

No. 677,737.

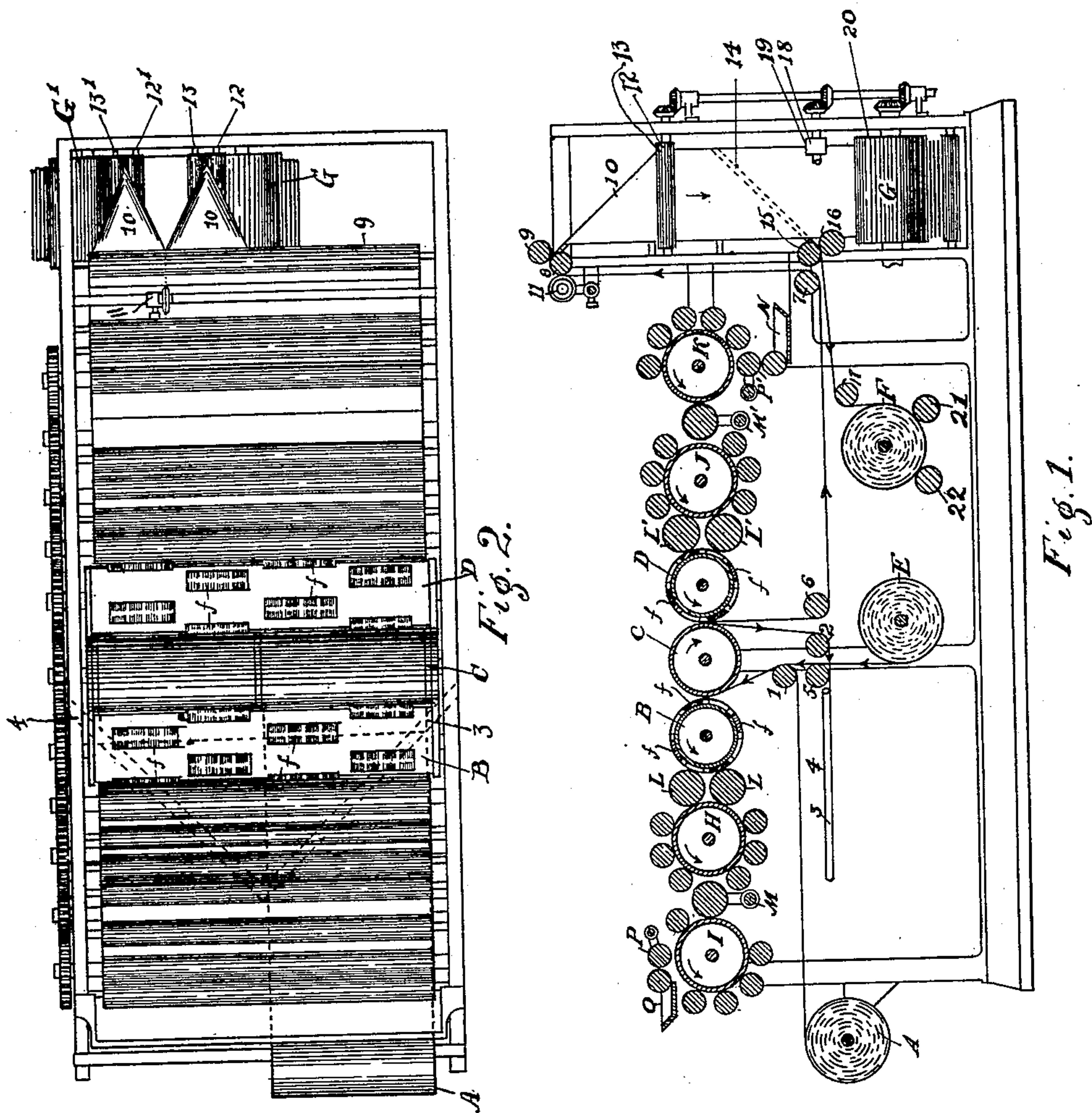
Patented July 2, 1901.

J. L. FIRM.
PRINTING PRESS.

(Application filed Nov. 12, 1900.)

