

C. D. Wrightington.

Printing Press.

N^o 107,583.

Patented Sept. 20, 1870.

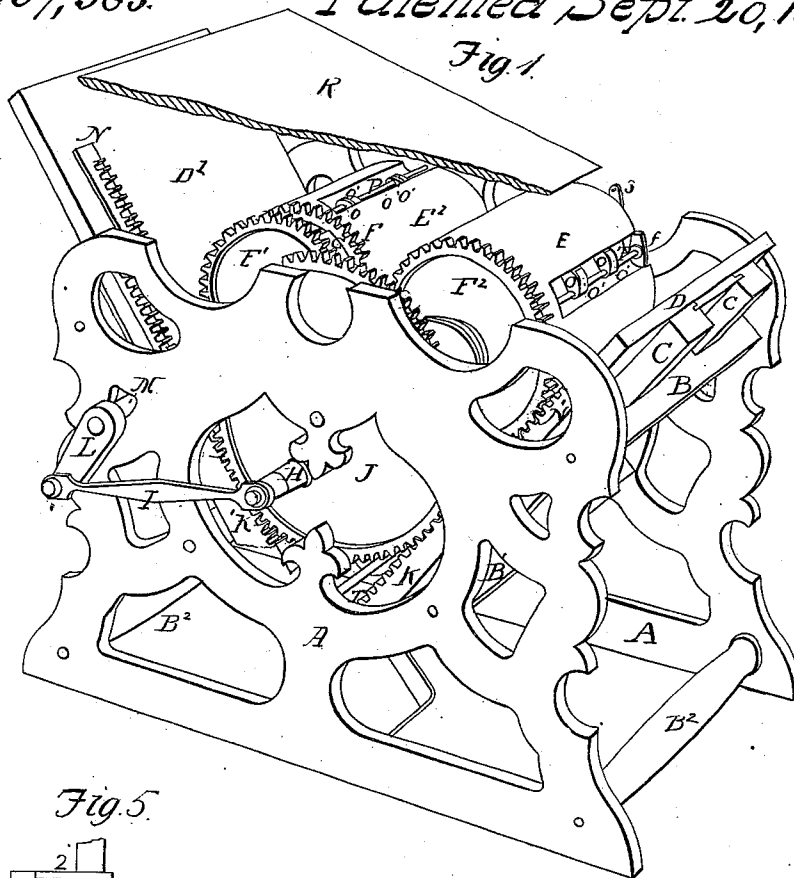


Fig 5.

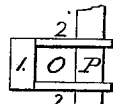


Fig 4.

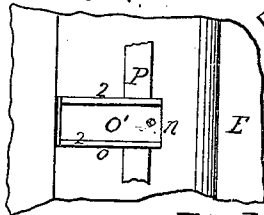


Fig 3.

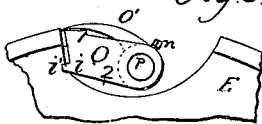
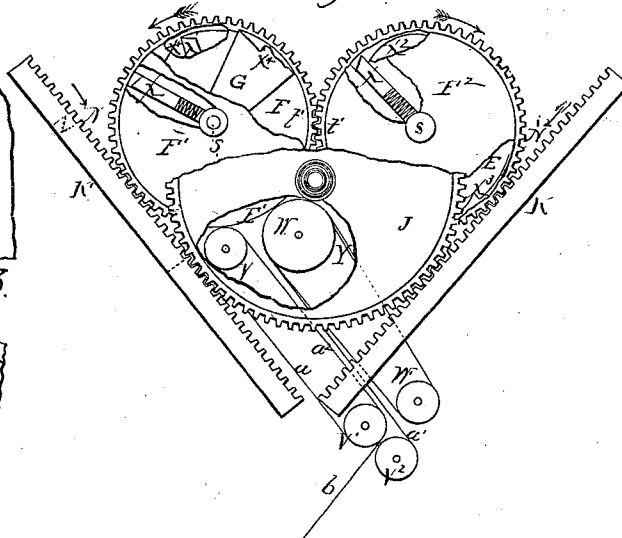


Fig 2.



Witnesses:

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Letters Patent No. 107,583, dated September 20, 1870.

IMPROVEMENT IN PRINTING-PRESSES.

The Schedule referred to in these Letters Patent and making part of the same.

