

(No Model.)

J. L. COX.  
PRINTING PRESS.

No. 525,137.

Patented Aug. 28, 1894.

Fig. 2.

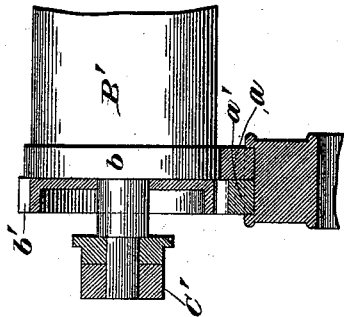
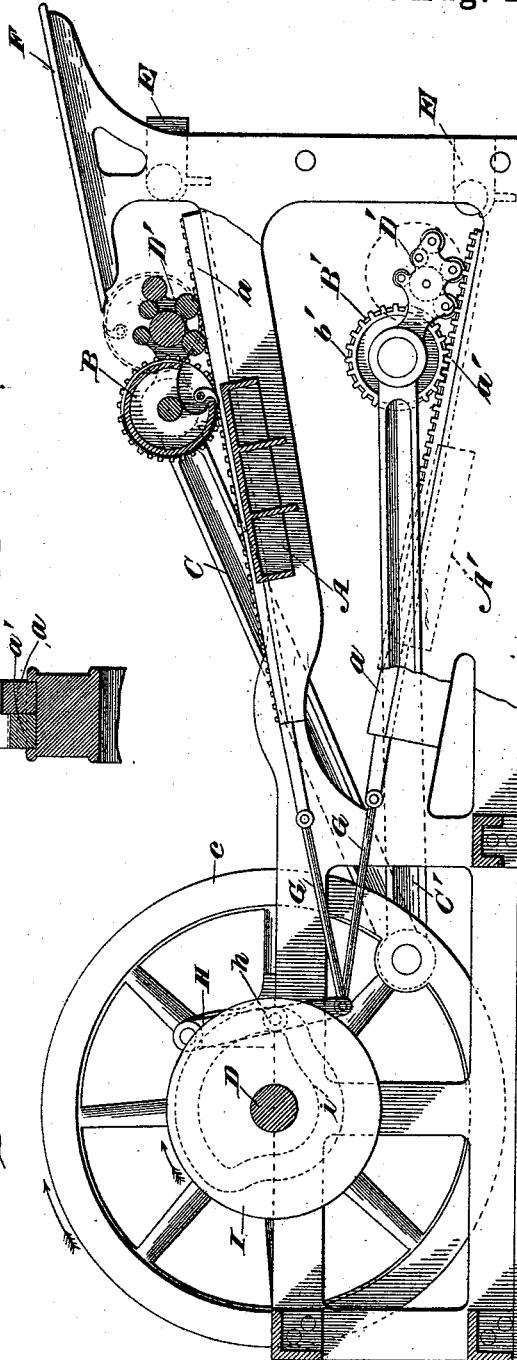


Fig. 1.



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# UNITED STATES PATENT OFFICE.

JOSEPH L. COX, OF BATTLE CREEK, MICHIGAN, ASSIGNOR TO THE DUPLEX  
PRINTING PRESS COMPANY, OF SAME PLACE.

## PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 525,137, dated August 23, 1894.

Application filed October 21, 1893. Serial No. 488,797. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH L. COX, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and  
5 useful Improvements in Printing-Presses; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked  
10 thereon, which form part of this specification.

This invention is an improvement in bed and cylinder presses, and is applicable to presses employing a movable bed and stationary cylinder, or stationary bed and traveling cylinder, and various other forms of  
15 presses, as will be apparent when the invention is clearly understood. It was designed as, and is, an improvement upon the locomotive cylinder press disclosed in my application for Letters Patent filed October 21, 1893, Serial No. 488,796, and its main object when applied to said press, or other presses, is to accelerate the speed of rotation of the gripper cylinder, or cylinders, when at the ends of  
25 the beds, so that the lateral reciprocating movement of the cylinder necessary to bring the grippers thereof to the proper desired position for taking up or delivering a sheet will be shortened; or if embodied in a stationary cylinder and movable bed press to shorten the travel of the bed by accelerating the rotation of the cylinder on its journals after the impression is taken, so as to bring the grippers into the desired position for  
30 delivering or receiving a sheet.

The object of my invention being thoroughly understood, I have illustrated in the drawings one practical application thereof to a stationary bed and traveling cylinder  
40 sheet perfecting press, but while intending to specifically cover the novel mechanical features shown in the drawings, the invention is applicable to a single acting non-perfecting press also, and the scope of the invention is co-extensive with its object, and  
45 summarized in the claims.

