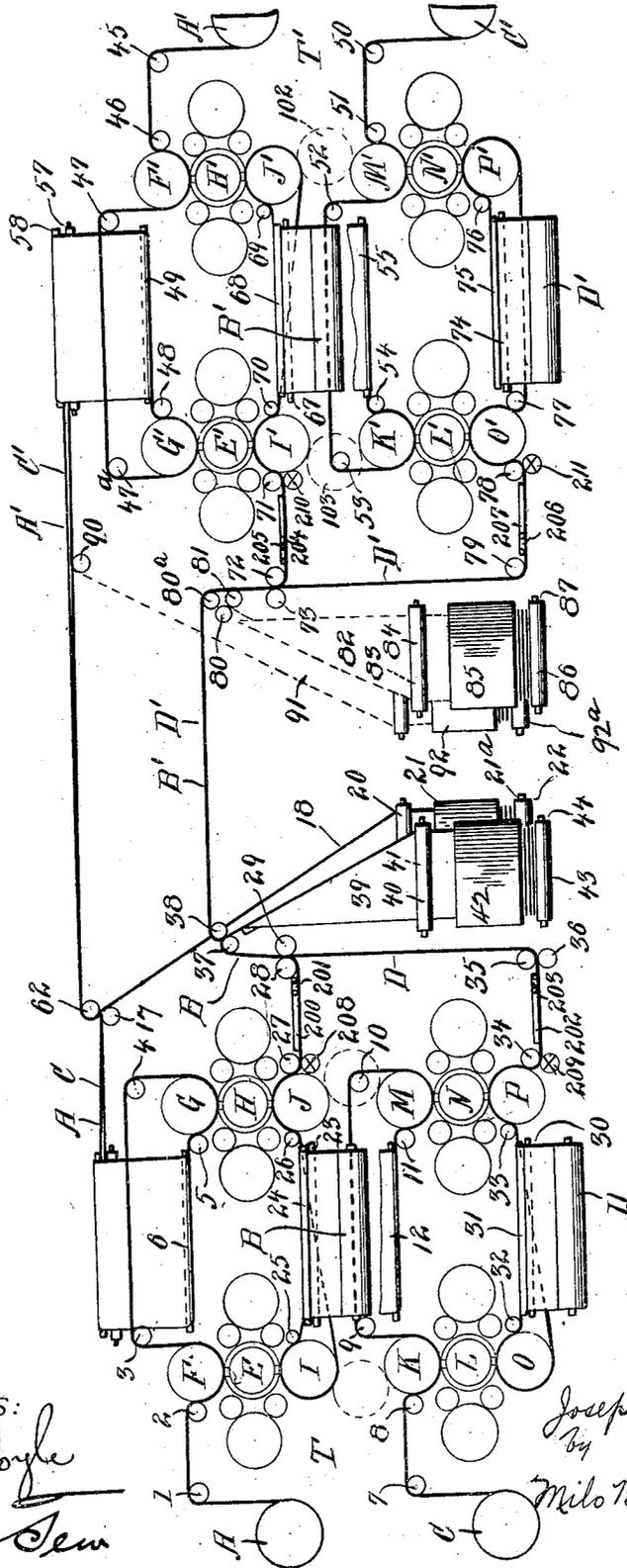


No. 836,311.

PATENTED NOV. 20, 1906.

J. L. FIRM.
PRINTING PRESS.
APPLICATION FILED NOV. 13, 1905.

3 SHEETS—SHEET 1.



WITNESSES:

