

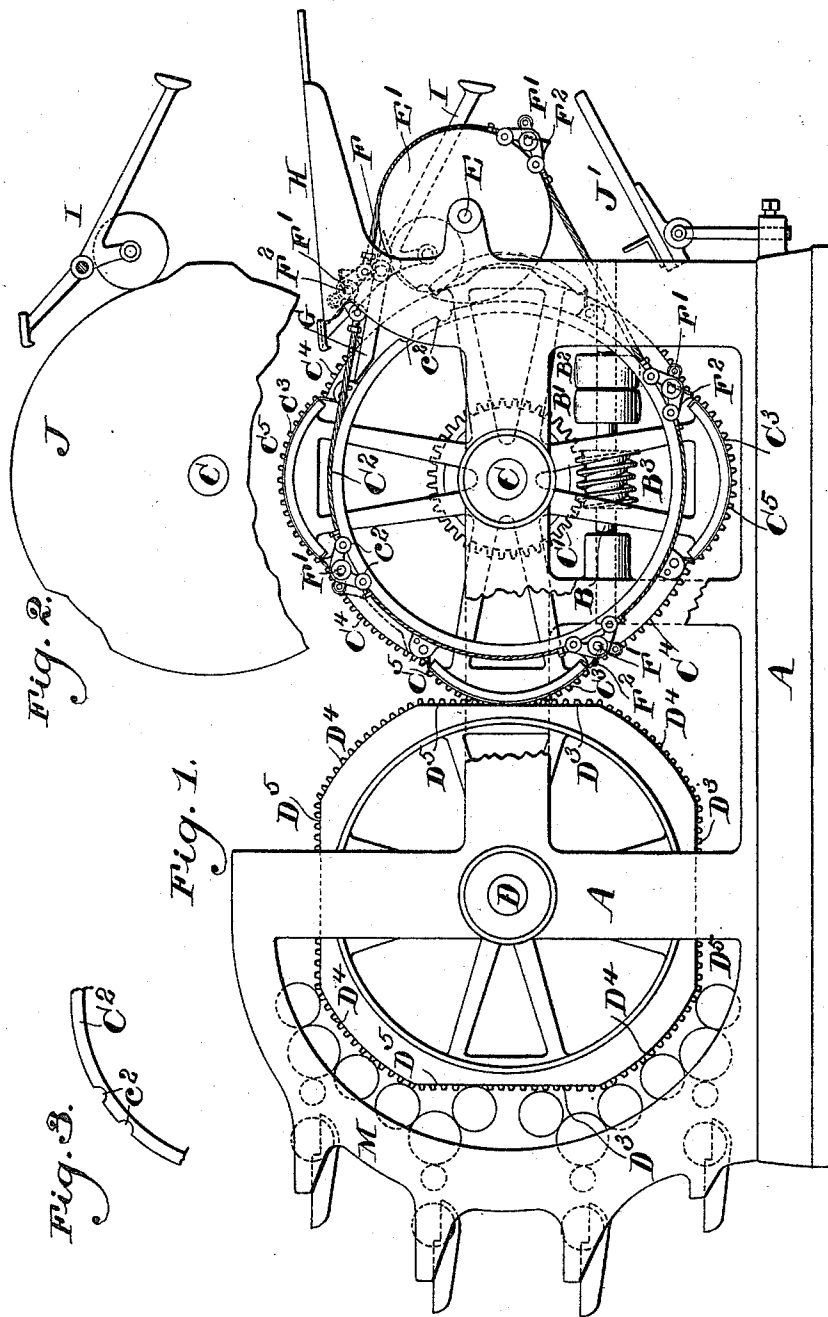
(No Model.)

2 Sheets—Sheet 1.

W. H. R. TOYE.
PRINTING PRESS.

No. 585,454.

Patented June 29, 1897.



WITNESSES:
Harry D. May
H. J. Pack

INVENTOR:
William H. R. Toye
by his atty
Francis T. Chamber

(No Model.)

