(No Model.)

# J. T. HAWKINS.

## SHEET DELIVERY FOR OSCILLATING CYLINDER PRINTING MACHINES.

No. 326,216. Patented Sept. 15, 1885.

Fig. 2.

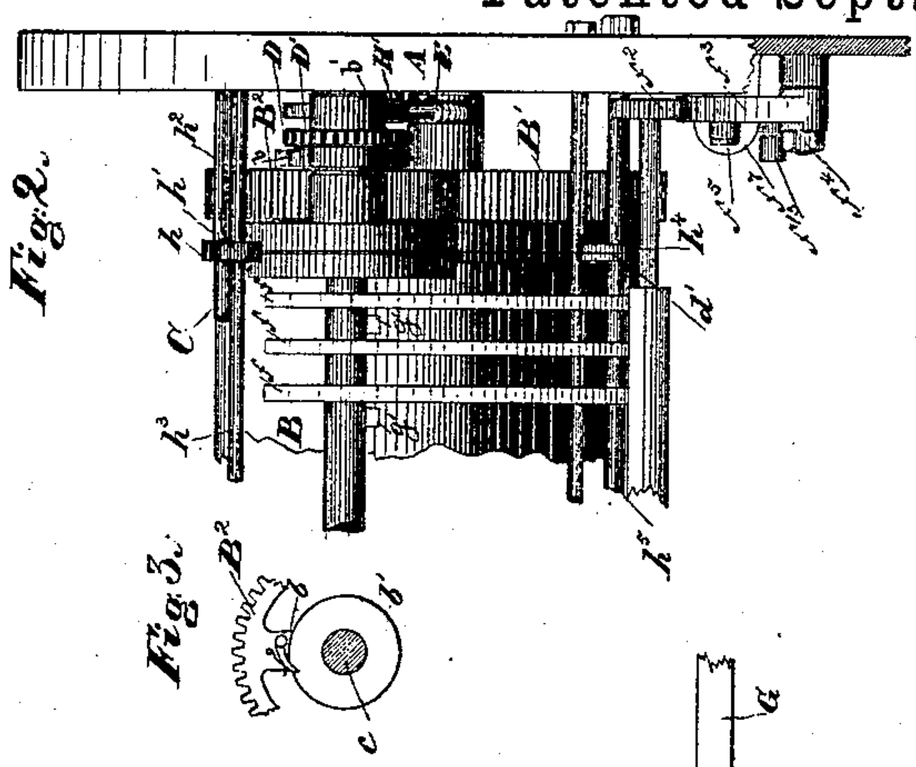
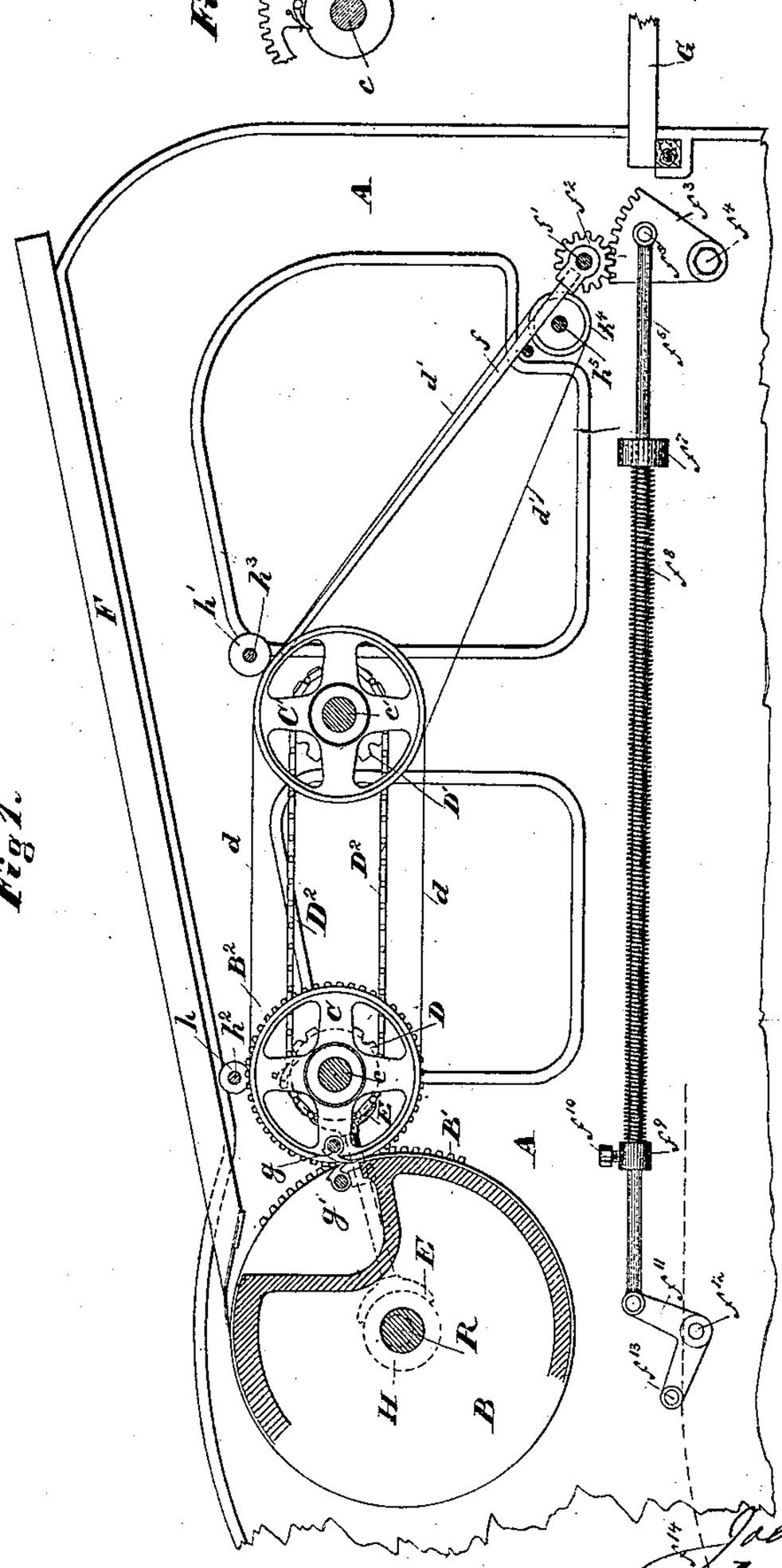


