No. 880,960. PATENTED MAR. 3, 1908.

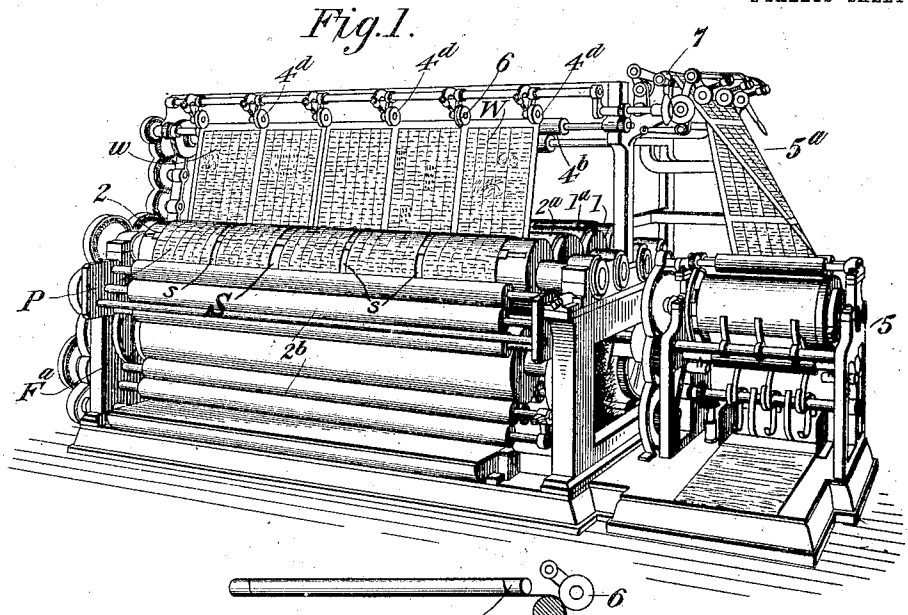
H. F. BECHMAN.

ROTARY CYLINDER WEB PERFECTING PRINTING PRESS.

APPLICATION FILED JUNE 1, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



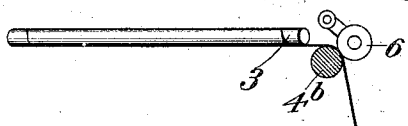
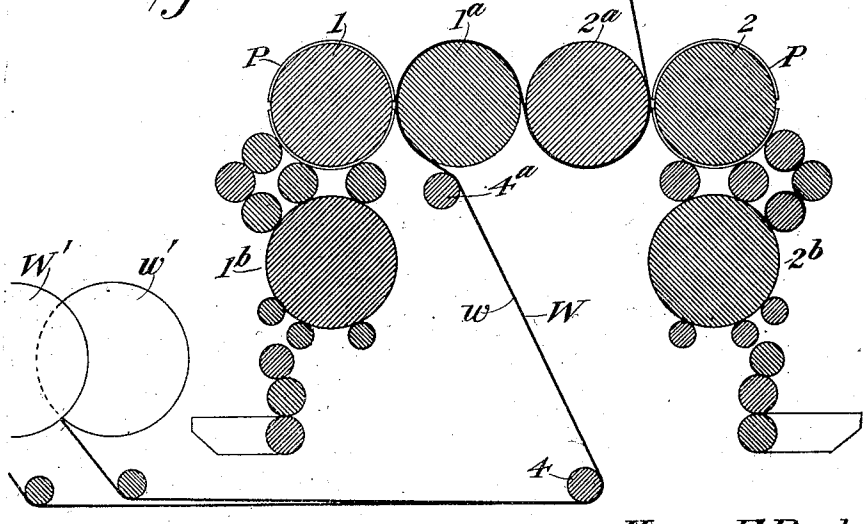


Fig. 2.



