

No. 629,388.

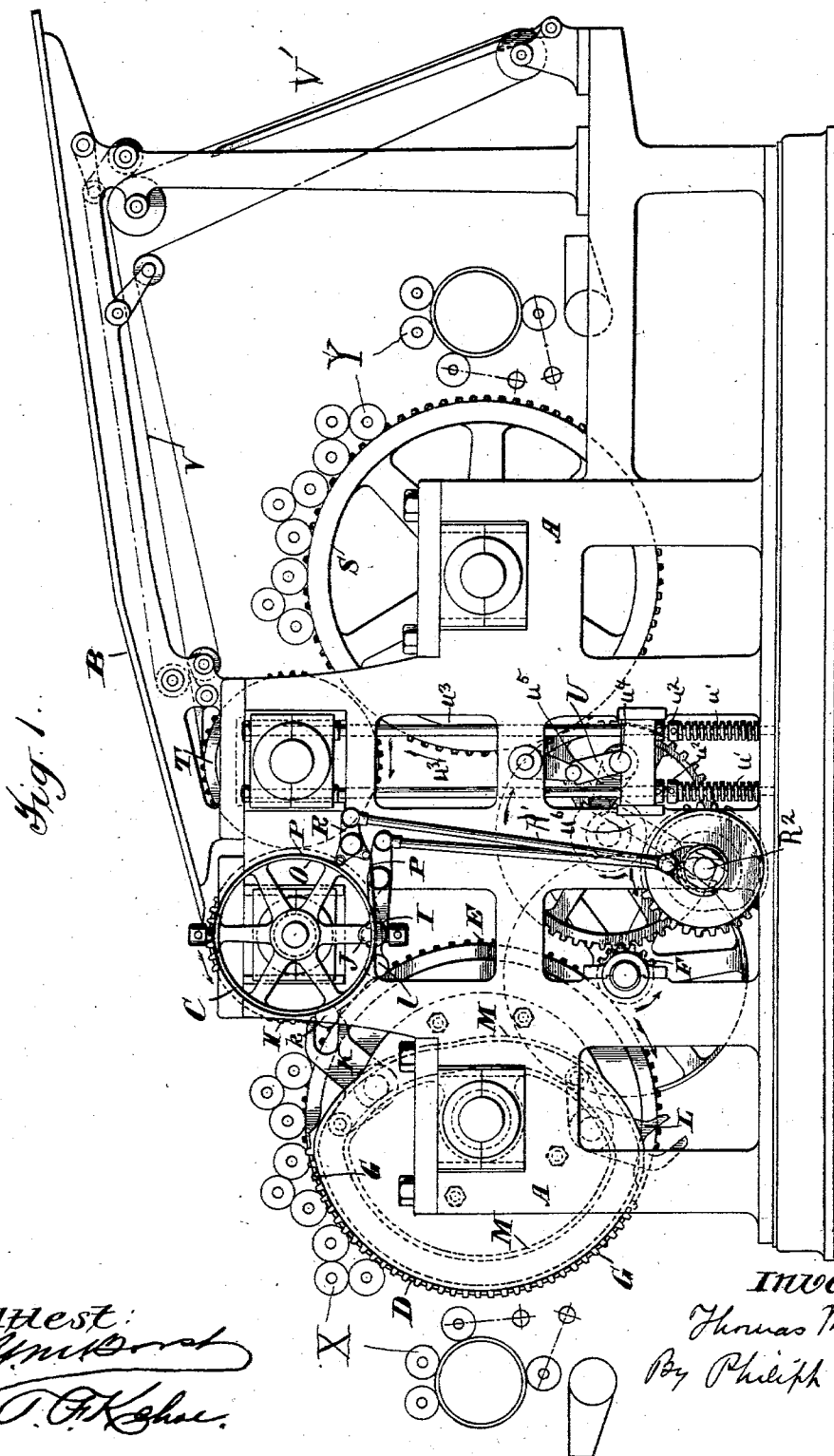
Patented July 25, 1899.

T. M. NORTH.
PRINTING PRESS.

(Application filed Nov. 26, 1897.)

(No Model.)

3 Sheets—Sheet 1.



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3 Sheets—Sheet 2.