Fig. 3.



Fig. 1.



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# UNITED STATES PATENT OFFICE.

JOHN T. HAWKINS, OF TAUNTON, MASSACHUSETTS.

## SHEET-DELIVERY FOR OSCILLATING-CYLINDER PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 326,216, dated September 15, 1885.

Application filed June 4, 1884. (No model.) Patented in England March 17, 1885, No. 3,460.

*To all whom it may concern:*

Be it known that I, JOHN T. HAWKINS, of Taunton, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Sheet-Deliveries for Oscillating-Cylinder Printing-Machines, which improvements or invention are fully set forth and illustrated in the following specification and accompanying drawings.

Since the filing of this application the necessary steps have been taken to patent this invention in England, and a certificate of the filing of a complete specification of said invention has been issued from the British Patent Office, bearing the number 3,460, and dated March 17, 1885.

The object of this invention is to adapt a well-known method of sheet-delivery employed in cylinder-presses whose cylinders rotate continuously and in which the sheet is delivered at the back of the press under the feed-board to a cylinder-press whose cylinder rotates alternately in each direction.

The invention consists of the parts hereinafter particularly described, as set forth in the claims.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of certain parts of an oscillating-cylinder press which embodies this invention. Fig. 2 is a rear elevation of a portion of one side of the same, the feed-board being removed. Fig. 3 shows in detail a portion of the gearing meshing with the impression-cylinder and a single-toothed ratchet and pawl for rotating the delivery cylinder or cylinders.

In said drawings the several parts are respectively indicated by letters as follows:

A is a part of one of the main frames; B, the impression-cylinder, which is rotated in each direction by being geared to a rack upon the reciprocating bed, (not shown,) and which latter may be actuated in any of the well-known ways.

F is the feed-board.

C is the delivery cylinder or series of short cylinders, preferably the latter, as shown, secured to a shaft, *c*, journaled in frames A, and carrying grippers *g*. The impression-cylinder B also carries the usual grippers, *g'*. The method of operating either of these series of grippers being well known is not shown, as not essential to the invention.

C' is another delivery cylinder or series of short cylinders secured to a shaft, *c'*, also journaled in frames A. A series of tapes or cords, *d*, run upon the two cylinders or series of short cylinders C C'.

Secured to the shafts *c* and *c'* are sprocket-wheels D and D'. Engaging the sprocket-wheels D and D' is an endless chain, $D^2$.

Secured to the impression-cylinder B is the gear-wheel B', gearing, as before explained, with the rack upon the reciprocating bed, which is not shown.

Running loosely upon the shaft *c* is a gear-wheel, $B^2$, carrying a ratchet-pawl, *b*, and secured to the shaft *c* is a ratchet, *b'*, having one tooth or notch only, as shown. The diameters of the gears B' and $B^2$ are so proportioned that whatever may be the number of revolutions or fraction of a revolution the cylinder B may make in one direction the gear-wheel $B^2$ will make an exact number of turns in each direction without the fractional part of a revolution, so that the pawl *b* shall return to drop exactly into the single notch of the ratchet *b'* at the point of reversal, and therefore said wheel can commence its rotation without shock. The ratchet *b'* having but one tooth the grippers *g* and *g'* will always arrive similarly juxtaposited at the nearest point of contact of the cylinders B and C.

Two series of pressure-pulleys, *h h'*, for holding the sheet in contact with the cylinders or series of cylinders C and C', respectively, are secured to the shafts $h^2$ and $h^3$, journaled in the frames A. A series of tape or cord pulleys, $h^4$, are secured upon a shaft, $h^5$, journaled in frames A. A series of tapes or cords, *d'*, run upon the cylinder or cylinders C' and the tape or cord pulleys $h^4$.

