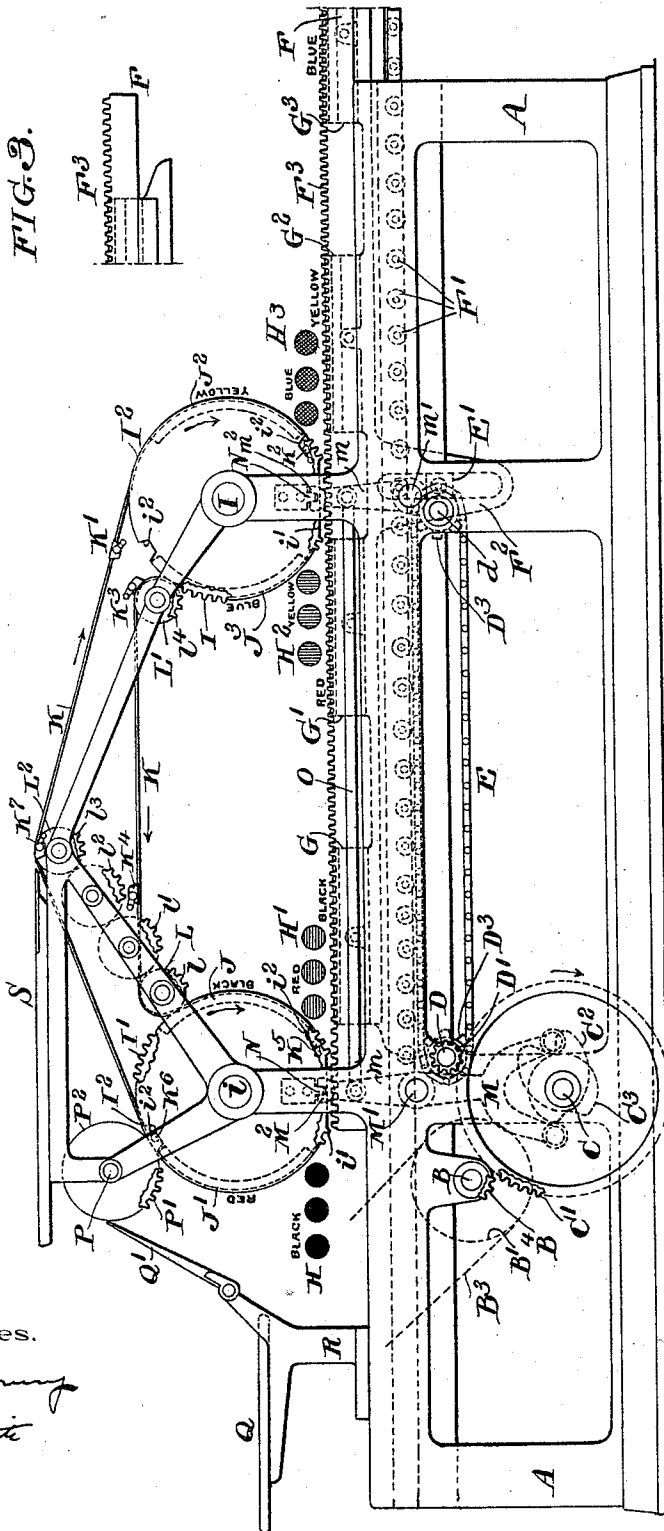


W. H. R. TOYE.
PRINTING PRESS.

No. 585,369.

Patented June 29, 1897.

FIG. 1.



Witnesses.

Henry Dwyer
Stewart

Inventor.

William H. Toye
James J. Chambers

his
Attorney.

(No Model.)