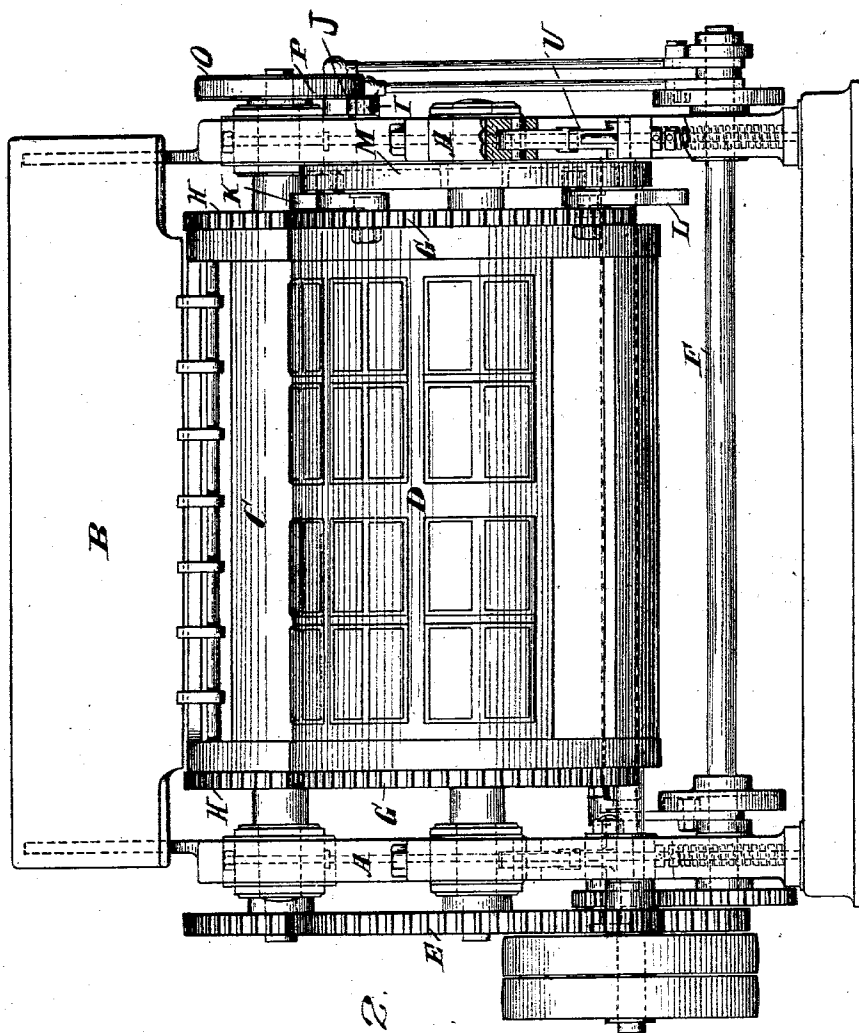


Fig. 2.

Attest:
G. M. Bond
T. F. Kehoe.

