

No. 675,773.

Patented June 4, 1901.

J. L. FIRM.  
PRINTING PRESS.  
(Application filed Jan. 10, 1900.)

(No Model.)

3 Sheets—Sheet 1.

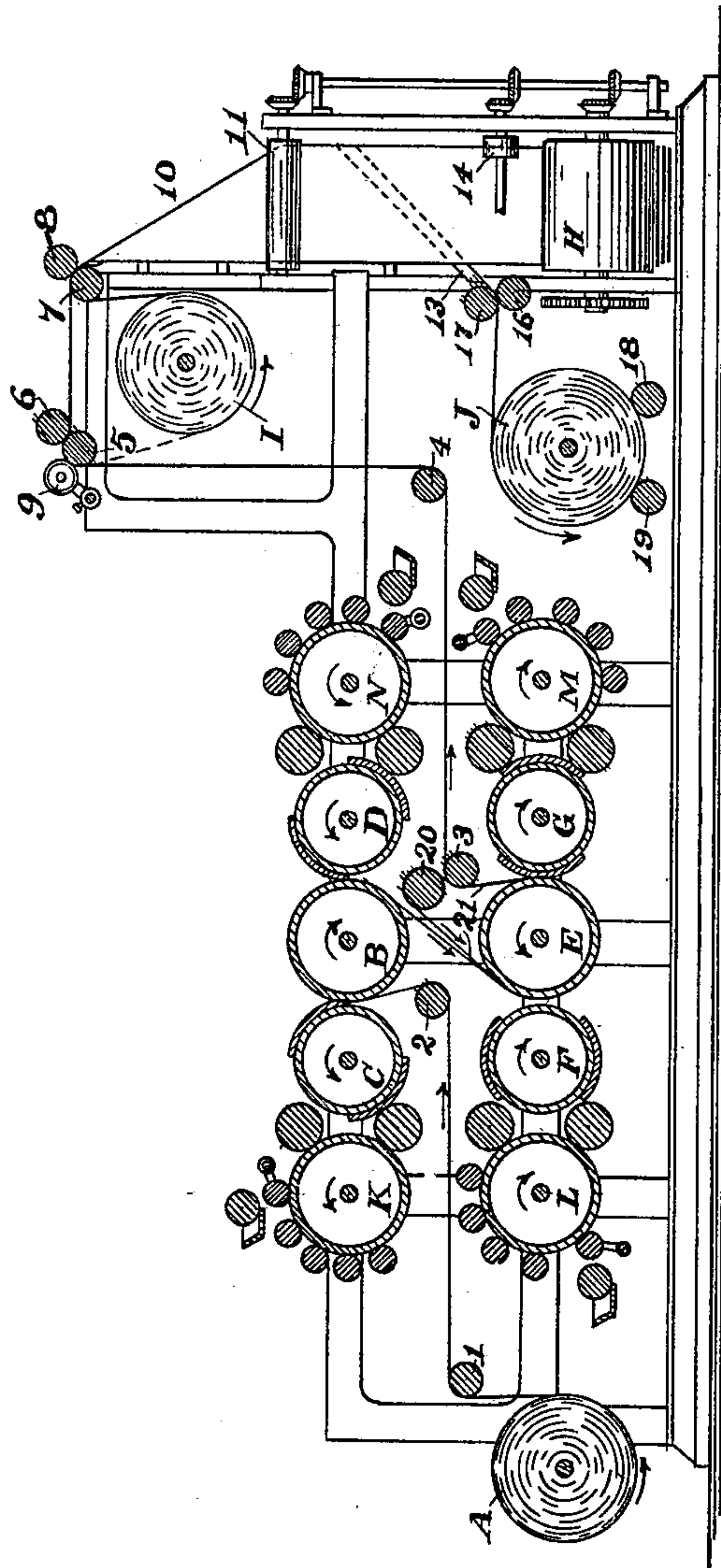


Fig. 1.

Witnesses  
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H. L. Reynolds.

Inventor  
By his Attorneys Joseph L. Firm  
Hoffman & Pusey.

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3 Sheets—Sheet 2.

