

No. 613,056.

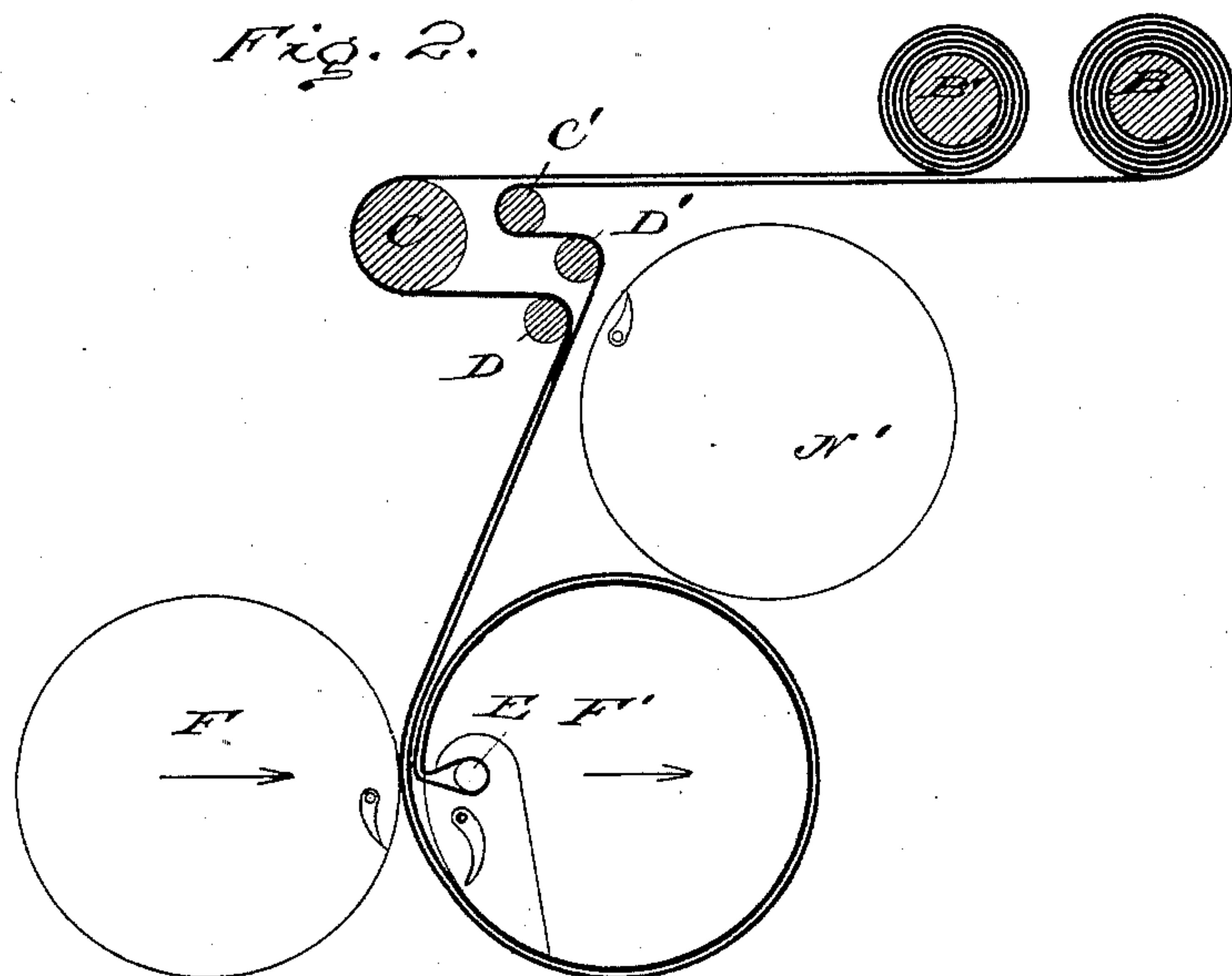