Inventor:
Thomas M. North
By *Philip Phillips & Son*

Atty's

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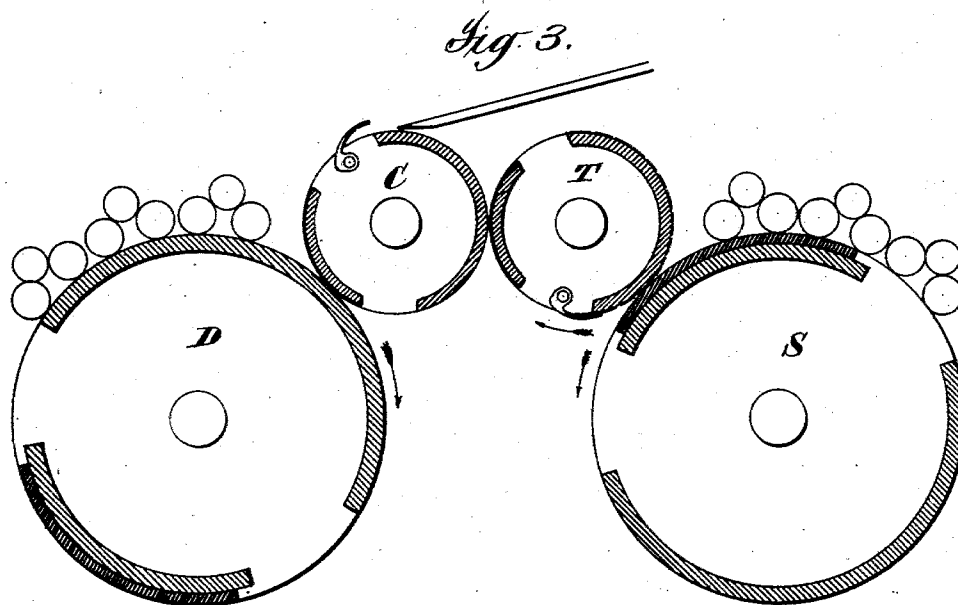
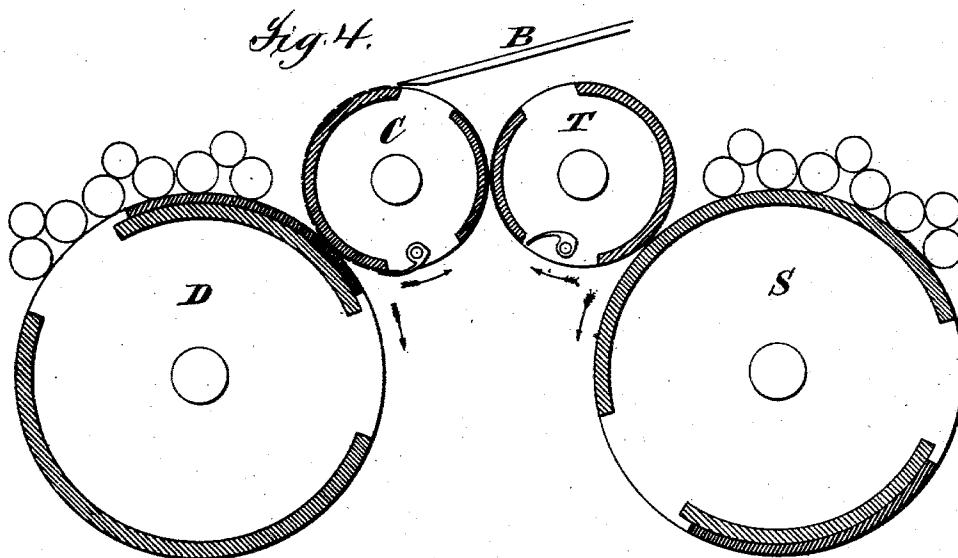
Patented July 25, 1899.

T. M. NORTH.
PRINTING PRESS.

Application filed Nov. 26, 1897.)

(No Model.)

3 Sheets—Sheet 3.



Attest:
Wm. B. Smith
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Inventor:
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By *Philip Phelps*
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UNITED STATES PATENT OFFICE.

THOMAS M. NORTH, OF NEW YORK, N. Y., ASSIGNOR TO ROBERT HOE, THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF SAME PLACE.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 629,388, dated July 25, 1899.

Application filed November 26, 1897. Serial No. 659,801. (No model.)

To all whom it may concern:

Be it known that I, THOMAS M. NORTH, a British subject, residing at New York, (Brooklyn,) county of Kings, and State of New York, have invented certain new and useful Improvements in Printing-Presses, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to printing-machines in which the printing is effected by two printing-couples each acting to print on the same sheet. In such machines as heretofore constructed it has been usual to have both members of both printing-couples rotate constantly or to have both members of both couples come to a stop when a sheet is fed to the first couple. The first form of machine referred to—namely, that in which both members of both couples rotate constantly—is open to the objection that the sheets are presented to the sheet-receiving cylinder of the couple when said cylinder is in motion, and therefore there is great liability of inaccurate feeding. In the second form of machine—namely, that in which both couples come to a stop when the sheet is fed to the sheet-receiving cylinder of the first couple—the danger of improper feeding is avoided; but there is a great waste of power in stopping and starting the two heavy printing-couples.