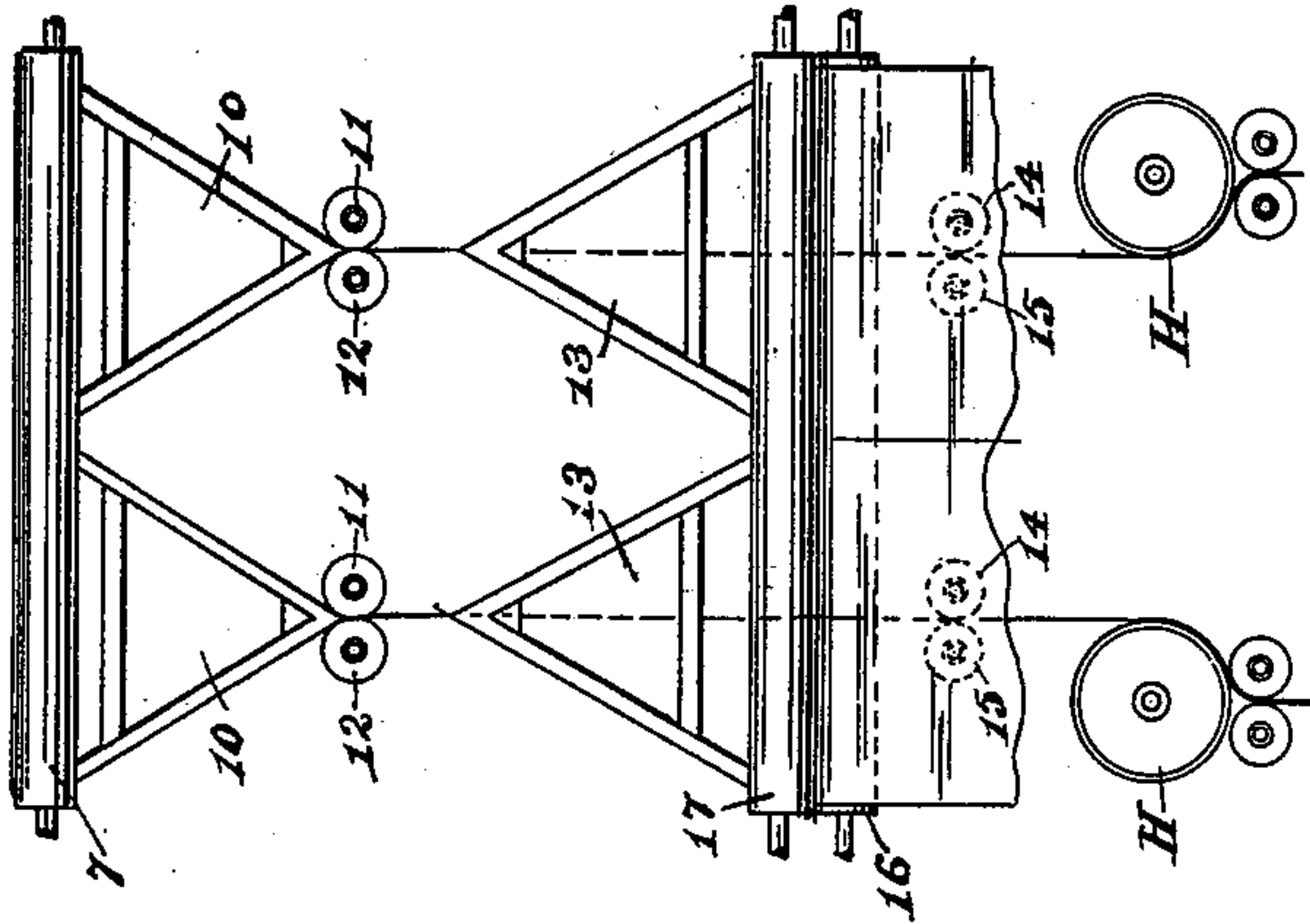


Fig. 3.

