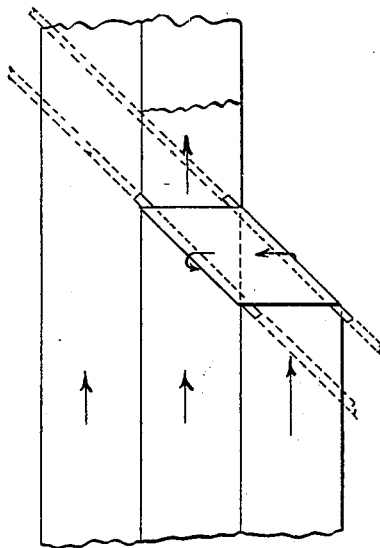


Fig. 4.

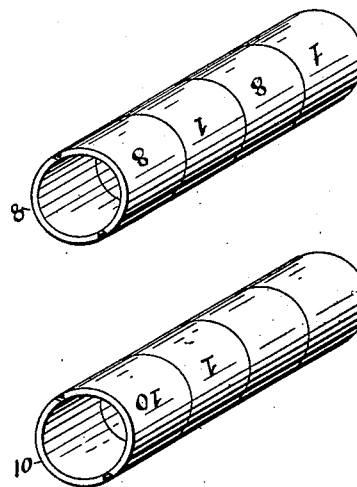


Fig. 5.

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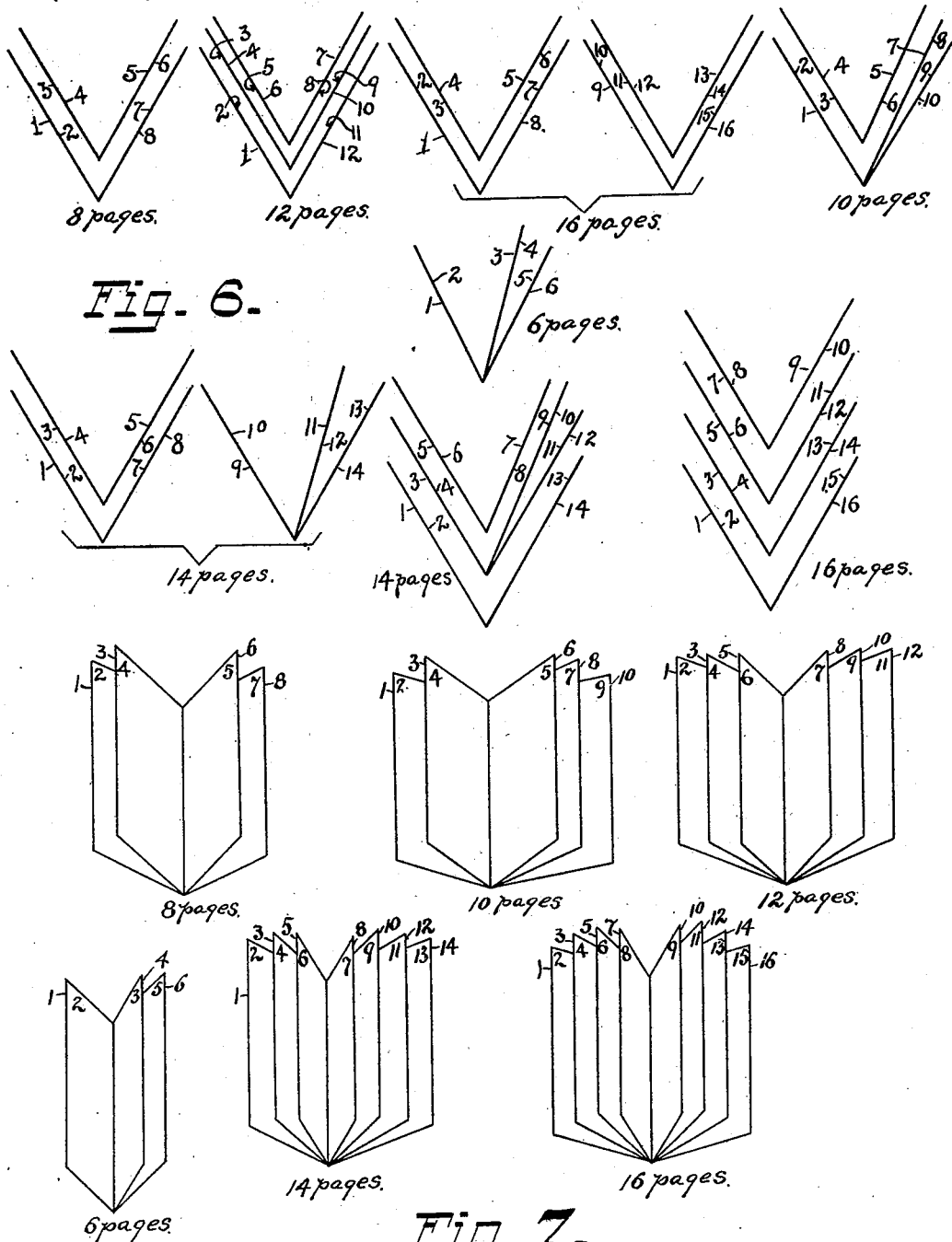
Patented May 8, 1900.

