E. PICKERING.

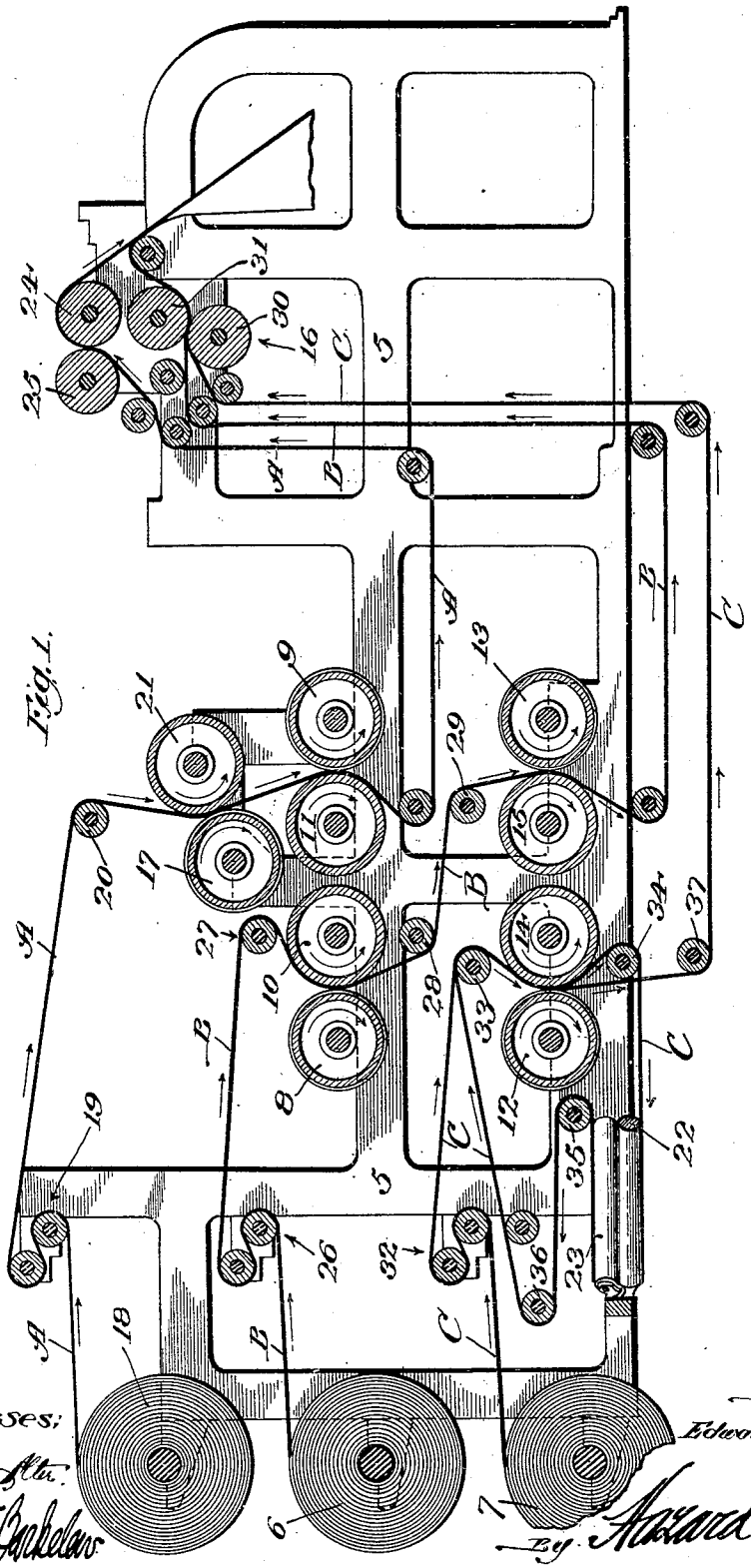
PRINTING PRESS.

APPLICATION FILED AUG. 10, 1908.

961,256. Patented June 14, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Lute A. Mer.

James T. Batchelor.

Inventor:

Edward Pickering,

By Howard & Howard

Attorneys &c.

E. PICKERING.

PRINTING PRESS.

APPLICATION FILED AUG. 10, 1908.

961,256.

Patented June 14, 1910.