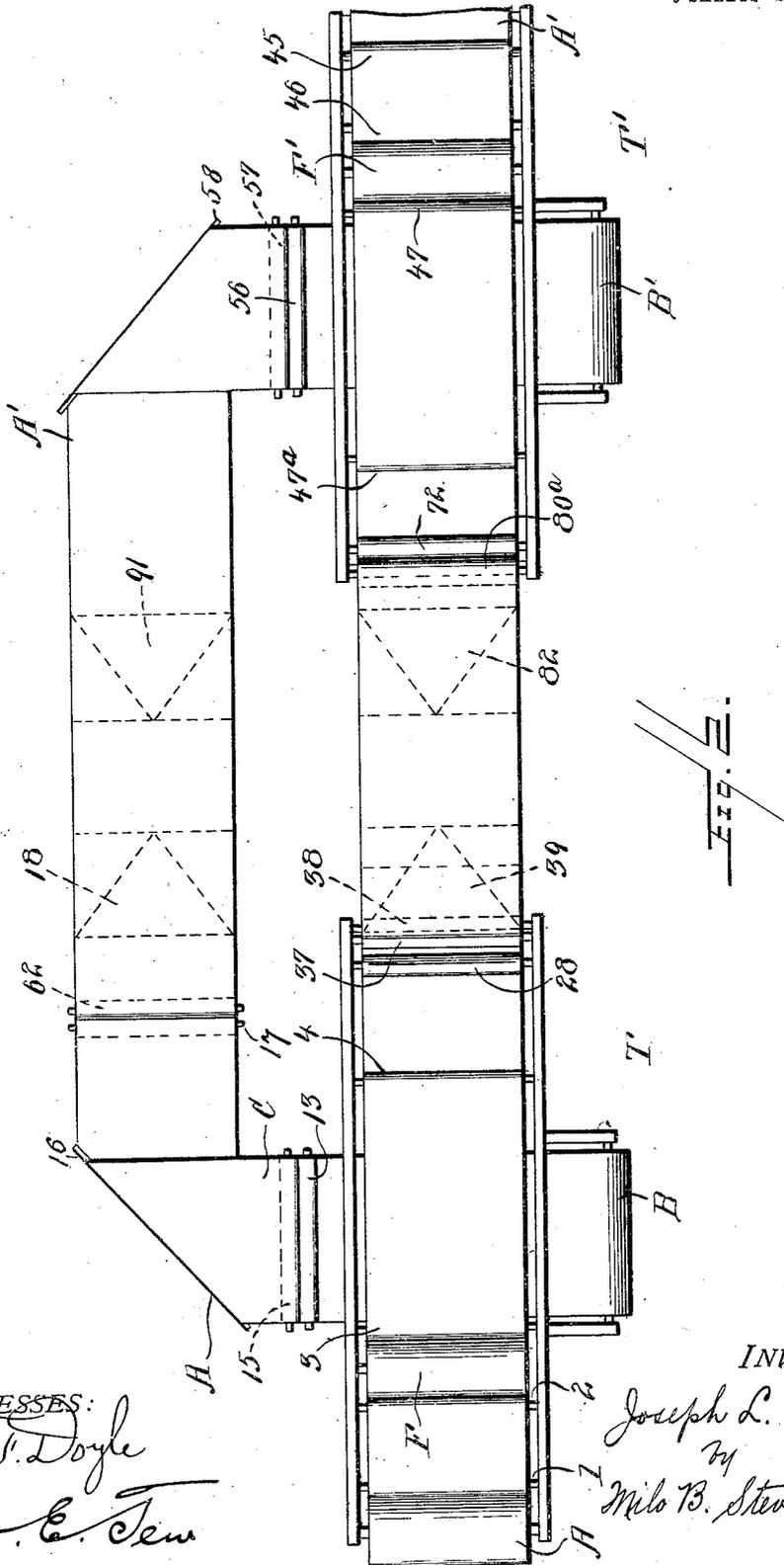
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3 SHEETS—SHEET 2.