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PRINTING PRESS.

(Application filed Nov. 23, 1899.)

(No Model.)

6 Sheets—Sheet 4.



Witnesses
Chas. W. Thomas.
H. L. Reynolds.

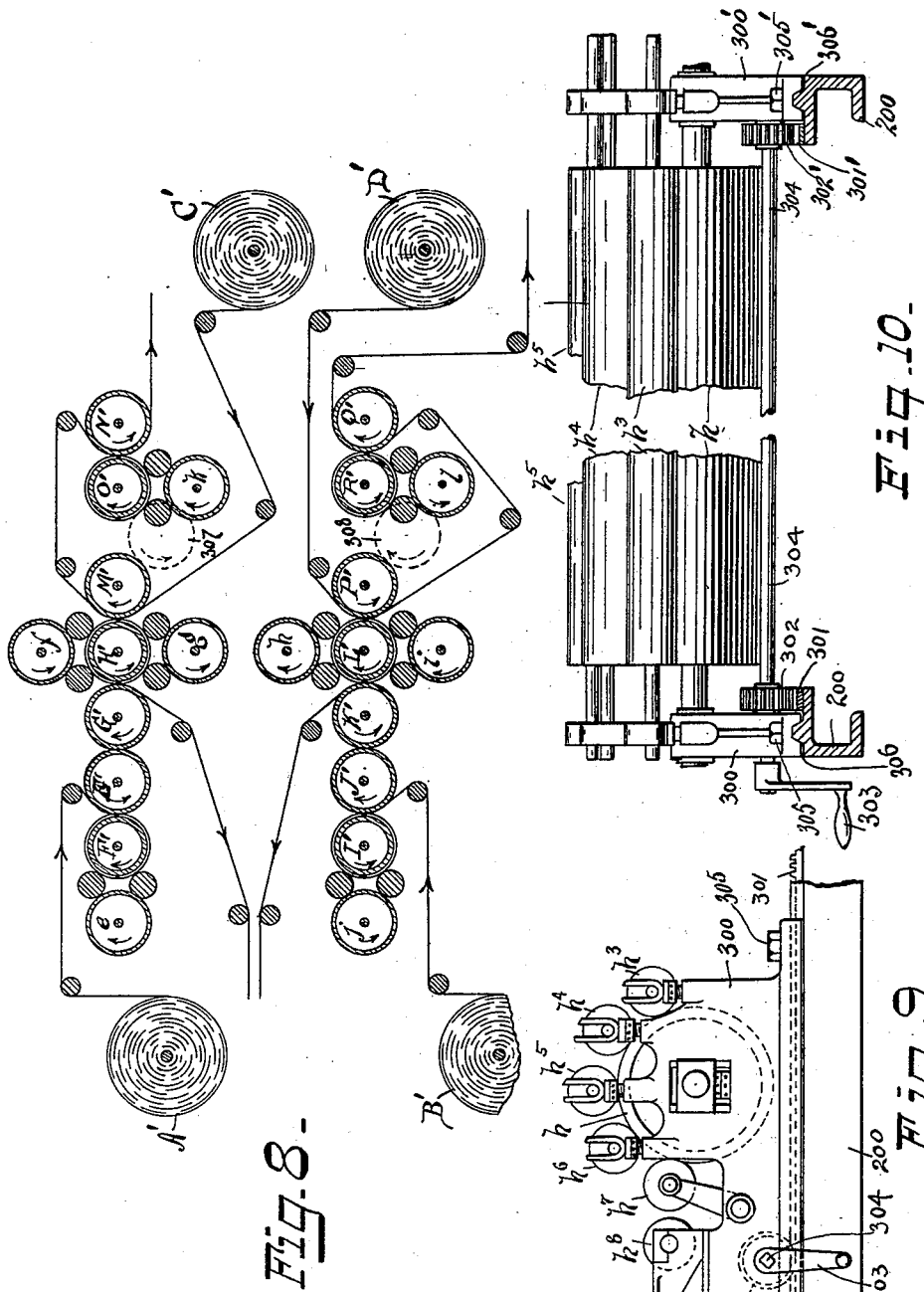
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(Application filed Nov. 23, 1899.)