2 SHEETS—SHEET 2.

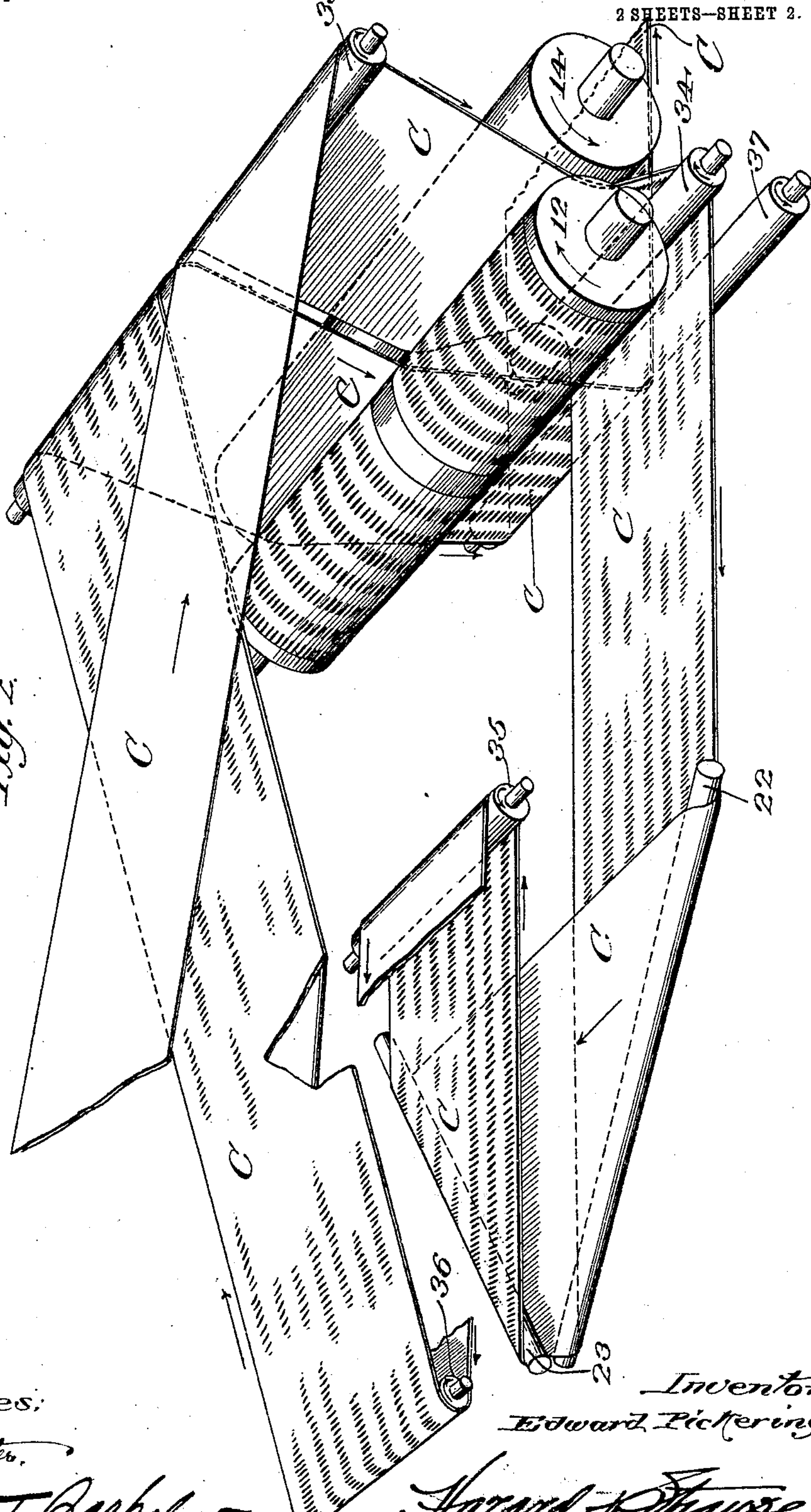


Fig. 2

Witnesses:

Pete S. Alter.

James T. Barkelew

Inventor:

Edward Pickering,

By Hazard & Strause,

Attorneys.

UNITED STATES PATENT OFFICE.

EDWARD PICKERING, OF PASADENA, CALIFORNIA, ASSIGNOR TO GOSS PRINTING PRESS CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PRINTING-PRESS.

961,256. Specification of Letters Patent. **Patented June 14, 1910.**

Application filed August 10, 1908. Serial No. 447,715.

To all whom it may concern:

Be it known that I, EDWARD PICKERING, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented new and useful Improvements in Printing-Presses, of which the following is a specification.