Referring to the accompanying drawings:—Figure 1 represents a longitudinal vertical section, and part side elevation of a perfecting stationary bed and locomotive gripper cylinder sheet press, indicating by dotted

lines the position of the cylinders after passing over the beds, and respectively in feeding and delivering position. Fig. 2 is a detail sectional view.

The upper and lower type beds A, A', are  
55 secured in the main frame one above the other, the lower one inclined upwardly, and the upper one downwardly, so that their inner ends are nearer than their outer ends. 60 The traveling locomotive gripper cylinders B, B', respectively moving over beds A, A', are operated back and forth by means of pitmen C, C', connected to a crank wheel c, on the main shaft D, said wheels and pitmen  
65 being duplicated on both sides of the machine. Suitable form inking and distributing rollers D', D', are journaled in locomotive bearings at the outer side of each cylinder, and travel therewith, being supplied  
70 with ink from fountains E, E. The upper cylinder B is supplied with paper from a feed table F, by hand or by any suitable sheet, cutting and feeding device, and presents it to the forms on the upper bed, as the cylinders are moved inward, and after being im-  
75 printed the cylinders come to rest at the inner ends of the bed, and while in this position the sheet is released by the first cylinder and gripped by the second lower cylinder, by which the sheet is reversed and presented to the forms on the lower bed and after impression surrendered to any suitable delivery mechanism.

In the machine indicated in the drawings  
85 the cylinders are alternately thrown off impression so that the upper cylinder produces an impression only when moving inward, and is off impression on its outward stroke, and the lower cylinder produces an impression only  
90 when moving outward, and is off impression when moving inward.

The gripper mechanism may be such as is described and shown in my aforesaid application or of any other desired suitable construction, and is not illustrated herein.

The cylinders have the usual bearers b, and gears b' the former running on the bed-bearers a, and the latter meshing with racks a'. In the present case the bed-bearers a and  
100 racks a', are made longitudinally movable, for a double purpose, first as a means to ac-

celerate the speed of rotation of the cylinders, and secondly as a "throw off." But any other suitable "throw off" mechanism may be employed. These bearers *a*, and racks *a'* are rigidly connected, and one, or both, tapered, on their bottoms, and rest in oppositely tapered grooves in the main frame, and consequently when the bearers are moved longitudinally they are slightly elevated or depressed by the opposing inclined surfaces, and the cylinders are accordingly lifted out of the type plane, or lowered into the type plane, and thus "thrown off" or on impression. In order to get the alternate "throw off" of the upper and lower cylinders, the racks and bearers of the lower cylinder are tapered oppositely to those of the upper cylinder. The bearers and racks are moved at the proper times, by means of pitman rods *G*, pivotally connected to the respective bearers *a*, *a'*, and to the end of a swinging lever *H* pivoted on the main frame and having a wrist pin *h*, engaging a cam groove *i*, in a cam disk *I* on shaft *c*, the cam as shown being so formed that the bearers *a*, and racks *a'* are shifted once forward and once backward for each complete reciprocation of the cylinders, (but only when the latter are clear of the forms).

In the press shown in my application above referred to and in this, the cylinders make one and one-half revolutions, in both their forward and backward movements, and the explanation of my invention in connection with the upper cylinder will suffice to make its general applicability and utility clear. Now ordinarily the cylinder or bed must move lineally a distance equal to the peripheral movement of the cylinder because it is positively controlled by the rack and gear, and must be to insure proper action and register. Thus for example suppose the cylinder to be eight inches in diameter and twenty-four inches in circumference at its periphery, to ordinarily rotate the cylinder one and one-half revolutions would necessitate a linear travel of the cylinder axis of three feet. Now by having the racks *a* longitudinally movable, and shifting said racks when the cylinder is clear of the forms obviously the periphery of the cylinder will be rotated or retarded to an extent equal to the movement of the racks.

Following out the above example supposing the upper cylinder to have just gripped a sheet lying on the feed board and commenced its inward movement, before it reaches the type bed the rack *a* is pushed forward six inches, turning the cylinder one-fourth and the reciprocal movement of the cylinder toward the bed turns it an additional one-fourth so that the sheet is properly presented to the type; the periphery of the cylinder having turned twelve inches, but the body of the cylinder only having moved lineally six inches, whereas ordinarily it would have had to move twelve inches, thus the in-

ward travel of the cylinder is shortened six inches. The lower cylinder is similarly affected in its inward movement. As shown the cylinders come to rest in position to transfer the sheet without any further acceleration of movement of their peripheries, and consequently travel thirty inches lineally, in moving inward. As they start on their outward movement the racks are moved outward six inches, thereby turning the cylinders one quarter independently of their lineal travel, substantially as described, and thus the outward linear travel of the cylinders is shortened six inches also. By doubling the cam surfaces so as to shift the racks both as the cylinders leave the beds and as they move toward them the linear travel of the cylinders can be shortened at both ends as will be apparent to any one skilled in the art. I only have described and illustrated the invention sufficiently to enable it to be thoroughly comprehended and practically applied.

