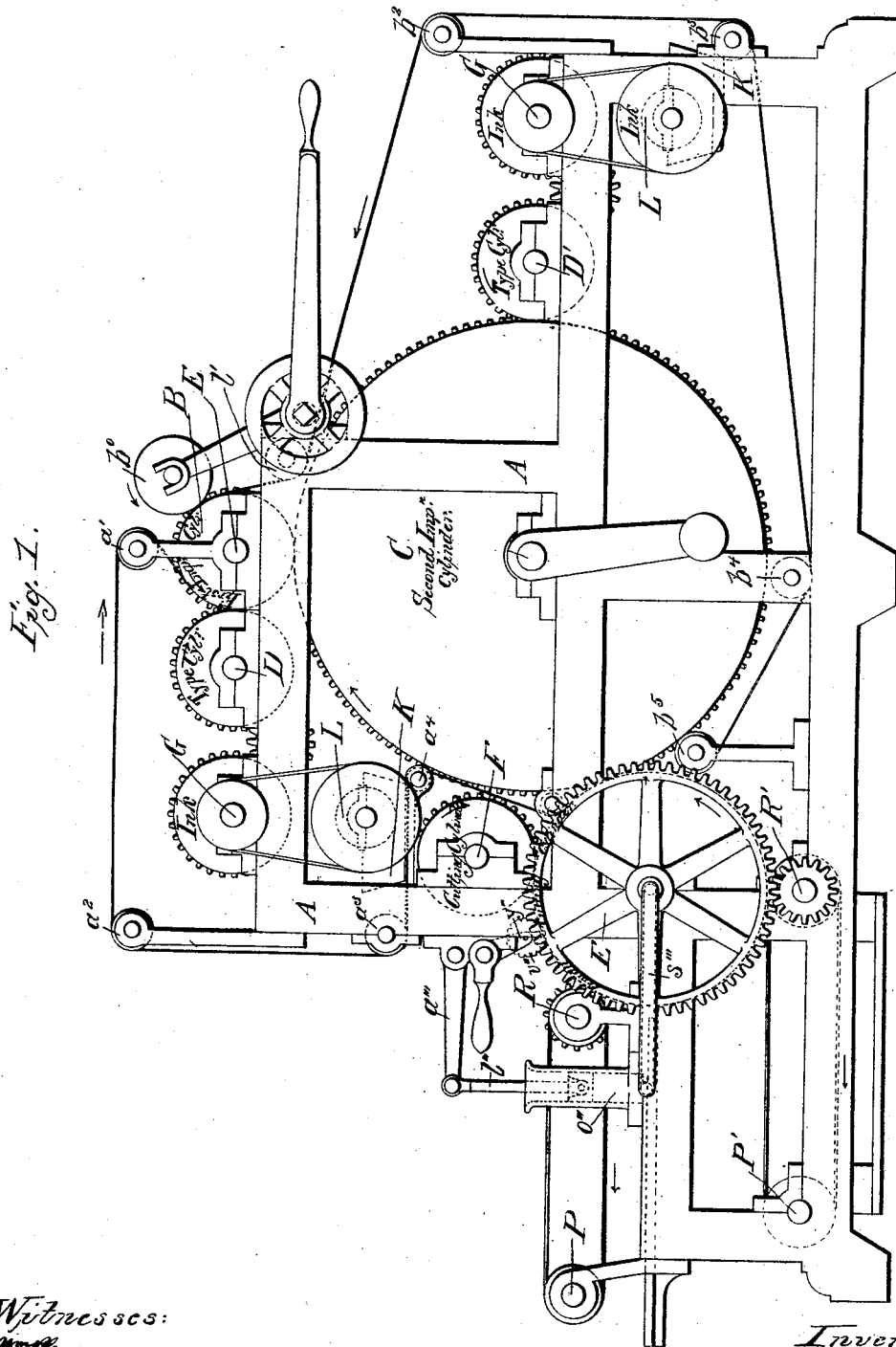


**J. W. KELLBERG.**  
**PRINTING PRESS.**

No. 110,244.

Patented Dec. 20, 1870.



Witnesses:

