

No. 851,039.

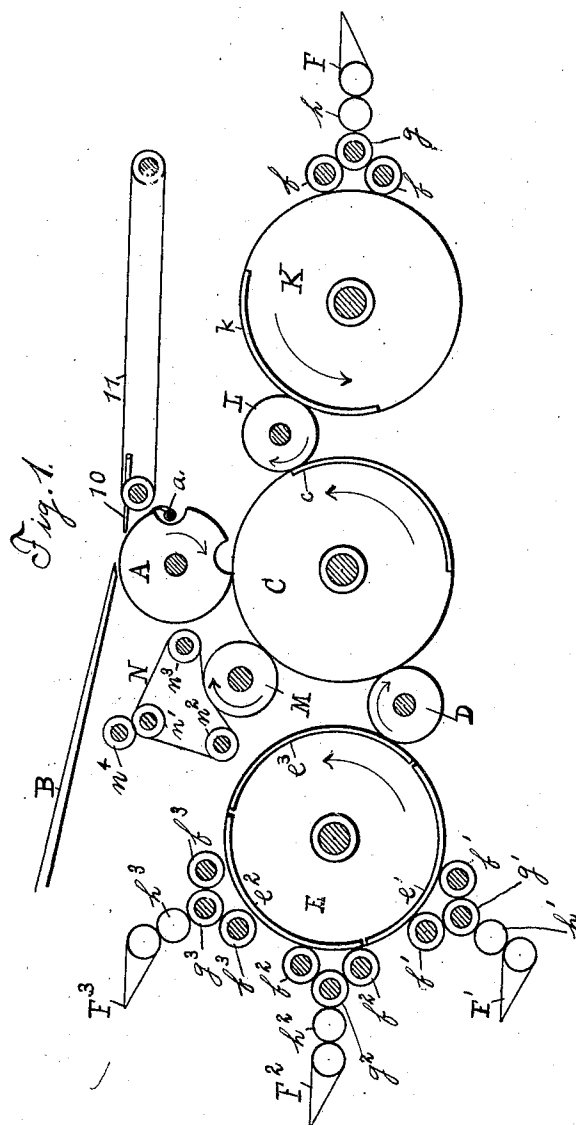
PATENTED APR. 23, 1907.

L. W. SOUTHGATE.

MULTICOLOR PRINTING MECHANISM.

APPLICATION FILED NOV. 27, 1899. RENEWED AUG. 2, 1906.

5 SHEETS—SHEET 1.



Witnesses
Harry M. Rugg.
M. O. Rogers.

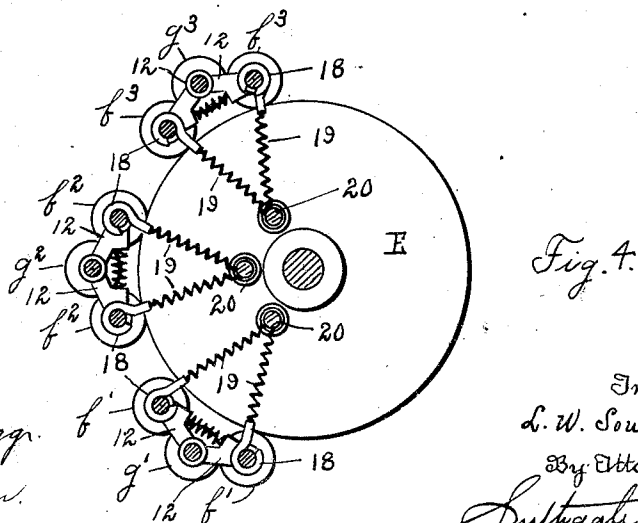
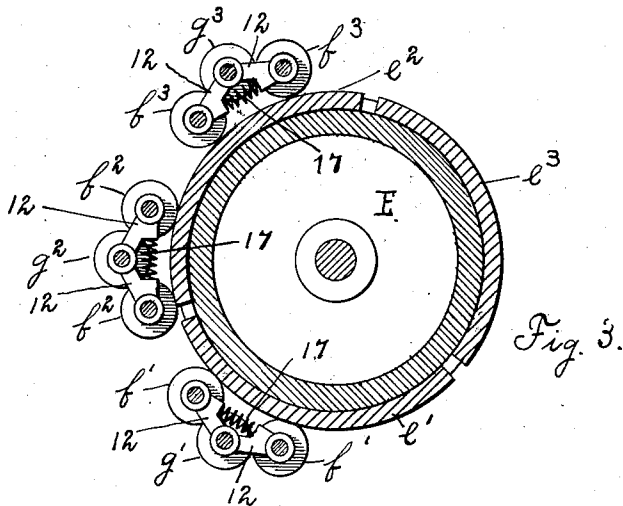
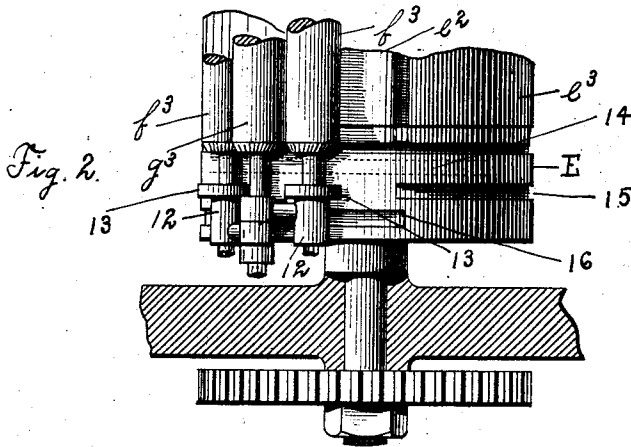
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5 SHEETS—SHEET 2.