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Witnesses

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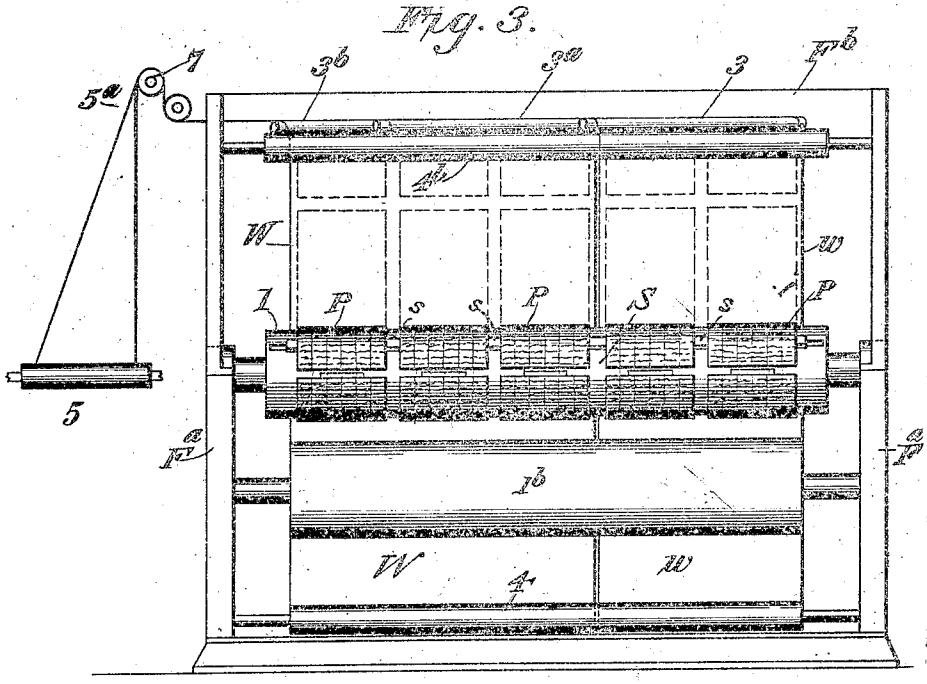
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2 SHEETS—SHEET 2.

Fig. 3.



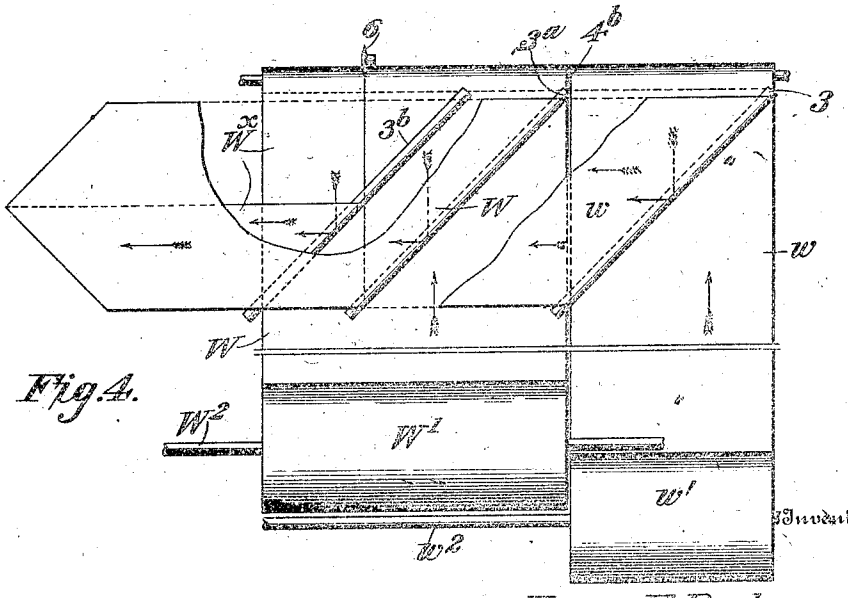


Fig. 4.

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UNITED STATES PATENT OFFICE.

HENRY F. BECHMAN, OF BATTLE CREEK, MICHIGAN, ASSIGNOR TO DUPLEX PRINTING PRESS COMPANY, OF BATTLE CREEK, MICHIGAN, A CORPORATION OF MICHIGAN.

ROTARY-CYLINDER WEB-PERFECTING PRINTING-PRESS.

No. 880,960. Specification of Letters Patent. Patented March 3, 1908.

Application filed June 1, 1907. Serial No. 376,835.

To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Rotary-Cylinder Web-Perfecting Printing-Presses; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in rotary cylinder web perfecting printing presses of the type shown in my Patent No. 814,510, dated March 6, 1906; and the object of this invention is to construct a single section perfecting press, having but two type cylinders and two co-acting impression cylinders, capable of printing newspapers of as many as twenty pages of ordinary newspaper size, at each operation of the press. And to this end the invention comprises a single rotary perfecting mechanism, in which the cylinders are arranged parallel, in substantially the same plane, side by side longitudinally of the press and means for directing two webs at same speed between such cylinders, and assembling such webs at the folder.