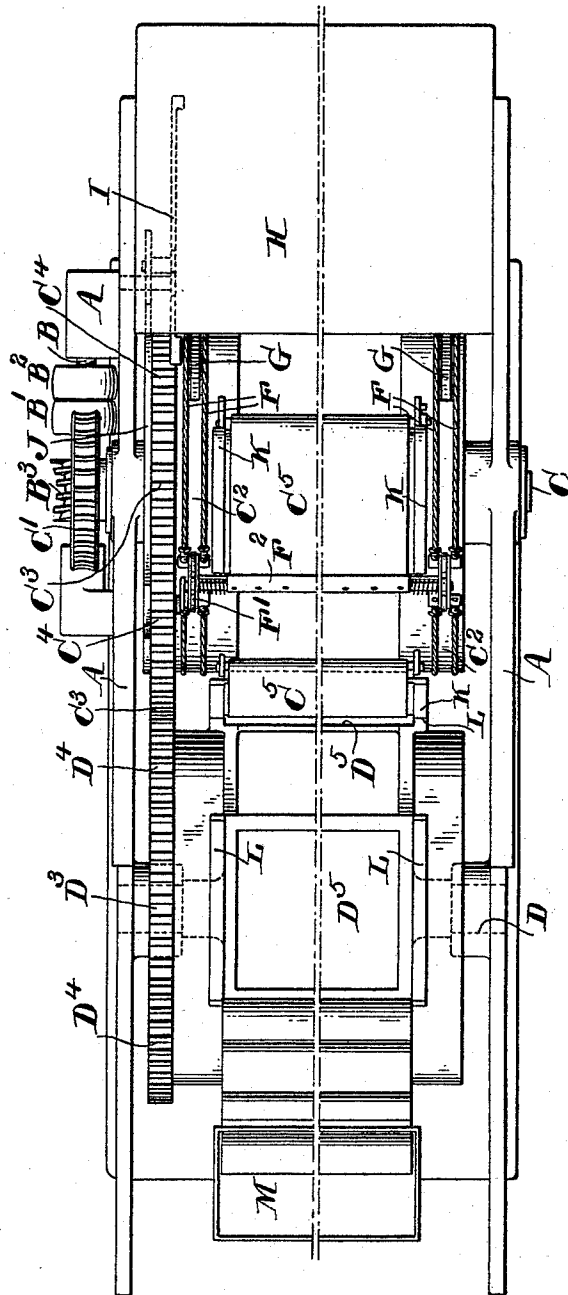
2 Sheets—Sheet 2.

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Fig. 4.



WITNESSES:

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INVENTOR:

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James T. Chambers

UNITED STATES PATENT OFFICE.

WILLIAM H. R. TOYE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
HIMSELF, ROBERT P. BROWN, AND EDWARD L. BAILEY, OF SAME PLACE.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 585,454, dated June 29, 1897.

Application filed June 3, 1895. Serial No. 551,493. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. R. TOYE, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a certain new and useful Improvement in Printing-Presses, of which the following specification is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the construction of printing-presses, and is particularly adapted for use in what are called "multiple-color" printing-presses, the object of my invention being to provide a press of this class which will not require curved type-forms and which at the same time will be of simple and efficient construction.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated, and in which—

Figure 1 is a side elevation of a press constructed in accordance with my invention; Figs. 2 and 3, details of the construction, and Fig. 4 a plan view of the press.

A indicates the frame of the press; B, the driving-shaft, which is here shown with fast and loose pulleys B' B² and a worm B³, gearing with a worm-wheel C', secured to the shaft C. The shaft C carries what I may call a "roll," the essential parts of which or parts carried by which are cylindrical surfaces C² C³, adapted to support and actuate the carrier, which I preferably make flexible, as indicated at F, and provided with a series of grippers, as indicated at F' and F². The gripping mechanism should actually engage with the surfaces of the cylinders C², so as to insure a positive motion in the carrier, and this can be accomplished by providing suitable recesses, as indicated at c², into which the gripper mechanism fits when in contact with the driving-cylinder.