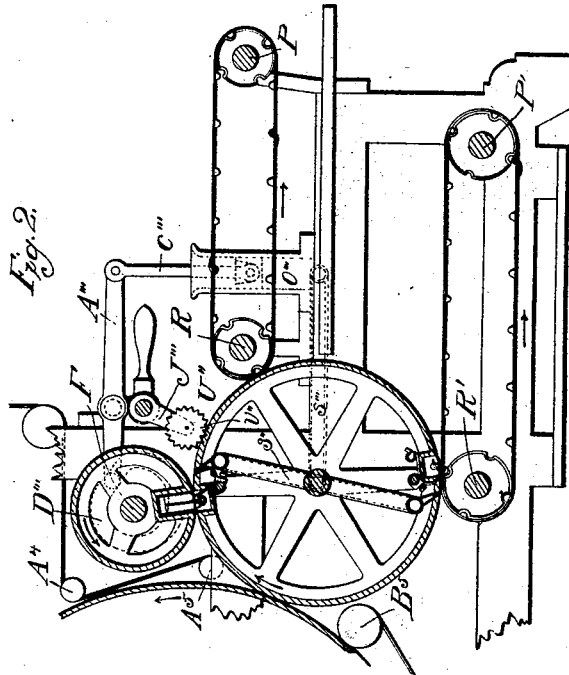
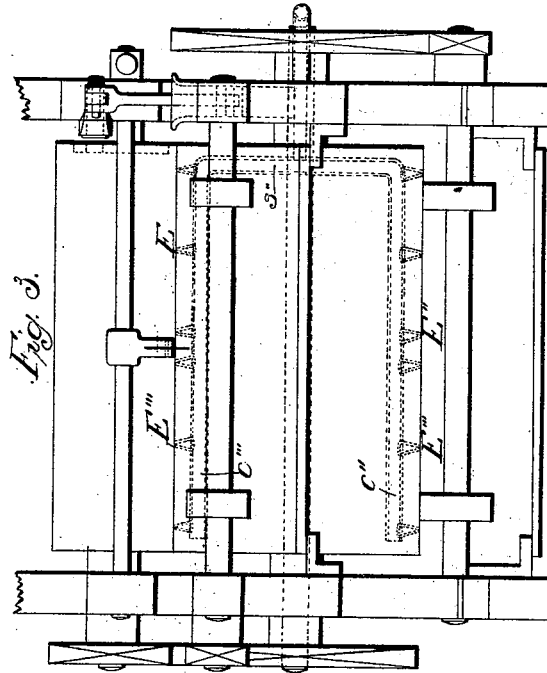
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Witnesses:

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# UNITED STATES PATENT OFFICE.

JOHN W. KELLBERG, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN PRINTING-PRESSES.

*Specification forming part of Letters Patent No. 110,244, dated December 20, 1870.*

*To all whom it may concern:*

Be it known that I, JOHN W. KELLBERG, of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Rotary Power Printing-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My improvement in printing-presses belongs to that class of machines in which the paper is printed from a continuous roll or web.

In the most successful of this class of machines, that patented by the late lamented William Bullock on the 14th of April, A. D. 1863, the paper is fed to the machine from a continuous roll or web; a sheet of the proper size severed from the roll, then printed on both sides, being carried through the machine by the use of grippers, and finally discharged in one pile from the machine thus perfected or printed on both sides. But the chief difficulty in this otherwise incomparable press has arisen from the uncertain action of the grippers in carrying the cut sheet evenly and squarely through the machine to the delivering apparatus; and to overcoming this difficulty my invention has special reference, and in accomplishing which I have also improved the delivering apparatus.

Figure 1 is a longitudinal side elevation of my machine, showing the frame and relative position and operation of the different parts. Fig. 2 is an enlarged longitudinal sectional elevation of the cutting-cylinders and fly or delivery apparatus. Fig. 3 is an end view of the machine, showing the cutting cylinder E, with the position of the air-pipes and openings for blowing the rear end of the sheet from the cylinder, and also the position and operation of the slitting-knife.

A is the frame of the machine, seen from one side, and having a corresponding frame upon the other side, the two sides being parallel with each other, and supporting the several shafts and cylinders which are placed horizontally between them. C is the second impression-cylinder, to which is applied the power that drives the machine, and from which all the other parts of the machine derive their motion, its diameter being a multiple of the first impression-cylinder B, type-cylinders D D', and male cutting-cylinder F. G G' are the ink-distributers. E is the female cutting-

cylinder, and its diameter is equal to two diameters of the male cutting-cylinder F. R P is the delivery apparatus, for receiving each alternate sheet from the female cutting-cylinder E and laying them in one pile. R' P' is the lower delivery apparatus, for receiving the other alternate sheets from the female cutting-cylinder E, and laying them also in one pile. o''' is an air-pump. b''' is the air-pump piston. a''' is the arm operating the air-pump. D''' (shown in dotted outline in Fig. 2) is the cam which operates the arm a''', forcing the air through the pipes s''' into the pipes s'', through the pipes c''' c'', and out the nozzles E''' E''. a<sup>1</sup>, a<sup>2</sup>, a<sup>3</sup>, a<sup>4</sup>, and a<sup>5</sup> are the pulleys carrying the cords or tapes on the outside of the paper on the first impression-cylinder B, and between the paper and second impression-cylinder C, and which cords or tapes carry the forward end of the sheet of paper from the second impression-cylinder onto the female cutting-cylinder E, leaving the paper at the pulley a<sup>5</sup>. b<sup>1</sup>, b<sup>2</sup>, b<sup>3</sup>, b<sup>4</sup>, and b<sup>5</sup> are the pulleys which carry the tapes or cords on the inside of the paper on the first impression-cylinder B, and on the outside of the paper on the second impression-cylinder C, and which cords or tapes, in combination with the cords or tapes on pulleys a<sup>1</sup>, a<sup>2</sup>, a<sup>3</sup>, a<sup>4</sup>, and a<sup>5</sup>, carry the paper to the female cutting-cylinder E at the pulley b<sup>5</sup>. b is the roll or web of paper to be printed and cut into sheets.