2 Sheets—Sheet 2.

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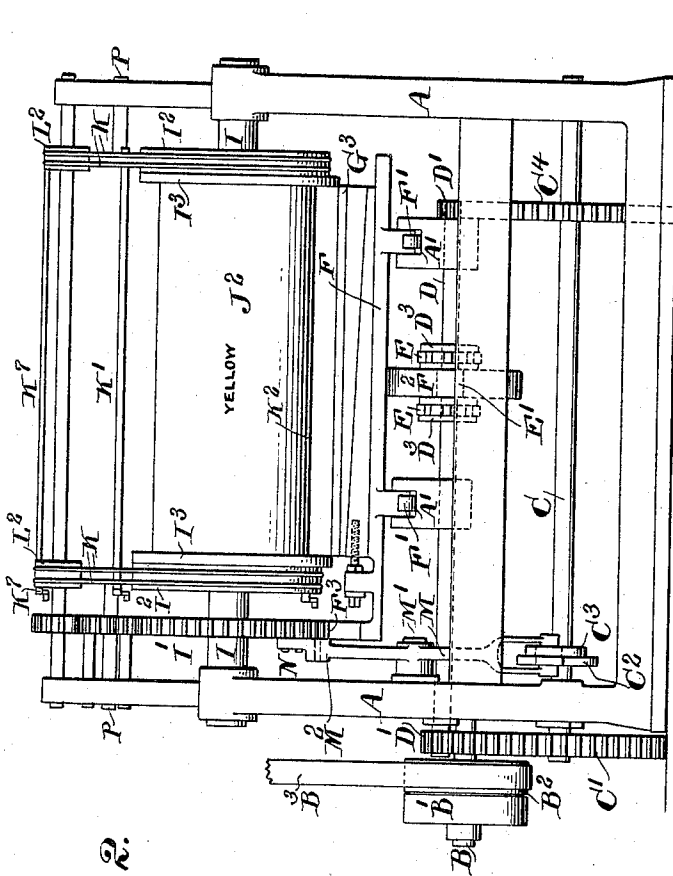


FIG. 2.

Witnesses.

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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. 585,369, dated June 29, 1897.

Application filed November 19, 1895. Serial No. 569,430. (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, in the State of Pennsylvania, have invented a certain new and useful Improvement in Printing-Presses, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to printing-presses, and especially to multicolor-printing presses, the object of my invention being to provide a press of this description which shall be capable of exceptionally rapid work and shall be at the same time of simple and effective 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 embodying my improvements; Fig. 2, an end elevation thereof, and Fig. 3 a view illustrating a detail of construction.

A indicates the frame of the machine; B, the main driving-shaft supported on said frame and carrying fast and loose pulleys B' B², upon which works the driving-belt B³. One or more spur-pinions B⁴, secured to the shaft B, engage with and drive gear-wheels C' C⁴, secured to a shaft C, which carries also cams C² and C³. The gear-wheels C' and C⁴ engage with gear-wheels D' D', secured to a shaft D and carrying sprocket-wheels D³ D³, around which sprocket-wheels and similar wheels D³ D³, secured on a shaft *d*, lying in the same plane as shaft D, pass sprocket-chains E E, said sprocket-chains carrying the pivot of a pivot-block E', which said block is free to move vertically in the slot of a slotted arm F³, said arm depending from a platform or carriage F, supported and moving upon rollers F', which rest in guides A', secured to the frame. Along one side of the carriage F is secured a rack, (indicated at F³,) while upon the surface of the carriage are secured a series of type-forms, (indicated at G, G', G², and G³,) H, H', H², and H³ indicating inking-rollers corresponding to the various type-forms on the carriage.

I and *i* indicate the shafts supporting the

impression-cylinders, said shafts also carrying gear-wheels I' I', formed so as to engage with the rack J³, but each having its teeth cut away or intermitted at one point, as indicated at *i' i'*, so that when this cut-away portion registers with the rack the shafts I and *i* are disengaged therefrom. Each shaft also carries supporting and driving sheaves for flexible carriers, said sheaves being indicated at I² I² and being cut away, as indicated at *i*², where the gripping-bars of the carriers come in contact with the sheaves. The impression-cylinders are indicated at I³ and the impression-surfaces at J, J', J², and J³, each impression-surface corresponding and being adapted to register with one of the type-forms on the carriage.

K is the flexible carrier, supported and driven, as before mentioned, by the sheaves I² between the two impression-cylinders and is carried up and over sheaves L and L', these sheaves being supported upon shafts to which are connected spur-wheels *l l*⁴, said gear-wheels being each in mesh with one of the gear-wheels I'. The gear-wheels *l* also drive a gear *l'*, and through another gear *l*² motion is imparted to a gear *l*³, which last-mentioned gear is secured to a shaft upon which are carrier-sheaves, (indicated at L²,) over which sheaves the flexible carriers pass, as indicated in the drawings.

K', K², K³, K⁴, K⁵, K⁶, and K⁷ indicate grippers secured to the flexible carriers K and by means of which the sheets of paper are carried through the-machine and in turn under the action of each printing couple.

M indicates a cam-fork, one arm of which is actuated by the cam C², while the other is actuated by the cam C³. The cam-fork is on the end of a lever pivoted at M', and on the opposite end of which is a device M², (here indicated as a recess,) which is adapted to engage with a device upon the impression-cylinder situated at the point where the teeth of the gear-wheels, secured to said cylinder or to its sheaves, are cut away. The device is here indicated as a tooth N. A similar-engaging device *n* is secured to the other cylinder and engages with a recess *m*² on an arm *m*, pivoted at *m'*, the arm *m* being connected with the fork-lever M by a connecting-rod O.

