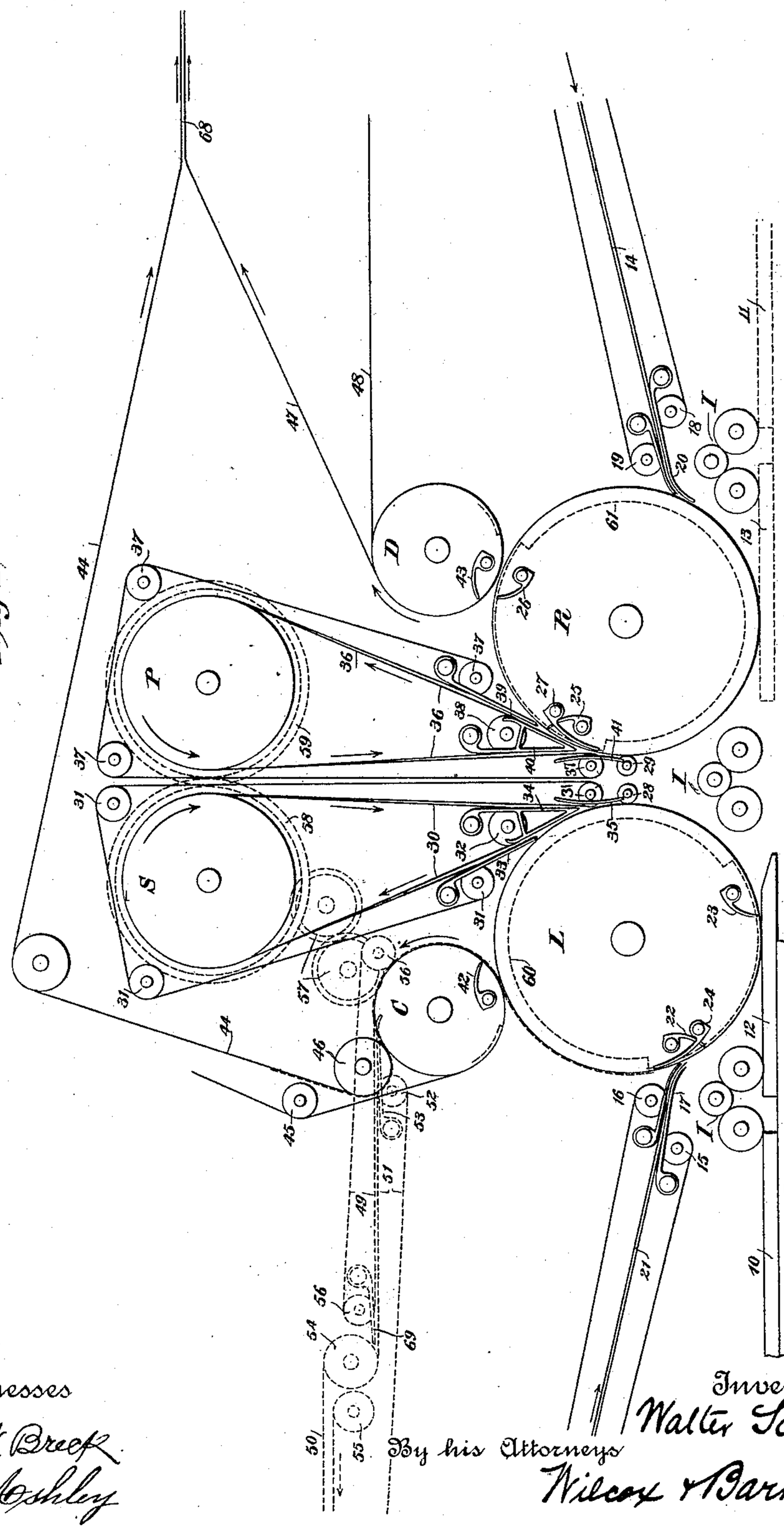
(No Model.) 2 Sheets—Sheet 1.

W. SCOTT.

PRINTING MACHINE.

No. 472,554. Patented Apr. 12, 1892.

Fig. 1.



Witnesses
Geo. W. Breck.
C. E. Ashley

Inventor
Walter Scott,
By his Attorneys
Wilcox & Barkley.

(No Model.) 2 Sheets—Sheet 2.