3 Sheets—Sheet 1.

(No Model.)



Witnesses
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3 Sheets—Sheet 2.

Fig. 3.

B	Blank	7	Blank	9
	Blank	15	Blank	14
	Blank	2	Blank	3
	Blank	10	Blank	11

Fig. 4.

B	Blank	5	Blank	8
	Blank	13	Blank	16
	Blank	4	Blank	1
	Blank	12	Blank	6

Fig. 5.

Fig. 6.

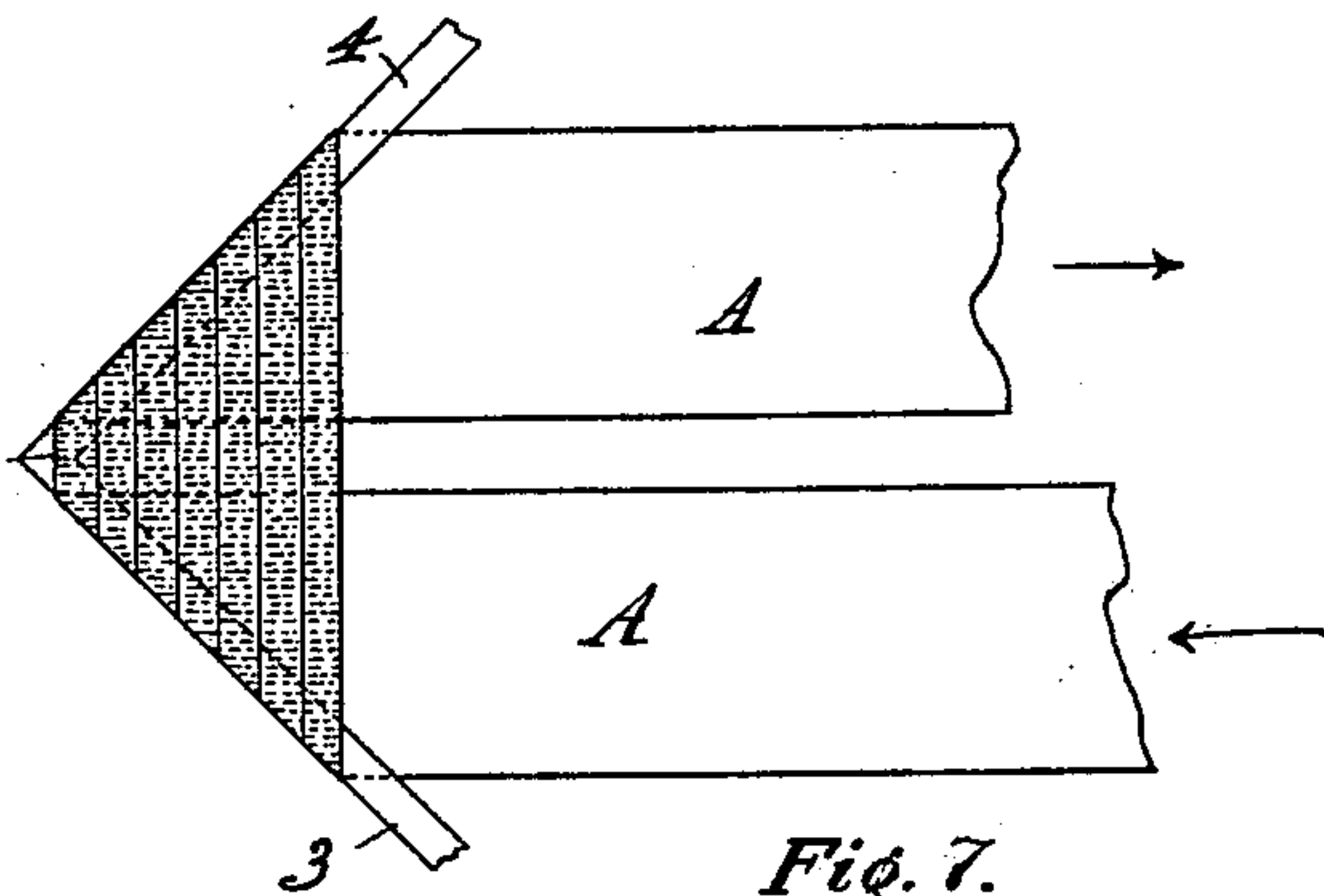


Fig. 7.