C³ C⁴ indicate portions of an irregularly-shaped gear-wheel with engages with a correspondingly-formed gear-wheel D³ D⁴, secured on the shaft D or on the "roll," so to speak, supported by said shaft. The portions D³ of the last-mentioned gear-wheel are plain and flat, while the portions D⁴ are cir-

cular. The form, therefore, of the portion C³ of the first-mentioned gear-wheel must be such as to drive the flat portion D³ of the driving-wheel, while the portion C⁴ will be a segment of a circle corresponding in diameter with the circle of the portion D⁴ and of a length equal to said portion. It will be seen that the two gears will revolve at the same time and will complete each revolution simultaneously, but of course the speed of the revolution will vary at different points in accordance with the irregular outline of the two gear-wheels.

C⁵ C⁶, &c., are impression-surfaces revolving with the shaft C and corresponding in outline to the pitch-line of the portions C³ of the gear-wheel, while D⁵ D⁶, &c., are type-forms corresponding in position with the flat portions D³ of the gear-wheel on the shaft D and so arranged that the face of the type will correspond with the pitch-line of the said teeth.

K K are bearer-surfaces corresponding in outline with the surfaces of the impression-surfaces C⁵, and L L are bearer-surfaces corresponding with the flat type-forms D⁵. These bearer-surfaces K and L are brought into contact at the same time that the type and impression-surfaces come into contact with each other, and they are to be formed so as to keep a close and, so to speak, "driving" contact with each other while the printing-couple is in contact. By these means—namely, the contact of the bearers—I have at the time each printing-couple is at work a double engagement between the two cylinders. The positive engagement of the gear-wheels and the frictional engagement of the bearers and a certainty and precision of movement are thus secured which would be with difficulty attained by either device alone.

The carriers F pass around the cylinders C² and around an auxiliary roll E', supported on a shaft E. The length of the carriers is such as to enable them to support a series of grippers one more in number than the impression-surfaces supported on the shaft C, the grippers being of course spaced with respect to each other just as are the impression-surfaces and the result being that in each complete revolution of the carrier each grip-

per is presented to a different impression-surface and made to register with it. The grippers register with the impression-surfaces at their front ends, the jaw F^2 holding the paper corresponding with the front lower edge of the impression-surface, so that the paper will lie close against such impression-surface from the point where it leaves the gripper to the rear end of the impression-surface.

10 H indicates the feed-board by which sheets of paper are fed to the grippers, I indicating a mechanism by which the grippers are caused to open and close at proper times. This mechanism is given motion by means of a cam J, secured on the shaft C, and is not shown in detail, as it forms no part of my present invention.

J' indicates the receiving-board by which the printed sheets are deposited, and M conventionally indicates the inking-rollers by which the type-forms are inked.

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

25 1. The combination of two printing-cylinders, one carrying a series of flat type-forms and the other carrying a series of corresponding curved impression-surfaces adapted as the cylinders revolve to roll over the type, gearing secured to and connecting the two cylinders so that one will drive the other and 30 each will make an equal number of complete revolutions in the same time, said gearing

corresponding in its pitch-lines with the type and impression-surfaces, cylindrical surfaces C^2 C^2 carried by the impression-cylinder, a carrier extending around and driven by the cylindrical surfaces C^2 of the impression-cylinder and a series of grippers one more in number than the number of impression-surfaces secured to said carrier and adapted to register in turn with the forward ends of the said several impression-surfaces.

2. The combination of two printing-cylinders, one carrying a series of flat type-forms and the other carrying a series of corresponding curved impression-surfaces adapted as the cylinders revolve to roll over the type, gearing secured to and connecting the two cylinders so that one will drive the other and each will make an equal number of complete revolutions in the same time, said gearing corresponding in its pitch-lines with the type and impression-surfaces, cylindrical surfaces C^2 C^2 carried by the impression-cylinder, a flexible carrier extending around and driven by the cylindrical surfaces C^2 of the impression-cylinder and a series of grippers, one more in number than the number of impression-surfaces, secured to said carrier and adapted to register in turn with the forward ends of the said several impression-surfaces.

WILLIAM H. R. TOYE.

Witnesses:

ROBERT W. LLOYD,
H. J. PACK.