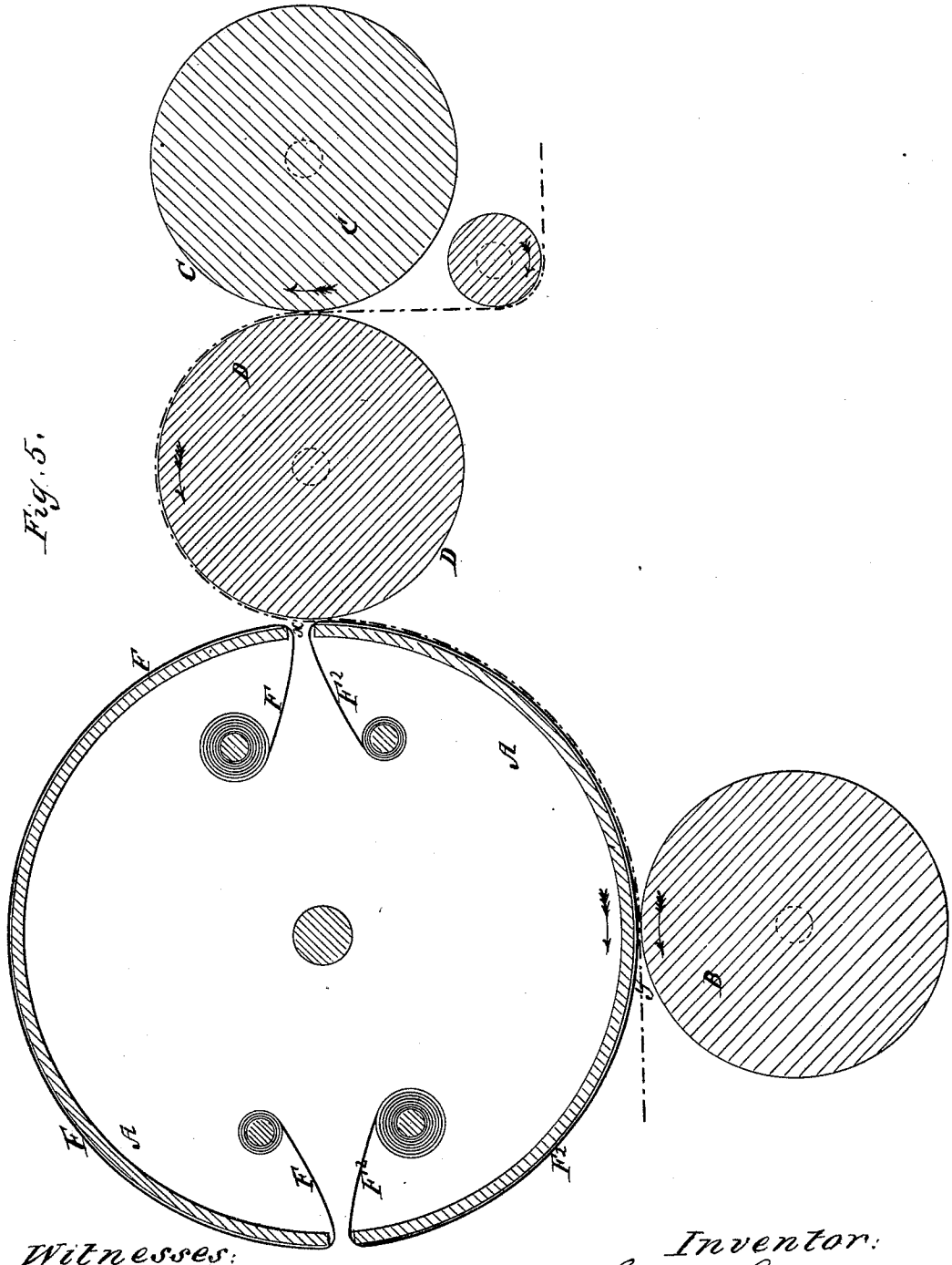
2 Sheets—Sheet 2.

C. B. COTTRELL.

PRINTING-PRESS.

No. 175,037. Patented March 21, 1876.

Fig. 5.



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UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF WESTERLY, RHODE ISLAND.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **175,037**, dated March 21, 1876; application filed January 8, 1876.