This invention relates to an improvement in multi-roll two-plate-wide printing-presses in which the several decks of printing couples are arranged one over another in the same vertical plane and in which the webs in the ordinary use of the press are run through the printing mechanisms and brought together or superposed in register before folding while traveling in the same vertical plane with each other and without the use of angle-bars, and particularly to a two-deck two-plate-wide press of this character; and its object is to provide a simple arrangement whereby in a two-deck press of this character fourteen, eighteen or twenty pages may be printed as well as the usual number of pages.

In such a two deck press of the general character illustrated in the drawings it is possible to obtain from each web as many as eight separate and different pages, four pages being printed on one side of the web by the plates on one printing cylinder and another four pages being printed on the backs of the first four pages by the four plates on the other printing cylinder against which the web passes, the separate pages being collected by the usual collecting cylinder into an eight page section. In accordance with prevalent practice it is also possible to print two or four pages upon a single web, the web upon which the two pages are printed being half the width of the web for four or eight pages. By means of combining the different numbers of pages which may be printed as above mentioned it will be seen that it is possible to print a paper consisting of two, four, six, eight, ten, twelve or sixteen pages. For forming a paper of fourteen pages it is readily noted that eight pages must be printed on one web and six pages upon the other web. With the construction now in use it is impossible to print six pages upon a single web, and it is the object of my invention to provide a simple improvement which may be applied to the typical two deck straight line press with a minimum of changes so that the press may print a paper of fourteen pages, the arrangement also enabling the press to print any even number of pages up to twenty.

I accomplish the above object by means of the device described herein and illustrated in the accompanying drawings, in which:—

Figure 1,—is a diagrammatic sectional elevation of a two deck press equipped with my improvement, plated for fourteen pages. Fig. 2,—is an enlarged perspective view of that part of the press which prints the single sheet, or two pages, necessary for a fourteen page paper.

A typical two deck press of the above described character is diagrammatically illustrated in the drawings the frame 5 being of the usual, or any convenient configuration. Web rolls 6 and 7 are the ones ordinarily mounted on a press of this character. The usual printing cylinders 8 and 9 and impression blanket cylinders 10 and 11 therefor are provided on the upper deck, the web from upper roll 6 passing through the upper deck cylinders in the usual manner if it is desired to use the press as a straight line, as for instance, in printing sixteen pages. The usual color cylinder is shown at 17 on the upper deck. In the usual construction of a multiple deck press the color cylinder 17 is arranged to coöperate with a blanket cylinder 11. In my improvement, the color cylinder is raised from the blanket 11 and is made to coöperate with an additional blanket cylinder 20 which I add in my construction. Printing cylinders 12 and 13 and impression cylinders 14 and 15 are mounted on the lower deck in duplicate of those on the upper deck. The usual aggregation 16 of cutting and collecting cylinders is provided immediately before the folder, there being no change in this part of the press. The several pipe rollers over which the webs pass are shown in their positions usual to this class of press, so that it will be understood that the changes involved by my improvement are very few and simple.

The additions to the typical press as above described are as follows:—An extra web roll 18 is mounted above roll 6 and pipe rollers 19 and 20 are provided over which web A

is conveyed between cylinder 17, ordinarily the color cylinder, and an extra impression or blanket cylinder 21. On the lower deck two angle bars 22 and 23 are added in positions whose relations to each other are clearly shown in Fig. 2, each of the bars reaching half way across the press. These simple changes, the addition of one cylinder and two angle bars, enable me to print a fourteen page paper upon a press of the character described and, further, to print any even number of pages up to twenty. The plating and operation will now be described for typical numbers of pages and especially for fourteen pages.

The plating and arrangement of webs for running fourteen pages is indicated in the drawings. Web A, full width, from upper roll 18 is passed over rollers 19 and 20 between cylinders 17 and 21 and then between cylinders 11 and 9. As before stated, cylinder 17 is the ordinary color cylinder of a press of this character and, in the present arrangement, this cylinder is provided with four plates for four separate pages, of the completed fourteen page paper, namely, pages 2, 4, 11 and 13 which are printed on one side of web A. Printing cylinder 9 is similarly plated for pages 1, 3, 12 and 14 which are printed on the back of pages 2, 4, 11 and 13, respectively. This makes eight complete pages which pass out of the press in the ordinary manner between the cutting and collecting cylinders 24 and 25. The cutting and collecting is accomplished in the usual manner and the pages from this web are collected into an eight page section which passes on to the folder (not shown).