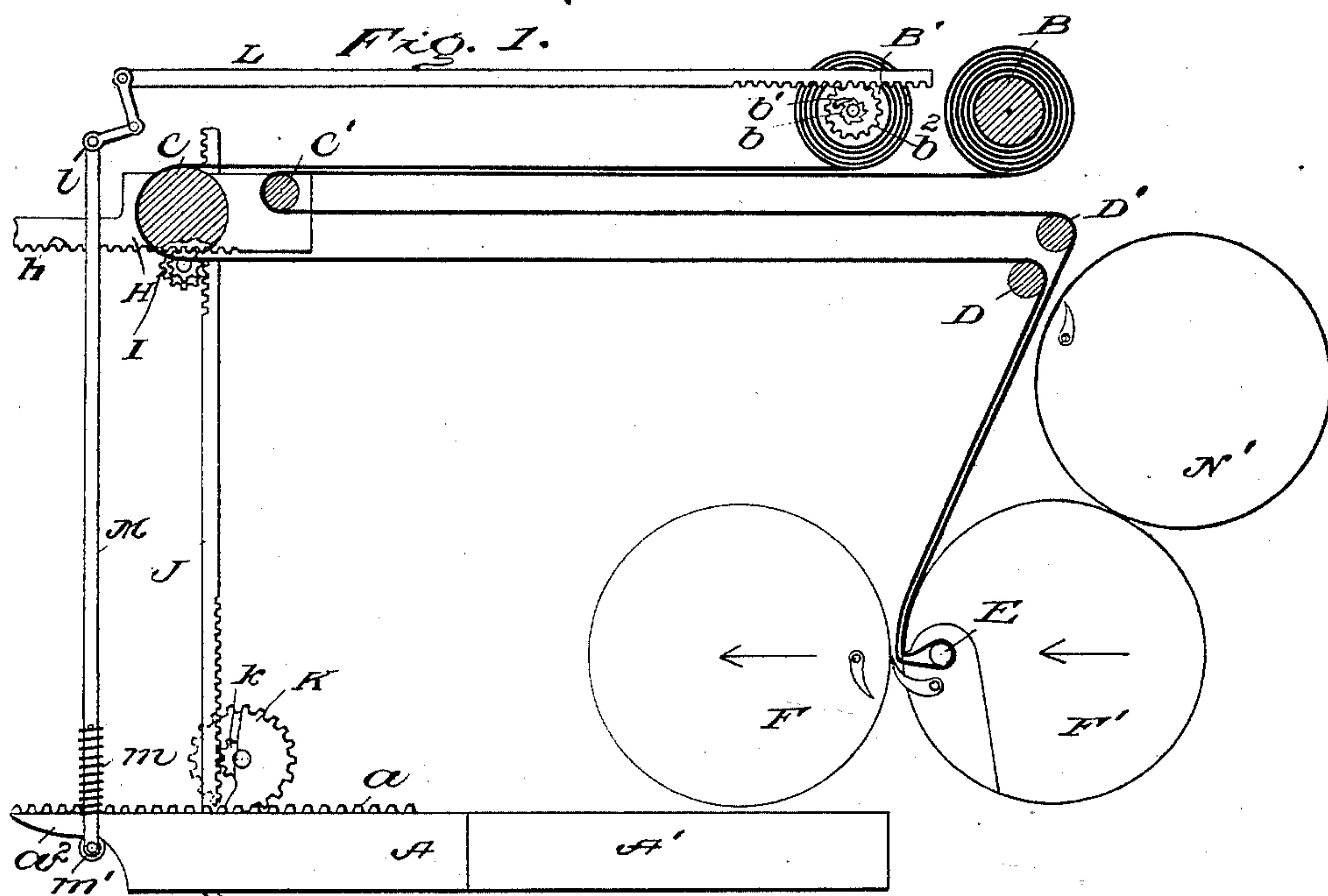
Patented Oct. 25, 1898.