I, CHARLES D. WRIGHTINGTON, of Fairhaven, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Printing-Machines or Presses, of which the following is a specification.

The first part of my invention relates to the combination of two rotating cylinders and two reciprocating type-beds, combined and embraced in the same machine in such a manner that a sheet of paper, or other material, may be printed upon both sides at one passage through the machine.

The type for printing on one side of the paper is placed upon one of the reciprocating beds, said bed receiving an impression from one of the rotating cylinders; and the type for printing upon the other side of the paper is placed on the second bed, the impression being given by the second cylinder; the object of this part of my invention being to construct a printing-machine in which either type or stereotype may be used, said machine not being confined to the use of stereotype or cast-metal plates or forms, which must be constructed specially for the machine; the machine embodied in my invention being so constructed as to allow the use of either type or stereotype, also any or all of the fixtures in general use, and not being confined to specially constructed fixtures, thereby obtaining a printing-machine plain and simple in its construction and operation, so that any person skilled in the art will readily comprehend and operate the same.

The second part of my invention relates to the combination of an oscillating toothed wheel, and two reciprocating beds, by means of two racks, the teeth of said racks meshing into the teeth of the aforesaid oscillating wheel, one of said racks being attached to each of aforesaid beds in such a manner that the oscillation of the said wheel shall cause the said beds to have a reciprocating motion.

In large machines it may be necessary to use a second oscillating wheel, and its two racks, upon the opposite side of the machine, for the purpose of securing greater steadiness and ease of motion to the machine.

This part of my invention further relates to the combination of said oscillating wheel, a revolving crank, and a pitman or connecting-rod, for the purpose of transmitting the motion from said crank to the aforesaid oscillating wheel, thereby causing said wheel to oscillate or vibrate, said wheel, in turn, imparting its motion to the aforesaid beds, causing them to have a reciprocating movement.

The third part of my invention relates to the combination of two rotating cylinders and two reciprocating beds in such a manner that the weight of one of the said beds shall counterbalance the weight of the other said bed, the said beds being in an inclined or vertical position.

The fourth part of my invention relates to the combination of the rotating cylinder, (or corresponding part in any printing-machine or press,) which gives the second impression, or causes the second side of the paper to be printed upon, and an endless revolving or traveling apron or blanket, composed of any suitable material, the surface of which shall press or rub against the surface of the aforesaid cylinder in such a manner that the said apron shall, by means of its contact with the aforesaid cylinder, absorb or wipe off from the surface of said cylinder (or corresponding part in any printing-machine or press) all ink that may be offset upon said cylinder, from the side of the paper that was first printed, while the second side is being printed.

I do not wish to confine myself to the endless apron alone; rotating rollers may be used instead.

The fifth part of my invention relates to the combination of the nippers or fingers that grasp the paper and confine it to the cylinders, and cushion or pad-holder, and the rod or shaft that operates the nippers, in such a manner that, when the aforesaid nippers are moved along the rod or shaft, the cushion or pad-holder shall be moved at the same time by one and the same operation, thereby rendering it very easy and convenient to adjust the nippers and cushion-holders upon both of the aforesaid cylinders.

Having explained the nature and objects of my invention, I will now give a general description of the machine, and the operation of its several parts, by referring to the accompanying drawing, the same letters and figures referring to the same parts in each figure of the drawing.

Figure 1 is a perspective view of the machine embodying my invention, part of the feed-board represented as broken away to show parts beneath it.

Figure 2 is a side elevation, showing those parts that operate the rotating cylinders and reciprocating beds, also seen in fig. 1, and designated by the letters J K K', F F' F²; also, the endless apron, for removing the offset ink from the aforesaid cylinder; also, the delivering-tapes and pulleys.

Figure 3 is an end elevation of that part of one of the cylinders which holds the nippers that grasp the paper and confine it to said cylinders, the cushion or pad-holders, and the rod or shaft that operates the nippers; said nippers are also seen at the top of the cylinders in fig. 1.

Figure 4 is a plan of the same.

Figure 5 is a plan of the cushion or pad-holder, the nipper being taken away.

A A, fig. 1, are two side frames, which should be substantially constructed to support and resist the strain and vibrations of the operating parts.

B B¹ B² B³ are the cross-ties or girts which connect

the side frames A A together, and also support the ways or tracks C C, in which the type-beds D D' slide, also forming part of the frame of the machine.