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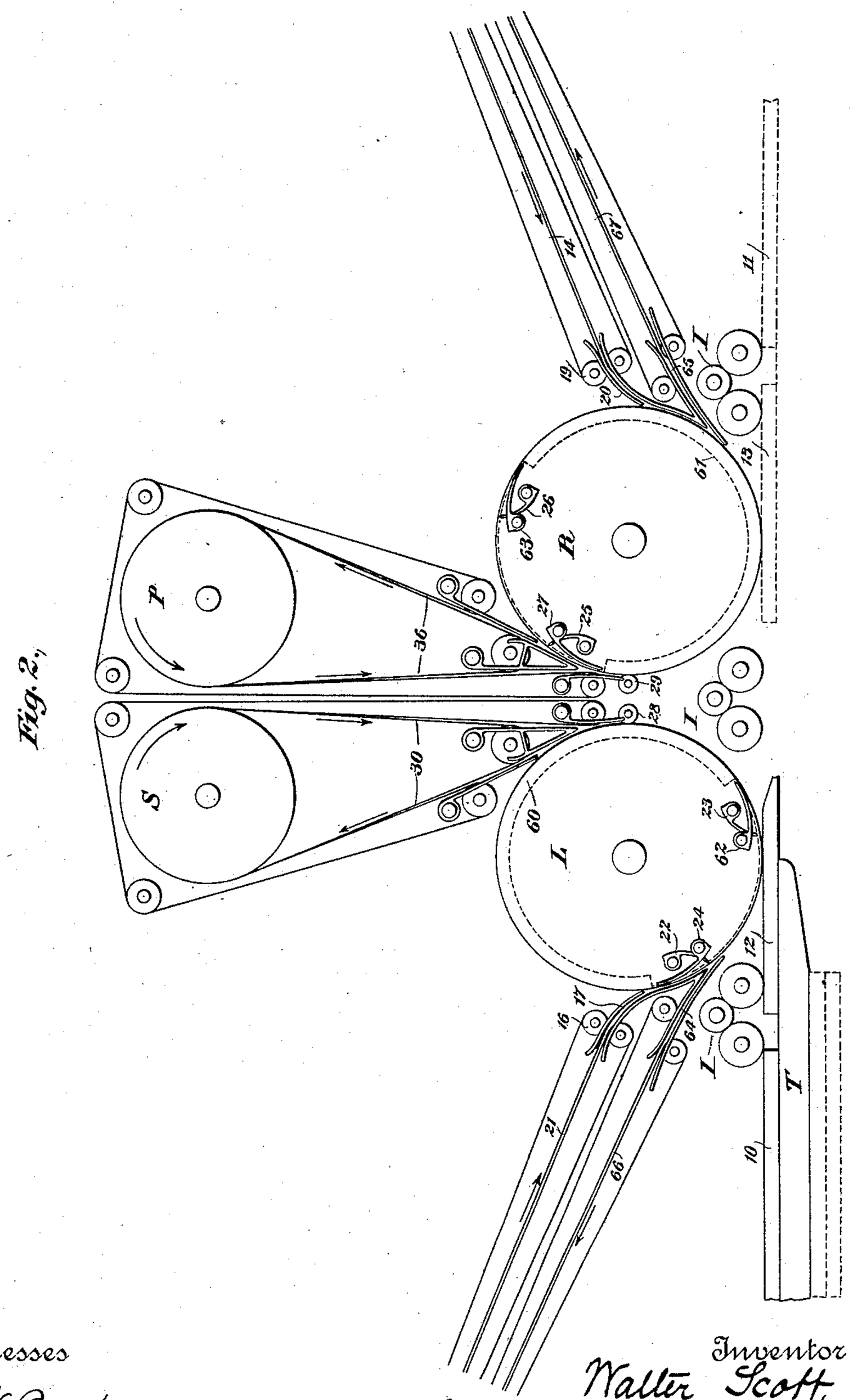

Fig. 2.

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UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 472,554, dated April 12, 1892.

Application filed February 14, 1891. Serial No. 381,429. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, a citizen of the United States, and a resident of Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Printing-Machines, of which the following is a specification.

My invention relates to printing-machines wherein the impression is taken between a flat bed and two cylinders; and it consists in the combinations of devices hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side view of a machine embodying my invention. Fig. 2 is a side view of a modification of my invention.