H. F. BECHMAN.
SHIFTING TYMPAN FOR PRINTING PRESSES.

(Application filed Sept. 28, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

James F. Mansfield

Inventor

Henry F. Bechman

by Alexander & Sowell

No. 613,056.

Patented Oct. 25, 1898.

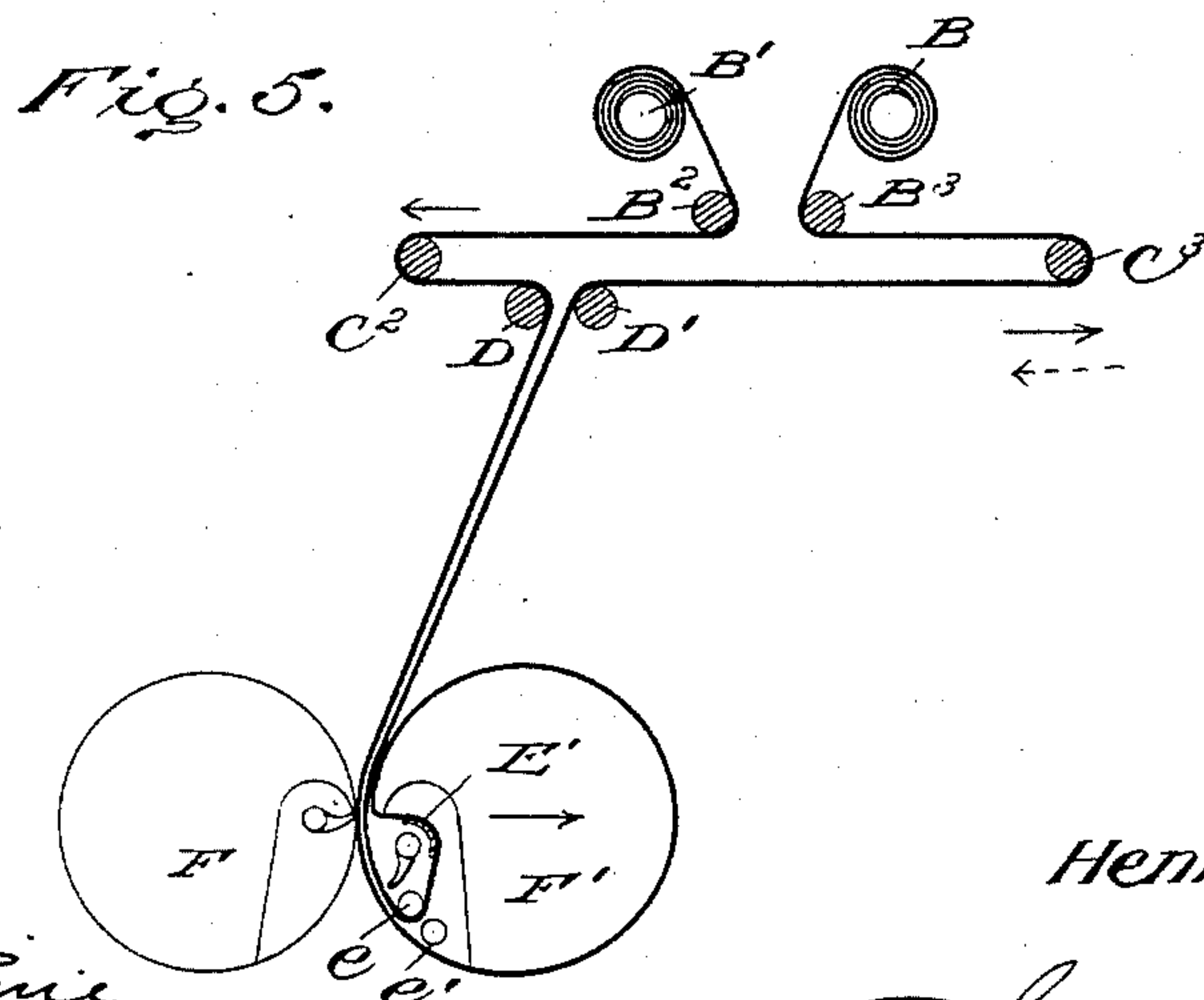
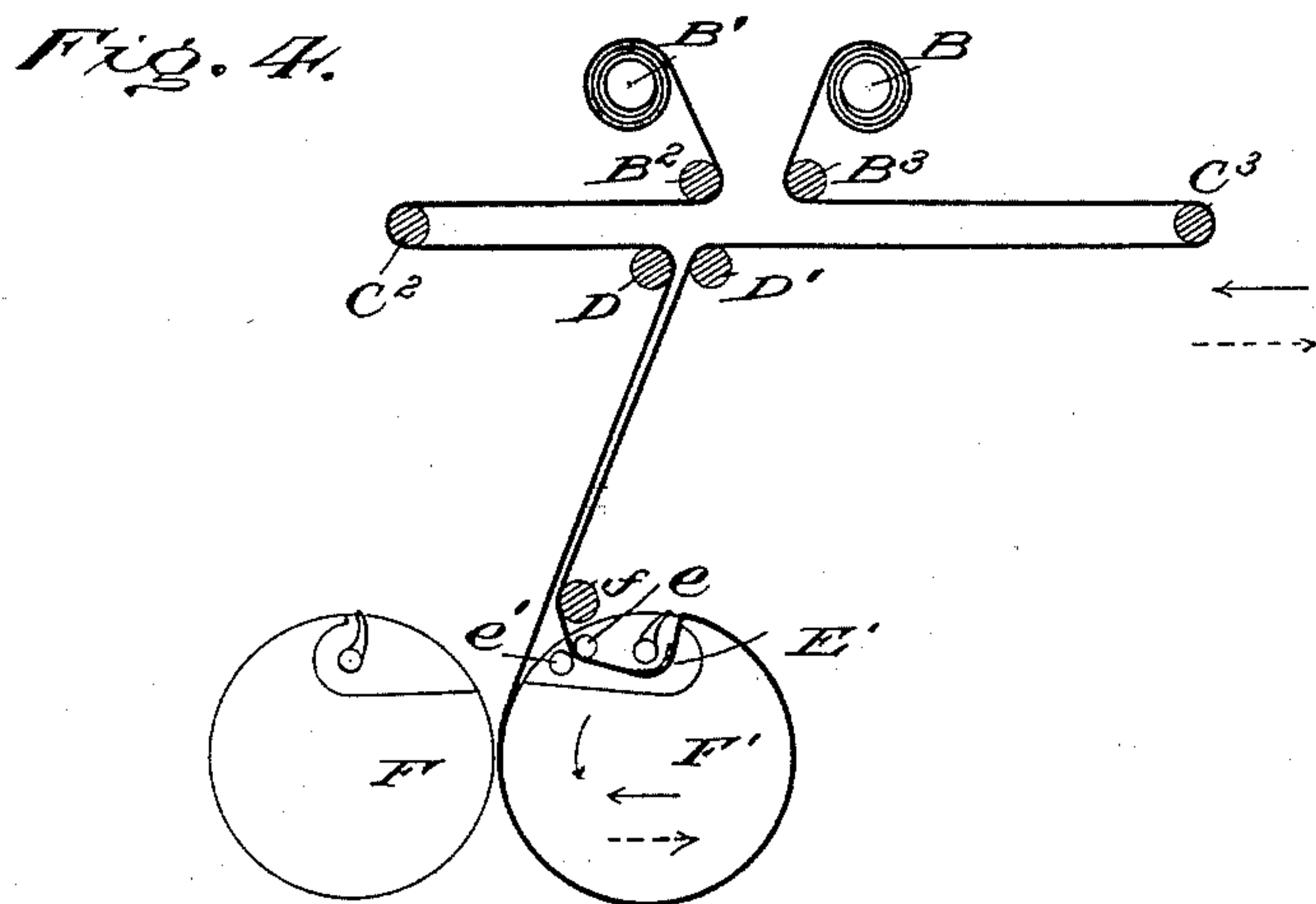
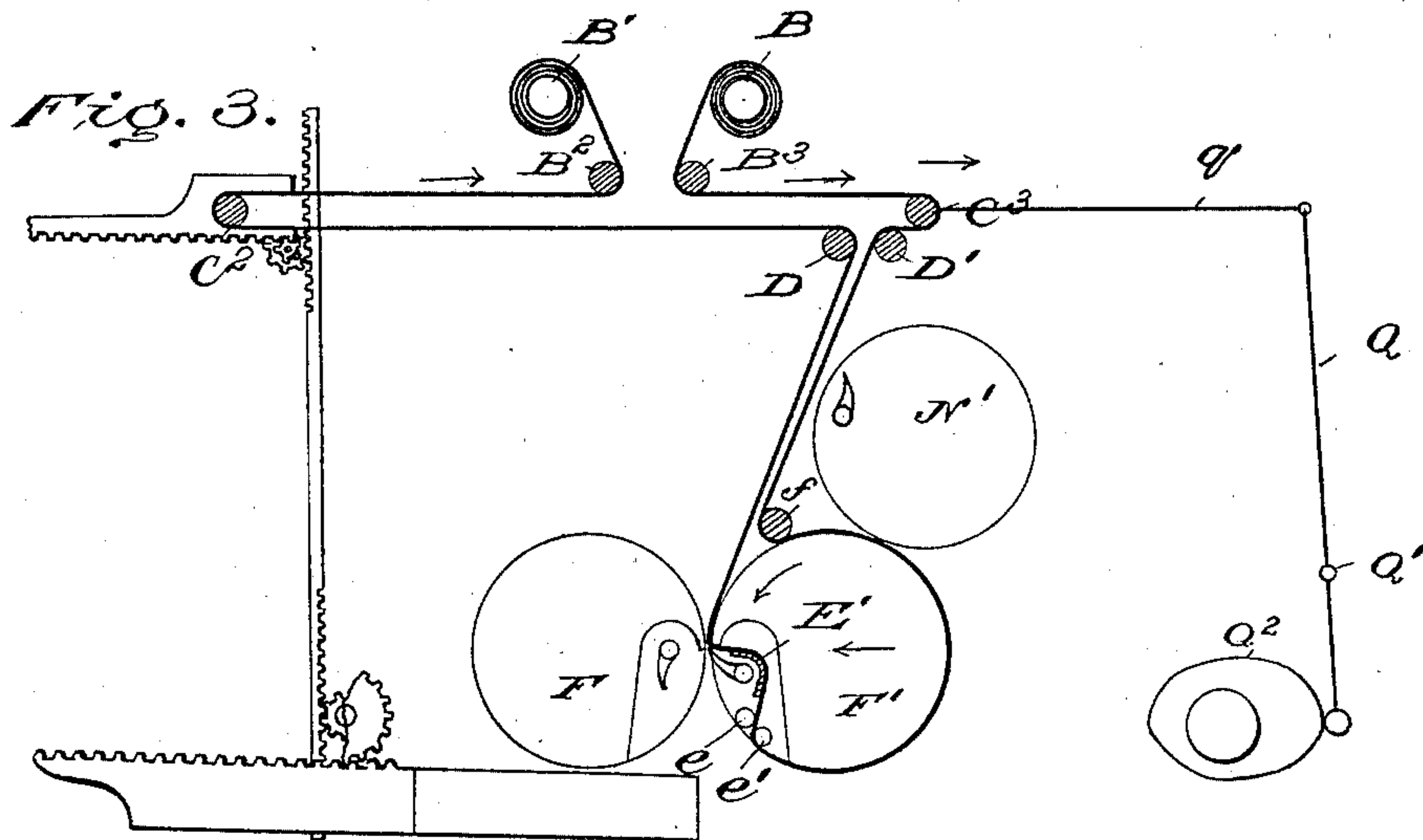
H. F. BECHMAN.