The peculiar noticeable features of the press being first, the unusual length of the cylinders, each plate cylinder being capable of carrying as many as ten full page plates arranged in two rows, of five plates each, on opposite sides of the cylinder; second—two webs are employed in printing papers of more than twelve pages, and one web if printing less than twelve pages; third—the twelve-page web is divided before reaching the folder; and fourth—the printed webs are all assembled at a folder at one end of the press. All the parts of such press are accessible from the floor, and the plates can be put on or removed from the plate cylinders by pressmen standing on the floor beside the press; the impression cylinders can also be packed from the sides of the press; the inking mechanisms are readily accessible; and the printed webs are simply given a quarter-turn over angle bars and led direct to the folder. The press can be used to produce newspapers of any size up to twenty newspaper pages, in multiples of two or four; for eight pages or less and for twelve pages a single web can be used; and for ten pages, or over twelve pages, two webs can be used.

The invention will be further explained in detail with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the complete press and folder, looking from the off-side of the press. Fig. 2 is a diagrammatic transverse vertical section through such press. Fig. 3 is a detail side elevation thereof with the ink fountains and ductor rolls removed, looking from the in-feed side of press; and Fig. 4 is a detail plan view showing the mode of assembling the printed webs.

The press has two plate cylinders 1, 2, and two impression cylinders 1^a, 2^a, respectively co-acting with the plate cylinders; said cylinders are all preferably arranged in substantially the same horizontal plane; and extend longitudinally of the press, being journaled in bearings on the end castings F^a of the main frame as shown, and can be easily reached from the floor, the plate cylinders 1, 2, being outermost. Each plate cylinder is long enough to carry five newspaper-page forms arranged side by side thereon,—as shown in Figs. 1 and 3. Each row of forms being arranged in two groups, two forms in one group, and three forms in the other group the groups of forms being separated further than the marginal spaces between the forms. Thus in Fig. 3 the three left-hand forms are one group, and the two right-hand forms are another group. These groups are separated by a space S wider than the marginal spaces *s* between the forms in the group. This wide space S enables two webs to be run side by side through the press, and allows each to have a proper margin at their adjacent edges without overlapping.

Beneath each plate cylinder is an inking mechanism 1^b, 2^b, indicated in Fig. 2, comprising an ink drum, fountain, ductor rolls, distributing rollers, and form rollers, preferably constructed substantially as shown and described in my Patent No. 823,098, dated June 12, 1906, and requiring no detailed description herein. Above the cylinders, are three angle bars 3, 3^a, 3^b, which are set at an angle of 45 degrees to the cylinders, and are attached to a bar F^b supported on the end castings F^a of the press. The webs W, *w*, are led from rolls W', *w'*, at one side of the press, said rolls being supported on shafts W^2, w^2, as usual, but arranged near together, so that the narrow web *w* runs close beside the wide web W, (see Fig. 1 and 4). Web W is

three pages wide, and web *w*, two pages wide, so that when run together, as in Figs. 1 and 4, the two webs are as wide as the rows of plate forms P on the cylinders plus the margins.

Assuming that a twenty-page paper is to be produced, each plate cylinder 1, 2, will carry ten page-forms P arranged thereon in two rows, five page-forms P in a row; and the webs W and *w* will be used, as indicated in Figs. 2 and 4. The webs are led in from the rolls to and under a guide 4 below the cylinders, then up over a guide 4^a to and between the cylinders 1, 1^a; then down between the impression cylinders 1^a, 2^a, then up between cylinders 2, 2^a, to and over a guide 4^b. Web *w* is then carried to and turned over angle-bar 3 and led therefrom longitudinally of the press to the former 5^a of the folding mechanism 5 at the end of the press, said folding mechanism being a rotary folder of the well known type by which the papers can be folded to half or quarter size and delivered from the press as indicated in Fig. 1.

The web W, is slitted longitudinally as it passes over roller 4^b, by a rotary slitter 6 which separates a strip $W^\times$ one page in width, from the other portion of web W. The main part of web W is led to angle-bar 3^a, given a quarter-turn thereover, bringing it parallel with the web *w*, and passed to the former 5^a, where it is assembled with web *w* and passes on to the folder 5. The other part $W^\times$ of web W is led to angle bar 3^b, given a quarter-turn thereover, and brought parallel with webs W, *w*, and led to former 5^a, and passed into the folder. The narrow web $W^\times$ passes down one side of the former, as indicated in Fig. 4, and is inclosed within the fold of web W made by the former, and web W is inclosed within the fold of web *w*, made by the former, so that the one-page-wide web $W^\times$ is inclosed within the two-page-wide webs W, *w*. The press may be equipped with suitable means to paste the inner margin of the pages and cause them to adhere when folded; as is well understood. The webs may be assisted over roll 4^b, by means of pinching rollers 4^d, running in the marginal spaces, as shown in Fig. 1. Before reaching the former 5^a webs *w* may be looped over an adjustable roller 7, as indicated in Fig. 1, so that proper register of the printed pages on the various webs can be obtained.