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3 Sheets—Sheet 3.

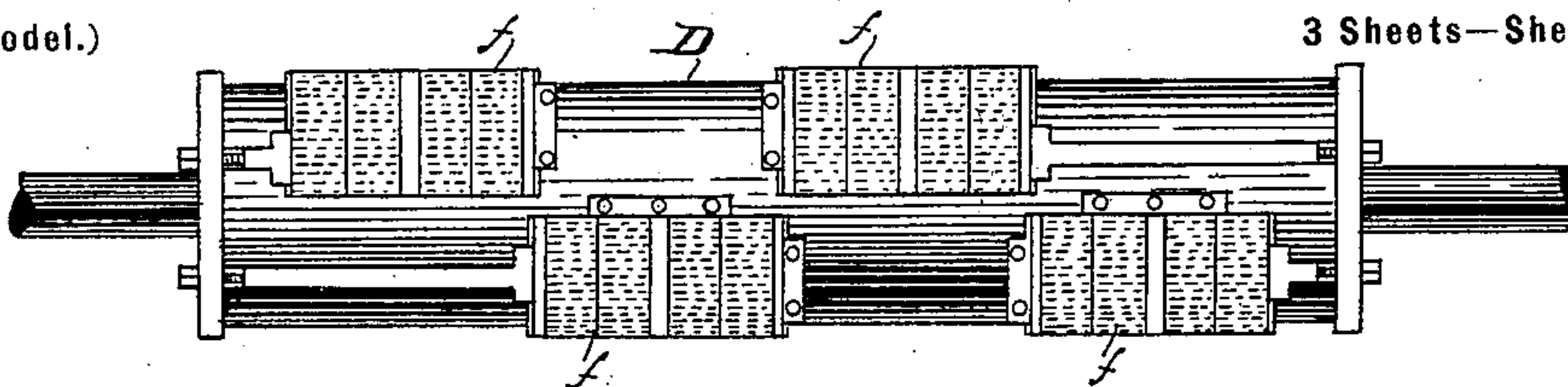


Fig. 8.

7		11	
	15		3
7		11	
	15		3

Fig. 9.

8		12	
	16		4
8		12	
	16		4

Fig. 11.

	10		6
2		14	
	10		6
2		14	

Fig. 10.

	9		5
1		13	
	9		5
1		13	

Fig. 12.

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UNITED STATES PATENT OFFICE.

JOSEPH L. FIRM, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GOSS PRINTING PRESS COMPANY, OF SAME PLACE.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 677,737, dated July 2, 1901.

Application filed November 12, 1900. Serial No. 36,204. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH L. FIRM, of Chicago, Cook county, Illinois, have invented a new and useful Improvement in Printing-Presses, of which the following is a specification.

My invention relates to an improvement in printing-presses, and comprises the novel features which will be hereinafter described, and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of a press built in accordance with my invention. Fig. 2 is a top plan view of the same. Figs. 3, 4, 5, and 6 are diagrams showing the imposition of the forms upon the cylinder. Fig. 7 shows in detail the turning-bars and the web being turned over the same. Fig. 8 shows a form-cylinder having the forms arranged thereon in a slightly-different manner from the forms as shown in Figs. 1 and 2, but in accordance with the same principles. Figs. 9, 10, 11, and 12 are diagrams showing the imposition of the pages corresponding with the construction of the form-cylinder shown in Fig. 8.