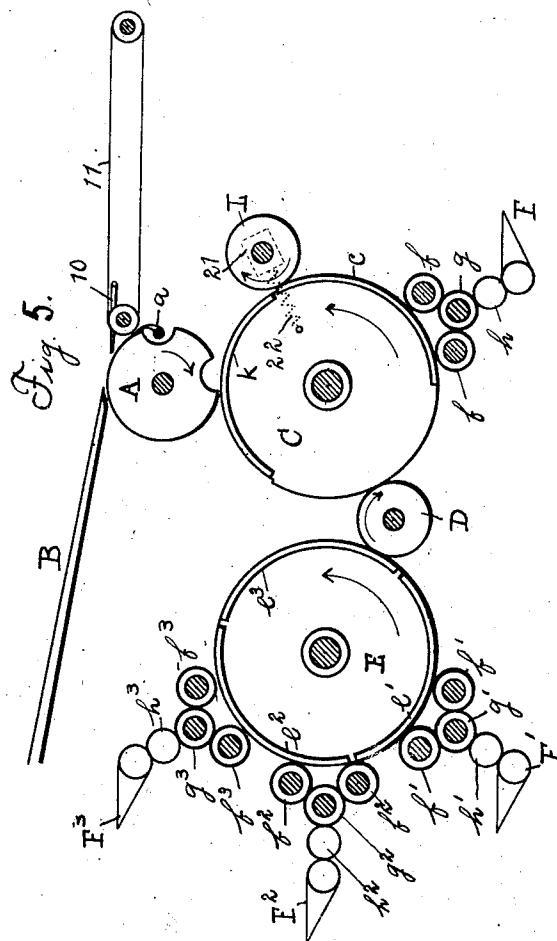


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5 SHEETS—SHEET 3.



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No. 851,039.

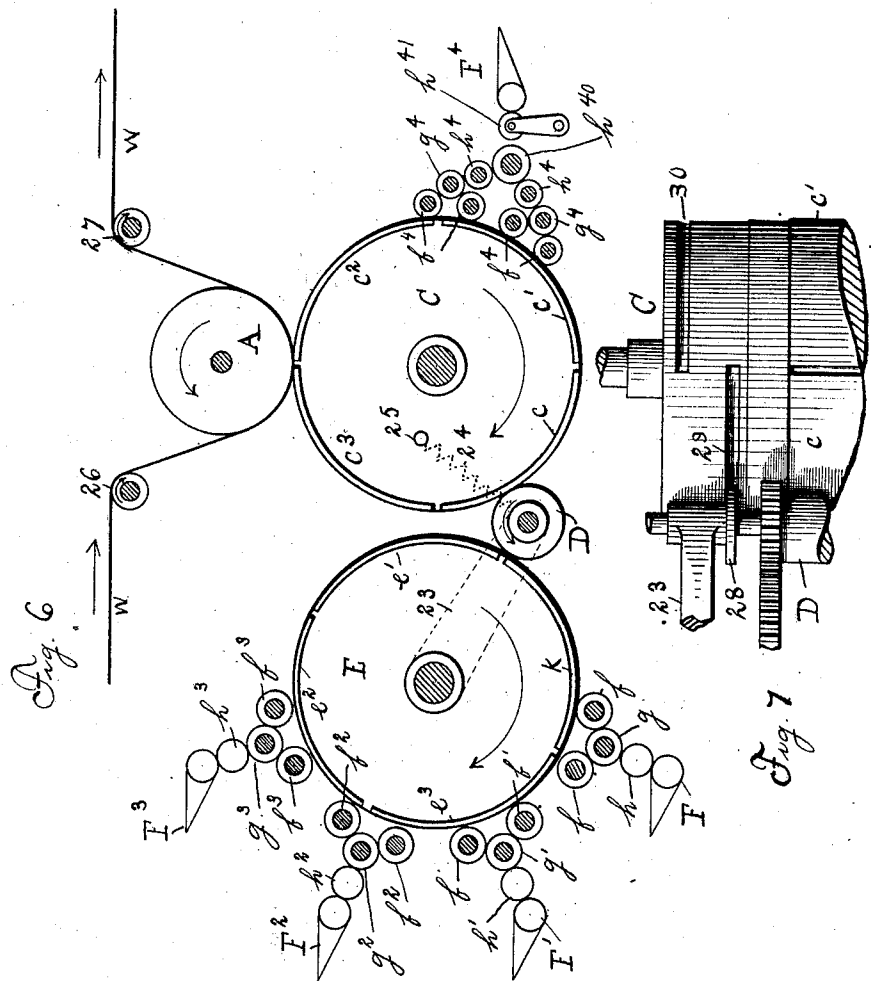
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5 SHEETS—SHEET 4.