The type-bed carrying two forms 10 11 (an inner and an outer) is reciprocated by any suitable means commonly used for that purpose. The forms are inked by rollers I I I, disposed as shown. The usual ink-tables 12 13 may be used, as ordinarily.

The two oscillating impression-cylinders L R are geared to the type-bed in a well-known manner. (Not shown.) The cylinders L R have impression surfaces or drums 60 61, respectively. The cylinder L has grippers 22 23. The cylinder R has grippers 25 26. To aid in directing the sheet to the guides of the reversing appliances, the cylinder L has throw-offs 24 and the cylinder R throw-offs 27. In the case where the sheets are delivered by means of guides and tapes, the cylinders L R are furnished with throw-offs 62 63, respectively. These throw-offs 62 63 are not used where delivery-cylinders, as C D, deliver the sheets.

The feed may be by any suitable means, as from a board. In the cases shown the feed is from rolls of paper and suitable cutting-cylinders, which cut the paper into sheets of a length suitable for two perfected copies. The sheets may be partially cut in two between the copies at the same time. The sheets are fed by means of tapes 14 and guides 20 to the cylinder R and by means of tapes 21 and guides 17 to the cylinder L. One part of the tapes 14 run about rollers 18 and the other part about rollers 19. In a similar manner the tapes 21 run around the cylinders 15 16.

The reversing appliances shown comprise cylinders, guides, tapes, and friction-cylinders, though cylinders alone may be used. Guides 33 34 receive the sheet from cylinder L and direct the sheet to tapes 30. One part of the tapes runs around the reversing-cylinder S and rollers 32, while the other part runs around the rollers 31, there being four in this instance. Guides 34 and 35 direct the sheets down close to the cylinder L for its grippers 23 to take. Guides 39 40, tapes 36, and guides 40 41, cylinder T, and rollers 38 and 37 have functions, respectively, relative to the cylinder R in a manner similar to the functions of guides 33 34, tapes 30, guides 34 35, cylinder S, and rollers 32 and 31 relatively to the cylinder L. Friction-rollers 28 29 co-operate with cylinders L R, respectively, in feeding the sheets up to the guides and tapes. These rollers oscillate with their respective cylinders, which oscillation may be caused by gearing or frictional contact.

Where reversing-cylinders alone are used, they are arranged adjacent the cylinders L R, at the upper sides thereof, and are furnished with grippers, as will be readily understood, taking the sheets and reversing them after the manner shown in my Letters Patent No. 456,741, dated July 28, 1891.

Where delivery-cylinders, as C D, are used, they are placed at the outer sides or halves of the cylinders L R. The delivery-cylinders C D have grippers 42 43, respectively, for a purpose hereinafter referred to. These delivery-cylinders may each deliver the sheets to a corresponding set of tapes and these to folders or fliers after the perfected copies are separated. These tapes may be arranged as shown at the left of Fig. 1 in dotted lines, where tapes 49 run around rollers 56 56, tapes 51 around rollers 52 55, and tapes 50 around rollers 54. Arms or guides 53 support the sheet from the cylinder C to the tapes 49 51. The sheets from the cylinder D may follow the path 48 by means of tapes arranged in a manner similar to that just described; or the sheets from the two cylinders C D may be run along the paths 44 47 and common path 68 to a common delivery, as folder or fliers, by means of suitably-arranged tapes. I have not deemed it necessary to show the arrange-

ment of parts for carrying the sheets along these paths, as the arrangements necessary will readily occur to any one skilled in the art. Indeed, they may be similar to that shown in dotted lines and which has just been described. There is this difference, however: One set of the tapes run around the cylinder C and the other set about a roller 46. A similar arrangement would exist in relation to cylinder D.

In the modification shown in Fig. 2 the impression, feed, and reversing devices are similar to those hereinbefore described and need no further description, and are not, therefore, fully supplied with reference-numerals. As above noted, the cylinders L R have additional throw-offs 62 63, respectively.

In the modification shown at Fig. 2 I employ guides 64 and tapes 66 to deliver the sheets from the cylinder L and similar guides 65 and tapes 67 to co-operate with cylinder R. I may also place small friction-rollers, similar to rollers 28 29, adjacent the cylinders L R and adjacent the lowest points of the guides 64 65 to aid in feeding the sheets through the guides to the tapes. These rollers would oscillate with their respective cylinders.