M is the driving-shaft, which is rotated by any suitable device.

L is a crank, which receives its motion from the shaft M.

I is a pitman or connecting-rod, which transmits the motion from the crank L to the wheel J.

The wheel J has an arm or wrist-pin, H, attached to it, to which the connecting-rod I is secured.

J is an oscillating wheel or gear, (also shown in fig. 2,) which is caused to oscillate or vibrate by the rotation of the crank L.

The wheel J has teeth or cogs on its perimeter, said teeth engaging with the teeth of the racks K K', said racks being secured to the type-beds D D', the wheel J being caused to oscillate by the crank L, and pitman I imparts its motion to the racks K K', and to the type-beds D D', causing them to have a reciprocating movement in alternate directions, one of the beds going up and the other coming down, and *vice versa*, thereby causing the beds D D' to travel back and forth under the impression-cylinders E E'.

N N' are toothed racks, which are secured to the type-beds D D', and are caused to reciprocate by said beds. The racks N N' are immediately behind and in the same plane of the racks K K', fig. 2.

The racks N N' engage with the teeth on the perimeters of the wheels F¹ F², and impart an oscillating motion to the said wheels F¹ F², causing each to make one-half of a revolution. Said wheels F¹ F² rotate loosely on the shafts s s, fig. 2, of the impression-cylinders E E'.

The wheel F² on the shaft s of the cylinder E also engages with the wheel F¹ on the shaft s of the cylinder E', and imparts an oscillating movement to the said wheel F¹, which rotates loosely on the shaft s.

D D' are two type-beds, upon which the type or forms to be printed from are secured, and which pass back and forth under the impression-cylinders E E'. Said beds D D' are connected with each other by the wheel J, from which the said beds derive their motion; and by which it will be seen that the weight of one of the beds counterbalances the weight of the other bed, thereby causing the aforesaid beds to move up or down with the same ease and without jar.

E E' are two impression-cylinders, upon which the paper to be printed is placed.

The cylinder E gives the impression which prints the first side of the paper, and E' the cylinder which gives the impression for printing the second side of the paper.

As the type-beds D D' move downward and under the cylinders E E', the said cylinders rotate in the same direction, and carry the paper between the surface of said cylinders and the face of the type, and causes the paper to receive the ink from the type.

I will now describe the manner in which the impression-cylinders E E' are rotated by referring to fig. 2 of the drawing.

The oscillating wheel J receives its motion from the crank L, fig. 1, and imparts a reciprocating movement to the racks K K' and beds D D'; they, in turn, imparting the same movement to the racks N N', said racks causing the wheels F¹ F² to oscillate one-half of a revolution, and the wheel F² causing the wheel F¹ to perform one-half of a revolution at each movement of the wheel J.

As the bed D passes down in direction of the arrow, under the cylinder E, the rack N' being secured to the bed D, causes the wheel F² to rotate one-half of a revolution in the direction of the arrow, which carries the cylinder E in the same direction by means of the spring catch or latch X, in the wheel F², engaging with and pushing against the projection X², which is secured to the cylinder E; also, the wheel F² at the

same time causes the wheel F to make one-half of a revolution, said wheel F causing the second cylinder E' to make one-half of a revolution, by means of the spring latch X of the wheel F engaging with and pushing against the projection X¹ of the cylinder E', the cylinder E then remaining stationary until the next downward movement of the bed D, by which it will be seen that the cylinder E has an intermittent motion.

When the bed D commences its upward movement the motion of the rack N¹, the wheel F², wheel F, is reversed. When the wheel F² has performed one-half of a revolution in this direction the latch X engages with the projection X² of the cylinder E, and is then ready to give the said cylinder another half of a revolution, as the bed D moves downward in the direction of the arrow again.

The bed D', being connected with the bed D by means of the wheel J, performs a downward movement while the bed D is moving upward.

The rack N, being carried down by the bed D', imparts its motion to the wheel F¹, causing said wheel to perform one-half of a revolution in direction of the arrow. The wheel F¹, by means of the latch X, engaging with and pushing against the projection X¹ of the cylinder E', causes the said cylinder E' to make one-half of a revolution.

It will be seen by the above that the first half revolution of the cylinder E' is derived from the downward movement of the bed D by means of the rack N', the wheel F², and the wheel F.

The cylinder E', therefore, has a continuous rotation, one-half of the rotation being derived from the bed D, and the second half rotation from the bed D'.