Witnesses:
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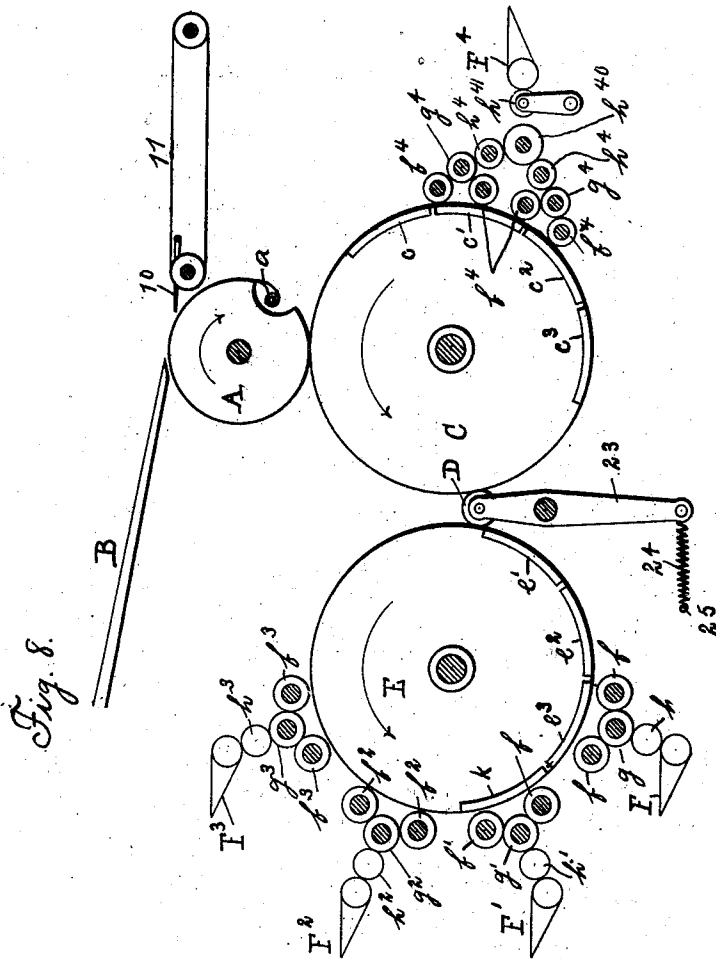
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APPLICATION FILED NOV. 27, 1899. RENEWED AUG. 2, 1906.

6 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

LOUIS W. SOUTHGATE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE
CAMPBELL PRINTING PRESS & MANUFACTURING CO., OF NEW YORK,
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MULTICOLOR-PRINTING MECHANISM.

No. 851,039.

Specification of Letters Patent.

Patented April 23, 1907.

Application filed November 27, 1899. Renewed August 2, 1906. Serial No. 328,952.

To all whom it may concern:

Be it known that I, LOUIS W. SOUTHGATE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Multicolor-Printing Mechanism, of which the following is a specification.

This invention relates to new and improved mechanism for multicolor printing.

10 The principle on which the invention works is as follows: A printing plate or form is prepared and the same is placed on a suitable base or carrier, coöperating with which is an impression member to force or press
15 the material to be printed against the printing plate or form. Separate color-design plates are prepared, generally three in number, each color-design plate being designed to be used in connection with one of the
20 distinct colors used. These color-design plates have raised or relief surfaces corresponding in height and position to the particular application which is to be made of the particular color. These color-design plates
25 are secured to an integral carrier or base, which is entirely independent of and distinct from the carrier or base for the printing-plate proper. A plurality of ink-fountains are employed in connection with the carrier
30 or base for the color-design plates. An ink-fountain is employed for each color. Ink-spreading rolls are arranged between the ink-fountains and the color-design-plate carrier or base, and suitable cam devices
35 are provided, so that the plate-inking rollers will be raised and lowered relatively to the carrier or base which carries the color-design plates, so that, for example, the inking-rollers which are arranged in connection with
40 the fountain which has red ink put therein will only contact with the color-design plate which is designed for the application of red ink, &c. Between the color-design-plate carrier and the printing-plate carrier is arranged a transfer device having a soft or receptive surface on which the various color
45 designs from the color-design plates are registered together lengthwise and widthwise to make up a positive of the complete multicolor design—that is to say, in practice the design or designs of each of the color-design
50 plates consists of one or more irregular shaped or outlined figures or spots, each de-

fining and controlling a particular application of the color manipulated by the particular color-design plate: The arrangement
55 before described is such that these various spots or designs coming from the plurality of the color-design plates will be registered together lengthwise and widthwise on the transfer device to make up a positive of the complete multicolor design. The colors
60 may be blended, if desired, as well as registered by having the designs overlap on the transfer device. The active transfer-surface of the transfer device is thus equal to
65 and is arranged to register with and ink the printing-plate. The operation with this construction is substantially as follows: The color-design plates will be properly
70 inked, as before described, the design of all the color-design plates will be transferred to the transfer-device, the printing-plate carrier and the transfer device will then move one relatively to the other, so that the transfer device will properly ink the printing-
75 plate, so that the various color designs properly blended or matched will be applied to the printing-plate. The impression member will then press the material to be
80 printed onto the properly-inked printing-plate, and in this way the multicolor impression will be made.