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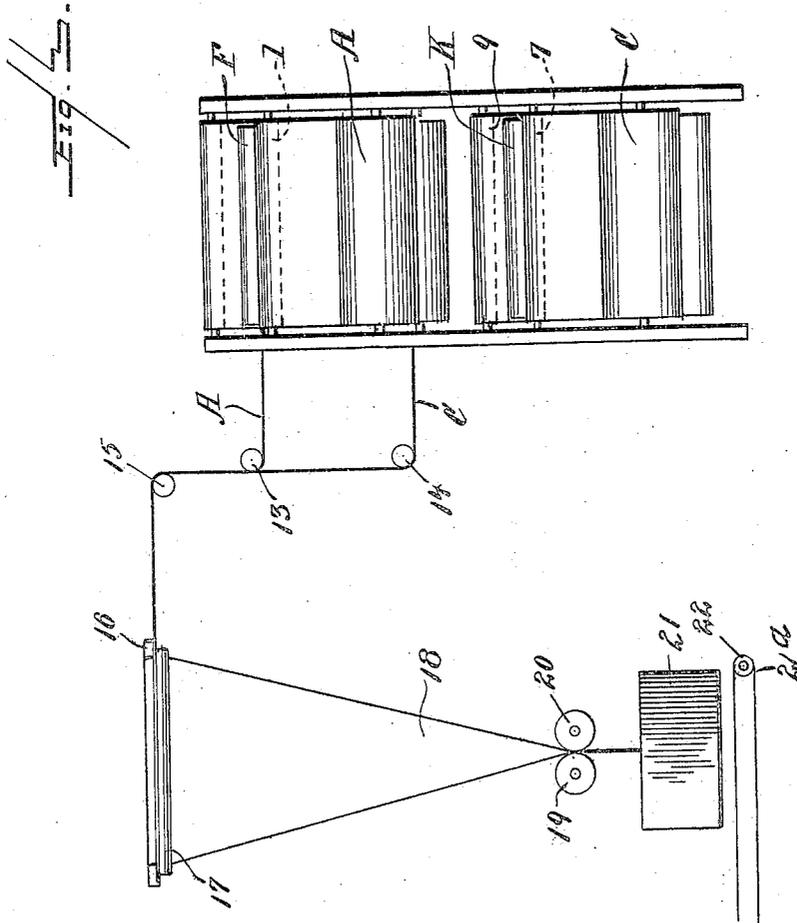
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UNITED STATES PATENT OFFICE.

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

PRINTING-PRESS.

No. 836,311.

Specification of Letters Patent.

Patented Nov. 20, 1906.

Application filed November 13, 1905. Serial No. 287,048.

To all whom it may concern:

Be it known that I, JOSEPH L. FIRM, a citizen of the United States, residing at Berwyn, in the county of Cook and State of Illinois, have invented new and useful Improvements in Printing-Presses, of which the following is a specification.

In my patent numbered 801,577, dated October 10, 1905, there is shown a press which prints four webs each of which is four pages wide. These webs are slitted and turned by slitters and turning-bars at the middle of the machine and are delivered as complete papers at the end and the side of the machine. Objection might be made to this press because of the width of the webs, and consequently of the form and impression cylinders, the inking-rollers, &c., the convenient handling of which might be impracticable, also because slitters and turning-bars, particularly double turning-bars, in the body of the machine sometimes tear the webs and do not permit as rapid work as a "straight-line" run.

The object of the present invention is to produce an arrangement which will avoid the excessive width of the cylinders and the other parts, and the double-width or four-page webs and render unnecessary the use of the slitters and double turning-bars found in the old machine.

A further object of the present invention is to form a press the parts of which will be very convenient of access and the deliveries from which will be adjacent to each other in convenient position to handle the product.

As before, the printing mechanism embodies double printing-couples, each couple consisting of two form and four impression-cylinders arranged in the same plane, so that eight rolls of paper may be printed at one time.

In the accompanying drawings, Figure 1 is a diagrammatic side elevation of the machine. Fig. 2 is a top plan view. Fig. 3 is an end elevation.

Referring to the drawings, it will be seen that the machine consists of duplicate sections or parts, T and T', set end to end and delivering toward the middle or to the space between the parts. Each of these parts, so far as the cylinders are concerned, is substantially identical with the press shown in said patent, except that the cylinders need be

only half the length, and there is an absence of the slitters and double turning-bars, which in the press shown in said patent serve to associate the parts of the product.

Referring to set T, A is a web of paper two pages wide, the roll of which is located at the end of the machine and which passes over the rollers 1 2 to impression-cylinder F and is printed by form-cylinder E, thence over the rollers 3 4 to impression-cylinder G and is printed upon its opposite side by form-cylinder H, thence over the roller 5 and over the turning-bar 6, after which it meets the web C. This passes from its roll at the end of the press over the rollers 7 8 to impression-cylinder K and is printed upon by form-cylinder L, thence over the roller 9 10 to impression-cylinder M and is printed upon its opposite side by form-cylinder N, thence over the roller 11 over the bar 12, after which it passes up and meets the web A, which passes out of the machine at its top, the web A, Fig. 2, passing under the roller 13 (see Fig. 3) and the web C under the roller 14. Thence both go over roller 15 and around the turning-bar 16 and over roller 17 to the V-former 18 and is folded, thence between the rollers 19 20 to the cutter 21, where it is cut and folded transversely and delivered by a rotary fly to the apron 21^a, which passes over the roller 22, completing, in connection with parts supplied from the other section T' of the machine, one sixteen-page paper.