SHIFTING TYMPAN FOR PRINTING PRESSES.

(Application filed Sept. 28, 1897.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses

*Johnnie
James R. Mansfield*

Inventor

Henry F. Bechman

by *Alexander & Dowell*
Attorneys

UNITED STATES PATENT OFFICE.

HENRY F. BECHMAN, OF BATTLE CREEK, MICHIGAN, ASSIGNOR TO THE
DUPLEX PRINTING PRESS COMPANY, OF SAME PLACE.

SHIFTING TYMPAN FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 613,056, dated October 25, 1898.

Application filed September 28, 1897. Serial No. 653,290. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Shifting Tym-
5 pans for Printing-Presses; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form
10 part of this specification.

This invention is an improvement in printing machinery, and relates particularly to the tympanans thereof. It is applicable to almost any form of oscillating-cylinder press, either
15 with movable or stationary beds or with movable or stationary cylinders, but is particularly designed for use with movable-bed and movable-cylinder sheet-presses, such as are shown in my applications for Letters Patent,
20 Serial No. 636,165, filed May 12, 1897, and Serial No. 649,365, filed August 24, 1897.

The objects of the invention are to enable the tympan to be shifted at will, so as to present partly or entirely new or clean surfaces
25 to the imprinted sheets to prevent or lessen offset, and in particular to so arrange the tympan mechanism that the tympan-rolls or shifting mechanisms can be located at any convenient point outside of the cylinder, thereby
30 avoiding the necessity of placing one of the tympan-rolls or any tympan actuating or shifting mechanism within the cylinder and allowing the cylinder to be made lighter and smaller than is possible where the tympanans
35 have to be carried therein.

The invention is also particularly adapted for a gripper impression-cylinder, and by it the tympan can be so shifted as to be wound and unwound from the surface of the cylinder, so
40 as to be properly presented beneath the sheet being perfected, and yet kept from interfering with the action of the grippers.

