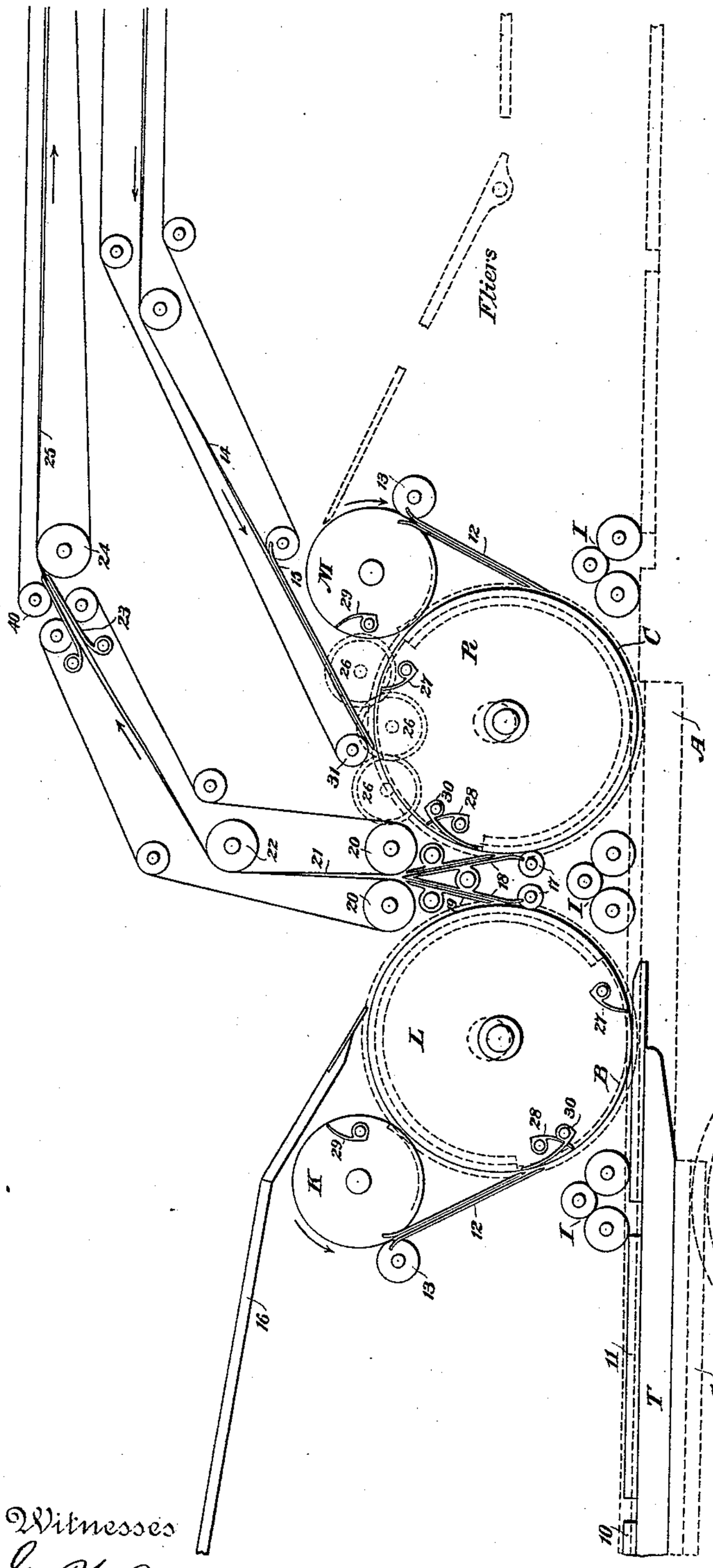
(No Model.)

W. SCOTT.

PRINTING MACHINE.

No. 488,637. Patented Dec. 27, 1892.



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UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 488,637, dated December 27, 1892.

Application filed February 10, 1891. Serial No. 380,889. (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 a certain new and useful Improvement in Printing-Machines, of which the following is a specification.

My invention relates to printing presses wherein the impression is taken between a flat bed carrying the form, and an impression cylinder.