The cylinders are geared to run at same peripheral speed, and the various web guiding devices, and folding mechanisms, and inking devices are geared up to be driven in proper time, to handle the web, and papers, and these features being well understood and merely mechanical features of construction familiar to all press builders, require no detailed explanation or illustration.

It is preferable to employ two webs as described because of the exceptional width of the rows of forms on the cylinders (5 pages wide) and it would be difficult, and costly to obtain single webs of such width, and the rolls would be troublesome to handle. The web W is ordinarily 56.25 inches wide; and web *w* is 34.25 inches wide. The two webs together being 90.50 inches wide. Furthermore by using two webs as described less paper has to be kept in stock and greater flexibility is obtained, for if it be desired to produce only eight-page papers, web *w* alone can be used; if only twelve-page papers, web W alone can be used; for 16-page papers, two webs *w* can be used. The narrower webs are also easier to handle and less expensive than the wide webs.

When printing twenty page papers as above described, the press will be run on the "collecting" method; that is—every page form on each cylinder will be different,—and thus as each plate cylinder can carry ten page forms the maximum capacity of the press is one twenty-page newspaper at each operation or for each rotation of the plate cylinders. If the press be operated on the non-collecting method—to wit the rows of plates on each cylinder being duplicates,—or each cylinder carrying two duplicate sets of plates—the maximum capacity of the press would then be two ten-page newspapers at each operation of the press—or for each rotation of the plate cylinders. These two methods of arranging the forms are well known, and does not affect the operation or speed of the machine, but simply the size of the papers produced.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a rotary printing press the combination of two plate cylinders and two co-acting impression cylinders all extending longitudinally of the press and arranged close together with the plate cylinders outermost, each plate cylinder adapted to carry rows of five newspaper-page forms arranged in two groups, two forms in one group and three in the other; a folder adjacent one end of said cylinders, guides for directing a wide and a narrow web between the cylinders to be perfected thereby, a slitter for the wider web and angle bars and guides for deflecting the narrow web and the two parts of the wide web and directing same to the folder.

2. In a rotary printing press the combination of two plate cylinders and two co-acting impression cylinders all extending longitudinally of the press and close together and arranged in substantially the same plane with the plate cylinders outermost, each plate cylinder adapted to carry rows of five newspaper-page forms arranged in two groups, two forms in one group and three in the other; a folder adjacent said cylinders guides for directing two webs of paper of different width side by side between the

cylinders to be perfected by the respective groups of forms thereon, a slitter for the wide web adapted to sever one page width therefrom and angle bars and guides for deflecting the narrow web and the two parts of the wide web and directing them to the folder.

3. In a rotary printing press the combination of two plate cylinders and two impression cylinders arranged side by side in substantially the same plane and extending longitudinally of the press each plate cylinder adapted to carry ten newspaper-page forms arranged in two rows, five page-forms in each row arranged in groups of two and three forms; with a folder having its cylinders in axial parallelism with the plate and impression cylinders, guides for directing a wide and a narrow web of paper between the plate and impression cylinders to be perfected, means for slitting the wide printed web, three angle bars above the cylinders for assembling the narrow and slit webs, and guides for directing the assembled webs to the folder.

4. In a rotary newspaper printing press the combination of two plate and two impression cylinders arranged closely adjacent and extending longitudinally of the press in substantially the same plane with the plate cylinders outermost, each plate cylinder adapted to carry two rows of forms, five newspaper-page forms in each row, said forms being arranged in two groups of three forms and two forms respectively; a folder at one end of the press, means for directing a wide and a narrow web of paper side by side between the plate and impression cylinders to be perfected by the groups of forms thereon, means for slitting the wide printed web longitudinally to separate a one page width of web therefrom, three parallel angle bars above the cylinders over which the narrow and the two parts of the slitted webs are given a quarter turn and assembled, and guides for directing the assembled webs to the folder.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

HENRY F. BECHMAN.

Witnesses:
F. W. DUNNING,
HENRY K. STONE.