A separate mechanism, consisting of a separate plate for black ink, an ink-fountain, a set of inking-rollers, and a transfer member,
85 is usually arranged in connection with the above-described color-printing mechanism to apply black ink to the printing plate or form, so that the impression made will not only be a color impression, but will have
90 black matter, as reading-matter, thereon.

The previously-described mounting of the color-design plates on a single integral carrier independent and separate from the
95 printing-plate carrier permits of the application of the invention to almost every variety of printing-press and permits of the designing of machines which will operate at high speed.

In this application for patent I claim the foregoing mechanism broadly, and specifically claim, show, and describe the application of the same to the rotary printing-press.

Referring to the accompanying five sheets of drawings, forming part of this application, Figure 1 is a diagrammatic elevation
105

illustrating the application of my invention to a rotary sheet-printing press. Figs. 2, 3, and 4 are an enlarged plan, partial sectional, and end elevation, of the color-design-plate carrier, illustrating the arrangement of the color-design plates and plate-inking rollers. Fig. 5 is a view similar to Fig. 1, illustrating a slightly-modified form of press. Fig. 6 is a view similar to Fig. 1, illustrating one application that may be made of my invention to a rotary printing-press printing on a continuous web and printing not only one page or sheet in colors, but one or more pages or sheets in black or colored ink. Fig. 7 is an underneath plan view of the printing-plate carrier shown in Fig. 6; and Fig. 8 is a view similar to Fig. 6, illustrating the arrangement in a rotary sheet-printing press when it is desired to print one page in colors and one or more pages of a signature in black or one-colored ink.

Referring now to the first and second sheets of drawings, I will describe the application therein shown of my invention.

A represents an impression-cylinder which has the usual grippers *a* and to which sheets are fed, as from feed-board B. The printed sheets are taken from the impression-cylinder by the usual stripper-fingers 10 and pass out on any of the usual delivery-tapes 11. The impression-cylinder may be of the two-revolution pattern, the stop-cylinder pattern, or the drum-cylinder pattern. The two-revolution is shown and is preferred for large work, while the drum-cylinder is preferred for small work.

C designates a printing-plate carrier. The same is designed to carry the printing-plate *c*. One convenient relative arrangement between the impression-cylinder and printing-plate carrier is to make the impression-cylinder one-half the size of the printing-plate carrier and to use two-thirds of the surface of the impression-cylinder for the largest size sheet that is to be manipulated and one-third of the surface of the printing-plate carrier for the largest plate that is to be used.

E designates the color-design-plate carrier. This color-design-plate carrier is separate and distinct from the printing-plate carrier. The same is capacitated to receive three color-design plates *e'* *e*² *e*³ of the size of the printing-plate *c*.

D designates a transfer-cylinder which has a soft or receptive surface and which is arranged between the printing-plate carrier C and the color-design-plate carrier E. The transfer-cylinder has a surface area equal to the largest printing plate or form to be used and is arranged so that the various color outlines or figures from the color-design plates will be registered together circumferentially and axially and so that its active surface will register with and ink the printing plate or form. The color-design-plate carrier and

the printing-plate carrier are driven by any suitable gearing, as the ordinary spur-gearing, to turn in the same direction. The transfer-cylinder makes as many revolutions relatively to the color-design-plate carrier E as the number of color-design plates said color-design-plate carrier is adapted to receive. Thus in the specific application now under consideration as the color-design-plate carrier has three plates the transfer-cylinder D will make three revolutions for each revolution of the color-design-plate carrier. Co-operating with the color-design-plate carrier E is an inking apparatus for each color-design plate.

The inking apparatus for the color-design plate *e'* consists of an ink-fountain F', an ink-carrier roller *h'*, a distributor-roller *g'*, and two form or plate inking rollers *f'* *f'*. The inking apparatus for each of the other two color-design plates is of the same pattern and is referred to by the same reference-letters, except that the inking apparatus which is used for color-design plate *e*² is referred to by reference-letters F² *h*², &c., and the inking apparatus that is used for the color-design plate *e*³ is referred to by the reference-letters F³ *f*³, &c. The plate or form inking rollers are journaled in arms or brackets 12 12, which are hung on the shafts of the distributor-rollers, as shown in the second sheet of the drawings. The distributor-rollers are rigidly journaled in the side frames or in suitable brackets in the ordinary manner. On the shaft of each of the plate-inking rollers is arranged a roll or wheel 13. Three cam-grooves are cut in each end of the color-design-plate carrier E to correspond with the position of the respective color-design plates. Thus, for example, grooves 14 correspond in position with the color-design plate *e'*, grooves 15 with the color-design plate *e*², and grooves 16 with the color-design plate *e*³. The wheels 13 on the plate-inking rollers *f*³ *f*³ are set to engage the grooves 15, the wheels on the plate-inking rollers *f*² *f*² the grooves 16, and the wheels on the plate-inking rollers *f'* *f'* the grooves 14. The grooves and wheels are preferably duplicated at each end of the color-design-plate carrier. Each distributor-roller and its two form or plate inking rollers may be inserted in the press as one set, the brackets 12 12 being kept in comparatively the same relative position by springs 17, arranged between the brackets. The form inking or plate rollers are also forcibly pulled toward the center of the color-design-plate carrier by hooks 18, which engage the brackets 12 12 or the shafts of the plate-inking rollers and which connect by heavy springs 19 to studs 20 on the inside of one of the frames. These hooks are used so that the inking devices can be readily taken out or put in place, as desired. By this described arrangement it will be seen that the form or