My invention has for its objects: first, to print four copies for each double stroke of the bed, there being two sheets, two copies on each sheet, each sheet being in one length, to deliver the perfected sheets and to separate the copies. Second, to print on one side of sheets, two sheets taking an impression for one stroke of the bed, and to deliver the sheets. I attain these objects by the mechanism shown in the accompanying drawing, forming a part of this specification, which shows a side view of my invention.

In the preferred form of my invention, and to carry out the first of the above objects, I employ a reciprocating type bed with "outside" and "inside" forms thereon, two oscillating impression cylinders each geared to the type bed, a reversing cylinder for each impression cylinder at the outer side or half thereof, delivery devices for each impression cylinder at the inner side or half thereof, and feeding appliances above each impression cylinder.

The type bed T is reciprocated by the rolling gear D which engages racks G, H; this gear D is driven by rod E and crank and other devices suitable for that purpose, as for instance the crank and gear, driving pinion belt and pulley as in a prior application of mine.

The impression cylinders L, R, are geared by the wheels B, C, respectively to the racks A on the type bed. The sheet-reversing cylinder M has a rotary motion only, which may be given it by any suitable means; for instance, such as set forth in my Letters-Patent No. 456,741, granted July 28, 1891. The reversing cylinder K also has a rotary motion given it by similar means. The surface speeds of cylinders M, K, and L, R, are the same. Rollers or cylinders 13 and guides 12 in conjunction with each reversing-cylinder return the sheets to the corresponding impression cylinder.

Inking rollers I, I, I, supply ink to the forms 10, 11 on the bed. The usual ink tables, fountains and rollers may be placed at the right and left hand sides.

The feed of the sheets may be in any desired way, as from a feed board, as 16, and gages, or by tapes, as 14, and guides, as 15, from cutting cylinders, and a roll of paper. I employ grippers 27 on each cylinder to take the leading edge of the sheet from the feed devices, and grippers 28 on each cylinder to take the leading edge of the sheet from the guides 12 after the sheets have been reversed. The rollers or cylinders 13 and the reversing cylinders control and feed the sheet to the guides 12. Of course, equivalent devices can be used to reverse and return the sheet to the impression cylinders.

To deliver the sheets, I preferably employ the following devices: There is a friction cylinder or roller 17, throw-offs 30, and guides 18—19 to each impression cylinder. The guides 18, 19 from each cylinder preferably converge at their upper ends, and deliver the sheets to one set of tapes, as 21, between tape carriers 20. These tapes 21 conduct the sheets around a cylinder or other tape carrier 22 between guides 23, and other tapes 25. The tapes 25 make a bend about the cylinder or other tape carrier 24, for a purpose hereinafter described. The grippers of the impression, and reversing cylinders, the throw-offs, and the tapes may be operated by means usually employed for that purpose.

Taking the devices in the positions shown, their operation is as follows:—As the bed moves to the right, the impression cylinders move in a direction contrary to the hands of a watch. After a short movement, the grippers 28 of the cylinder L grasp the sheet coming from the corresponding guides 12 (since in practice there would be a sheet there, for the purpose of preventing an impression