When the machine is ready for operation, or to be put in motion by the application of power to the second impression-cylinder C, the forward end of the paper, which rests on the cylinder B, is inserted between the two series of tapes running on the pulleys a<sup>1</sup> b<sup>1</sup>, and, being carried between the first type and first impression cylinders, receives its first impression and is printed on one side, from whence it is carried between the two series of tapes on around the second impression-cylinder C, receiving its second impression, printing it on the other side between the second impression-cylinder C and the second type-cylinder D', from whence it is still carried on around the second impression-cylinder, between the said two series of tapes, to the female cutting-cylinder E, the circumference of which, being equal to the length of two sheets of paper to be cut, is provided with two sets

of grippers, which are directly opposite each other, and so constructed, arranged, and operated as to seize the forward end of the roll immediately after its severance from the preceding sheet; but as the rear end of the preceding sheet would then be over the openings through which the grippers seizing the forward end of the roll, as aforesaid, must pass, the cam which operates the arm  $a'''$ , attached to the air-pump  $o'''$ , forces the piston  $b'''$  down into the cylinder  $o'''$ , and drives the air out of the apertures in the cutting-cylinder E, made for that purpose, and designated  $E''' E''' E'''$ , thereby removing or blowing the rear end of the cut sheet on the cylinder E out of the way or reach of the grippers in seizing the forward end of the roll of paper.

The forward end of the roll is then seized and retained by the grippers on the female cutting-cylinder E until it reaches the delivery apparatus R P, when the grippers on the cylinder E are made to let go their hold of the paper and resume their position ready for their next sheet. The grippers on the delivery apparatus (Bullock's) then seize hold of the paper and carry it along until after its severance from the roll and until just as the rear end is arrested and knocked down, when the grippers are made to release their hold and resume their position ready for their next sheet.

The diameter of the male cutting-cylinder F being one-fourth of that of the impression-cylinder C, and one-half that of the female cutting-cylinder, the cut sheet will be one-half the circumference of the female cutting-cylinder E; consequently each set of grippers on the female cutting-cylinder is made to operate alternately, and the cams are so arranged that one set of grippers will deliver the forward end of the roll to the delivery apparatus R P, and the other set of grippers will deliver the forward end of the cut sheet to the delivery apparatus R' P'.

It would be impossible for one delivery apparatus of this kind to take charge of sheets following each other in unintermitted succession without any space between the sheets of paper, as there would be no opportunity for the return of the knocker or fly rods from striking down the rear end of the sheet, and for this reason a second delivery apparatus, R' P', is added, which receives and disposes of each alternate sheet, and still, if the delivery apparatus R' P' were to run at the same speed as the delivery apparatus R P, the tail or rear end of the sheet delivered to the delivery appa-

ratus R' P' would be in the way of the operation of the grippers on the delivery apparatus R P; to obviate which difficulty the grippers on the delivery apparatus R' P' are made to travel at an accelerated speed, so that as soon as they close on the forward end of the cut sheet the sheet is slid along on the female cutting-cylinder E, leaving a space between the rear end of the cut sheet and the forward end of the roll for the operation of the grippers on the delivery apparatus R P.

It will readily be seen that the use of cords or tapes, grippers, or other device for carrying the paper can be entirely dispensed with in the above arrangement, the paper remaining in one continuous sheet until it reaches the cutting apparatus at the delivery end of the press.

When it is desired to slit the sheet of paper, a slot or rabbet is made around the circumference of the female cutting-cylinder E, into which a circular serrated blade is suspended or inserted, and being suspended at its axis on an arm,  $y''$ , the serrated blade  $v'''$  will revolve at the same speed as the paper simply by the passage of the paper itself, and thereby slit or perforate the paper as desired.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a perfecting printing-press, printing without intermission from a continuous roll, so combining and arranging the various cylinders that the paper shall be in continuous contact with their convex surfaces until cut into sheets for delivery, so as to avoid the necessity of using any carrying tapes, belts, grippers, or bridges, substantially as shown and set forth.

2. The roll of paper  $b^o$ , in combination and rolling contact with the first impression-cylinder B, as and for the purposes substantially as described.

3. An air-blast, substantially as described, for the purpose of removing the rear end of the sheet from the reach of the grippers in seizing the forward end of the roll.

4. Two delivery apparatus, one running at a faster speed than the other, as and for the purposes substantially as described.

5. A circular serrated knife, for slitting or perforating the sheet, operated as and for the purposes substantially as described.

JOHN W. KELLBERG

Witnesses:

WM. P. CORSA,  
ISIDOR KJELLBERG.