S indicates the feed or delivery board, by

which the sheets of paper are fed to the grippers on the flexible carrier.

P is the shaft, to which is secured a gear-wheel P', engaging with the gear-wheel I' on the shaft *i*, said shaft carrying a take-off roll P², by which the printed sheets of paper are carried away from the flexible carrier and delivered to the fingers Q', which lay them down upon the table Q, supported on the arms R, which extend up from the frame A of the machine.

It will readily be seen that a reciprocating motion is given to the carriage F by the revolution of the sprocket-chains E, the pivot-block E' supported by which moves up and down in the slotted arm F² and by means of said arm moves the carriage backward and forward. The action of the rack F³ is to cause the revolution of the two impression-cylinders when the carriage F is moving forward in the direction to print, and the intermitted or cut-away portion of the teeth in the gear-wheels I' is arranged to register with the rack at the end of the forward stroke, and just before the gear-wheels are disengaged from the rack the teeth N N engage with the slots on the levers M and *m*, the cams on the shaft C coming into action at this time and being so shaped as to arrest the motion of the levers M and *m*, and thereby arresting the motion of the impression-cylinders just at the proper time. These cylinders remain stationary while the carriage is moving back, and then as the carriage resumes its forward motion the cams on shaft C actuate the fork-lever M and through it the arm *m*, so as to cause the impression-cylinders to revolve until the teeth of the gear-wheels I' engage the teeth of the rack F³, which engagement of course insures the continued revolution of the impression-cylinders.

It will be seen that the flexible carrier-bands are carried up over the inking-rollers between the impression-cylinders, and, obviously, each sheet of paper is, by the arrangement shown, printed upon once by each impression-cylinder. Thus, in the case shown, each cylinder carries two impression-surfaces requiring two passages through the machine for each sheet. By the devices shown and hereinabove described a perfectly synchronous motion of all the operative parts of the machine is insured, and the machine is capable of rapid and at the same time exact work.

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

1. In a printing-press the combination of a reciprocating carriage adapted to support a series of printing-forms, of two or more impression-cylinders each having two or more impression-surfaces, each surface corresponding to one of the type-forms and adapted to register and coact therewith, mechanism for driving the cylinders at the same speed as

the carriage when said carriage moves in one direction and arresting the motion of the cylinders during the reverse motion of the carriage, a flexible carrier supporting a series of grippers for engaging sheets of paper and feeding them through the press said grippers being arranged as specified to come into operative registry with each printing-couple in the press in two or more revolutions of the carrier and said carrier being elevated above the type-forms as it passes between the impression-cylinders and two or more sets of inking mechanisms situated between the cylinders below the carrier.

2. In a printing-press, the combination of a reciprocating carriage adapted to support a series of printing-forms and carrying a rack, of two or more impression-cylinders each having two or more impression-surfaces, each surface corresponding to one of the type-forms and adapted to register therewith, gear-wheels secured to each impression-cylinder and in engaging relation to the rack on the carriage, each gear being intermitted or cut away at one point so as to disengage the cylinders from the rack, a flexible carrier supporting a series of grippers for engaging sheets of paper and feeding them through the press, said grippers being arranged as specified to come into operative registry with each printing-couple in the press in two or more revolutions of the carrier and said carrier being elevated above the type-forms as it passes between the impression-cylinders and two or more sets of inking mechanisms situated between the cylinders below the carrier.

3. In a printing-machine the combination with a reciprocating carriage adapted to support printing-forms and carrying a rack of two impression-cylinders each having two or more impression-surfaces corresponding to the type-forms on the carriage and each carrying a gear-wheel adapted to mesh with the rack and having its teeth cut away at one point so as to clear said rack, a starting-lever M positively actuated and adapted to act upon one cylinder and engage it with the rack, a starting-lever *m* adapted to start the other cylinder, a rod O connecting levers M and *m* so as to operate lever *m* simultaneously with lever M, a flexible carrier supporting a series of grippers for engaging sheets of paper and feeding them through the press said grippers being arranged as specified to come into operative registry with each printing-couple in the press in two or more revolutions of the carrier and said carrier being elevated above the type-forms as it passes between the impression-cylinders and two or more sets of inking-cylinders situated between the cylinders below the carrier.

WILLIAM H. R. TOYE.

Witnesses:

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