The present invention has for its object to produce a machine in which two couples are employed to print on the sheet and in which the impression member of the first couple has its speed varied either by slowing down its movement or bringing it to a full stop in order that the sheet may be fed thereto, and to do this without stopping the movement by which the other couple effects the printing operations.

The invention therefore includes the provision of means by which the impression-cylinder of a printing-press employing two printing-couples printing on a sheet, the sheet being fed to said impression-cylinder, has its speed varied in order that the sheet may be fed thereto, the mechanism used being preferably such that the impression-cylinder will be driven at full speed during the printing operation, will be slowed down or brought to

a stop while the sheet is being fed thereto, and then will be again driven at full speed to print and deliver the sheet to the cooperating printing-couple.

The invention also includes mechanism for gradually accelerating the speed of the sheet-receiving cylinder after the sheet has been fed thereto until it is brought up to the speed of its cooperating printing member, after which the two members are driven in unison until the sheet is printed. After the printing of a sheet the mechanism then acts to slow down the cylinder in order that it may receive a fresh sheet, the printed sheet having been in the meanwhile delivered to the second couple.

The particular mechanism shown herein for giving movement to the receiving impression-cylinder is the same as that shown in greater detail in my application, Serial No. 618,024, filed January 5, 1897, and therein claimed. It is, however, of course obvious that other means than this particular mechanism may be employed for giving motion to the receiving impression-cylinder, and I wish it understood that I do not limit myself in this application to any special form of mechanism for performing this function nor to a mechanism for giving motion to the receiving impression-cylinder which connects the receiving impression-cylinder with the plate-cylinder.

My invention also includes other features of construction, which will be hereinafter fully described, and pointed out in the claims.

In the drawings annexed, forming a part of this specification, Figure 1 is a side elevation of a press embodying my invention. Fig. 2 is an end view of the press, taken from the left of Fig. 1. Fig. 3 is a diagrammatic view of the press in position for receiving a sheet on the first cylinder while printing on the second, and Fig. 4 is a diagrammatic view of the press in the position of printing the side of the sheet first printed.

Referring to said drawings, A is the frame of the press; B, the feed-board; C, the receiving impression-cylinder, and D a plate or form cylinder. The plate-cylinder shaft is provided at one end with a gear-wheel E, which gears with a pinion F on the driving-shaft. On each end of the plate-cylinder is

a toothed segment G, which gears during the time in which the sheet is being printed with a corresponding segment H on the cylinder C. While the sheet is being fed, the impression-cylinder stands in the position shown in Fig. 1, being locked therein by the cam-actuated stop I engaging with a lug J on the brake-wheel attached to the cylinder. During this position of the impression-cylinder the surface of the plate-cylinder, which revolves continuously, passes freely by the same without touching or engaging in any way therewith. In order to provide for bringing the impression-cylinder into gear with the plate-cylinder, two coupling-levers K and L are provided, pivoted to the plate-cylinder and each having a guide-roller which travels in a fixed path-cam M. The cylinder C is provided with two rolls or studs k l , placed between the extremities of the segment H, with which the levers K L are adapted to respectively engage, receiving the same in a recess or jaw of appropriate shape, as shown. The function of the coupling-lever K is by engaging with stud k to rotate the impression-cylinder from a position of rest until its segment H comes into gear with segment G. The shape and position of the jaw of the coupling-lever K and the shape of the path-cam M are such that the motion thus given to the cylinder C is at first very slight and that it is gradually accelerated until when the two cylinders come into gear they are moving at the same surface speed.

The function of the coupling-lever L is by engaging with stud l to maintain the driving connection between the plate and the impression cylinder after the segments on the two cylinders have passed out of gear and to gradually slow down the impression-cylinder until it reaches a state of rest and is locked therein by the stop I.

The shape and position of the coupling-lever L and the shape of path-cam M are such that the gradual slowing down of the cylinder C is effected.