The devices shown in Fig. 1 operate as follows: As the bed moves to the right the grippers 22 of cylinder L take the leading edge of a sheet from the guides 17. Then the cylinder L begins to take an impression. Next the grippers 26 of the cylinder R take the leading edge of a sheet from the guides 40 41, (since in practice there would be a sheet in the tapes 36 and guides 40 41,) and thereafter to take an impression at about the time the cylinder L, roller 28, and throw-offs 24 begin to run the sheet into the guides 33 34 and thence between the tapes 30 and around the cylinder C. The grippers 43 of delivery-cylinder D next take the perfected sheet from cylinder R, whose grippers 26 open. When the bed has reached its extreme position to the right, (shown in dotted lines,) grippers 23 of cylinder L are opposite the cylinder C and the grippers 25 of cylinder R are opposite the guides 20. As the type-bed moves to the left the parts operate in a similar manner. The grippers 25 take a sheet from guides 20, cylinder R begins to take an impression, grippers 23 take the sheet from guides 34 35, cylinder L begins taking an impression at about the same time that cylinder R, roller 29, and throw-offs 27 run the sheet into guides 39 40 to tapes 36 around cylinder T, and, lastly, the grippers 42 take the perfected sheet from cylinder L, whose grippers 23 open. The tapes 50 51 run at a higher speed than tapes 49. When the leading edge of the sheet is in the turn between rollers 54 55, the rear edge is still between cylinder C and roller 56. The greater speed of rollers 54 55 causes a pull on the sheet, which parts along the line between the copies, which, as above noted, are partially cut apart before the first feeding operation. The sheets delivered by cylinder D are served in like manner.

The operation of the modification shown in Fig. 2 is obviously similar to that just described, except that the delivery operates differently. The throw-offs 62 (or 63) direct the sheet into the guides 64, (or 65,) the grippers 23 (or 26) opening at the proper time, and the tapes 66 (or 67) delivering the sheet as to a folder or to fliers, the copies first being severed, as above described.

The reversing and delivery cylinders may be given their rotary motion by any suitable means. For instance, the mechanisms set forth in my Letters Patent No. 456,741, dated July 28, 1891, may be used.

The tapes are operated in any usual manner. The grippers and throw-offs are operated by the usual means employed for that purpose.

Having thus fully described my invention, what I desire to secure by Letters Patent is—

1. In a printing-machine, the combination of a reciprocating type-bed, two oscillating impression-cylinders, means at the outer side of each cylinder for feeding the sheets, sheet-reversing appliances for each cylinder, and delivery devices for each cylinder, substantially as described.

2. In a printing-machine, the combination of a reciprocating type-bed, two oscillating impression-cylinders, means at the outer side of each cylinder for feeding the sheets, sheet-reversing appliances at the inner side of each cylinder, and delivery devices for each cylinder, substantially as described.

3. In a printing-machine, the combination of a reciprocating type-bed, two oscillating impression-cylinders, means at the outer side of each cylinder for feeding the cylinders, reversing appliances for each cylinder, and delivery devices at the outer side of each cylinder, substantially as described.

4. In a printing-machine, the combination of a reciprocating type-bed, two oscillating impression-cylinders, means at the outer side of each cylinder for feeding the sheets, sheet-reversing appliances at the inner side of each cylinder, and delivery devices at the outer side of each cylinder, substantially as described.

5. In a printing-machine, the combination of a reciprocating type-bed, two oscillating impression-cylinders, means at the outer side of each cylinder for feeding the sheets, sheet-reversing appliances at the inner side of each cylinder, and delivery-cylinders at the upper and outer side of each cylinder, substantially as described.

6. In a printing-machine, the combination of a reciprocating type-bed, two oscillating impression-cylinders, means for feeding sheets to each cylinder, reversing appliances at the inner side of each cylinder, and delivery devices for each cylinder, substantially as described.

7. In a printing-machine, the combination

of a reciprocating type-bed, two oscillating impression-cylinders, means for feeding sheets to each cylinder, reversing appliances at the inner side of each cylinder, and delivery devices at the outer side of each cylinder, substantially as described.

Signed at New York, in the county of New York and State of New York, this 13th day of February, A. D. 1891.

WALTER SCOTT.

Witnesses:
F. GOODWIN,
R. W. BARKLEY.