The webs B and D are mounted at the side of the press, the web B passing over the roller 23, thence over the bar 24 to the roller 25, thence to impression-cylinder I and is printed upon by form-cylinder E, thence under the roller 26 to impression-cylinder J and is printed upon its opposite side by form-cylinder H, thence over the roller 27 and between rollers 28 and 29, where it meets the web D. This passes over the roller 30 and bar 31, Fig. 1, thence under the roller 32 to impression-cylinder O and is printed upon by form-cylinder L, thence under the roller 33 to impression-cylinder P and is printed upon its opposite side by form-cylinder N, thence under the roller 34 and between rollers 35 and 36, after which it meets the web B, passing with it between the rollers 28 and 29 and 37 and 38 to the V-former 39 and is folded, thence between the rollers 40 and 41 to the cutter 42, where it is cut and folded

transversely and delivered by a rotary fly to the apron 43, which passes over the rollers 44, completing, with the addition of a part from the other section of the machine, one more copy of sixteen-page papers.

The duplicate section T' is set in line with the section just described, but with the web-rolls at the opposite end and the delivery toward the middle, so as to associate the deliveries together between the sections. Thus the web from roll A' passes over the rollers 45 46 to impression-cylinder F' and is printed upon by form-cylinder H', thence over the rollers 47 47^a to impression-cylinder G' and is printed upon its opposite side by form-cylinder E', thence over the roller 48 and over the turning-bar 49, after which it meets the web C'. This passes over the rollers 50 51, thence to impression-cylinder M' and is printed upon by form-cylinder N', thence over the rollers 52 53 to impression-cylinder K' and is printed upon its opposite side by form-cylinder L', thence over the roller 54 and the turning-bar 55, where it meets web A' in a manner similar to that described with respect to webs A and C. The webs A' and C' then pass under the roller 56, over roller 57, and over turning-bar 58, and thence across between the sections and around the roller 62 to the folder 18, where they are associated with the webs A and C and folded transversely and delivered by the rotary fly to the apron 21^a, completing one more copy of sixteen-page paper.

The roll B', Fig. 1, passes over the roller 67 and turning-bar 68 and under roller 69 to impression-cylinder J' and is printed upon by form-cylinder H', thence under the roller 70 to impression-cylinder I' and is printed upon its opposite side by form-cylinder E', thence under the roller 71 and between rollers 72 and 73, where it meets the web D'. This web passes from its roll over the roller 74 and turning-bar 75 and under the roller 76 to impression-cylinder P' and is printed upon by form-cylinder N', thence under the roller 77 to impression-cylinder O' and is printed upon its opposite side by form-cylinder L', thence under the rollers 78 and 79 and between rollers 72 and 73, where it meets the web B'. These two webs then pass together over the roller 80^a to the other side and between rollers 37 and 38 to the V-former 39 and are associated and folded with webs B and D and pass therewith between the rollers 40 and 41, where they are cut and folded transversely and delivered by a rotary fly to the apron 43, which passes over the roller 44, completing one more copy of sixteen-page paper.

The arrangement above described makes a total of four complete papers of sixteen pages for each revolution, and it will be seen that there are no slitters and no turning-bars in the body of the machine. Part of each pa-

per is from one section of the machine and part from the other. Each web of paper makes two copies of four-page papers for each revolution, the plates being so imposed on the form-cylinder that each two plates cover one-half of the semicircumference of each cylinder. Thus each set of webs A and C superposed gives at each revolution two copies of eight-page papers led to the folder 18, and each set of webs A' and C' similarly give two more copies of eight pages led to the same folder. Each folder thus folds and delivers two copies of sixteen-page papers. The folders are of that kind which will cut and fold two copies at each revolution of the same. When the webs B B' and D D' pass out of the machine and are associated at the folder 39, it gives at each revolution two more copies of sixteen-page papers. This makes four copies of sixteen-page papers for each revolution, the folders 82 and 91 not being used.