The object of my invention is to produce a compact press which shall produce newspapers, magazines, and similar matter which contain illustrations and printed matter either upon the same or separate pages. This is a rotary perfecting-press and is so constructed that it may produce work of the character above named in greater quantities than may be produced upon other than a rotary perfecting-press and in better style than the ordinary rotary press. The great difficulty in the operation of rotary presses for producing fine printing of the character mentioned is that they require the services of an expert pressman to make the forms ready, so as to produce good printing upon both illustrations and printed matter. As these two kinds of printing—that is, illustrations and printed matter—require considerable variation in the supply of ink, it is exceedingly difficult, if not impossible, to satisfactorily print the two upon cylinders where pages of

a different character follow after each other in the same circumferential section of the cylinder—that is, where a page containing many illustrations follows after a page of printed matter one is apt to require more ink than the other, and if the supply of ink is adjusted for one page it will not produce satisfactory work upon the other page. In my present press the forms are placed upon the form-cylinders in sections which alternate with blank spaces of substantially equal size, so that each form-cylinder will print only one-half of one surface of the web at one passage. To produce a perfecting-press, I therefore use two form-cylinders acting upon opposite sides of a common impression-cylinder. At the same time I use a half-width web—that is, a web half the width of the entire length of the cylinders—and reverse the web and shift it to the opposite side of the cylinders, so that the first passage of the web prints one side thereof by contact with the halves of the cylinders at one end and the other side of the web is printed by contact with the halves of the cylinders at the other end in its second passage.

The press, as shown in Figs. 1 and 2, has the central impression-cylinder C and the two form-cylinders B and D lying upon opposite sides thereof. These form and impression cylinders are of equal length and of a length twice the width of the web. The web is shown as a roll at A, from which point it passes about the guide-roller 1 and thence over the impression-cylinder C at one end thereof, contacting in its passage about the impression-cylinder with the form-cylinders B and D. The web then passes under the guide-roller 2 and thence about the turning-bars 3 and 4, which are shown in detail and plan in Fig. 7. By these bars it is shifted into line with the other half of the cylinders and is reversed, so that when it passes again over the guide-rollers 5 and 1 to the impression-cylinder C the other halves of the form-cylinders B and D will act upon the other side of the web, thus completing its printing. The web after this second passage between the impression and form cylinders is conducted about the guide-rollers 6 and 7 and then between guide-rollers 8 and 9, at which point, if desired, it is

acted upon by a slit 11, and then passes over formers and folders 10 between rollers 12 and 13 after a manner which is not of itself new in my present invention. An offset-web, which is shown in a roll at E, is conducted thence with the web A in its second passage about the impression-cylinder and between said web and the impression-cylinder, so as to prevent blurring of the ink. The offset-web is conducted with the printed web about the guide-rollers 6, 7, and 8 and is folded with the web by the formers 10 and 10', two of which are shown in Fig. 2. The two webs are then partially opened out by the formers 14, and the offset-web is removed from between the printed web and is conducted between the rollers 15 16 and thence over the roller 18 and is wound up, as the roll F, which roll is supported and turned by means of the rollers 21 and 22. Suitable inking mechanisms, as the rolls L L' H I J K, are provided for supplying the impression-cylinders with ink. These inking mechanisms may be of any approved construction in which it is possible to adjust the supply of ink so that it may be varied for different portions of the length of the roll. As this feature is one which is common and well known in the art, a further description and illustration thereof in the present application are not deemed necessary. The printed web after having the offset-web removed therefrom is conducted between rollers 18 19 and thence to cutting and folding mechanisms G, which may be of any approved construction.

Figs. 3, 4, 5, and 6 show the imposition of the various pages, the pages being numbered to correspond with the numbering which they would bear in the completed product, the numbers running from "1" to "16" and the figures being shown reversed or wrong side up on those pages in which the printed matter would be correspondingly placed. In Fig. 8 the forms are shown secured to one of the form-cylinders in a manner differing from that shown in Fig. 2 by having the column-rules running circumferentially of the cylinder instead of lengthwise thereof, as shown in Fig. 2. In Fig. 2 the forms are shown as each extending over one-eighth of the circumference of the cylinder, while in Fig. 8 they extend over a greater section of the cylinder. The number of forms which are used upon any circumferential zone of the cylinder may vary according to circumstances; but all the forms upon any circumferential zone should be duplicates of each other, so that the inking which is best for one form will be best for all the others. The impression-cylinder C should also be of such size relatively to the form-cylinders that the forms will at all times contact with the same surfaces of the impression-cylinder, so that the preparation of the surface of the impression-cylinder may be made such as will best correspond with the matter being printed.