R, fig. 1, is the feed-board, from which the paper is fed to the cylinder E of the machine.

O' O' O' O' are the nippers which grasp the sheet and confine it to the cylinders while it is being printed upon.

O O O O are the cushion or pad-holders, an elevation of the same being shown at fig. 3, and a plan of the same at fig. 4, and detached plan of the cushion-holder at fig. 5.

The nipper O', in figs. 3 and 4, is constructed similar to those in general use.

Said nippers require to be moved back and forth along the shaft P, for the purpose of accommodating various sizes of paper.

In all machines heretofore constructed, the nippers O' O' O' O' are secured to the shafts P P, and the cushion or pad-holders O O O O secured to a second or supplementary shaft, thereby causing greater complexity, both of construction and operation, said nippers and cushion-holders being entirely independent of each other.

In order to adjust any one of said nippers and its cushion-holder, two separate operations are required, thereby causing trouble and a loss of time to set the nipper, so that it shall strike the cushion in the proper place.

In my invention it will be seen that, by loosening the set-screw n, figs. 3 and 4, both nipper and cushion-holder are moved along the shaft P by one and the same movement, thereby allowing them to be adjusted with ease and facility.

O, figs. 3 and 5, is the cushion-holder, of which 1 is the cushion.

i is a projection or tongue on the outer end of said cushion-holder, said tongue i fitting into and sliding in the groove i' of the cylinder E.

I do not confine myself to the precise arrangement of the nipper and cushion-holder, as shown by the drawing. The object of my invention is the combination of the nipper and its cushion-holder in such a manner that the operation of either will control the operation of the other.

Fig. 5 is a plan of the cushion-holder, showing the manner of its construction, 1 being the cushion, which is made of any suitable elastic material.

2 2 are metal wings or plates, which form a part of the body of the said holder, also through which the shaft P passes.

The nipper O', figs. 3 and 4, is secured between the wings or plates 2 2 of the holder O. Said holder requires no other fastening, it being confined to its place by the nipper, which is secured by the set-screw n. By moving the nipper the holder is also moved.

As has been shown in the foregoing description, the cylinder E has an intermittent rotation. Said cylinder is, therefore, provided with two sets of nippers, one set, O' O', seen in fig. 1. The other set is directly opposite, upon the under side of said cylinder E, (not shown in the drawing,) each set of aforesaid nippers grasping a sheet of paper alternately.

As has also been shown in the foregoing description, the cylinder E' has a continuous rotation, and is, therefore, provided with but one set of nippers, seen at the top of cylinder E', fig. 1. Said nippers grasp the sheet of paper and take it from the cylinder E.

Fig. 1, f is a tumbler, which turns the nipper-shaft P. Each nipper-shaft is provided with a similar one.

S is a pin which the tumbler f strikes against, said tumbler turning over, and thereby closing the nippers. There is a similar pin at the point where the nippers are opened, to release the paper, (and not shown in the drawing.) The cylinder E' is also provided with similar pins S.

The above manner of operating the nippers is a device commonly used, and which I do not claim as part of my invention.

V V¹ V², fig. 2, are the pulleys upon which the delivering-tapes run.

a a' a'' are the delivering-tapes, which may be extended any desired distance by means of pulleys.

W W' are cylinders or rollers upon which the endless apron or belt Y revolves.

Said apron is pressed against the cylinder E' by the roller W.

The roller W may be also used without and independent of the aforesaid apron Y.

Having described each part of my invention, and its operation separately, I will now describe the operation of the machine complete, and as a whole.

The paper to be printed is placed at the forward end of the feed-board R. It also projects over the cylinder E.

The machine is then put in motion by rotating the shaft M, by which the crank L is also caused to rotate, and, through the pitman or connecting-rod I, causes the wheel J to oscillate. The said wheel J imparts a reciprocating movement to the type-beds D D'.

As the bed D begins to descend, the wheel F² begins to rotate. The spring-latch X of said wheel engages with the projection X² of the cylinder E, and causes said cylinder to rotate. The tumbler f comes in contact with the pin S, and closes the nippers O' O' upon the paper on the feed-board R.

The cylinder E makes one-half of a revolution, and carries the forward edge of the paper nearly to the type on the bed D, (at the same time the cylinder E' makes one-half of a revolution, by means of the wheel F² engaging with the wheel F, the latch X of the wheel F pushing against the projection X¹ of the cylinder E'.)