(No Model.)

6 Sheets—Sheet 5.



Witnesses
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(Application filed Nov. 23, 1899.)

(No Model.)

6 Sheets—Sheet 6.

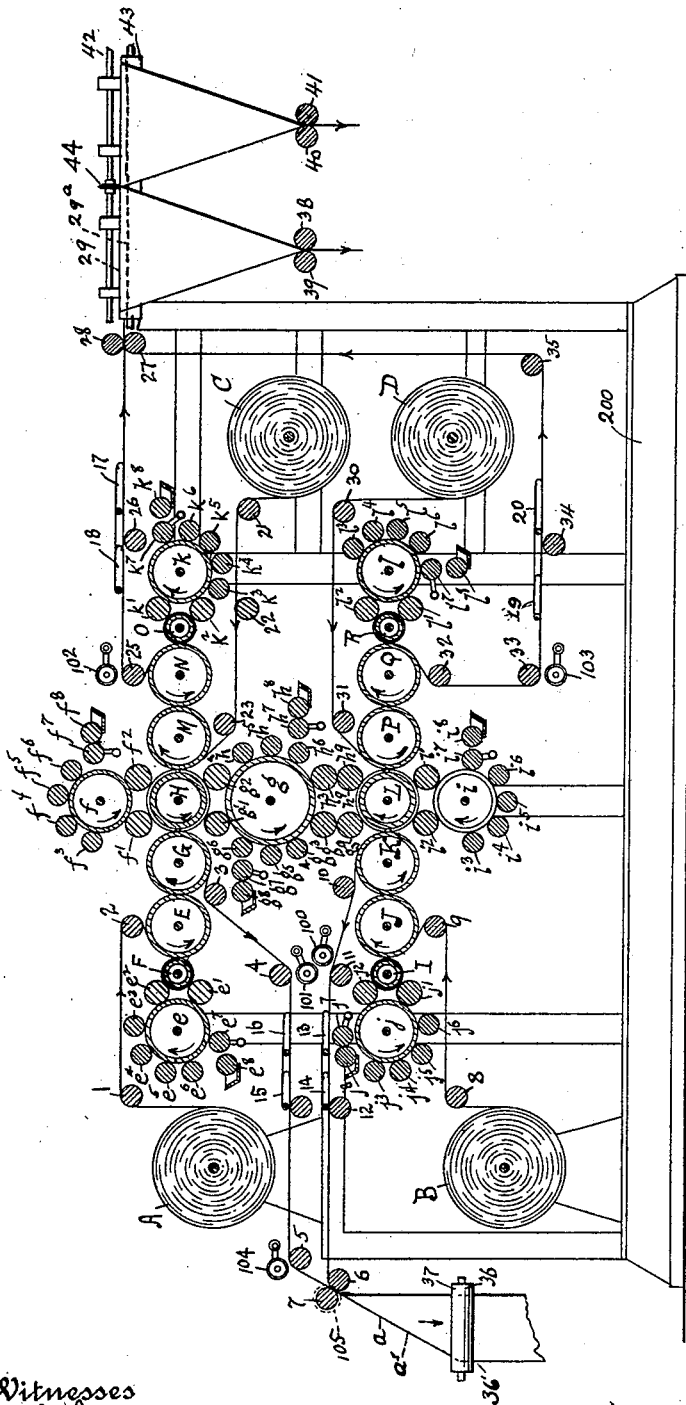


Fig. 11.

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UNITED STATES PATENT OFFICE.

JOSEPH L. FIRM, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE GOSS
PRINTING PRESS COMPANY, OF CHICAGO, ILLINOIS.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 648,938, dated May 8, 1900.

Application filed November 23, 1899. Serial No. 737,989. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. FIRM, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State
5 of New Jersey, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

The principal object of my invention is to provide a new and improved printing-press
10 which is adapted to print a plurality of copies of a newspaper or pamphlet on continuous webs and to assemble the webs belonging to the respective newspapers or pamphlets in an expeditious manner by a less number of forms
15 or plates than heretofore used.

Another object of my invention is to economize space and construction by having less form and impression cylinders where a plurality of webs are used, making a machine
20 more compact in form and less liable to get out of order in operation.

Many of the parts of my improved press are substantially similar to presses heretofore in use, and it will therefore be necessary for me
25 to show and describe only such parts as are necessary for understanding novel features.

Figure 1 of the accompanying drawings is a vertical longitudinal section at right angles with the axes of the printing-cylinders. Fig.
30 2 is a plan view of the press. Fig. 3 shows the position in which the pages are printed, from one to eight, inclusive, on the webs C and D of Fig. 1. Fig. 4 shows the manner of turning a portion of the web laterally onto