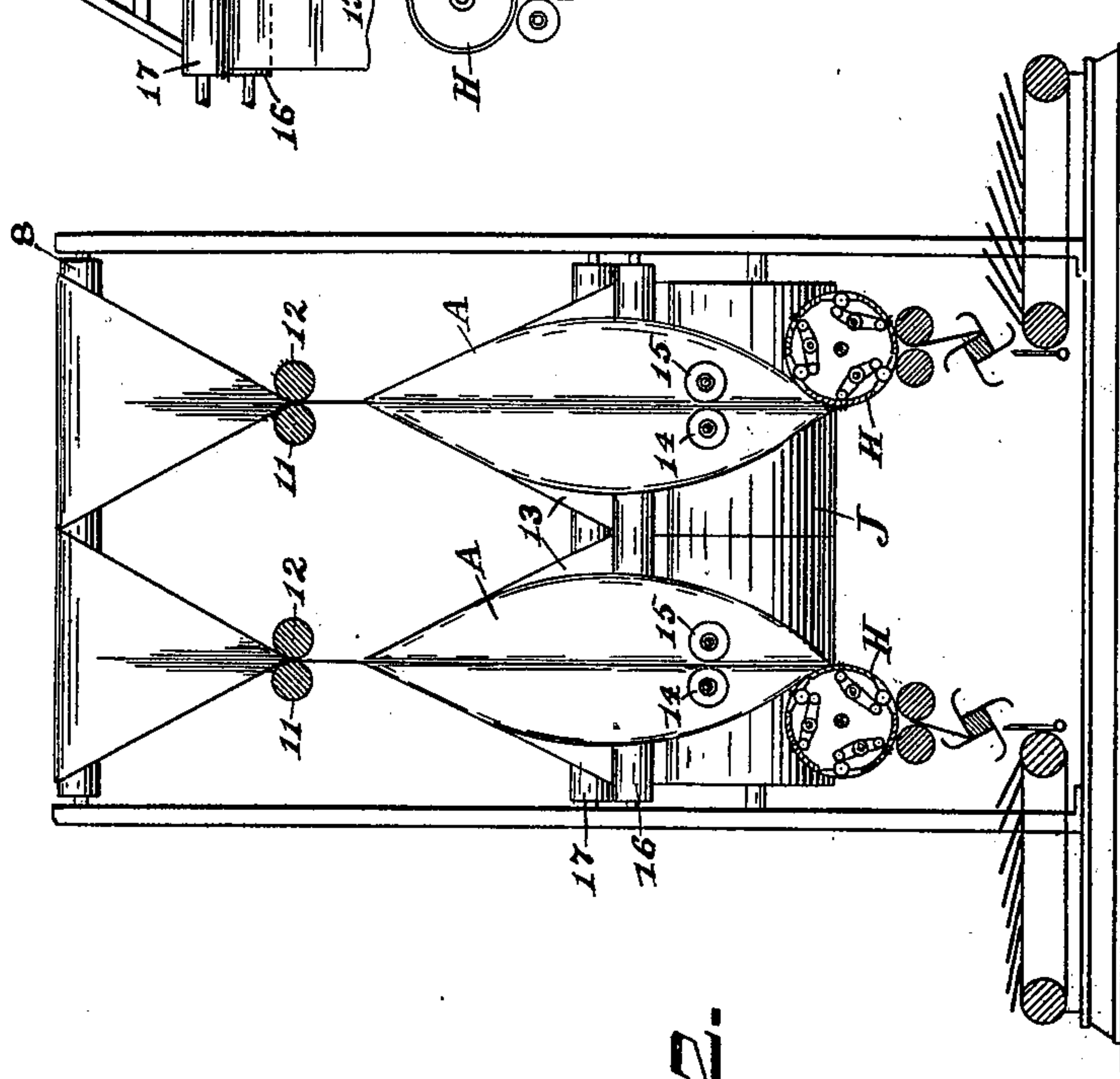


Fig. 2.

Witnesses  
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3 Sheets—Sheet 3.