In order to assist in smoothly bringing the impression-cylinder to a stop, there are provided a brake-wheel O on the cylinder-shaft and a brake-strap P, of which the ends are attached to lugs on the pivoted cam-actuated lever R. The lever R is operated by a rod R', which is actuated by means of a cam on an auxiliary cam-shaft R². In order to perfect the sheet, a second plate or form cylinder S is provided and a second impression-cylinder T, which latter is geared to the plate-cylinder S and revolves continuously. The two plate-cylinders mentioned are provided with the usual ink supply and distributing rolls X and Y. This second impression-cylinder receives the sheet from the first impression-cylinder and in coöperation with plate-cylinder S causes it to be printed on its second side. It is then stripped from the impression-cylinder and carried off by the delivery-tapes V to the fly V'. To prevent con-

tact between the impression-cylinder T and the ink-plates on cylinder S, the cylinder T is mounted on vertically-sliding journal-boxes. The journal-boxes are raised by means of springs u' , which act against collars u^2 on sliding rods u^3 , which pass through the journal-boxes. The boxes are lowered by means of toggle-levers U, the lower levers of each pair being mounted on a rock-shaft u^4 . This rock-shaft is actuated by means of an arm u^5 , this arm being connected to a rod u^6 , which extends down to and is actuated by a cam located on the auxiliary shaft R². The mechanism just described is a common form of throw-off mechanism and is effective for the purpose; but the cylinder may be controlled by any other suitable or well-known form of throw-off mechanism. The cylinder T is thus lifted to clear the ink-plates and to bring the grippers thereon into position to take the sheet from cylinder C.

Instead of raising and lowering the cylinder T by means of a throw-off mechanism this cylinder may be mounted in fixed bearings. In this case the ink-plates on the cylinder S will be so mounted as to be nearer the axis of the cylinder than the form-carrying surface, and means will be provided for moving the form-rollers to and away from said plates as the cylinder revolves. It is of course obvious how the ink-plates may be mounted, and the mechanism for controlling the form-rollers may be similar in construction to that shown in my application, Serial No. 698,847, filed December 10, 1898. Again, when the cylinder T is mounted in fixed bearings the ink-distributing plates on the cylinder S may, if desired, be omitted, in which case the ink will be delivered directly from the ink-distributing cylinder to the form-rollers. This modification being obvious it is not illustrated.

What I claim is—

1. In a printing-press the combination of a continuously-rotating plate or form cylinder, an impression-cylinder, means for rotating the impression-cylinder intermittently so that it shall stop once in each revolution of the plate-cylinder, a second and continuously-rotating impression-cylinder and a second plate-cylinder coöperating therewith, substantially as described.

2. In a printing-press, the combination of a continuously-rotating plate or form cylinder, an impression-cylinder, means for rotating the impression-cylinder intermittently so that it shall stop once in each revolution of the plate-cylinder, means for locking it in such position until the time arrives for it to again rotate, a second and continuously-rotating impression-cylinder and a second plate-cylinder coöperating therewith to perfect the sheet, substantially as described.

3. In a printing-press, the combination of a continuously-rotating plate or form cylinder, an impression-cylinder, means for rotating the impression-cylinder intermittently so that it shall stop once in each revolution of the

plate-cylinder, means for giving the impression-cylinder a graduated rotatory motion from its position of rest to even motion with the plate-cylinder, and again from even motion with the plate-cylinder to a position of rest, a second and continuously-rotating impression-cylinder and a second plate-cylinder cooperating therewith to perfect the sheet, substantially as described.

4. In a printing-press, the combination of a continuously-rotating plate or form cylinder, an impression-cylinder, means for rotating the impression-cylinder intermittently so that it shall stop once in each revolution of the plate-cylinder, segmental gearing for connecting the two cylinders while the printing operation is in progress, means for communicating a graduated rotary motion to the impression-cylinder between its position of rest and its position when geared to the plate-cylinder, a second and continuously-rotating impression-cylinder and a second plate-cylinder cooperating therewith to perfect the sheet, substantially as described.

5. In a printing-press, the combination of a continuously-rotating plate or form cylinder, an impression-cylinder, means for rotating the impression-cylinder intermittently so that it shall stop once in each revolution of the plate-cylinder, segmental gearing for connecting the two cylinders while the printing operation is in progress, means for communicating a graduated rotatory motion to the impression-cylinder between its position of rest and its position when geared to the plate-cylinder, and again between its latter position and its position of rest, a second and continuously-rotating impression-cylinder and a second plate-cylinder cooperating therewith to perfect the sheet, substantially as described.