35 another portion of the same web. Fig. 5 shows the arrangement of forms on certain of the form-cylinders. Fig. 6 shows in edge view the position of the pages in signatures containing, respectively, six, eight, ten, twelve,
40 fourteen, and sixteen pages. Fig. 7 shows the same in isometrical view. Fig. 8 is a modified arrangement of the printing-cylinders. Fig. 9 is a detail of the mounting of an inking-cylinder in end view. Fig. 10 is a side view of
45 the same. Fig. 11 is a modification of Fig. 1.

The form and impression cylinders, the inking-rolls, and the web-holding rolls are all mounted with their axes parallel upon the frame 200. The location of these rolls and
50 the positions of the guide-rolls will best be

explained by describing the path of each web through the machine.

The supply-rolls of webs A and B are located one above the other at one end of the printing mechanisms. The supply-rolls of
55 the webs C and D are located one above the other at the opposite end of the printing mechanisms. The folding mechanism *a a'* for the webs A and B is located at the end of the machine outside of the supply-rolls for those
60 webs. The folding mechanism *b c* for the webs C and D is located at the opposite end of the machine and outside of the supply-rolls of the webs C and D. Thus the printing mechanisms are grouped at the middle of the machine,
65 and at each end thereof are placed two web-supplying rolls and the mechanism for folding the same after printing.

Each web for the purpose of being printed proceeds from its supply-roll toward the middle
70 of the machine, the webs of one end proceeding inversely to those at the opposite end. After being printed each web returns toward the end of the machine from which it started and proceeds past its supply-roll to the folding
75 mechanism located behind its supply-roll at that end.