To all whom it may concern:

Be it known that I, C. B. COTTRELL, of Westerly, in the county of Washington, in the State of Rhode Island, have invented new and useful Improvements in Printing-Presses; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon:

Previous to my invention, one of the greatest difficulties encountered in the use of perfecting-presses, has arisen from the tendency to a "set-off" by the tympan of the impression-cylinder while printing the second side of the sheet. Every builder and operator of perfecting-presses is familiar with this defect in the principle of operation of such presses, and with this tendency to a "set-off" or transfer of ink from the tympan of the impression-cylinder onto the printed surface of the sheet while the latter is being perfected or printed on the second side; and numerous remedies have been suggested for this evil, none of which, however, to my knowledge, have proven practically very successful or useful. It has been suggested to employ a continuously-moving sheet of paper or tympan, which should travel in contact with the circumference of the impression-cylinder (which effects the impression on the second side of the sheet) and between it and the printed surface of the sheet, while the latter should be receiving its second impression; but contrivances made to carry out this plan of preventing set-off involve necessarily a very cumbersome tympan, and much additional machinery, and do not appear to be very practicable. The best practical way known and used is, I believe, to employ a large impression-cylinder and to have either one or a series of tympans which are capable of adjustment (or of being shifted) periodically; but the use of the smallest successfully operative impression-cylinder is of course a desideratum, and in any machine in which the tympan has to be shifted, as mentioned, the necessary stoppage of the press to permit such shifting of the tympan is of course a great objection, an uninterrupted and rapid running through of an edition of the paper (or large quantity of the printed matter) being of the greatest moment where perfecting-presses are employed.

I propose to overcome the objections alluded to, and provide for use a perfecting-press, in which, while a small impression cylinder may be employed all set-off shall be completely avoided; and to these ends and objects my invention consists in the use, in combination with the impression-cylinder of a perfecting-press, of a divided tympan, or two or more separate tympans and means for shifting said tympans while the press is running, whereby the surface of the material which comes in contact with the freshly-printed sheet is so frequently shifted during the operation of the press as to avoid the occurrence of set-off, as will be more particularly explained hereinafter.

To enable those skilled in the art to make and use my invention, I will proceed to more fully describe it, referring by letters to the accompanying drawings, making part of my specification, and in which I have illustrated so much of a printing-press as is necessary to a full understanding of my invention.

Figure 1 is a side view, Fig. 2 a vertical longitudinal section, and Fig. 3 a partial top view, of part of a perfecting-press, and clearly showing the arrangement in the main frame of a set of impression and form cylinders or rolls, having my invention embodied. Fig. 4 is a detail end view of the second impression-cylinder taken from the side of the machine opposite to that seen at Fig. 1; and Fig. 5 is a partial side view of a press having a different arrangement of the cylinders and my invention embodied in it.

In Figs. 1, 2, 3, and 4, A is the usual main frame of the machine, in which are mounted, in any of the customary proper ways, the impression and form cylinders. In the arrangement of cylinders shown, B and C are respectively the form and impression cylinders, by means of which the first side of the sheet or web of paper is printed, while D and E are respectively the form-cylinder and impression-cylinder by means of which the sheet or web of paper has its second side printed, or by which the printing of the sheet or web is completed or perfected. The two form-cylinders

large-newspaper work to give about an inch movement, as that will insure a complete renewal of the tympan-surface in about thirty-three or thirty-four turns, or during the printing of about that many impressions with one tympan; but the extent of movement is wholly a matter of discretion, and dependent upon surrounding circumstances.

Whenever the tympans may have become unwound from rollers *h* and *j* onto rolls *g* and *h*, the ratchet mechanisms may be temporarily thrown out of gear and the tympans wound back on the rolls *h* and *j* by turning said rolls with a suitable key or wrench by hand; or mechanism may be devised and applied for more rapidly winding back the tympan; or duplicate tympans and rolls may be adapted to substitute for those requiring rewinding or renewal.

At Fig. 5 is shown a different form of press, in which the arrangement of the two sets of form-cylinders and impression-cylinders is such that more time and a better opportunity are afforded for the operation of the shifting-tympans. In this form of press, it will be seen, the disengaged tympan moves through a greater space from the time one of its ends runs out of contact with the web or sheet of paper until its other end comes into operation with the form-cylinder.

From a glance at Fig. 5 it will be seen that the impression-cylinder A has to make about a quarter of a revolution from the time the tympan F runs out of contact with the web at the point *y* until it comes into operation at the point *x* with the impression-cylinder D, and that, therefore, the tympan F can be undergoing transposition of its surface during all this time.

In the form of press shown at Fig. 5, the web or sheet of paper, illustrated by broken lines, is fed in and receives its first impression between the form-roll *c* and impression-cylinder D, and then passes on, as indicated by arrows, and is printed on the second side between the impression-cylinder A and form-cylinder B.

My invention, it will be understood, may be carried out in many ways and under various modifications in different sort of perfecting-presses. I do not, therefore, wish to be understood as limiting myself to any particular mode of carrying out the idea of the automatically-shifting tympans on an impression-cylinder; but,

Having so fully explained my invention that those skilled in the art can make and use printing-presses involving it, what I claim as new, and desire to secure by Letters Patent, is—

In combination with the impression-cylinder, two or more tympans and means for shifting them while the press is running, substantially as and for the purposes set forth.