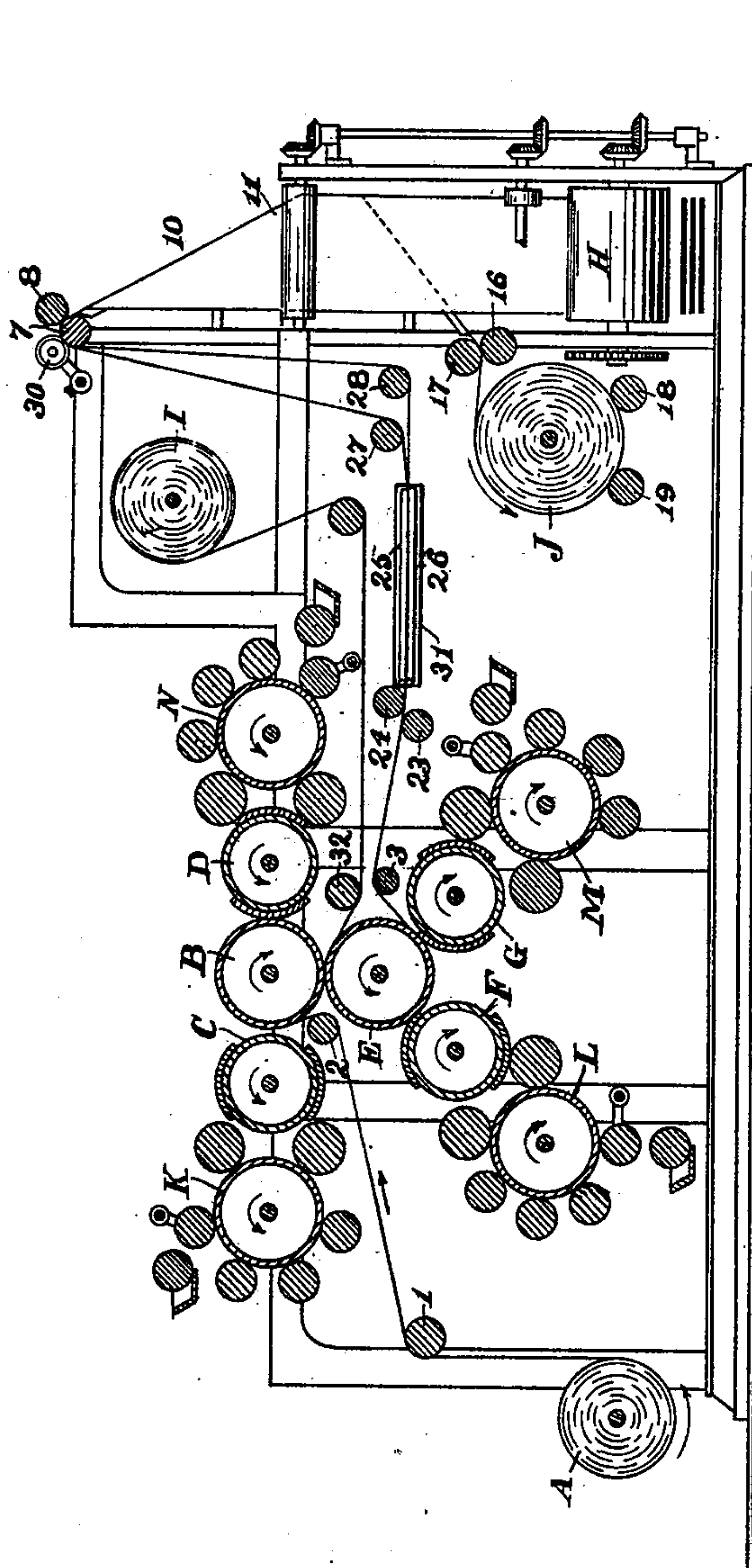


Fig. 4.

Witnesses  
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By his Attorneys  
Joseph L. Firm  
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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. 675,773, dated June 4, 1901.

Application filed January 10, 1900. Serial No. 938. (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 Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Printing - Presses, of which the following is a specification.

My invention relates to certain improvements in rotary or web-printing presses by which they are adapted to successfully produce a character of work not ordinarily attempted on rotary presses, such as magazine-work and other fine printing, particularly where illustrations are used, and which upon a rotary press of ordinary construction would be impossible of successful production on account of offsetting or transference of ink from one page to another when the web is folded.

My invention comprises certain novel devices by which offset webs may be used in conjunction with the printed web to prevent offsetting between the printed pages.

The features comprising my invention will be particularly pointed out hereinafter.

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 having my device attached thereto. Fig. 2 is an end elevation of the folders at the delivery end of the press. Fig. 3 is an end elevation of the upper portion of the folders from the inner side. Fig. 4 is a sectional side elevation of a press slightly different in construction from that shown in Fig. 1.

In attempting to use ordinary rotary presses for magazine-work and other fine printing, and especially where illustrations are used, it is found practically impossible to prevent offsetting or smearing of ink from one page to another when the web is folded, as it has been practically impossible to successfully use an offset web with a printed web when the sheets are folded. With my present device this is successfully accomplished, and it is therefore possible to use a rotary printing-press for all kinds of fine work.