Various advantageous modifications or arrangements may be made with a machine constructed as shown. Thus instead of crossing the webs from one machine to the other they may be delivered separately to several folding and delivery mechanisms. As shown in dotted lines, the four webs of the section T' may be completed and delivered by themselves. The webs A' and C' after being associated with each other pass over a roller 90 to the V-folder 91 and thence to the cutter 9^a and the delivery-apron 92^a, which is located opposite the delivery-apron 21^a. The webs B' and D' instead of being passed over the roller 80^a pass between rollers 80 and 81 to V-folder 82, rollers 83 and 84, cutter 85, and delivery-apron 86, which passes over roller 87. Each pair of these webs make two copies of eight-page papers at each revolution, making eight copies of eight-page papers delivered for each revolution, which is a great capacity. This, with the use of ordinary web, two pages wide, so that the webs A and C superposed give at each revolution two copies of eight-page papers at the folder 18, the webs B and D give the same at the folder 39, the webs B' and D' at the folder 82, and the webs A' and C' at the folder 91, making a total of eight copies of eight-page papers for each revolution.

It is to be understood that each two webs superposed makes two copies of eight-page papers at each revolution, the plates being imposed as above stated, and each folder and delivery apparatus has the capacity of cutting and folding two copies of each product at each revolution.

In making ten-page papers I use the webs A and A' and B and B' for eight-page and a half-width web D. By withdrawing the gears 102 and 103 I silence the printing mechanism that prints the webs C' and D' and the folder 82, using only the folders 18

and 39. The same arrangement is used with twelve-page papers, only the web D is full width instead of half-width. In making fourteen pages the webs A A', B B', and a half-width C' and D' are used. In making sixteen pages all the printing mechanism is used and the folders 18 and 39, giving four copies of sixteen pages, as above described. For any product above sixteen pages the press and web would be four pages wide, with additional folders to meet the capacity. In making ten, twelve, and fourteen page papers any of the pairs of webs corresponding in number to the webs above specified may be used, and the webs not required are simply not used—that is, they are left idle—the impression-cylinders therefore being backed off out of contact in a manner well known in the art.

Also turning-bars 200 201 202 203 204 205 206 207 and slitters 208 209 210 211 may be used when required to trim and slit the web after it has left the printing mechanism; also, additional folding mechanism may be added to each side of the present folders, as the output of the machine requires, as this press is intended to be used as a two-page-wide machine; but I do not limit the machine for only two pages. It may be three or four pages wide.

The inking, folding, and delivering mechanisms being old and well known, it is thought that no extended description thereof is required.

A marked feature of this press, in addition to the facility for association of different pages from one section to another, as described above, is the convenience of the various deliveries. They are all located adjacent and opposite each other at the middle of the machine, where they are conveniently accessible for manipulation of the product at a saving of time and labor.

I claim—

1. In a printing-machine, in combination, two spaced web-perfecting sections placed end to end in line with each other and having web-deliveries at the adjacent ends, and also at the same side of both sections, means to associate, fold and deliver the webs from the end of one section with those from the end of the other, and means to associate, fold and

deliver the webs from the side of one section with those from the side of the other, said folding and delivery means for all the end and side deliveries being located opposite each other on the same floor or level and in line with the space between the sections.

2. In a printing-machine, in combination, two web-perfecting sections placed end to end and having web-deliveries at their adjacent ends and also at the sides, a folder and cutter for each delivery, the folders and cutters of the respective end deliveries being arranged opposite each other between the sections, and the folders and cutters of the respective side deliveries being arranged opposite each other beside the aforesaid folders and cutters.

3. In a printing-machine, in combination, two web-perfecting sections placed end to end and having web-deliveries at their adjacent ends and also at the sides, a folding and cutting mechanism for the end deliveries, located between the sections, means to associate the end webs from both sections and deliver the same thereto, a folding and cutting mechanism for the side deliveries, and means to associate the side webs from both sections and deliver same thereto, the respective folding and cutting mechanisms for both the side and the end deliveries being located beside each other.

4. In a printing-machine, in combination, two web-perfecting sections placed end to end and having web-deliveries at their adjacent ends also at the sides, two folding, and cutting mechanisms for each section placed respectively opposite and in line with each other between the sections, means to convey the product of the end deliveries to either one of two of said mechanisms, and means to convey the product of the side deliveries to either one of the other two of said mechanisms, including turning-bars over which the side deliveries pass and which turn them in toward each other.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH L. FIRM.

Witnesses:

NELLIE FELTSKOG,
H. G. BATCHELOR