The printing mechanisms for the several webs are arranged so that the pair of printing mechanisms for the two upper webs coming from opposite ends of the machine occupy
80 corresponding positions horizontally and the pair of printing mechanisms for the lower webs coming from opposite ends of the machine occupy corresponding positions beneath
85 the first pair. One form-cylinder, as H, is made to serve in both the printing mechanisms of the first pair and another form-cylinder, as L, is made to serve in both printing mechanisms of the second pair. The form-
90 cylinders F and H print upon the web A and the form-cylinders O and I print upon the web C. Similarly the form-cylinders J and L print upon the web B and the form-cylinders R and L print upon the web D. The two
95 central form-cylinders H and L may receive ink from different or from the same inking mechanism interposed between them, as shown, respectively, in Figs. 1 and 11, as well as from additional inking mechanisms lo-
100

cated, respectively, above and below. These inking mechanisms, as herein shown, consist of the cylinders f , g , h , and i and their cooperating rollers f' to f^s , inclusive, g' to g^s , inclusive, h' to h^s , inclusive, and i' to i^s , inclusive, but may be of any approved construction. The other form-cylinders F, O, J, and R are provided with corresponding inking mechanisms consisting of the cylinders e , k , j , and l , with their cooperating rollers e' to e^s , inclusive, k' to k^s , inclusive, j' to j^s , inclusive, and l' to l^s , inclusive.

The web A passes over the rollers 1 and 2 and to about the impression-cylinder E and is printed upon one side by the form-cylinder F. It then passes about the impression-cylinder G and is printed on its opposite side by the form-cylinder H. It then passes over the guide-roller 3, under roller 4, where it is acted upon by the slitter 101 to separate such sections of the web as is necessary, and then past the bars 15 and 16, by which any section of the webs may be imposed upon another, if desired. It then passes over the roller 5, where the sections of the web may be further divided by the slitter 104, and then between rollers 6 and 7 to the folding mechanism a and a' . The web C has a similar course over rollers 21 and 22, beneath rollers 23, about impression-cylinders M and N, where it is printed by the form-cylinders I and O, over guide-rollers 24 25, where it may be slit by the slitters 102, over roller 26 and bars 17 and 18, if desired, to impose one section upon another, between rollers 27 and 28, and then over rollers 43, where it is engaged by the slitter 44, and thence between rollers 38, 39, 40, and 41 to the folding mechanism.

The web from roll B passes over roller 8, under roller 9, about impression-cylinders I and K, where it is successively acted upon by form-cylinders J and L to print opposite sides, then under roller 10, over roller 11, where it is acted upon by slitter 100, if desired, past bars 13 14, by which one section may be imposed upon another, over roller 12, between rollers 6 and 7, where it is associated with the web A and acted upon by slitters 105, and then to the folding mechanism a and a' .

The web D passes over rollers 30 and 31, about impression-cylinders P and Q, where it is acted upon by form-cylinders L and R to print both sides, about rollers 32 and 33, where one or more of the sections are severed by the slitter 103, if desired, past the bars 19 and 20, by which one section may be imposed upon another, over roller 34, under roller 35, between rollers 27 and 28, where it is associated with the web C, and thence to the folding mechanism b and c .

In Figs. 8 and 11 the general course is the same, the differences consisting, mainly, in shifting the relative position of some of the impression and inking cylinders. In Fig. 8 two of the impression-cylinders N' and D' are located outside of the form-cylinders O' and

R', and their inking-cylinders k and l are placed beneath these form-cylinders.

In Fig. 11 the outer form-cylinders I, F, O, and R are made of half the size of the form-cylinders H and L, and a common inking-cylinder g is used for the form-cylinders H and L.

The form-cylinders H and L each print upon two different webs at a time—the cylinder H upon the webs A and C and the cylinder L upon the webs B and D—thus saving many plates and forms, the number depending upon the number of different papers being printed. Where eight copies of eight-page papers are being printed at each revolution, sixty-four different forms would ordinarily be required, whereas by the arrangement herein shown, the central form-cylinders being used for all papers, one-quarter of the above number of forms, or sixteen, are saved, necessitating only forty-eight instead of sixty-four. The same is true when printing four copies of sixteen-page papers.

In printing eight-page papers four full-width webs are used, which are slit on their central line and each folded longitudinally.

In printing a larger paper one or more of the sections of the web alongside the central line is slit clear of the body of the web and turned over bars, as 15 16, upon the section on the other side of the central line and is folded with it and its attached outer section.