6. In a printing-press, the combination of an impression-cylinder, a plate or form cylinder, means for connecting the two cylinders so that the former cylinder shall receive motion from the latter during a portion only of each revolution of the plate-cylinder, a second and continuously-rotating impression-cylinder and a second plate-cylinder cooperating therewith to perfect the sheet, substantially as described.

7. In a printing-press, the combination of an impression-cylinder, a plate or form cylinder, means for connecting the two cylinders so that the former cylinder shall receive motion from the latter during a portion only of each revolution of the plate-cylinder, means for graduating the motion transmitted to the impression-cylinder so that the same shall gradually increase from a position of rest to equality with the plate-cylinder and shall gradually decrease from such equality to a position of rest, a second and continuously-rotating impression-cylinder and a second plate-cylinder cooperating therewith to perfect the sheet, substantially as described.

8. In a printing-press, the combination of

a continuously-rotating plate or form cylinder, an impression-cylinder, means for rotating the impression-cylinder intermittently so that it shall stop once in each revolution of the plate-cylinder, a second and continuously-rotating impression-cylinder, a second plate-cylinder cooperating therewith, and means for lifting the journal-boxes of the continuously-rotating impression-cylinder during a portion of each revolution of the second plate-cylinder, substantially as described.

9. In a printing-press, the combination of a continuously-rotating plate or form cylinder, an impression-cylinder, means for rotating the impression-cylinder intermittently so that it shall stop once in each revolution of the plate-cylinder, means for giving the impression-cylinder a graduated rotatory motion from its position of rest to even motion with the plate-cylinder, and again from even motion with the plate-cylinder to a position of rest, a second and continuously-rotating impression-cylinder, a second plate-cylinder cooperating therewith, and means for lifting the second impression-cylinder during a portion of each revolution of the second plate-cylinder, substantially as described.

10. In a printing-press, the combination of an impression-cylinder, a plate or form cylinder, means for connecting the two cylinders so that the former cylinder shall receive motion from the latter during a portion only of each revolution of the plate-cylinder, means for graduating the motion transmitted to the impression-cylinder so that the same shall gradually increase from a position of rest to equality with the plate-cylinder and shall gradually decrease from such equality to a position of rest, a second and continuously-rotating impression-cylinder, a second plate-cylinder cooperating therewith, and means for lifting the second impression-cylinder during a portion of each revolution of the plate-cylinder, substantially as described.

11. In a printing-press, the combination of a continuously-rotating plate or form cylinder, an impression-cylinder, means for rotating the impression-cylinder intermittently so that it shall stop once in each revolution of the plate-cylinder, a second and continuously-rotating impression-cylinder, a second plate-cylinder cooperating therewith, and delivery mechanism for taking the sheet from the second impression-cylinder, substantially as described.

12. In a printing-press, the combination of a continuously-rotating plate or form cylinder, an impression-cylinder, means for rotating the impression-cylinder intermittently so that it shall stop once in each revolution of the plate-cylinder, the above mechanism serving to print the sheet on one of its sides, and means including a continuously-rotating member for printing the other side of the sheet, substantially as described.

13. In a printing-press, the combination with a printing-couple having a rotating mem-

ber, of a second couple having a continuously-rotating member, and means whereby the speed of the first rotating member is varied in order that a sheet may be fed thereto, substantially as described.

14. The combination with a printing-couple having a rotating member, the couple acting to print a sheet on one side, of a second printing-couple having a continuously-rotating member and acting to print the sheet on the opposite side, and means whereby the speed of the first rotating member is varied in order that a sheet may be fed thereto, substantially as described.

15. In a printing-press, the combination with a printing-couple consisting of an im-

pression-cylinder and a continuously-rotating form-cylinder, of a second printing-couple consisting of two continuously-rotating cylinders, and means whereby the rotation of the impression-cylinder of the first couple may be varied with respect to the speed of its form-cylinder in order that a sheet may be fed thereto, substantially as described.

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

THOMAS M. NORTH.

Witnesses:

M. H. PHELPS,
A. L. KENT.