The shoo-fly fingers *f* oscillate upon a shaft, *f'*, operated in any of the well-known ways. In the machine of which the accompanying drawings show a part, in which the cylinder B rotates freely upon an eccentrical rock-shaft for an axis, the fly *f* is preferably operated through a sector, $f^3$, engaging a pinion, $f^2$, upon the shaft *f'*, and oscillating upon a stud, $f^4$, secured to the frames A. Said sector is operated by an inclined surface upon the recip-

rocating type-bed (indicated by the dotted line $f^{14}$) engaging a roller, $f^{13}$, carried on an arm of a bell-crank, $f^{11}$, oscillating upon a stud, $f^{12}$, secured to the frames A, and by the connecting-rod $f^6$ and spring $f^8$. The stop $f^7$ projects from the frames A, and the collar $f^9$ is adjustably secured to the connecting-rod $f^6$ by a set-screw, $f^{10}$. The spring $f^8$ will therefore force the sector $f^3$ in one direction, and the incline $f^{14}$ compress the spring and force the sector in the opposite direction.

E is a brake partly encircling a hub, H, upon the eccentrical rock-shaft R, upon which the cylinder B runs, and similarly engaging a hub, H′, upon the shaft *c*. The action of the eccentrical rock-shaft R, as operated to raise and lower the impression-cylinder B, operates to clamp the brake E against the hub H′ on shaft *c* at the proper time to absorb its momentum and bring it to rest at said time, thus preventing the shaft *c* from overrunning the position at which the pawl *b* will drop exactly into its notch in the ratchet *b*′. Said pawl will therefore commence to move said ratchet, and with it the cylinder C, without shock at its next rotation.

As shown, in this construction the two cylinders or series of cylinders C and C′ are used (instead of the series of cylinders C only) in order to adapt this method of delivery to an oscillating cylinder taking the sheet at the top and having a diameter too small to permit the fly *f* to have a radius or sweep sufficient to clear the under side of the feed-board F. It is evident that such would be the case if the sheet were taken directly from the delivery cylinder or series of cylinders C. Whenever the cylinder B is of sufficient diameter to carry the feed-board F high enough, the cylinder or series of cylinders C′, and their shafts *c*′ and sprocket-wheels D D′, chain $D^2$, and tapes or cords *d* may be dispensed with, and the fly *f* be placed to receive the sheet direct from the cylinder or series of cylinders C.

The operation of the mechanism as shown and described is as follows: The sheet, being held after printing by the grippers *g*′, is taken from them at their common point of meeting by the grippers *g*, (the gear-wheel $B^2$ being rotated by the gear-wheel B′, and the pawl *b* rotating the shaft *c* and its cylinder or series of cylinders C, carrying the grippers *g*.) The sheet is thus carried upward over the cylinder or series of cylinders C to and upon the tapes or cords *d* until the end of the motion in the printing direction of the cylinder B has been reached. Upon the commencement of the retrograde rotation of the cylinder B, and during the whole of said rotation, the cylinder or series of cylinders C C′, tapes or cords *d*, and tapes or cords *d*′, and consequently the sheet, now lying face downward upon the tapes or cords *d*, remain at rest. At the commencement of another forward or printing rotation of cylinder B the pawl *b* engages the single notch of the ratchet *b*′ and causes the cylinders or series of cylinders C C′ again to rotate in the same direction as at first, causing the sheet lying upon the tapes or cords *d* to pass under the pressure-pulleys *h*′ and down in front of the fly-fingers *f*. Upon its arrival at the proper place upon the fly-fingers *f* the latter are operated to carry the sheet over and deposit it upon the fly-table or receiving-board G in the usual way, or by means of the mechanism already described. In the mean time the succeeding sheet has been brought to lie upon the tapes or strings *d*. Thus, while the impression-cylinder rotates alternately in each direction the cylinders or series of cylinders C C′ rotate in one direction only and remain at rest during the retrograde rotation of the impression-cylinder B.

I do not confine myself to the method herein shown of operating the fly-fingers *f* or the brake E, the latter being applicable only to that variety of cylinder-press in which the cylinder B rotates freely upon an eccentrical rock-shaft. The fly-fingers *f* and the brake E may each be operated in many well-known ways.

Having thus fully described my said improvements as of my invention, I claim—

1. In an oscillating-cylinder printing-press, the combination, with an impression-cylinder, as B, of a gear-wheel, as B′, rotating with said cylinder, a delivery cylinder or series of cylinders, as C, carrying grippers, as *g*, and intermittently actuated by means of a gear-wheel, as $B^2$, meshing with said gear-wheel B′, and running freely upon the shaft of said delivery cylinder or series of cylinders, and carrying a pawl engaging a single-toothed ratchet secured to the shaft of said delivery cylinder or series of cylinders, substantially as and for the purposes set forth.

2. In a cylinder printing-press, in combination with an oscillating impression-cylinder, as B, and an intermittently-actuated delivery mechanism substantially as described, an automatic brake, as E, actuated from any suitable moving part of the machine, whereby the momentum of the delivery mechanism is absorbed and the same brought to rest simultaneously with the arrest of the impression-cylinder, substantially as and for the purposes set forth.

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