This may be secured by making the impression-cylinder of the same size as the form-cylinders or by making the circumference thereof any multiple of the distance between successive forms. The impression-cylinder may therefore be either larger or smaller than the form-cylinders so long as the proportion stated is maintained.

Figs. 9, 10, 11, and 12 show the imposition of the pages corresponding with the arrangement of forms shown in Fig. 8. The figures placed upon these figures of the drawings correspond with the number of the pages of the printed product, but are not all made to stand in the same direction as the types would in the printed product.

With a press of this character illustrated magazines and similar illustrated work may be rapidly produced and the quality of the printing be first class. At the same time the press is in a compact form and all parts thereof easily accessible.

I do not wish to be limited to the exact construction and proportion of parts herein shown and described where it is possible to change them without changing the principles of their operation, but desire to claim all modifications of such nature, whether they have herein been specifically referred to or not.

I am aware that returning the web to the same printing-couple to print the second side is not new, and I do not herein seek to cover such a construction broadly, but only in combination with my peculiar arrangement of form and impression cylinders and also in combination with the same and an offset-web.

I claim—

1. A printing-press having a single printing-couple consisting of a single impression-cylinder and plural form-cylinders of equal length and coacting therewith to print both sides of the web, means for conducting a half-width web between one end half of said impression-cylinder and form-cylinders to print one side of the web, means for turning and shifting the web into line with the other end halves of impression and form cylinders and means for passing the web between said other halves of the impression and form cylinders to print the other side of the web, substantially as described.

2. A printing-press having a single printing-couple consisting of a single impression-cylinder, two form-cylinders of equal length coöperating therewith to print both sides of the web, said form-cylinders having forms secured thereto upon alternating and substantially equal spaces both circumferentially and longitudinally thereof whereby only half the surface of the web is printed at a time by each form-cylinder; the forms upon one cylinder printing in the spaces left blank by the forms upon the other cylinder and means for turning and shifting a half-width web coming from one end halves of the cylinders and

presenting it to the other end halves of the cylinders to print the other side thereof in the same manner, substantially as described.

3. A printing-press having a single printing-couple consisting of a single impression-cylinder and plural form-cylinders of equal length coacting therewith to print both sides of the web, means for conducting a half-width web between one end half of said impression-cylinder and form-cylinders to print one side of the web, means for turning and shifting the web into line with the other end halves of the impression and form cylinders, means for passing the web between said other halves of the impression and form cylinders to print the other side of the web and means for conducting an offset-web between the web being printed and the impression-cylinder during the second passage of the web about the impression-cylinder, substantially as described.

4. A printing-press having a single printing-couple consisting of a single impression-cylinder and plural form-cylinders of equal length and cooperating therewith to print both sides of the web, said form-cylinders having forms secured thereto upon alternating and substantially equal spaces both circumferentially and longitudinally thereof whereby only one-half the surface of the web is printed at a time by each form-cylinder; the forms upon one cylinder printing in the spaces left blank by the forms upon the other cylinder, means for turning and shifting a half-width web coming from one of the end halves of the cylinders and presenting it to the other end halves of the cylinders to print the other side of the web in the same manner and means for conducting an offset-web between the web being printed and the impression-cylinder during the second passage of the web about the impression-cylinder, substantially as described.

5. A printing-press having a single printing-couple consisting of an impression-cylinder and two form-cylinders of equal length coacting therewith to print both sides of the web, means for conveying a half-width web between one end half of said impression-cylinder and form-cylinders to print one side of the web; the form and impression cylinders being proportioned to bring the same surfaces in contact at all times, means acting upon the web after one side is printed to turn the web and shift it into line with the other end halves of the impression and form cylinders and means for conducting the web between said other end halves of the impression and form cylinders to print the other side of the web.