The invention when applied to movable-bed presses involves the employment of looping
45 or compensating rollers for the tympan moving relatively to the bed; also, when applied to reciprocating-cylinder presses it involves the employment of compensating rollers moving with the cylinder, and when applied to
50 compound or oppositely-reciprocating bed and cylinder presses both compensating mechan-

isms are employed, all of which will be clearly understood from the specifications and drawings, and the invention, when understood, can be adapted without change to each form of
55 press by those skilled in the art.

In the accompanying drawings I have illustrated two modifications of the tympan mechanism as applied to the cylinders of my book-press or perfecting-press described in my ap-
60 plication, Serial No. 636,165, aforesaid, and have not deemed it necessary to illustrate all the mere formal details of construction, as the invention is such that any press-builder
65 will immediately comprehend and understand the construction and how to apply the invention to said press or to other oscillating single-revolution cylinder press.

Referring to the accompanying drawings, Figure 1 is a diagram illustrating the position
70 of the gripper-cylinders and beds of my said book-press when at the delivery end of the press, (viewed from the right-hand side of the machine,) showing the cylinder F' in position to nip the sheet on cylinder F and the
75 position of the tympan and tympan rolls and guides at such time as adapted to such press. Fig. 2 is a similar diagram illustrating the positions of the same parts when the cylinders are at the feed end of press. Fig. 3 is a view
80 similar to Fig. 1, showing a modified arrangement of the tympan mechanism. Fig. 4 is a view of the parts shown in Fig. 3 when at the middle of their stroke, and Fig. 5 is a view
85 of same parts when at the feed end of press.

In said drawings, A A' designate the reciprocating type-beds, F F' the oscillating cylinders reciprocating oppositely to the beds, and N' the delivery transfer-reel moving with the cylinders, all substantially as described
90 in my aforesaid application, Serial No. 636,165.

The tympan is a continuous web of proper material and its opposite ends are wound upon shafts B B', which are suitably supported in preferably stationary supports
95 above the cylinders and transfer-reel, as shown. From roll B' the tympan is led horizontally forward to and around a movable guide-roll C, thence to and around a guide D,
100 mounted above and moving with the cylinders, then down to and around a guide-roller E, located in the gripper-pit of the impres-

sion-cylinder F' , thence doubled back upon itself and up to and over a roller D' , movable with the cylinders beside and slightly above roller D , forward to and over a small guide-roller C' in rear of and movable with roll C , and thence back to roll B , as shown.

It will be observed that a double thickness of tympan is laid upon the surface of cylinder F as it moves to the left, during which time the sheet is perfected thereon. The cylinders, starting in the position shown in Fig. 1, move to the left, the sheet at that moment being transferred from cylinder F to F' and wrapping on the surface of the cylinder simultaneously with the wrapping thereon of the double thickness of tympan, the sheet being, however, partly removed from cylinder F' by reel N' before the cylinder F' has completed its left-hand stroke, so that it is not pinched or caught between the overlapping double thicknesses of tympan at the left of cylinder F' when the cylinders have completed one revolution to the left, Fig. 2. It will also be observed that in order that the tympan may wrap around the cylinder F during its left-hand stroke it is necessary either that the tympan unwind from one or both tympan-rolls $B B'$ or that the loops of web between $C C'$ and $D D'$ and $C C'$ and $B B'$ be shortened. It is preferable to shift the guide-rollers $C C'$ or $D D'$, or both, to compensate for the alternate taking up and giving off of the tympan, due to the oscillation of cylinder F' .

If the beds $A A'$ are stationary and the cylinders reciprocate, the movement of rolls $D D'$ toward or from rolls $C C'$ will compensate the alternate slack and take up of tympan by the cylinder. If the cylinders are fixed and the beds move, the rolls $C C'$ can be moved toward rolls $D D'$ to compensate the tympan. Where both beds and cylinders reciprocate, as in my aforesaid application, the tympan is compensated partly by the movement of rolls $D D'$ and by the movement of rolls $C C'$, as shown.

Rolls $C C'$ may be mounted upon a sliding support H , having a rack h on its lower edge meshing with one of a pair of like pinions I , the other of which meshes with a vertically-movable rack-bar J , which meshes at its lower end with a pinion k on the shaft of a gear K , meshing with a rack a on the beds, as indicated in Fig. 1. Thus the rolls $C C'$ are moved simultaneously with the movement of the beds, to which the cylinders are geared in the usual manner.