I have herein shown my device in connection with a rotary press, which consists of two banks of printing mechanisms which are

placed above each other, the upper bank consisting of a central impression-cylinder B, two form-cylinders C and D, placed upon opposite sides of the impression-cylinder, and inking mechanisms K and N, coöperating with their respective form-cylinders. The lower bank of printing mechanism consists of similar parts or a central impression-cylinder E and form-cylinders F and G, placed upon opposite sides thereof and their coöperating inking mechanisms L and M. The web A to be printed upon is placed at one end of the press and is conducted over guide-rollers 1 and 2, thence about the impression-cylinder B, where it is printed upon by the form-cylinders C and D, thence downward and about the impression-cylinder E, where it is printed upon by the form-cylinders F and G, and thence over the guide-rollers 3 and 4, from whence it is led to the folding and offsetting mechanisms. This form of printing mechanism is given only as an illustration of a rotary printing-press, and it is not to be understood that the use of my device is confined to this form of printing mechanism, but that it may be used in connection with any form of rotary printing mechanism.

The printing mechanism shown in Fig. 4 is slightly different from that shown in Fig. 1. It is substantially the same, but has a slightly-different arrangement, the form and impression cylinders of the lower bank of printing mechanisms being arranged in a pyramidal form instead of in a horizontal line, as shown in Fig. 1.

The printing mechanism shown herein forms no part of my present invention, but is claimed by me in application Serial No. 26,688, filed August 13, 1900.

In Fig. 1 an endless offset web 21 is shown, which passes about a guide-roller 20 and the lower impression-cylinder E. This offset web or apron is set at such a distance from the impression-cylinder E that it will vary the sections thereof which contact with the successive pages of the printed web. This roller is crowned, and the device as a whole is the same as shown in the United States Patent No. 631,424, granted to me August 22, 1899. This offset web contacts with the surface of the web A, which is printed by the upper set of



printing mechanisms and which surface is next to the impression-cylinder E.

The printed web A after passing from the printing mechanisms is conducted over the guide-rollers 3 and 4 and then between the guide-rollers 5 and 6, where it is engaged, if desired, by a slitter 9, so as to divide the web into two or more parts. The web then passes between the rollers 7 and 8, from whence it is led over a former 10. While the web is passing between either the guide-rollers 5 and 6 or the guide-rollers 7 and 8 an offset web is combined therewith. This web is placed in the form of a roll I in the upper part of the press-frame just back of the folder 10. As shown in Fig. 1, the offset web I is first combined with the printed web as the latter passes between the guide-rollers 7 and 8. In this case the offset web is not slitted. If it is desired to slit the offset web, as would be the case if the offset web were of the same width as the web A and the web A were slitted, the offset web is then combined with the web S as the latter passes between the guide-rollers 5 and 6, as shown by dotted lines in Fig. 1. In this case both the web A and the offset web I are slit by the slitter 9. The longitudinal folder 10 is of the ordinary construction and folds the web or the parts of the web as delivered thereto longitudinally upon its center line. The offset web I being combined with the printed web A before the latter reaches the former, the two are folded together, the offset web I being inside and preventing offsetting or smearing of adjacent surfaces of the printed web. Any ink which will offset from the printed web is taken upon the offset web I. Both the printed web and the offset web after passing the former 10 are partially opened out by auxiliary formers 13, as shown in Figs. 2 and 3. Before reaching the auxiliary formers 13 the folded webs pass between the rollers 11 and 12, which press the folded parts of the webs closely together. The offset web after passing over the auxiliary formers 13 is passed between the rollers 16 and 17, by which it is restored to its normal position or opened out flat. It is then rolled up in a roll J, which roll is supported and turned by means of the rollers 18 and 19 in a manner common to the art. The printed web A after passing the auxiliary former has its two sections brought together and then passes over a transverse folder and cutting mechanism H, which is of ordinary construction or such as shown in Fig. 1 of my Patent No. 635,719, of October 24, 1899, or in Fig. 2 of Patent No. 637,330, of November 21, 1899. Its particular description herein is therefore not thought necessary. The folded edge of the printed web or sections of the printed web are engaged by short rollers 14 and 15 to prevent the same from being drawn out through the offset web. By the means above described the offset web after being used is removed from between the printed web and rolled up to be used again. It is

therefore possible to use the offset web over and over again, and by the use of the slitter 9 the offset web may when originally put in place be of the same width as the web A, in which case it is conducted first about roller 5, as shown by the dotted line in Fig. 1. After having been once used it will, if the web A has been slit, be also slit and will then be in parallel sections or narrow duplicate webs, which may, however, be used in the same manner. In this event the web will be conducted, as shown in full lines in Fig. 1, through the guide-rollers 7 and 8, not needing to be slit.