6. A printing-press having a single printing-couple consisting of a single impression-cylinder and two form-cylinders of equal length cooperating therewith to print both sides of the web; said form-cylinders having forms secured thereto upon alternating and substantially equal spaces both circumferentially and longitudinally thereof, whereby

only one-half the surface of the web is printed at a time by each form-cylinder; the forms upon one cylinder printing in the spaces left blank by the forms upon the other cylinder, the form and impression cylinders being proportioned to bring the same forms in contact with the same spaces of the impression-cylinder at all times and means for turning and shifting a half-width web coming from one of the end halves of the cylinders and for presenting it to the other end halves of the cylinders to print the other side thereof in the same manner, substantially as described.

7. A printing-press having a single printing-couple consisting of an impression-cylinder and two form-cylinders cooperating therewith to print both sides of the web, the forms upon any circumferential zone of either cylinder being duplicates of each other, means for passing a half-width web in succession between opposite end halves of the cylinders and means for reversing the web between said successive passages whereby each of the end halves of the cylinders prints upon a different side of the web, substantially as described.

8. A printing-press having a single printing-couple consisting of an impression-cylinder and two form-cylinders cooperating therewith to print both sides of the web, the forms upon any circumferential zone of either cylinder being duplicates of each other, means for passing a half-width web in succession between opposite end halves of the cylinders and means for reversing the web between said successive passages whereby each of the end halves of the cylinders prints upon a different side of the web and means for conveying an offset-web between the printed web and the impression-cylinder during the second passage of the printed web about the impression-cylinder, substantially as described.

9. A printing-press having a single printing-couple consisting of an impression-cylinder and two form-cylinders of equal length cooperating therewith to print both sides of the web, said form-cylinders having forms secured thereto upon alternating and substantially equal spaces both circumferentially and longitudinally thereof whereby only half the surface of the web is printed at a time by each form-cylinder; the forms upon one cylinder printing in the spaces left blank by the forms upon the other cylinder, the forms upon any circumferential zone of either cylinder being duplicates of each other, means for passing a half-width web in succession between opposite end halves of the cylinder and means for reversing the web between said successive passages whereby each of the end halves of the cylinders prints upon a different side of the web, substantially as described.

10. A printing-press having a single printing-couple consisting of an impression-cylinder and two form-cylinders of equal length cooperating therewith to print both sides of the web, said form-cylinders having forms se-

cured thereto upon alternating and substantially equal spaces both circumferentially and longitudinally thereof whereby only half the surface of the web is printed at a time by each
5 form-cylinder; the forms upon one cylinder printing in the spaces left blank by the forms upon the other cylinder, the forms upon any circumferential zone of either cylinder being
10 half-width web in succession between opposite end halves of the cylinder and means for reversing the web between said successive passages whereby each of the end halves of the cylinders prints upon a different side of
15 the web, means for conveying an offset-web between the printed web and the impression-cylinder during the second passage of the printed web about the impression-cylinder, substantially as described.
20 11. A printing-press having a single printing-couple consisting of an impression-cylinder, a pair of form-cylinders of equal length cooperating therewith to print both sides of the web each form-cylinder having forms of
25 substantially equal size secured thereto so that both circumferentially and longitudinally each form is adjacent to a space of substantially equal size whereby only half of one surface of the web is printed by each cylinder
30 at the same passage of the web; each

form-cylinder printing upon the spaces of the web left blank by the other form-cylinder, means for passing a half-width web in succession between opposite end halves of the cylinders and means for reversing the web
35 between said successive passages, substantially as described.

12. A printing-press having a single printing-couple consisting of an impression-cylinder, a pair of form-cylinders of equal length
40 cooperating therewith to print both sides of the web, each form-cylinder having forms of substantially equal size secured thereto so that both circumferentially and longitudinally each form is adjacent to a space of sub-
45 stantially equal size whereby only half of one surface of the web is printed by each cylinder at the same passage of the web; each form-cylinder printing upon the spaces of the web left blank by the other form-cylinder
50 means for passing a half-width web in succession between opposite end halves of the cylinders and turning-bars adapted to turn and laterally shift the web between said successive passages, substantially as de-
55 scribed.

JOSEPH L. FIRM.

Witnesses:

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CHAS. J. RATHJEN.