In case ten, twelve, or fourteen page papers are being printed certain of the webs are either half or three-quarters width, and one section is slit from the others and turned over upon them, as shown in Fig. 4. For ten-page papers two half-width webs and two three-quarter-width webs are used. For twelve-page papers two half-width webs and two full-width webs are used, the full-width webs being slit centrally and the two halves superposed by the bars, as 15 16, before reaching the folders. For fourteen-page papers two full-width webs and two three-quarter-width webs are used, and for sixteen-page papers four full-width webs are used, the webs in both cases being slit on the center line of the machine and the parts superposed, as described, before reaching the folders. In each case one-quarter of the usual number of plates is saved.

In Figs. 9 and 10 the inking mechanism is shown mounted so that it may be moved to one side to facilitate putting the plates upon the cylinders H and L. The inking mechanism is mounted upon a frame which slides upon guides on the main frame 200 and carries a shaft 304, which has pinions 302 302' thereon engaging racks 301 301' on the main frame, the shaft having a crank 303 attachable to one end thereof.

I claim—

1. In a rotary printing-press, in combination, a pair of printing mechanisms having a common form-cylinder with the remaining cylinders of each mechanism grouped between

said common form-cylinder and an opposite end of the machine, web-supply rolls and folding mechanisms located at each end of the machine and guiding mechanisms whereby
5 each web is conducted from its supply-roll toward the middle of the machine and thence back again to the folding mechanism located at the same end of the machine.

2. In a rotary printing-press, in combination, plural pairs of printing mechanisms each pair having a common form-cylinder and the remaining cylinders of each mechanism of the pair extending from said common form-cylinder oppositely from those of the
10 other mechanism, web-supply rolls and folding mechanisms for said printing mechanisms, and associating and folding mechanisms combining the webs from one printing mechanism of different pairs, substantially as described.
20 described.

3. In a rotary printing-press in combination with printing mechanisms grouped in pairs, each pair having a common form-cylinder and other cylinders extending oppositely from said common form-cylinder, a web-supply for each printing mechanism, web-guiding mechanisms conducting one of the webs of each pair first to the common form-cylinder and then to its individual cylinder,
25 and the other web of the pair first to its individual form-cylinder, and last to the common form-cylinder, substantially as described.
30

4. In a rotary printing-press in combination with printing mechanisms grouped in
35 pairs, each pair having a common form-cylinder and other cylinders extending oppositely from said common form-cylinder, a web-supply for each printing mechanism, web-guiding mechanisms conducting one of the webs of each pair first to the common form-cylinder and then to its individual cylinder,
40 and the other web of the pair first to its individual form-cylinder, and last to the common

form-cylinder, and associating and folding mechanisms combining and folding the webs
45 from corresponding printing mechanisms of different pairs, substantially as described.

5. In a rotary printing-press, in combination a pair of printing mechanisms having a common form-cylinder, and an individual
50 form-cylinder for each printing mechanism, two impression-cylinders for each printing mechanism located between the individual form-cylinder and the common form-cylinder, said form and impression cylinders being
55 grouped in a row, two inking mechanisms for the common form-cylinder placed laterally of and one at each side of said row of form and impression cylinders, and an inking mechanism for each individual form-cylinder and
60 forming a continuation of said row, substantially as described.

6. In a rotary printing-press, in combination a pair of printing mechanisms having a common form-cylinder, and an individual
65 form-cylinder for each printing mechanism, two impression-cylinders for each printing mechanism located between the individual form-cylinder and the common form-cylinder, said form and impression cylinders being
70 grouped in a row, two inking mechanisms for the common form-cylinder placed laterally of and one at each side of said row of form and impression cylinders, and an inking mechanism for each individual form-cylinder and
75 forming a continuation of said row, and web-guiding mechanisms passing the web about the impression-cylinders to contact with the form-cylinders in the two sets of printing mechanisms in inverse order or with the common form-cylinder first in one set and last in
80 the other.

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Witnesses:

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