being taken on the cylinder L, and subsequent "set off" on the paper). Shortly after, the grippers 27 of the cylinder R grasp the sheet coming from the tapes 14 and guides 15. Both cylinders will next take impressions from the form in succession, and then to deliver the sheets, cylinder L to the delivery devices, the cylinder R, at a later time, to the reversing cylinder M. Following each sheet separately in their order of time, the cylinder L (its grippers 28 opening at the right time) its throw-offs and the corresponding friction cylinder 17 direct and feed the sheet into the guides 18, 19, which again direct it into the tapes 21. The tapes 21 run the sheet along through the guides 23 to the tapes 25. Cylinder L begins to deliver its sheet before cylinder R begins to take an impression on its sheet; and by the time cylinder R begins to deliver to the reversing cylinder M, the sheet from cylinder L has its leading edge beyond the tape-carrier 22. The grippers 27 of cylinder R take the sheet as described, and just before the cylinder has made a complete revolution from the position shown, the grippers 29 of the cylinder M grasp, and the grippers 27 loose, the sheet. Cylinder R continues to turn until the type bed is in its extreme right hand position, at which time, the grippers 28 of cylinder R will be in a position analogous to that shown for grippers 28 on cylinder L: that is, ready to grasp the sheet from the guides 12, the reversing cylinder and cylinder 13 having fed the sheet down, the grippers 29 having opened at the proper time to permit such feed. When the bed is in its extreme right hand position, the grippers 27 of cylinder L are to the left of the point of the feed board as much as the grippers 27 of cylinder R are shown to the right of the point of the guides 15. It is therefore apparent that, in the machine shown, the cylinders R and L make about a turn and a half to a stroke of the type bed in either direction. These proportions can be varied to suit a particular case without departing from my invention. On the reverse stroke of the bed, the parts operate in the following order:—grippers 28 of cylinder R take the sheet from the guides 12; grippers 27 of cylinder L take a fresh sheet from the board 16; cylinder R begins to take an impression, and then to deliver by means of its throw-offs and cylinder 17; cylinder L begins to take an impression, and subsequently to deliver the sheet to reversing cylinder K the grippers 27, 29, being appropriately operated; cylinders K and 13 (grippers 29 opening) run the sheet down guides 12; the parts assume the positions shown. The tapes 21 feed the sheet along as soon as they reach them.

The paper to be printed upon may be cut into lengths suitable for two complete copies in any suitable way. If the feed is from a roll, the paper may be cut suitably, as by cutting cylinders, into the proper lengths. After being printed upon both sides, it is necessary to separate the two copies, or to make two signatures. The signatures may be partly severed, before the printing takes place, by suitable means, and completely severed after the printing. This separation may be caused by pulling, as the paper is run into the tapes 25. The tapes 25 being run at a higher speed than tapes 21 and being bent about carriers 24, they get a good grip on the sheet, the rear end of which is gripped over the carriers 22. There is thus a good grip and pull at each end, and the copies are separated. Or the tape-carriers 24 and 40 may be replaced by cutting cylinders which will separate the copies, and suitable tapes, or other means may be used to deliver from the cutting cylinders.

By means of suitable cams for operating the grippers thereof, the cylinders K, M, may deliver the sheets to suitable fliers or other delivery means at a point above the cylinders 13. In this case, the sheets would be printed upon but one side, and could have an "inside" and an "outside," or two "insides," or two "outsides," printed thereon, as might be desired. Cylinder L can be lifted as the bed moves to the right and cylinder R as the bed moves to the left in the figure, shown by the broken line circles which indicate the positions of the shafts of cylinders L, R, so, as not to take an impression from the forms to avoid "set off," on the other stroke of the bed, by any suitable means well known for that purpose, as, for instance, the means shown in my patent, No. 425,710, dated April 15, 1890; or the guides 12 can be replaced by feed devices and sheets (printed on one side or not) can be fed to the cylinders L, R, and be delivered to the tapes 21, thus printing with each cylinder for each stroke of the bed. I thus attain the second object of my invention.

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 carrying two forms (an inner and an outer), two oscillating impression cylinders which take impressions in both directions of their movement, feeding devices to each cylinder, and delivery means common to the two cylinders, substantially as described.

2. In a printing machine, the combination of a reciprocating type bed, two oscillating impression cylinders, sheet-feeding devices above each cylinder, sheet-reversing apparatus at the outer half of each cylinder, sheet-delivery means at the inner side of each cylinder, converging guides and tapes for receiving and feeding the delivered sheet, substantially as and for the purpose described.

3. In a printing machine, the combination of a reciprocating type bed, two oscillating impression cylinders, sheet-feeding devices

above each cylinder, sheet-reversing apparatus at the outer side of each cylinder, throw-offs on each cylinder and a friction cylinder at the inner side of each cylinder, for delivering the sheets, and converging guides and tapes for receiving and feeding the sheets, substantially as and for the purpose described.

Signed at New York, in the county of New York and State of New York, this 9th day of February, A. D. 1891.

WALTER SCOTT.

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