plate inking rollers of each set will only supply ink to one of the color-design plates. Thus, for example, the form-inking rollers $f'f'$ will turn about the distributor-roller g' to contact with the color-design plate e' as the same passes the first inking apparatus by reason of the cam-grooves 14 allowing the springs 19 to pull them into operative position, but when the plate e' passes the first inking apparatus the smooth portion at the end of the color-design-plate carrier will cam or raise the plane or form inking rollers $f'f'$ clear of the color-design-plate carrier, so that the first ink-fountain will only supply ink to the first color-design plate e' .

The operation of this mechanism before described is such that the color-design plates will be properly inked by the rotation of the color-design-plate carrier or cylinder, and if the three primary colors are used—as, for example, red in the first fountain, blue in the second fountain, and yellow in the third fountain—the color-design-plate carrier, with its three plates, will be adapted to give fine shadings and blendings to make up almost any multicolor design. The designs of all the color-design plates will be transferred to the transfer-cylinder D, and the transfer-cylinder will apply the three colors registered and blended, if desired, to the printing-plate c , so that the same will be properly inked to give a properly matched or blended multicolor impression. The operation will be as rapid as sheets can be fed to the impression-cylinder, as the cylinders can be made of convenient size. If it is also desired to apply black ink to the printing-plate, a separate carrier K may be arranged to turn in the same direction as the printing-plate carrier and the color-design-plate carrier. A plate k may be secured thereon and may have portions in relief which correspond to the application which is to be made of the black ink. An ink-fountain F, ink-carrying roller h , distributor-roller g , and plate or form inking rollers ff are arranged to properly ink the plate k . A transfer-cylinder L is arranged between this third carrier K and the printing-plate carrier, said transfer-cylinder L being the same size as transfer-cylinder D. By this arrangement the black design will be properly applied by the transfer-cylinder L to the printing-plate c , so that the impression made will not only be a multicolor impression, but will have portions thereof, as reading-matter, in black. This mechanism for applying the black ink is preferably arranged to apply the black ink to the printing-plate after the latter has received its application of colored inks, so that there will be an impression taken from the printing-plate before the same again comes around to the transfer-cylinder which applies the colored inks, so that the black ink will be prevented from working into the color-fountains.

I generally provide a cleaning device for cleaning the printing-plate between each impression and inking. This cleaning device may consist of a soft cylinder M, turning in connection with the printing-plate carrier to remove any surplus ink therefrom after impression. This cylinder M bears on a blanket or apron N, which is trained around suitable guide-rollers $n'n^2n^3$ and is held in place by a roller n^4 . The blanket N is preferably held stationary, so as to take up the surplus ink from the cylinder M, and is shifted from time to time so as to present a fresh surface. In this way the printing-plate will be cleaned after each impression and before the next inking.

The parts A C L K and C M and C D E are connected to turn together by spur-gearing, which is not deemed necessary to detail in this case for a clear understanding of the invention.

The before-described mechanism constitutes a very simple and rapid multicolor-press in which a multicolor impression can be made or a multicolor impression with part thereof in black, or by putting some ink besides black in the fountain F the impression may be made four-color or three-color, with the reading-matter or matter printed from plate k in a separate color.

In Fig. 5 I have shown a slightly-modified form of the foregoing machine. In this modification the plate k is arranged on the printing-plate carrier C. The ink is taken therefrom by the transfer-cylinder L and put on the printing-plate c . The inking apparatus for the plate k is arranged as shown, and the form-inking rollers ff are allowed to contact only with the plate k by using the mechanism illustrated in the second sheet of the drawings. The plate k in this modification is preferably set a little below the plate c , so that the same will not contact with the impression-cylinder A or the transfer-cylinder D, and the transfer-cylinder L is arranged in sliding boxes 21, which are controlled by springs 22 to contact both with plate k and printing-plate c .