When the cylinders are at the right-hand end of their stroke, the tympan is then simply doubled around roller E and is substantially clear of cylinder F , and when in that position it can be shifted from one roll to the other, so as to present clean surfaces to the imprinted sheet. Any suitable mechanism can be employed for shifting the tympan. A simple means is shown in Fig. 1, wherein the shaft of roll B' has a fixed ratchet b and loose pin-

ion b^2 on one end, the pinion b^2 having a dog b' , engaging the ratchet when the pinion is turned in a direction to wind up the tympan on roll B' . The pinion is meshed with a rack L , connected to a bell-crank l , in turn connected to a vertically-movable bar M , which is pressed upward by a spring m , and is provided with a roller m' , adapted to be engaged by a cam a^2 on the end of bed A' , so as to shift the tympan after impressions and when the beds are at the end of their left-hand stroke and the cylinders near the end of their right-hand stroke, as indicated in Fig. 1. I do not, however, limit myself to the tympan looping or shifting mechanisms herein shown and described, as they can be varied to suit the press to which the invention is adapted at the will of the constructor without departing from the essence of the invention.

In Figs. 3, 4, and 5 I have indicated a modification of the construction. In this case the web is led from roll B' under a stationary guide B^2 to and around a movable looping-roller C^2 , back to and over a roller D , movable with the cylinder, down to the cylinder F' , around a curved plate E' in the gripper-pit thereof, to and between a pair of parallel rollers $e e'$, located in the gripper-pit, then around the cylinder F' , to and under a roller f , movable with the cylinders, up to and over roller D' , back around a looping-roller C^3 , forward under a fixed guide B^3 , and up to roll B . This construction only gives one thickness of tympan between the sheet and cylinder F' , but it involves a somewhat more complicated action of looping-rollers than the other.

As the cylinders move to the left the tympan is fed around cylinder F' , so that the loop around roller C^2 is shortened, while that around roller C^3 is elongated, this action continuing until the cylinders have made about three-fourths of their stroke, Fig. 4, when the rotation of cylinder F' causes roller e' to move against the rear strand of tympan and double it upon itself back over the gripper-pit, as indicated in Fig. 5. As soon as roller e begins to thus pull, the tympan-roller C^3 is stopped or moved inward to compensate for this new demand of the web. Then when the cylinders start backward and the tympan is slacked off cylinder F' or fed backward thereunder the loop around roller C^2 is elongated and roller C^3 is moved to the right to take up the slack in the tympan given off from the loop around roller e until roller e passes roller f . Then the loop around roller C^3 is shortened to supply the demand in the tympan due to the rotation of the cylinder F' . Roller C^2 would move with the bed if it moved or be fixed if the bed was fixed. Rollers $D D'$ are fixed in relation to the cylinders, and roller C^3 may be properly shifted by cams.

In Fig. 3 I have indicated means for operating the looping-rollers $C^2 C^3$. As shown, the looping-roller C^2 is operated from the reciprocating bed by substantially the same means used for operating the looping-rollers

C C' in Fig. 1. The roller C³ may be operated by a pitman *q*, connected to the upper end of an oscillating lever Q, fulcrumed at Q' and operated by a cam Q² on a shaft driven by any suitable means. I do not, however, confine myself to any specific mechanism for operating these looping-rollers.

From the foregoing it will be seen that I have a very novel and useful tympan for cylinder-presses, and the advantages of locating both tympan-rolls outside of the cylinder will be appreciated by pressmen familiar with the old tympan mechanisms.

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

1. In a printing-press the combination of an oscillating cylinder, a tympan having its ends supported exterior to the cylinder and having an intermediate portion loosely connected to the cylinder, whereby the tympan is alternately wrapped and unwrapped upon the cylinder, substantially as described.

2. In a printing-press, the combination of an oscillating impression-cylinder with a tympan therefor having its ends supported exterior to the cylinder, and the intermediate portion loosely connected to the cylinder and tympan-compensating mechanism, substantially as and for the purpose described.

3. In a printing-press the combination of an oscillating cylinder, with a tympan therefor, having both ends arranged exterior to the cylinder and adapted to be wrapped and unwrapped upon the surface of the cylinder, as it rotates, substantially as and for the purpose described.

4. In a printing-press the combination of an oscillating impression-cylinder, a tympan therefor having its ends supported exterior to the cylinder, and an intermediate portion connected thereto so as to wrap and unwrap thereon and mechanism for looping the tympan intermediate the supports and cylinders, for the purpose and substantially as described.