In Fig. 4 a modified form of device is shown, in which one offset web is used for protecting both sides of the printed web. In this form of construction the offset web 21, as shown in Fig. 1, is done away with, and the one web I is used for protecting both sides of the printed web. In this construction the offset web I is placed in the same position as in Fig. 1, but is led downward over a guide-roller 35 and thence toward the center of the printing mechanism beneath a guide-roller 32 and then about the impression-cylinder E of the lower printing mechanism between said impression-cylinder and the web which has been printed upon one side. It passes about this impression-cylinder with the printed web, both of said webs being passed over the guide-roller 3 and between the guide-rollers 23 and 24. The printed web thence passes between the turning bars 25 and 26, but is not affected thereby. The offset web is passed about the two turning bars 25 and 26 and an intermediate roller 31, whereby it is transferred from the upper to the lower side of the printed web. These turning bars and rollers are common in the art where it is desired to superpose two sections of a web, and their particular description herein is therefore not given. After passing the turning bars the two webs are reversed in position—that is, the offset web, which before was above the printed web, is now below the printed web. The printed web is shown as passing over a guide-roller 27 and the offset web as passing over a guide-roller 28. From these two guide-rollers both webs pass upwardly between the guide-rollers 7 and 8, from whence they are led over the forming and opening-out mechanisms previously described, the mechanism from this point being the same as that described in connection with Fig. 1. In connection with the guide-rollers 7 and 8 a slitter 30 is shown, which may be used for slitting the webs, if desired.

I claim—

1. The combination with the former of a printing-press, of an offset web, means for delivering the same to the former with a printed web to fold them both longitudinally and means for removing the offset web and rolling it up, substantially as described.

2. A web-press having a former adapted to fold a web longitudinally, and means for in-



5 introducing thereto a printing and an offset web to fold them together, and means for removing the offset web from the printed web and for opening it out, substantially as described.

10 3. The combination of a former adapted to fold a web longitudinally with means for simultaneously introducing thereto and folding plural webs and means for removing and opening out one of the webs, substantially as described.

15 4. A web-press having means for folding an offset web with the printed web and means for removing therefrom and opening out the offset web, substantially as described.

20 5. A web-printing press having a former adapted to receive and fold two webs longitudinally, an auxiliary former adapted to engage the webs after they pass the main or first former to partially open them out, means for refolding one web after leaving the auxiliary former, and means for opening out the other web after leaving the auxiliary former, whereby when two webs are passed through  
25 the device they may first be both folded together and then one web opened out and the other folded, substantially as described.

30 6. A web-printing press having a former adapted to receive and fold two webs longitudinally, an auxiliary former adapted to engage the webs after they pass the main or first former to partially open them out, transverse rolls adapted to engage and complete the opening out of one of the webs, gripping-rolls  
35 engaging the fold of the other web while the first web is being removed and rolls receiving the second web to fold it, substantially as described.

7. The combination with a web-printing

mechanism, of an offset web, means for conducting the offset web about one impression-cylinder, means for folding both printed and offset webs together and means for removing the offset web from the printed web and for opening it out, substantially as described. 40 45

8. The combination with a web-printing mechanism, of an offset web, means for conducting the offset web about one impression-cylinder, means for transferring the offset web to the opposite side of the printed web  
50 after it is printed, means for folding the printed and offset webs together and means for removing and opening out the offset web, substantially as described.

9. The combination with a web-perfecting press of an offset web, and means for conducting said web successively in contact with opposite sides of the printed web, substantially as described. 55

10. The combination with a web-perfecting press of an offset web, and means for conducting it successively in contact with opposite printed surfaces of the printed web immediately after printing the same, substantially as described. 60 65

11. The combination with a web-perfecting press, an offset web and means for conducting the two webs together, of two turning bars located one on each side of the course of the webs after printing, and a roller cooperating with said turning bars whereby the offset web may be transferred to the opposite side of the printed web, substantially as described. 70

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Witnesses:

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