Another advantageous way my invention can be applied to a rotary press is to make the carrier which carries the printing-plate carry one or a number of other plates which will print in black. This construction is shown in the fourth sheet of the drawings in Figs. 6 and 7. In this construction the color-design-plate carrier E is made to carry four plates, one of which may be the plate k of the previous devices, and this carrier has four fountains coöperating therewith. The printing-plate carrier C has not only the plate c , which is to make the multicolor impression, but three other plates $c'c^2c^3$ secured thereto. In this case the transfer-cylinder D is made one-fourth the size of the cylinders C and E. The same is arranged in arm 23, which are hung about the center of the cylinder E and

which are normally held up by springs 24, arranged between said arms and fixed studs 25. An inking apparatus is arranged in connection with the plate-carrier C to ink the plates $c' c^2 c^3$. This inking apparatus may consist of a fountain F^4 , four form or plate inking rollers f^4 , two distributor-rollers g^4 , two ink-carrying rollers h^4 , an ink-drum h^{40} , and a ductor h^{41} . This inking apparatus is preferably made double, as shown, on account of the large amount of ink it has to supply. The form or plate inking rollers $f^4 f^4$ are mounted as shown in the second sheet of drawings and are controlled by grooves 30, which extend around the cylinder C in position to register with the plates $c' c^2 c^3$. The transfer-cylinder D is allowed to contact only with the plate c by means of wheels 28, mounted on the shaft thereof, which engage grooves 29, cut in the cylinder C to register with said plate c . The impression-cylinder A in this modification is made to present a continuous web w by means of web-guides 26 and 27. In this mechanism the ink-fountain last described, arranged in connection with the printing-plate-carrying cylinder, has its inking-rollers controlled by the cam mechanism, so that the plate or plates on the printing-plate-carrying cylinder which are to print in black will be inked with black over their entire surfaces; but the color-printing plate c will not be operated upon by said inking-rollers. This last plate c corresponds to the printing-plate of the previous devices, and the same will be inked in colors and black, if desired, by the transfer-cylinder D, which coöperates between the cylinders C and E. If, as shown, three plates for black printing and one for color-printing are arranged in this manner, a continuous web will be printed with three pages in black matter and the fourth page in colored matter. This is an advantageous arrangement for magazine or newspaper work. If desired, of course the plate-carrier for the printing-plates may be made to carry any number of printing-plates which are to give black impressions more or less than three, so that any desired signature of pages can be obtained, with one or more pages thereof printing in colors.

In Fig. 8 the same arrangement is shown as applied to a press arranged to print sheets. In this arrangement the plates are arranged to extend only part way around the cylinders C and E, so that time will be given for the feeding and delivery of sheets to and from the impression-cylinder. In the particular device shown the plates are made to cover four-ninths of the surface of the impression-cylinders, and the transfer-cylinder D is proportioned to make nine revolutions for each revolution of the cylinders C and E, or, in other words, its circumference is equal to the circumferential length of one plate.

In all of the previously-described devices of course as many plates may be arranged axially on the cylinders as desired, or what has been described as one plate, as plate c , &c., may be made up of a number of plates or of a plate which will print a number of pages. Plates smaller than those shown may be arranged on the respective cylinders by making the heads thereof come to the same point where the heads of the plate shown come.

In the previously-described devices only one transfer-cylinder has been shown between the various cylinders; but it is to be understood that in certain cases the same may be duplicated, or a transfer-cylinder may be used between the cylinders C and E for each plate on the cylinder E.

The size of the parts and their relative arrangements may be greatly modified by a skilled designer without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a multicolor-printing press, the combination of a printing plate or form carrier, an impression member coöperating therewith, a separate color-design-plate carrier adapted to carry a plurality of color-design plates circumferentially, an inking apparatus for each color-design plate, means for taking ink from each apparatus and applying the same to one color-design plate only, and a transfer device arranged between the printing plate or form carrier and the color-design-plate carrier on which the various colors are registered together circumferentially and axially to make a positive of the multicolor impression and from which the positive is applied to the printing plate or form.

2. In a multicolor-printing press, the combination of a printing plate or form carrier, an impression member coöperating therewith, a separate color-design-plate carrier adapted to carry a plurality of color-design plates circumferentially, an inking apparatus for each color-design plate, means for taking the ink from each apparatus and applying the same to one color-design plate only, and a transfer-cylinder having a surface area equal to the printing-plate, arranged between the printing plate or form carrier and the color-design-plate carrier on which the various colors are registered together circumferentially and axially to make a positive of the multicolor impression, and from which the positive is applied to the printing plate or form.

3. In a multicolor-printing press, the combination of a rotary printing-plate carrier, a rotary impression member coöperating therewith, a separate rotary color-design-plate carrier adapted to carry a plurality of color-design plates circumferentially, an inking apparatus for each color-design plate, means

for taking ink from each apparatus and applying the same to one color-design plate only, and a rotary transfer-cylinder having a surface area equal to the printing-plate, arranged between the rotary printing-plate carrier and the rotary color-design-plate carrier on which the various colors are registered together circumferentially and axially to make a positive of the multicolor impression and from which the positive is applied to the printing-plate.

4. In a multicolor-printing press, the combination of a rotary printing-plate carrier, a rotary impression member cooperating therewith, a separate color-design-plate carrier rotating in the same direction as the rotary printing-plate carrier, and adapted to carry a plurality of color-design plates circumferentially, an inking apparatus for each color-design plate, means for taking the ink from each apparatus and applying the same to one color-design plate only, and a rotary transfer-cylinder having a surface area equal to the printing-plate, arranged between the rotary printing-plate carrier and the rotary color-design-plate carrier on which the various colors are registered together circumferentially and axially to make a positive of the multicolor impression and from which the positive is applied to the printing-plate.