Witness my hand and seal this 6th day of January, 1876.

C. B. COTTRELL. [L. S.]

In presence of—
J. N. McINTIRE,
JACOB FELBEL.

J. C. CRAMER.

HAY-ELEVATOR.

No. 175,038. Patented March 21, 1876.

FIG. 1.

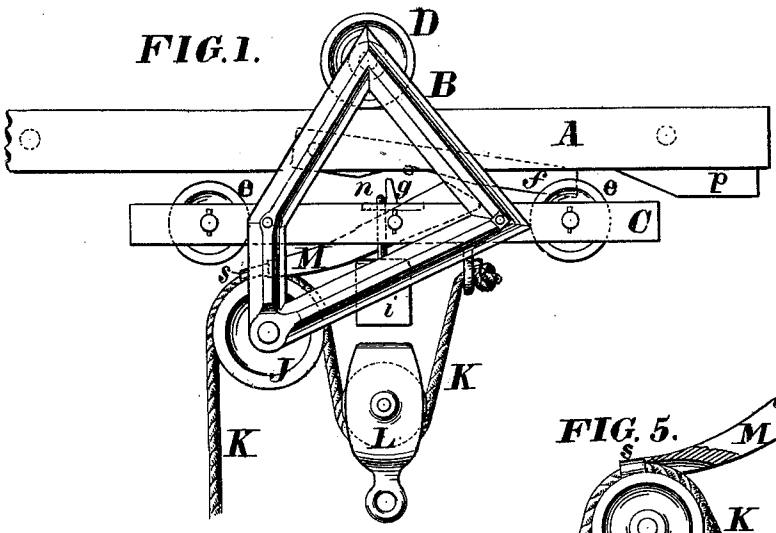

FIG. 2.

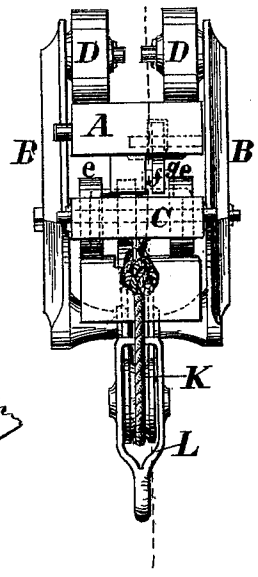

FIG. 5.

FIG. 3.

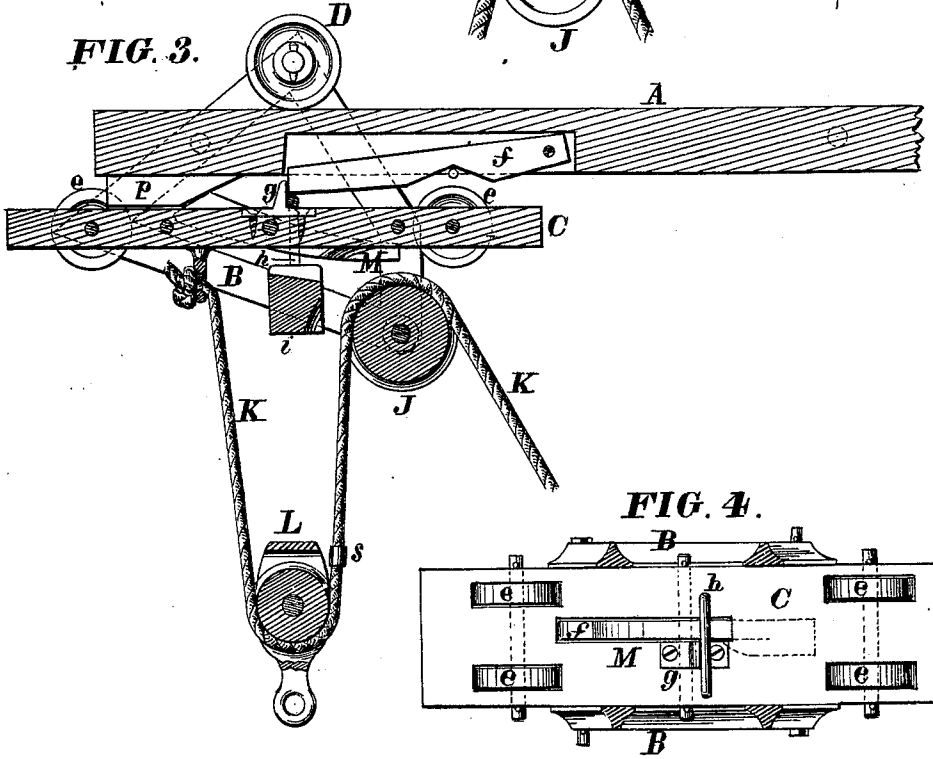

FIG. 4.

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