5. In a printing-press the combination of a cylinder, a tympan having its ends supported exterior to the cylinder and its intermediate portion carried under a guide in the periphery of the cylinder, and mechanism for compensating the tympan for the movement of the cylinder, all substantially as described.

6. In a printing-press the combination of an oscillating cylinder, a tympan having its ends supported exterior to the cylinder and having an intermediate portion loosely connected to the cylinder and adapted to wrap and unwrap thereon, and mechanism for shifting the tympan after impressions, substantially as described.

7. In a printing-press the combination of a cylinder, a tympan having its opposite ends supported exterior to the cylinder, and its intermediate portion loosely connected to the cylinder so as to wind and unwind thereon, and mechanism for compensating for the alternate slack and take-up of the tympan by the

cylinder, all substantially as and for the purpose described.

8. In a printing-press the combination of an oscillating impression-cylinder, with a tympan arranged and supported exterior thereto, having a part thereof doubled around a guide in the periphery of the cylinder, whereby the cylinder is packed by a double thickness of tympan, and means for compensating for the slack and take-up in the tympan, substantially as described.

9. In a printing-press the combination of an oscillating impression-cylinder, a tympan therefor having its ends supported exterior to the cylinder, and mechanism for looping the tympan intermediate the supports and cylinder, and mechanism for compensating for the alternate slack and take-up of the tympan by the cylinder, substantially as and for the purpose described.

10. In a printing-press the combination of an oscillating impression-cylinder, with a tympan arranged and supported exterior thereto having a part thereof doubled around a guide in the periphery of the cylinder whereby the cylinder is packed by a double thickness of tympan, and mechanism for compensating for the alternate slack and take-up of the tympan by the cylinder all substantially as and for the purpose described.

11. In a printing-press the combination with an impression-cylinder, of a tympan, both ends of said tympan being supported outside of the cylinder, and its intermediate portion loosely connected to the cylinder so as to wrap and unwrap thereon, and means for compensating for the slack and take-up in the tympan all substantially as and for the purpose described.

12. In a printing-press the combination of a reciprocating gripper-cylinder, with a tympan having its ends supported exterior to the cylinder but having its intermediate portion connected to a guide in the cylinder in such manner that the latter is properly packed thereby, and means for compensating for the alternate slack and take-up of the tympan by the cylinder, substantially as and for the purpose described.

13. In a printing-press the combination of an impression-cylinder, a tympan having its ends supported exterior to the cylinder and intermediately doubled upon a guide in the periphery of the cylinder, so as to wrap and unwrap thereon, and mechanism for compensating for maintaining a uniform tension of the tympan, and mechanism for shifting the tympan from one roll to the other, substantially as described.

14. In a printing-press the combination of an impression-cylinder, a tympan having its ends supported exterior to the cylinder and intermediately doubled upon a guide in the periphery of the cylinder so as to wrap and unwrap thereon, and means for compensating for the slack and take-up in the tympan, substantially as described.

15. In a printing-press the combination of a reciprocating gripper impression-cylinder, with a tympan having its ends supported exterior to and independently of the cylinder, and its intermediate portion passed around a guide in the gripper-pit of the cylinder, and means for compensating for the slack and take-up in the tympan for the purpose and substantially as described.

10 16. In a printing-press the combination of a type-bed, a coacting impression-cylinder, tympan-supports exterior to and independent of the cylinder, and a tympan extending from one support to and around a guide in the periphery of the impression-cylinder, back to the other support; with tympan guiding and looping rollers both fixed and movable relatively to and with the cylinder, and tympan guide and looping rollers both fixed and movable relatively to and with the bed, all substantially as and for the purpose described.

15 17. In a printing-press the combination of a reciprocating gripper impression-cylinder, with a tympan having its ends supported exterior to and independently of the cylinder,

and its intermediate portion passed around a guide in the gripper-pit of the cylinder mechanism for compensating the tympan for the movement of the cylinder, and means for shifting the tympan, all substantially as and for the purpose described.

18. In a printing-press the combination of a type-bed, a coacting impression-cylinder, tympan-supports exterior to and independent of the cylinder, and a tympan extending from one support to and around a guide in the periphery of the impression-cylinder, back to the other support, with tympan guiding and looping rollers; means for operating the said tympan-looping rollers, and means for shifting or feeding the tympan, all substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY F. BECHMAN.

Witnesses:

FRANK W. DUNNING,
CHAS. H. WHEELOCK.