The cylinder E then remains stationary, while the bed D is moving upward, (the bed D' at the same time descending.) At the next downward movement of the bed D, the cylinder E makes another one-half of a revolution, (by means of the latch X of the wheel F² pushing against the second projection, X², of the cylinder E,) and carries the paper between the surface of said cylinder and the face of the type on the

bed D, and causes one side of the paper to be printed upon, (at the same time the second set of nippers of the cylinder E grasps another sheet of paper from the feed-board R.) The cylinder E then remains stationary, while the bed D again makes an upward movement, the nippers O' O', which hold the forward edge of the paper, then being at the position t, fig. 2, at which position said nippers release the paper, which is seized by the nippers of and taken onto the cylinder E'.

While the bed D is making aforesaid upward movement, the bed D' at the same time makes a downward movement, and causes the cylinder E' to make one-half of a revolution, (by means of the wheel F¹, fig. 2, latch X, and projection X¹ of the arm G, which is secured to the shaft s of the cylinder E',) carrying the nippers O' O' to the position t' opposite the position t of the cylinder E.

The bed D' then makes an upward movement, the nippers of the cylinder E' take the paper from the nippers of the cylinder E, causing the side of the paper already printed to be inside and against the surface of the cylinder E', the side of the paper not yet printed being on the outside, ready to take an impression from the type on the bed D'.

The cylinder E' then makes one-half of a revolution, (by means of the downward movement of the bed D, which causes the wheels F² and F' to rotate, and the latch X of the wheel F pushing against the projection X¹ of the cylinder E', fig. 2,) and carries the forward edge of the paper nearly to the type on bed D'.

The bed D' then makes a downward movement, and causes the cylinder E' to make another one-half of a revolution, (by means heretofore described,) and carries the paper between the surface of said cylinder and the face of the type on the bed D', thereby causing the second side of the paper to be printed.

When the cylinder E' carries the forward edge of the paper opposite the roller V, fig. 2, the nippers are caused to open, (by means already described,) and the paper is conveyed over said roller V, (by means of the tape a', which passes around the cylinder E' and over the rollers V V¹ V², and under the roller W, and again onto the cylinder E',) and along the tape a'', between the rollers V¹ and V², in the direction of the line b.

The paper is then finished and conveyed from the machine.

The manner of conveying the paper through the machine and the arrangement of the delivering-tapes are common devices, therefore I do not claim them as part of my invention.

Claims.

I claim as my invention—

1. The combination of two rotating or oscillating cylinders, E and E', and two alternately-reciprocating type-beds, D and D', substantially, and for the purpose hereinbefore set forth.
2. The combination of two cylinders, E and E', and two alternately-reciprocating type-beds, D and D', moving in an inclined or vertical direction, substantially, and for the purpose hereinbefore set forth.
3. The combination of two cylinders, E and E', and two beds, D and D', in such a manner that the beds D and D' shall counterbalance each other, substantially, and for the purpose hereinbefore set forth.
4. The combination of two cylinders, E and E', and two alternately-reciprocating type-beds, D and D', in such a manner that the rotation of said cylinders E and E' shall be derived from the motion of the beds D and D', substantially, and for the purpose hereinbefore set forth.
5. The combination of two cylinders, E and E', wheels F F¹ F², the spring-latches X X X, and the

projections $X^1 X^2 X^3 X^4$ of the cylinders E and E', and the arm G and the shaft S, the two racks N and N', and the beds D and D', substantially, and for the purpose hereinbefore set forth.

6. The combination of two type-beds, D and D', the racks K and K', and the oscillating or vibrating wheel or segment J, substantially, and for the purpose hereinbefore set forth.

7. The endless apron Y, in a printing-machine, when used for carrying away the ink which may be offset upon the surface of the second impression-cylinder, E', and the rollers W and W', and cylinder E', substantially, and for the purpose hereinbefore set forth.

8. The combination of the nippers O' O' O' O', the cushion-holders O O O O, the shafts P P, the tongue i, and the cylinders E and E', substantially, and for the purpose hereinbefore set forth.

9. The combination, in a printing-machine, of the cylinder E, which first takes the paper, and two sets of nippers, substantially, and for the purpose hereinbefore set forth.

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Witnesses:

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