5. In a multicolor-printing press, the combination of a rotary printing-plate carrier, a rotary impression member cooperating therewith, a separate rotary color-design-plate carrier adapted to carry a plurality of plates circumferentially, an inking apparatus for each plate, means for taking the ink from each apparatus and applying the same to one color-design plate only, and a rotary transfer-cylinder arranged between the rotary printing-plate carrier and the rotary color-design-plate carrier, and making as many revolutions relatively to the rotary color-design-plate carrier as the number of color-design plates said color-design-plate carrier is adapted to receive circumferentially, on which the various colors are registered together circumferentially and axially to make a positive of the multicolor design, and from which the positive is applied to the printing-plate.

6. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a separate color-design-plate carrier adapted to carry a plurality of color-design plates, an inking apparatus for each color-design plate, a transfer member on which the various colors are registered together circumferentially and axially, arranged between the color-design-plate carrier and the printing-plate carrier, a plate for applying black ink, an inking apparatus for inking this plate, and a transfer member arranged to take ink from this plate and apply it to the printing-plate.

7. In a multicolor-printing press, the com-

bination of a printing-plate carrier, an impression member cooperating therewith, a separate color-design-plate carrier adapted to carry a plurality of color-design plates, an inking apparatus for each color-design plate, a transfer member on which the various colors are registered together circumferentially and axially, arranged between the color-design-plate carrier and the printing-plate carrier, a plate for applying black ink, and an inking apparatus therefor, and a transfer member for taking the ink from this plate and applying the same to the printing-plate after the latter has received the colored inks.

8. In a multicolor-printing press, the combination of a printing plate or form carrier, an impression member cooperating therewith, a separate rotating color-design-plate carrier adapted to receive three color-design plates circumferentially, three inking apparatuses cooperating therewith, means for applying the ink from each apparatus to one of the said color-design plates only, and a transfer member making three turns to each turn of the color-design-plate carrier arranged between the color-design-plate carrier and printing plate or form carrier, on which the various colors are registered together circumferentially and axially, and from which the same are applied to the printing plate or form.

9. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a separate color-design-plate carrier adapted to carry three color-design plates, three inking apparatuses cooperating therewith, a transfer member on which the various colors are registered together circumferentially and axially, arranged between the color-design-plate carrier and printing-plate carrier, and making three revolutions to each revolution of the color-design-plate carrier, a separate plate for applying black ink, an inking apparatus for this plate, and a transfer member for supplying the black ink to the printing-plate.

10. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a separate color-design-plate carrier, adapted to carry three color-design plates, three inking apparatuses cooperating therewith, a transfer member on which the various colors are registered together circumferentially and axially, arranged between the color-design-plate carrier and printing-plate carrier, and making three revolutions to each revolution of the color-design-plate carrier, a separate plate for applying black ink, an inking apparatus for this plate, and a transfer-cylinder making three revolutions to each revolution of the color-design-plate carrier, and adapted to supply black ink to the printing-plate after the latter has received the application of the colored inks.

11. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a separate color-design-plate carrier adapted to carry a plurality of color-design plates, an inking apparatus for each color-design plate, a transfer member on which the various colors are registered together circumferentially and axially, arranged between the color-design-plate carrier and printing-plate carrier, a third carrier carrying a plate for the application of black ink, and a transfer member arranged between this third carrier and the printing-plate carrier.

12. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a separate color-design-plate carrier adapted to carry a plurality of color-design plates, an inking apparatus for each color-design plate, a transfer member on which the various colors are registered together circumferentially and axially, arranged between the color-design-plate carrier and printing-plate carrier, a third carrier carrying a plate for the application of black ink, an inking apparatus for this plate, and a transfer member arranged between this third carrier and the printing-plate carrier in position to apply black ink to the printing-plate after the latter has received the application of colored inks.

13. In a multicolor-printing press, the combination of a printing plate or form carrier, an impression member cooperating therewith, a separate rotary carrier adapted to carry a plurality of color-design plates circumferentially, an inking apparatus for each color-design plate, a transfer member arranged between the printing plate or form carrier and the color-design-plate carrier on which the colors are registered together to make up a positive of the multicolor design and from which the positive is applied to the printing plate or form, and a cleaning device for cleaning the printing plate or form after each impression.

14. In a multicolor-printing press, the combination of a rotary printing-plate carrier, an impression member cooperating therewith, a separate rotary color-design-plate carrier adapted to carry a plurality of color-design plates circumferentially, an inking apparatus for each color-design plate, a transfer member arranged between the printing plate or form carrier and the design-plate carrier on which the colors are registered together to make up a positive of the multicolor imprint and from which the positive is applied to the printing plate or form, and a cleaning device for the printing plate or form arranged between the impression member and the transfer-cylinder.

15. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a

separate color-design-plate carrier adapted to carry a plurality of color-design plates, an inking apparatus for each color-design plate, a transfer member on which the various colors are registered together circumferentially and axially arranged between the color-design-plate carrier and printing-plate carrier, a plate for supplying black ink arranged on the printing-plate carrier, an inking apparatus therefor, and a transfer member for taking the ink from said last-named plate and applying the same to the printing-plate.

16. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a separate color-design-plate carrier adapted to carry a plurality of color-design plates, an inking apparatus for each color-design plate, a transfer member on which the various colors are registered together circumferentially and axially arranged between the color-design-plate carrier and printing-plate carrier, a plate for supplying black ink arranged on the printing-plate carrier, an inking apparatus for this plate, and a transfer member for taking the black ink from this last-named plate and applying the same to the printing-plate after the latter has received its application of colored inks.

17. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a color-design-plate carrier adapted to carry a plurality of color-design plates, an inking apparatus for each color-design plate, a transfer member on which the various colors are registered together circumferentially and axially arranged between the color-design-plate carrier and printing-plate carrier, one or more printing-plates for printing in black arranged on the printing-plate carrier, and an inking apparatus therefor.

18. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a color-design-plate carrier adapted to carry a plurality of color-design plates, and a plate for applying black ink, an inking apparatus for each of said plates, a transfer member on which the various colors are registered together circumferentially and axially arranged between the color-design-plate carrier and printing-plate carrier, one or more plates for printing in black arranged on the printing-plate carrier, and an inking apparatus therefor.

19. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a separate color-design-plate carrier, an inking apparatus for each plate thereon, a transfer member on which the various colors are registered together circumferentially and axially arranged between the color-design-plate carrier and printing-plate carrier, one or

more plates for printing in black ink carried by the printing-plate carrier, an inking apparatus for such plates, and means controlling said transfer member so that the same will only apply ink to the color-printing plate on the printing-plate carrier.

20. In a multicolor-printing press, the combination of a printing-plate carrier, an impression member cooperating therewith, a color-design-plate carrier adapted to carry a plurality of plates, an inking apparatus for each of said plates, a transfer member on which the various colors are registered together circumferentially and axially arranged between the color-design-plate carrier and printing-plate carrier to contact only with one plate carried by the printing-plate carrier, one or more plates for printing in black carried by the printing-plate carrier, and an inking apparatus therefor arranged to supply ink to said plates, but to clear the plate which is to print in colors.

21. In a multicolor-printing press, the combination of a printing-plate carrier, arranged to carry a plate which is to print in colors, and one or more plates which are to print in black or one color, an impression member cooperating therewith and presenting a continuous web to the printing-plate carrier, a color-design-plate carrier adapted to carry a plurality of plates, an inking apparatus for each plate thereon, a transfer member on which the various colors are registered together circumferentially and axially arranged between the color-design-plate carrier and printing-plate carrier, and controlled to supply ink to the printing-plate which is to print in colors, and an inking apparatus arranged to cooperate with the plate or plates which are to print in black, but to clear the plate which is to print in colors.

22. In a multicolor-printing press, the combination of a printing-plate-carrier cylinder, an impression-cylinder of half the diameter thereof cooperating therewith, and geared to make two turns for every turn of the printing-plate-carrier cylinder, a color-design-plate-carrier cylinder of the same diameter as the printing-plate-carrier cylinder capacitated to receive three color-design plates circumferentially, an inking apparatus for each

of said color-design plates, and a transfer-cylinder arranged between the printing-plate-carrier cylinder and the color-design-plate-carrier cylinder of one-third the diameter of the printing-plate-carrier cylinder.

23. In a multicolor-printing press, the combination of a printing-plate-carrier cylinder, an impression-cylinder of half the diameter thereof cooperating therewith, a color-design-plate-carrier cylinder of the same diameter as the printing-plate-carrier cylinder, capacitated to receive three color-design plates circumferentially, an inking apparatus for each color-design plate, a transfer-cylinder arranged between the printing-plate-carrier cylinder and the color-design-plate-carrier cylinder of one-third the diameter of the printing-plate-carrier cylinder, a plate for applying black ink, and a transfer-cylinder of the same size as the previously-named transfer-cylinder for taking the ink therefrom and applying it to the printing-plate.

24. In a multicolor-printing press, the combination of the three cylinders E, C and K of the same size, and geared to turn in the same direction, the cylinder E serving as a color-design-plate-carrier cylinder and capacitated to receive three color-design plates circumferentially, an inking apparatus for each of said color-design plates, the cylinder C serving as a printing-plate-carrier cylinder, a transfer-cylinder D between the cylinders E and C of one-third the diameter thereof, the cylinder K serving as a carrier for carrying a plate for applying black ink, an inking apparatus for said plate, a transfer-cylinder L arranged between the cylinders C and K and of one-third the diameter of the cylinders E, C and K, and an impression-cylinder A of one-half the size of the cylinder C geared thereto and making two turns for every turn of the cylinder C.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LOUIS W SOUTHGATE.

Witnesses:

M. E. REGAN,
JOHN F. CROWELL.