Web B, full width, from roll 6 passes over rollers 26 and 27 and between cylinders 8 and 10, thence over rollers 28 and 29 and between cylinders 13 and 15. Cylinder 8 is plated with two sets of plates for pages 9 and 6 of the completed fourteen page paper, there being four plates on this cylinder as on cylinders 17 and 9. Cylinder 13 is plated for pages 5 and 10 in a manner similar to the plating of cylinder 8 and these pages will be printed upon the backs of pages 9 and 6. The web passes out of the press in the usual manner between cutting cylinders 30 and 31 to the folder. Upon each revolution of the cylinders 17 and 9 it will be seen that eight complete, separate pages will be printed on web A. Upon each revolution of cylinders 8 and 13 two sets, of four complete, separate pages each, will be printed. If the two webs were run through the press at the same speed it will be seen that every time an eight page section was gathered at the collecting cylinders from web A, two four page sections would run through on web B. This difficulty is obviated by running web A through the press at full speed and web B at half speed, so that a single section of eight pages will run through on web A in the same time that a single section of four pages will run through on web B. The mechanism for running one set of cylinders at half speed is old to the art and is not illustrated.

The above described arrangements constitute the means for printing twelve of the fourteen pages of the complete paper, the following mechanism being designed to print the remaining two. This arrangement and mechanism is more clearly shown in Fig. 2. Web C, passing from roll 7, is of just half the width of webs A and B. This web passes over rollers 32 and 33 on the near side of the press in the illustration shown, and then downwardly between cylinders 12 and 14. Printing cylinder 12 is provided with two sets of plates, a set at the end over which the web first passes composed of two duplicate plates for page 7, and a set at the other end of two plates for page 8. The web passes between cylinders 12 and 14 for the first time and page 7 is continuously imprinted upon it. The web then passes over pipe roller 34 and longitudinally to angle bar 22 where it is passed at right angles across the press to the far side over angle bar 23 which turns it again to a longitudinal direction. Passing over a roller 35 to a roller 36 the web passes again over roller 33 at the far side of the press. In addition to being transferred to the far side of the press it will be noted that web C has been also reversed so that its clean or unprinted side comes in contact with the plates for page 8 on the far end of printing cylinder 12. Here the pages 7 previously printed will be backed by pages 8 and the web will then pass over roller 37 in the usual manner to the cutting cylinders.

What has been said in regard to the number of sections printed on web B at each and every revolution of its printing cylinders is obviously also true of web C and, consequently, web C must also be run at half speed in order to supply but a single section of pages 7 and 8 to every eight page section supplied by web A. As webs B and C are both traveling at the same speed they are run between the same set of cutting cylinders, the sections passing straight through to join the eight page sections gathered in cutting and collecting cylinders 24 and 25.

For running eighteen pages it is only necessary to run web B at full speed and to plate its printing cylinders for eight pages instead of two sets of four. This web is then passed through cutting and collecting cylinders 24 and 25 along with web A as these two webs are running at the same speed. From these two webs a sixteen page section is collected. The other two pages are supplied by web C in the exact manner before explained.

For running twenty pages all the webs and cylinders travel at full speed, webs A and B supplying eight pages apiece and web C supplying four pages. The four page plating for web C is accomplished by plating cylinder 12 for four separate pages rather than for two sets of two pages each. In this case all the webs will pass through cylinders 24 and 25 without being cut and collected, the cutting and collecting being done in the folder after the webs have passed over the former.

From the foregoing description it will be seen that I have provided a simple mechanism which may be added to a press of the character described to enable it to print numbers of pages which were heretofore impossible. The change involves the addition of only one cylinder, as the arrangement of web C enables both sides of that web to be printed on a single cylinder. Otherwise it is obvious that the addition of two more cylinders as a set for printing the back side of web C would be necessary. Thus, by the arrangement particularly shown in Fig. 2 the addition of extra cylinders is reduced to a single one, namely cylinder 21, and the press is enabled to print any even number of pages up to twenty.

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

A printing press comprising an upper deck and a lower deck, two sets of printing and blanket cylinders carried by said lower deck, two sets of printing and blanket cylinders carried on the upper deck, a color cylinder, an additional blanket cylinder, means for passing a full width web between the color cylinder and the additional blanket cylinder and between one set of printing and blanket cylinders on the upper deck, means for passing a full width web between the other set of printing and blanket cylinders on the upper deck, means for carrying said web between one set of printing and impression cylinders in the lower deck, means for guiding a one-half width web between half of the other set of printing and impression cylinders in the lower deck and means to reverse the web and re-pass it between the same set of printing and impression cylinders in the lower deck.

In witness that I claim the foregoing I have hereunto subscribed my name this 3rd day of August, 1908.

EDWARD PICKERING.

Witnesses:

EDMUND A. STRAUSE,

OLLIE PALMER.