While, in the example above given, and as I contemplate applying my invention,—the speed of the cylinder is accelerated when clear of the forms,—yet my invention embraces and is applicable for exactly the reverse application, to wit: for shortening or stopping the peripheral movement of the cylinder, irrespective or independently of its linear movement:—for example supposing that in the press shown when the cylinder has cleared the form bed the grippers are in the desired position, (with respect to the axis of the cylinder) that they must be when the sheet is to be fed, transferred, or delivered, and yet the point of feed, transfer, or delivery is not reached, yet is so close to the cylinder that it cannot make a complete revolution between the bed and such point, unless its speed be accelerated, in such case, instead of accelerating the rotative speed of the cylinder, the rack could be moved at a speed equal to and corresponding with the linear travel of the cylinder, and thus the cylinder be kept from rotating, while it may be (in a locomotive cylinder press) yet moving laterally or lineally. Therefore I would consider such application of my invention embraced herein. In fact the longitudinally movable cylinder rack may be so shifted by cams and levers, that the rotation of the cylinder can be accelerated, retarded or stopped, irrespective of its axial or linear movement.

The racks and bearers being tapered as shown and described and moved together, it will be obvious that when the racks are longitudinally shifted, one cylinder will be lifted and the other lowered, thus a simple "throw off" is provided, operating like that described in my aforesaid application, but I do not confine myself to tapered racks either, nor to such a "throw off" in connection with cylinder accelerating mechanism, though such specific forms are herein specifically

claimed. When the bed bearers and rack are connected and moved together, there is no friction engendered between the cylinder bearer and bed bearer when the rotatory movement of the cylinder is accelerated, retarded or stopped.

The applicability of my invention to various forms of presses will be obvious from the foregoing, and therefore I do not limit it to use with sheet perfecting locomotive cylinder presses.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent thereon, is—

15 1. The combination with a stationary bed, a traveling cylinder, and mechanism for giving it travel; of a movable rack and means, independent of the mechanism for giving the cylinder travel, for shifting the rack, whereby  
20 the rotation of the cylinder is controlled independently of its traveling movement, substantially as and for the purpose set forth.

2. The combination of a stationary type bed, a traveling cylinder, and a "throw off" mechanism; with means, operating independent of the mechanism for giving the cylinder  
25 its travel, for controlling the rotation of the cylinder while separated from the bed, substantially as described.

30 3. The combination of a type bed, a traveling cylinder and a "throw off" mechanism; with a longitudinally movable cylinder rack for controlling the rotation of the cylinder, substantially as specified.

35 4. The combination of the type bed, the traveling cylinder, and the longitudinally movable cylinder rack and bearer, and mechanism for simultaneously shifting the cylinder rack and bearer, substantially as specified.

40 5. The combination of a type bed, a cylinder, a longitudinally movable cylinder rack,

and longitudinally movable tapered bearer, substantially as specified.

6. The combination of a type bed, a cylinder, a longitudinally movable and tapered  
45 cylinder rack, and means for shifting said rack, substantially as and for the purpose specified.

7. The combination of two beds, two traveling cylinders, their driving mechanism, and  
50 a "throw off" mechanism; with longitudinally movable rack bars for controlling the rotation of the cylinders irrespective of their travel, substantially as and for the purpose specified.

8. The combination of two stationary beds,  
55 a cylinder traveling over each bed, means for simultaneously operating said cylinders, longitudinally movable cylinder rack bars, and the cam and levers for operating said  
60 rack bars, all constructed substantially as described.

9. The combination of the two oppositely inclined stationary beds, arranged one above the other, an impression cylinder for each  
65 bed, means for transferring a sheet from one cylinder to the other, crank wheels and pitmen for simultaneously reciprocating the cylinders over their respective beds, mechanism for alternately throwing said cylinders off  
70 impression respectively on the forward and backward strokes, and mechanism for accelerating the rotation of the cylinders, substantially as and for the purpose specified.

In testimony that I claim the foregoing as  
75 my own I affix my signature in presence of two witnesses.

JOSEPH L. COX.

Witnesses:

E. D. AUSTIN,

A. L. FOGG.